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# The social life of placebos: proximate and evolutionary mechanisms of biocultural interactions in Asante medical encounters

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GRADUATE SCHOOL OF ARTS AND SCIENCES

Dissertation

**THE SOCIAL LIFE OF PLACEBOS:  
PROXIMATE AND EVOLUTIONARY MECHANISMS OF BIOCULTURAL  
INTERACTIONS IN ASANTE MEDICAL ENCOUNTERS**

by

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Submitted in partial fulfillment of the  
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Doctor of Philosophy

2018



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# **THE SOCIAL LIFE OF PLACEBOS: PROXIMATE AND EVOLUTIONARY MECHANISMS OF BIOCULTURAL INTERACTIONS IN ASANTE MEDICAL ENCOUNTERS**

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## **ABSTRACT**

*The Social Life of Placebos* is an interdisciplinary study of the evolution of placeboogenic responses – beneficial ones activated by psychosocial triggers -- and their elicitation in Asante medical contexts. Based on an extensive literature review in social, cultural, and medical studies and over 26 months of intensive research in rural Ghana, West Africa, it examines the therapeutic efficacy of Asante medical encounters by analyzing rites of care-giving within an evolutionary framework. Section 1 investigates why evolutionary processes appear to have made human physiology susceptible to psychosocial manipulation, what the health consequences of that susceptibility are in modern environments, and how culturally specific expectations and healing rituals might dampen or amplify that susceptibility. Because of key transitions in human evolution, the fitness consequences of sociality have increased rapidly and created the conditions whereby endogenous mechanisms have become responsive to sociocultural conditions. This explanation helps us better understand why culturally specific rituals can elicit powerful beneficial (placebo) and adverse (nocebo) physiological responses.

Using a mixed methodology of physiological data and ethnographic case studies collected from hundreds of Asante medical encounters, Section 2 illuminates

evolutionary and proximate processes in Asante contexts of care-giving and healing rituals in detailed chapters on pain, emotion, and stress. It examines the social and cultural resources and techniques that Asante health practitioners rely on for pain management in contexts where no pain medication is available. It analyzes the biocultural interactions that can take place when healers modify patient perceptions, emotions, and expectations. The dissertation concludes with biometric evidence that Asante indigenous ritual healing ceremonies actually promote significant entrainment and relaxation effects.

## PREFACE

It has been said that a preface should really be called a confession (Thacker 2005). So I begin by confessing a couple of things. First, when I began fieldwork I never intended on studying the biological aspects of ritual healing. I was a trained<sup>1</sup> sociocultural anthropologist and Africanist interested in researching Asante social relationships, cultural and symbolic meaning and how healers and patients negotiate sickness and disease in Asante medical contexts.<sup>2</sup> However, after witnessing hundreds of these encounters in the field the same questions kept coming up over and over: How do social relationships, cultural meaning and ritual actions influence the healing process? How can non-physical variables elicit changes (both beneficial and adverse) in the physical body? And why would our bodies be prone to this?

These questions led me down the unanticipated path toward placebo studies and evolutionary medicine. In order to be qualified to contribute to such an interdisciplinary and complicated body of literature I also completed all of the PhD coursework and comprehensive exam requirements for the degree in biological anthropology and have spent the last decade immersed in literature from many disparate disciplines. While this deep dive into biological anthropology and placebo studies increased my confidence, it also left me feeling paralyzed by the sheer amount of information, both ethnographic and scientific, that I have collected since 2005 when I began this journey. As such, the first draft of this dissertation was 10 chapters long and about 1,000 pages! Something that no

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<sup>1</sup> BA, MA and PhD degrees all in Sociocultural anthropology and African studies.

<sup>2</sup> Throughout this manuscript you will notice that I consciously do not use the term ethnomedical for a discussion about terminology see Chapter 4: Proximate Mechanisms

committee (or person for that matter) wants to read. Thus, my second confession is that I am loathe to but aware that this manuscript will leave out many important ethnographic stories and research findings. Cultural anthropology readers will want more ethnographic details and linguistic analysis, my biological anthropology audience might wish I spent more time and precise language explaining evolutionary processes and the results of my physiological data collection and placebo studies researchers may feel uncomfortable with speculatively applying clinical research to alternative medical contexts and how I use/define the terms, broaden the scope and situate placebo and nocebo responses into a larger nomothetic theory. Despite these considerations, I still think that the attempt to answer these questions and merge these bodies of knowledge is worth it. Thus, rather than viewing this dissertation as a comprehensive or definitive guide, it should be read as a descriptive narrative about the many different variables interacting in Asante medical encounters and my journey to untangle and explain what effect these variables have on sickness and healing, how they interact, why they developed and what behaviors people have developed in order to make sense of and exert control over them.

My third confession is that the more I learn about Asante culture and healing contexts, the less I felt like I should be the one telling this story. If anthropological authority comes from extreme field conditions, then I feel confident that I have earned the right to wax poetic (i.e., my main source of water was hauled from ponds and needed to be regularly “skimmed” to clear away the maggots and larvae growing on top, every article of clothing needed to be ironed to prohibit bot fly eggs from hatching under the skin, every day began with a two mile hike along a dirt road to access local transportation



and visiting research sites meant upwards of 12 mile or waiting the equivalent time in hours for a taxi. I contracted malaria (4x), typhoid, dysentery, ear infections, and esophagitis. I survived terrifying tro-tro rides, unbelievable adventures, limited access to basic hygiene, sanitation and food sources, 4 am funeral parades with full marching bands and professional wailers, spiders the size of grapefruits, boils, worms, termites, Harmattan weather, monsoon rains, dust in every crevice, lifelong friendships and heartbreaking ethical quandaries). Yet, having spent time somewhere does not necessarily give me the authority to talk for or about a population or to explain their expectations or behaviors. Any attempt on my part is destined to fall short in one way or another.<sup>3</sup>

This thought struck me one day in the field during a lunch break at the compound I was living in with a host family. Every time before I ate a meal I would take out a small bottle of hand sanitizer and rub it on my hands. I did not talk about it, why I did it or what ingredients were in hand sanitizer. It was something I never even thought about. However, it was an action that Tina, my cook, noticed and obviously thought was very important to me because of its regularity. The following year when I returned to that tiny village in central Ghana we quickly reestablished our lunch routine. During that first meal I noticed something different. There was a tiny bottle of lotion sitting in the middle of the table. Tina gestured toward the bottle and very proudly said, “It is for you to rub on your hands before you eat; like you always do!” She had remembered a year later this little

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<sup>3</sup> This point is emphasized in some *Twi* idioms: The word *kronkron* means pure, clear, unmingled, unadulterated, real and true. *Otwini kronkron* is a phrase that means a genuine *Tshi*-man (or *Twi*-man; *Tshi* was the 18<sup>th</sup> century way of spelling *Twi*) and this idiom makes it clear that foreigners can never become true *Twi*-people: *omamfrani nnyin kronkron*: “a foreign settler does not become pure, i.e., he will never become quite like the native, so as to retain nothing of strange habits” (Christaller 1881: 220).

American behavior. It was a perfect example of the abundance of Ghanaian hospitality, but that bottle of lotion was also a reminder every day as I sat down to eat lunch, that observing a ritual is not the same thing as understanding it! Lotion is not the same as hand sanitizer. Their purpose and function are completely different even though their appearance and behavior of usage is largely undifferentiated. That little bottle of lotion forced me to wonder on a daily basis, what aspects of Asante medical encounters contain active ingredients for healing that I am mistaking for aesthetic salve?

This fear of my ability to ever fully establish an Asante emic perspective, of always wondering if I am missing something important is one of the reasons why I have consciously chosen the particular tone, audience, subject and direction of my dissertation. What is presented in these pages is not the same thing that an Asante would write about their own culture. In fact, I hope that we see that book someday. Rather, this research uses ethnographic perspectives and contexts in order to raise new questions, elucidate complex biocultural interactions and cast a critical gaze on our taken for granted assumptions about sickness and healing.

Another confession is that it took me a very long time to figure out how to present all of the disparate ethnographic and scientific information in a coherent manuscript. I think of my dissertation research as two separate tasks: in the field and in the library. I spent enormous amounts of time in both settings doing research, but by and large most of my time was spent thinking about these stories, pondering their meaning, weighing their relevance or application to scientific theories, finding new connections and deliberating on the broader implications of this research for our daily lives. It has now been over

fifteen years since I first went to Ghana and started thinking about placebo effects in Asante healing rituals. I am uncertain if this approach will do justice to either the science or the ethnography, but I am convinced that uncovering the biocultural evolutionary interactions in Asante healing contexts is an important endeavor that will hopefully inspire many new ideas, connections and questions in the future.

My final confession is that none of this work could have been accomplished without the unending and tireless support of my professors and administrators at Boston University. When other schools would have given up on a single mom working two jobs and taking seven years to finish writing, the Anthropology Department at Boston University has gone out of its way to help me finish. I owe this manuscript to my *Ɔkomfor*, friends, and informants in Ghana, without whom none of these pages could have been written. Finally, to all of my family, past and present, who have been patient and supportive providing babysitting and nourishment in the long nights working toward completion.

In addition, I would like to thank The Wenner-Gren Foundation for Anthropological Research for their generous dissertation fellowship as well as the Marion and Jasper Whiting Foundation, the Boston University Graduate School of Arts and Sciences Research Abroad Fellowship, and various scholarships and grants from Boston University and Brigham Young University.

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## GLOSSARY<sup>4</sup>

***Mogya:*** Physical matter.

***Sunsum:*** Spiritual matter.

***Akan:*** A tribe in southern Ghana made up of Kwa speakers with two ethnic and language groups, the *Asante* and the *Fante*.

***Tro-tro:*** Local transportation, usually makeshift buses.

***Obruni:*** Foreigner, usually referring particularly to white foreigners.

***Asantehene:*** Asante King

***Onyame:*** The supreme God

***Abosom:*** A pantheon of lesser gods.

***Ɔkomfo:*** Asante indigenous healers.

***Ɔkomfor:*** (plural): Asante indigenous healers

***Malams:*** Islamic healers trained in Koranic studies.

***Nkate:*** Perception via the physical sensations.

***Mmoetia:*** Spiritual beings that are short with backwards feet

***Adɛn?:*** Why?

***Wo kɔ hɛn?:*** Where are you going?

***Bra:*** Come

***Fu-Fu:*** A favorite staple meal in Ghana of pounded boiled cassava root and soup

***Fugu:*** A ceremonial tunic covered in blood talismans worn by Ɔkomfor

***Kɔ:*** Go

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<sup>4</sup> All *Twi* words that appear in the manuscript be italicized and defined here with the exception of locations and names.

**Hie:** Home

**Abusua:** Family

**Ayɛm:** Witch

**Trokosi:** A slave given to someone as repayment for a loan or misdeed and their freedom has to be earned back. Sometimes these slaves are sex slaves.

**Mesrɛ wo:** I beg you

**Sumsumyare:** The duality of blood and spirit.

**Dzemawon:** Immaterial being who can take on many forms

**Abiku:** Spirits that inhabit the bodies of infants and take them back to the spirit world

**Sasabonsam:** Wild and hairy forest creatures

**Atenka:** A slow crawling or striking warning

**Atumpan:** Talking drum

#### **PROVERBS:**

**Sɛ wode abofra re saw bɔ ne, ka kyere ɔ: ‘wo yɛ saw bɔ ne’; yɛ da ka kyere ɔ: ‘dɔfo, yɛ den wo pɛ:** If your child is dancing clumsily, tell him: 'you are dancing clumsily'; do not tell him: ‘darling, do as you please.

**Abufuo kasa de amane-nya ba:** The slip of the tongue is more dangerous than the slip of the foot.

**Papa so akatua ba hiada:** Kindness is like a loan, not a gift.



## PRONUNCIATION GUIDE

Orthographically, there are two vowels in *Akan* that are not present in the English language. These are represented by the letters  $\epsilon$  and  $\mathfrak{c}$ .

- $\epsilon$  Is pronounced **eh**. The equivalent English sound is **e** as in **pet** and **bet**.
- $\mathfrak{c}$  Is pronounced **ah**. The equivalent English sound is **aw**, **ough** and **augh** as in **law**, **bought** and **naught**.

There are also nine double consonant which are not present in the English language and are represented by the letters: **dw**, **gy**, **tw**, **kw**, **ky**, **hw**, **hy**, **ny**, and **nw**.

- dw** Is pronounced **j + w (jw)**. There is not an equivalent English sound.
- gy** Is pronounced **j**. The equivalent English sound is **j** as in **join**.
- hw** Is pronounced **sh + w (shw)**. There is not an equivalent English sound.
- hy** Is pronounced **sh**. The equivalent English sound is **sh** as in **sheep**.
- kw** Is pronounced **kw**. The equivalent English sound is **qu** as in **quite**.
- ky** Is pronounced **ch**. The equivalent English sound is **ch** as in **check**.
- nw** Has a nasalized **ñ** and pronounced **n + nasal** + the English word **we (nwe)**. There is not an equivalent English sound but it is equivalent to the Spanish virgulilla in **ñ** or **eñe** (pronounced **enyeh**) in **mañana** (tomorrow) plus the English word **we** articulated rapidly.
- ny** Has a nasalized **ñ** and pronounced **n + nasal + y (ny)**. There is not an equivalent English sound but it is equivalent to the Spanish virgulilla in **ñ** or **eñe** (pronounced **enyeh**) in **mañana** (tomorrow).
- tw** Is pronounced **ch + w (chw)**. There is not an equivalent English consonant but an equivalent sound is **tchw** as in **latch window**.

In addition to these sounds, **Twɪ** has other pronunciation factors which bring about changes in the meaning of words such as nasalization and vowel lengthening. It is also a tonal language where the tone of the word differentiates its meaning from the same word in a different tone (Dolphyne 1998; Kotey 1998).

## SECTION 1

### **CHAPTER 1: RESEARCH & DISSERTATION OVERVIEW**

#### 1.0 Ethnographic Breakthrough: Osei's<sup>5</sup> Explanation

##### 1.1 Interview Analysis

#### 1.1 Research Objectives

##### 1.1.1 Research Questions

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##### 1.4.1 Section Overview

### **1.0 ETHNOGRAPHIC BREAKTHROUGH**

One day during a long afternoon discussion, I asked an Asante indigenous healer how a woman we knew could have become pregnant after simply attending a ritual healing ceremony. The healer, Osei, is a friend of eleven years whom I have had the opportunity to watch transition from a reluctant apprentice to a respected and highly sought-after *Ɔkomfo*.<sup>6</sup> His answer opened the door to an ethnographic breakthrough – a moment of clarity that illuminated Asante therapeutic efficacy for me in a completely new way.

The ritual my friend Abena had attended seemed to have nothing to do with increasing fertility, nor did she take any active medications that would alter her biochemistry to make her more fertile. Yet, after following all of the ritual instructions of the *Ɔkomfo*, Abena got pregnant. I had seen this same healing phenomenon many times

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<sup>5</sup> All of the names of people and places have been changed in this manuscript to protect identities and locations.

<sup>6</sup> *Ɔkomfo* (singular), *Ɔkomfor* (plural): *Twi* word for Asante indigenous healer or “fetish” priest, as they are colloquially called in English. The *Ɔkomfor* acts as an intermediary between humans and the natural world and gods and the supernatural world. They have powers imbued upon them that allow them to speak to ancestors, lower gods (*abosom*), and the ultimate God (*Onyame*) as well as the ability to combat malevolent spirits and witchcraft.

at Osei's shrine and throughout the Asante region, and I was intrigued. In an Asante worldview, how do non-physical actions lead to physical changes in the body? "How did Abena become pregnant through the ritual healing process?" I asked.

"The gods here are very powerful" he replied. I nodded in agreement, having witnessed extraordinary spirit possessions and patient healings myself.

"But how did she go from being infertile to becoming pregnant after attending shrine?" I persisted, determined to dig deeper into the ethnophysiology of the process.<sup>7</sup>

Osei explained that many women come to him for help after having visited doctors with no success, and these women often become pregnant after offering sacrifice, bathing in some herbs and attending shrine. A common explanation of infertility is the use of witchcraft by jealous or vengeful people. "One patient was being cursed by witchcraft," Osei explained. "I found the witches and made them tell me where they were keeping this woman's uterus, and I released it, and she got pregnant."

I had heard this kind of story often. A ritual of cursing was conducted, with the malevolent intention of harming the victim's fertility. Sometimes a victim's reproductive functions were stolen or blocked via witchcraft. Afterwards, victims would wake feeling normal, but having lost their fertility. Their tubes had been spiritually tied or they had undergone a "spiritual hysterectomy". These spiritual actions can cause the physical manifestations of infertility. Because biomedical doctors can only see and fix the physical parts of the body, their medicines and procedures don't work on women who have been

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<sup>7</sup> See Appendix Chapter 1: 1.1 *Theory versus Praxis* for more background on my reasons for pursuing this line of questioning.

cursed by witchcraft. Only when a woman attends a shrine and an *Okomfor* divines the spiritual etiology of the infertility can the root cause of the problem be fixed. Because in Asante ethnobiology, the body is made up of both physical (*mogya*) and spiritual (*sunsum*) elements and embedded in a larger social community where the body (and the processes of sickness and healing) is capable of being influenced by people in both the physical *and* the spiritual worlds. As such, physical ailments are often the manifestation of problems that exist in the spiritual or social domain.

Once an *Okomfor* discovers the deeper etiology of the problem, s/he uses divination and often requests the presence of family and friends in order to uncover the specific details of the case, e.g., who the witch is, what exactly she did to the patient, what it will take to undo it, etc. In only a few cases I witnessed were patients given no hope. One patient was told that she would remain barren because the offending witch, who had spiritually removed and hidden her uterus, had already died. Despite all of the *Okomfo*'s power they were unable to locate where this witch had "buried" the uterus and thus her fertility could never be restored. However, in most cases through a series of elaborate rituals and investigations into complex spiritual and social relationships, patients are given a clear diagnosis and individualized treatment plans in order to boost their fertility.

Normally, after hearing this type of explanation from an *Okomfo* (especially one that was very consistent in form and content with similar answers from other *Okomfor*), I would have finished writing up my notes, thanked the healer and set up a time to meet again, but with Osei I felt comfortable pushing further. Despite this background knowledge, I was still curious about one specific aspect of Asante healing encounters:

how actions in the spiritual or social domain influence biological changes in the physical domain. So I persisted in my line of questioning.

“But how does giving back a spiritual uterus make a woman pregnant?” I asked. “How can spiritual things or even social feuds and reconciliations lead to physical changes? How can women become pregnant through only ritual actions?” I wondered out loud. Osei sensed my incredulity at the connection but took it differently than I had intended.

“I do not actually impregnate these ladies!” Osei blurted, out wide-eyed and defensively.

“Of course not!” I replied. “I’m sorry. That was not what I was insinuating. I am just trying to understand.” Then Osei thought for a moment and began to speak quietly, as if to himself. His answer changed the course of my entire research.

“I do not cause them to be pregnant,” he said. “I fight the witchcraft or cursing or problem that is keeping them from being pregnant. I protect their womb from witchcraft and prevent it from being cursed in the future. I find the people who have wronged them and I make them confess or I appease the gods.” He hesitated and then continued, “That way they can become pregnant like other people, the normal way.” (The last phrase was directed at me with a pointed glare.) “The thing is,” he explained thoughtfully, “I help the body do what it naturally knows how to do if it is not being afflicted. It’s like that with a lot of things I do at the shrine.”

### **1.1 Interview Analysis**

Osei's explanation made sense to me in a way that no other had before. It got to the heart of what I was trying to understand. Psychological, emotional, social, cultural and spiritual factors exacerbate illness and inhibit natural homeostasis and repairing processes. Ritual healing, with its concomitant features: music, social support, spiritually divined etiologies, individualized treatment plans, etc., can reduce these negative psychosocial determinants of sickness and activate endogenous healing mechanisms. Among the healing actions are protecting patients from witchcraft, preventing further attacks, preparing them with specific steps to avoid being cursed, resolving social conflict, appeasing offended family/gods/ancestors, promoting *dwudwo*<sup>8</sup> and solving the spiritual or social cause of the physically manifested symptoms.

While Osei's last explanation was revelatory for me personally, it was clear that for him this was only one among many co-contributing factors. A rich analysis could be written about each explanation mentioned above. However, for the purposes of this research I will turn the focus to Osei's last explanation in order to better understand the relationship between sociocultural and biological processes in Asante medical encounters.

## **1.1 Research Objectives**

### **1.1.1 Research Questions**

Osei's explanation of how ritual processes affected Abena's infertility (and that of many women like her) was relatively straightforward. Since "non-physical" or psychosocial factors influence physiological processes, one can alter physical states by

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<sup>8</sup> *Dwudwo* (*jwùjwóu*) (v) = to calm, allay, tame, appease, soften, tame, refresh. To soften, to tame, to become soft or tame.

manipulating those factors. This is not a foreign concept in mind-body medicine.

Psychosocial factors such as stress, fear, inferiority, ostracism and negative expectations can trigger and exacerbate physical and mental ailments. Relaxation, positive expectations, empathetic relationships and meaningful interventions can activate endogenous healing mechanisms and even enhance therapeutic processes (Kaptchuk 2002). What we do not fully understand is: **a) why evolutionary processes have left human bodies susceptible to psychosocial manipulation, b) the health consequences of that susceptibility and c) how culturally specific expectations** (like stolen uteruses) **and rituals of care-giving** (like indigenous ritual healing ceremonies) **reduce and amplify this susceptibility and how they elicit physiological responses, including ones we could call beneficial (placebo) and adverse (nocebo).** Answering these questions requires a process of creative, interdisciplinary bricolage. In this manuscript, I make no novel evolutionary or scientific claims. Rather, I will bring together pre-established evidence-based findings from seemingly disparate fields in original ways.

### **1.1.2 Research Goals**

The two main goals of *The Social Life of Placebos* are 1) to provide a thick description of culturally contextualized biocultural interactions in Asante medical encounters that will shed some light on complex quandaries in mind-body interactions, evolutionary medicine and placebo/nocebo studies, and 2) to present a thorough investigation of mind-body interactions, evolutionary medicine and placebo/nocebo studies that will, in turn, help us to better understand esoteric expectations and behaviors in Asante medical encounters.

## **1.2 Research Design and Implementation**

### **1.2.1 Research Design**

*The Social Life of Placebos* is designed to answer these research questions and realize these goals by explicating the evolutionary processes and proximate mechanisms (Tinbergen 1963)<sup>9</sup> of biological and sociocultural interactions in Asante medical encounters.

### **1.2.2 Research Background**

Nothing about this research was fast. I met most of my closest informants over 15 years ago when I first went to Ghana, and the seeds of this research were just being planted. Over the course of those years I had the opportunity to return to Ghana five different times for a total of 26 months of fieldwork.<sup>10</sup> I was fortunate to maintain many of those relationships throughout and was able to watch a decade unfold in the lives of my friends. I traveled both as a student researching in Ghana and as a researcher bringing students to Ghana. I studied the language *Twi* in and out of Ghana for 4 years and studied under the tutelage of chiefs, priests, mothers, and queens. I was invited into the homes and shrines of hundreds of Asante *Okomfor* (including being the only anthropologist invited to a ceremony of Asante indigenous priests at the Asantehene's<sup>11</sup> palace in 2008). I lived with families that treated me as one of their own and returned the favor when a few found their way to the United States. I did rounds with doctors and suffered in clinics next to patients.<sup>12</sup>

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<sup>9</sup> Subsequent chapters will elucidate Tinbergen's (1963) model of Evolutionary and Proximate explanations and a more detailed description is located in Appendix: Chapter 2: 2.1

<sup>10</sup> 2001, 2002, 2003, 2007, and 2008-2009.

<sup>11</sup> Asante King, headquartered in Kumasi, Central Ghana.

<sup>12</sup> I contracted 4 cases of malaria, 2 cases of typhoid, and regular dysentery and infection.



In this dissertation you will meet people whom I love and cherish and with whom I have shared homes, meals, *tro-tro*<sup>13</sup> rides, and emotionally fraught experiences. These stories briefly grace the pages as examples or anecdotes, but in real life they are long, elaborate, and varied. The most difficult part of the writing process was cutting down years' worth of stories and experiences to fit into a coherent thesis,<sup>14</sup> especially because there would be no narrative without that long and arduous process of just going about Asante daily life. My Asante contacts invited me into their homes, shrines, initiations, and families and when I needed to take physiological measurements or ask difficult questions they also let me poke around their minds and bodies. They taught me as they would a child: answering my inane questions, laughing at my failed attempts to be a good Asante housewife, and teaching me their language(s), religion(s), culture(s) and rituals. There is a famous Asante proverb: "*Se wode abofra re saw bɔ ne, ka kyere ɔ: 'wo ye saw bɔ ne'; ye da ka kyere ɔ: 'dɔfo, ye den wo pɛ.'*" "If your child is dancing clumsily, tell him: 'you are dancing clumsily'; do not tell him: 'darling, do as you please.'" I was on the receiving end of many of these chastisements and while all the mistakes contained herein are mine alone, this research would not exist without those who have taken the time to teach me how to think, speak, feel, and respond like an Asante.

A typical week in the field consisted of attending indigenous ritual healing ceremonies about three times a week, with additional ceremonies on festivals and

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<sup>13</sup> Local van-like, over-crowded, cheap mini-buses.

<sup>14</sup> For each page you read and each story you hear there are seven more hidden away in the folders filling my hard drive and the packing boxes overrunning my hallway closets. At one point, I considered myself *done* with the manuscript only to find that I had written ten chapters, each 100 pages long (single spaced)!

holidays. I attended the shrines of at least one of my core group of *Okomfor* informants (10 healers I stayed in touch with from 2002-2008) each week and filled my other shrine days meeting and observing new Asante *Okomfor*. In the evenings I participated in community events, learned how to cook Asante food, and held small focus groups once a week to discuss questions raised in the field. On non-shrine days, I volunteered at the local secondary school as a biology teacher and I followed around other healthcare practitioners in their daily medical contexts.

I conducted research with practitioners and patients (often doing rounds or attending services) at hospitals and clinics, and with local herbalists, chemists, pharmacists, bone setters, traditional birth attendants, Christian faith healers, Muslim Malams<sup>15</sup> and a new phenomenon: hybrid divine healers.<sup>16</sup> I interviewed patients on how they negotiated the many different healthcare options and the hierarchy of resort (Janzen 1978). I recorded patient experiences with sickness and healing in these various settings on a large scale, mapping the variety, prevalence and standard treatment of certain diseases in specific health care settings over time and following a large group of patients through one medical experience. I interviewed participants (patients and practitioners) and took biometric data before, during and after medical encounters to look for physical, psychological and phenomenological changes. On a smaller scale I collected life-long patient medical

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<sup>15</sup> Malam is a combination of *Hausa* and *Arabic* words that means someone educated or trained in Koranic studies. In Ghana, these Islamic faith healers combine the practices of Islam with book divination and are able to diagnose problems and offer solutions.

<sup>16</sup> Hybrid divine healers are a new type of healer emerging in the area that combines the practices and beliefs of popular Western religion like Christianity, Islam, etc. with Asante indigenous religion (See Chapter 5 for a detailed description).

histories, recorded detailed patient and practitioner explanatory models and tracked the onset, symptoms, help-seeking behaviors, diagnoses and treatments of particular patients throughout the course of their illness. I was granted access to both public and very private medical encounters across these healthcare settings, talking to patients in their homes and witnessing their self-medicative practices. Although not all of this research can be included in this dissertation, it was foundational in understanding Asante sociocultural expectations and behaviors regarding sickness and healing and how Asante indigenous religion and ritual healing fits within the medically pluralistic landscape of central Ghana.

To accommodate dissertation page limits, I have shifted non-essential content into the accompanying appendix. For example, in *Appendix: Chapter 1: 1.1 Qualifications*, you can read details about my qualifications, training, language acquisition, field setting, integration into the community and how I got access to insider information.

### **1.2.3 Methodology**

I've written a detailed annotated description of each method used in the research for this manuscript. It also includes ethnographic narratives to acquaint the reader with my field site, informants, and the trial and error process of conducting anthropological mixed-method research. While the detailed descriptions may seem onerous to cultural anthropology readers, they are essential in explicating what anthropological methods are, how ethnographic research was designed and carried out, and which methods were used for different circumstances. It is important for medical researchers, evolutionary biologists and other non-anthropology readers studying placebo responses to comprehend the difficulty and ambiguity involved in collecting contextualized, person-centered

experiences and the methods anthropologists use to do so. It is also important to recognize the methodological limitations of studying biocultural interactions in natural settings. A detailed explication, however, may be redundant for many anthropology readers and exceeds page limit requirements. To save space, I've included a brief summary here and in the corresponding chapters. Then, in the appendix, I have included a comprehensive explanation of my mixed method approach, with a detailed description of each method evaluated, attempted, and used. These pages will answer methodological questions that arise and provide some interesting stories themselves.

#### **1.2.3.1 Qualitative Ethnographic Contextualization Summary**

The interdisciplinary and biocultural nature of this research demands multiple methods, each necessary for capturing one piece of the larger puzzle. “Fluency in a broad range of methods is essential for developing successful collaborations within medical anthropology and across disciplinary lines” (Gravlee 2011: ix). Below, I outline the qualitative and quantitative methods used in this project. I received Institutional Review Board (IRB) approval for all of these methods and verbal informed consent from informants before proceeding.

As will be argued in subsequent chapters, detailed, socioculturally specific contextualized ethnographic case studies of biocultural interactions are needed to explicate the actual concrete (rather than theorized) somatic and extra-somatic processes involved in niche construction, enculturation, developmental plasticity and social susceptibility. Or rather, how exactly sociocultural expectations, behaviors and institutions become embodied in the individual.

Biocultural anthropologists have used a diverse methodological tool kit which allows us to connect biology to cultural processes...borrowing heavily from other fields...While there are benefits to making dimensions of culture explicit, it is not necessary to quantify culture to make it central to biocultural analyses. What is important is to take culture seriously as it structures and is structured by human action, and to elicit the voices and perceptions of individuals with whom we work...Moreover, while standardized methodologies are common in biocultural studies....they can draw attention away from local contexts and appropriateness of measures...In short, among all the methods biocultural anthropologists employ, there is no escaping the basic work of doing ethnography (Leatherman and Goodman 2011:35-36).

As such, this research relies heavily on ethnography to capture the meanings, motives, expectations, behaviors, feelings and contradictions inherent in normal everyday Asante life and social action, especially in regard to how these features are socially produced and manipulated, culturally constructed and mediated and individually embodied and enacted in Asante contexts of sickness and healing. I focused on person-centered ethnography, which is concerned with not only understanding cultural and social institutions but also informants' own experiences, sensations, emotions, social relationships, degree of cultural consonance, conflicts, failures and hopes, and how these change over time (both over the course of a life event or even during specific encounter). For me, it was not enough to understand what my informants did, I also wanted to know what they thought and how they felt. This attention to phenomenology is necessary in ethnography on biocultural interactions because consciousness, expectation, past experience and self-interpretation modulate how psychosocial information influences the body. In more concrete terms, I examined "the physical and temporal contexts that surround the individuals and their actions" in "the cultural domain (area of everyday life)" (Trotter 2011:54). In this dissertation, I narrowed the units of analysis to biocultural interactions in Asante medical contexts and sought to create a thick

description (Geertz 1973) of each encounter. I paid attention to both standardized (how people spoke and thought) and person-centered (how people felt) information, and tried to portray what was actually done and said without interpretation (which would occur later in the writing process). I structured questions to facilitate “the opportunity for all of the participants (researchers and researched) to explain, interpret, and clarify what is happening from each stakeholder’s point of view” (Trotter 2011:54).

In *Appendix: Chapter 1: 1.2 Qualitative Methods* there is a detailed description of each of the following topics and qualitative methods I used in this research.<sup>17</sup>

- Units of Analysis
- Sampling Process
- Extended Integrated Fieldwork
- Participant Observation (includes field notes, recordings, and the problem-oriented approach)
- Interviews (includes formal, semi-formal, informal structured and unstructured interviews, stakeholder interviews, rapid assessment interviews, longitudinal interviews, life history interviews, health history interviews and genealogical taxonomies)
- Syndemics (e.g., clustered health contributors, interactions, constraints, motivators, and reinforcers, etc. as explained by Singer 2009 and Sobo 2013)
- Person-Centered Ethnography (which includes phenomenology)
- Explanatory Models
- Ethnography of an Indigenous Healer
- Ethnography of Medical Institution or Medical Context
- Informal Consent Analysis of Practitioner-Patient Interactions
- Informally Applied Clinical Research
- Focus Groups (includes reflexive anthropology)
- Ethno-taxonomies (includes ethnobiological, ethnobotanical, ethnomedical, and ethnopharmacological)
- Go-Along Method
- Resonance Methods (includes emotional intelligence, empathetic understanding, entrainment, acquiring tacit knowledge, categorizing and hierarchizing degrees of intensity and significance, phenomenological experiences, hierarchies of emotional intensity, and degrees of genuineness)
- Signs and Signifiers

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<sup>17</sup> I also describe how I combined these methods in the field and some of the research limitations I encountered in *Appendix: Chapter 1: 1.2.1 Qualitative Mixed Methods Combined* and *1.2.2 Qualitative Research Limitations and Significance*.

- Content analysis
- Consistency Checks (includes informal inter-consensus and informal cultural consensus)
- Informal Person-Centered Cultural Consonance
- Reliability Checks
- Photographic, Video, and Voice Recordings
- Field School Approach
- Qualitative Research Combined
- Limitations (includes case-control samples, standardization, and applications)
- Significance

#### **1.2.3.2 Quantitative Physiological Measurements Summary**

My frameworks for selecting qualitative and quantitative methods could not have been more opposite. I had an abundance of qualitative methods to choose from, extensive training and the flexibility to test them out in the field to see if they solicited useful and relevant information. Some worked better than others in a particular research setting and I purposefully selected methods which best elicited specific information. Choosing and implementing quantitative methods on physiological measurements was a different story. I had a very limited set of methods to choose from based on the specific geographic, cultural, topical and infrastructural constraints of my research setting. I had much less training, experience and flexibility in biological data collection. I could not easily “experiment” in the field due to ethical and financial restrictions, nor was I willing to subject my long-term key informants to a confusing battery of pokes and prods during cherished ritual healing encounters “just to see” (none of which—I had to state for IRB purposes—had any medicinal value and which could, in fact, cause physical or psychological harm).

Even if I succeeded in collecting enough data (which was unlikely because I could not control any of the factors in the research setting: e.g., consistency of the participants, time of day, duration of medical event and ritual procedures), it was nearly impossible to

keep samples viable in the remote field settings where my research occurred (e.g., no access to refrigeration, consistent electricity or even regular postal services). In order to find evidence that Asante indigenous ritual healing ceremonies influence physiological processes, I needed to take measurements before, during, and after these ceremonies.

Furthermore, due to ethics, informed consent, IRB regulations, and common decency, whatever methods I chose would need to be translated into *Twi*, as a large percentage of my informants did not speak English. This made things complicated because there were no *Twi* equivalents for many of the medical, technical, and psychological concepts that I needed convey. Miscommunication risks grew exponentially the more complicated the method was. I've included many of the *Twi* language explications I created as I was trying to translate the following methods.

As a result of all of these factors, my quantitative methods were drastically limited by: a) what was an effective measurement of physiological change, b) what could be translated into the *Twi* language without major miscommunication, and c) what could be accurately implemented in my remote field setting.

I provide a detailed explication of the following methods I attempted in the field and what worked, what didn't and why. In *Appendix: Chapter 1: 1.3 Quantitative Methods* there is a detailed description of each of the following topics and quantitative methods I used in this research.<sup>18</sup>

- Perceptual Measures of Stress (includes Perceived Stress Scale (PSS), State-Trait Anxiety Inventory (STAI), STAI-6, and State-Trait Inventory for Cognitive and Somatic Activity (STICSA))

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<sup>18</sup> I also describe some of the research limitations I encountered in *Appendix: Chapter 1: 1.3.1 Quantitative Research Limitations and Significance*.



- *Twi* Translations of PPS STAI-6
- Rapid Assessment Perceptual Interviews
- Physiological Measurements of Stress (includes stress hormones and the stress response)
- Stress Hormones (includes salivary cortisol measurements, catecholamines, feedback regulation of the HPA axis, measurements of Vagal tone, Galvanic Skin Response (GSR) or skin conductance methods)
- Biospecimens (includes blood, urine, sweat, cheek, and hair samples)
- Physiological Stress Response Measurements (includes heart rate, pulse, blood pressure, respiration rates, and blood oxygen saturation levels)
- Data Collection Process
- Group Entrainment
- Binaural Beats (includes alpha, beta, theta, and delta states and potassium and sodium levels and ratios)
- Limitations
- Significance

In the end, I collected physiological measurements (e.g., heart rate, pulse, blood pressure, blood oxygenation levels, and subjective feedback) of over 95 different individuals in two types of samples. The first was collecting physiological measurements at shrines over the course of a year in order to obtain a comparative baseline for Asante physiological patterns before, during and after indigenous ritual ceremonies. The second sample type was measuring the same people at the same shrine over the course of a year. This helped me understand the different physiological responses between long-time ritual attendees or shrine workers and new patients. It also helped me track the variation in responses from ritual to ritual to understand the pattern of general trends over time (e.g., changes in individual patients over the course of one ritual ceremony and over the course of many different ritual ceremonies).<sup>19</sup> All in all, the combined qualitative and

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<sup>19</sup> This was accomplished using two battery-operated devices: a blood pressure monitor (the cuff went around the participant's left bicep) and a pulse oximeter (that clipped lightly onto the participant's right index finger). I placed both devices on at the same time and their combined time of measurement lasted from one to three minutes depending on whether there were any errors. I recorded all measurements in a notebook without any identifying features that could trace back to particular individuals.

quantitative mixed methods used for this research provided a rich context for discussing biocultural interactions in Asante medical encounters.

### 1.3 RESEARCH SUMMARY POINTS

This chapter was designed to give readers a sense of the extensive field experience, broad training and ethnographically grounded methodologies that went into *The Social Life of Placebos*. While the following chapters may appear as one connected argument, they stem from many different research directions and discoveries in the field over time. There are also countless other ways each of the case studies you will read about could have been analyzed. However, in order to meet the research objectives (1.1.1) of this dissertation, I have selected the specific methodological tools and explanatory models necessary to answer the research questions outlined above (1.1) and achieve the stated research goals (1.1.2). As already stated, the main units of analysis in this research are biocultural interactions in Asante medical contexts (see *Appendix: Chapter 1:1.2 Qualitative Methods, 1.2.1 Units of Analysis* for more). I examine these in four main ways:

1. I use **ethnographic qualitative methods** to create a thick description of Asante medical encounters in order to culturally contextualize the biocultural interactions I witnessed therein.
2. I use **quantitative methods of physiological measurements** before; during and after Asante indigenous ritual healing ceremonies to investigate whether culturally specific expectations and behaviors alter physiological processes.
3. I compare these results to some of the **proximate neurobiological mechanisms of placebo and nocebo responses** to explain the myriad ways that psychosocial interactions might elicit physical reactions.
4. I situate all of these findings within a **biocultural evolutionary framework** in order to elucidate why our bodies evolved to be susceptible to psychosocial manipulation, and the health consequences of that susceptibility in modern environments.

### 1.4 DISSERTATION OVERVIEW

*The Social Life of Placebos* is an interdisciplinary study of biocultural interactions in Asante medical encounters. More specifically, it explores the question of how action on psychosocial factors may affect physiological processes. It is rooted in evolutionary explanations for why the human body has evolved to be highly responsive to psychosocial triggers and uses neurobiological research from placebo studies to illustrate many of the proximate mechanisms through which those bio-cultural interactions operate.

For better or worse,<sup>20</sup> the body is constantly responding to cues in its environment, especially those in the social domain. Many of those cues in the Asante worldview, where witchcraft is common and familial obligations are constant, can trigger negative physiological reactions. Because the majority of the therapeutic encounters I witnessed in rural central Ghana did not contain the use of any active medication, Asante case studies provide an ideal lens through which to examine mind-body interactions and culturally-specific physical responses to “inert” therapies, or placebos. In a land where pharmacological solutions are largely unavailable, what strategies of care do Asante employ to minimize sickness and maximize healing?

The answers to this question did not come easily. More than just uncovering the complex neurobiological mechanisms involved in medical encounters, the biological anthropologist in me kept wondering *why* physical states were susceptible to psychosocial manipulation in the first place and how those biocultural interactions play out in Asante medical encounters.

### **1.4.1 Section Overview**

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<sup>20</sup> See Chapter 2 for a more detailed argument about how human physical adaptability to social conditions evolved and how it may be a maladaptive mismatch with modern environments today.

The *Social Life of Placebos* is broken down into two main sections. The first section is comprised of Chapters 1-3 and covers theoretical foundations and literature reviews for: biocultural evolution, social susceptibility, adaptability, plasticity, mind-body medicine, and placebo and nocebo responses. These chapters are intended to lay the groundwork for a complicated discussion about how psychosocial variables can influence physiological processes. I contribute no original theories or primary data to this section, although I do present tangentially related interdisciplinary research in new and, hopefully, insightful ways. This section was written with placebo studies and biological anthropology readers in mind with the hope that it will provide them with enough of a scientific and neurobiological foundation to follow me along to the more ethnographic chapters.

Section 2 is comprised of Chapters 4-6, which cover the subjects of Pain, Emotion, and Stress. This section was designed to provide thick descriptions of Asante medical encounters so that readers, on all sides of the biological/cultural divide, will understand how critical cultural contextualization is to the processes of sickness and healing. Each chapter in this section seeks to understand how biological and cultural variables interact in Asante medical encounter and why ultimate and proximate mechanisms of pain, emotion, and stress influence wellbeing. These chapters are intended to show how placebo and nocebo responses play out at the local level of Asante medical encounters. Most of the ethnographic and biometric data in this section is original and illustrates how Asante healing rituals are able to alter physiological processes.

## **CHAPTER 2: EVOLUTIONARY EXPLANATIONS & SOCIAL SUSCEPTIBILITY**

- 2.0 Chapter Overview
- 2.1 A Biocultural Evolutionary Framework: Tinbergen's model
- 2.2 Social Susceptibility
  - 2.2.1 Caveat
  - 2.2.2 *Nkate*
  - 2.2.3 Introduction to Social Susceptibility
- 2.3 The Evolutionary Processes of Social Susceptibility
- 2.4 Evolutionary Medicine
  - 2.4.1 Evolutionary Medicine of Medical Therapy
- 2.5 Cultural Niche Construction
- 2.6 Health Systems
  - 2.6.1 Health resource allocation
  - 2.6.2 Cultural management of health
    - 2.6.2.1 *Psychoprophylaxis*
    - 2.6.2.2 *Practical Implications*
    - 2.6.2.3 *Dysevolution*
- 2.7 Conclusion

### **2.0 Chapter Overview**

Chapters 2 and 3 deviate from the largely ethnographic basis of the rest of *The Social Life of Placebos*. They constitute a foundation essential to understanding the basic evolutionary<sup>21</sup> and proximate mechanisms involved in biocultural interactions. They provide the theoretical framework from which the subsequent Asante ethnographic case studies are analyzed. Furthermore, while chapters 2 and 3 mostly describe a review of the relevant interdisciplinary literature, they also contain original arguments that contribute to expanding current theory and adding to ongoing debates in mind-body medicine. This chapter explores why evolutionary processes have made human bodies vulnerable to psychosocial manipulation and the following chapter discusses the neurobiological

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<sup>21</sup> See *Appendix: Chapter 2: 2.1 Evolutionary Background* for a brief primer on some key evolutionary tenets

mechanisms by which that manipulation functions. Subsequent chapters will build on these arguments to examine culturally specific ways that pain, emotion and stress (and our degree of susceptibility to them) are regulated via Asante expectations and medical interventions.

Answers to these questions require an interdisciplinary analysis that places the phenomenon of physiological-psychosocial interpenetration under an evolutionary<sup>22</sup> microscope in order to clarify some of the transitions and adaptations that have made bodily processes responsive to changing environmental pressures, or what I call *social susceptibility*. I introduce the concept of social susceptibility in this chapter to discuss the ways that our human evolutionary history make us highly susceptible to psychosocial influence, in both helpful and harmful ways. Social susceptibility refers to the ways that our bodies have evolved to physiologically adapt to cues in our social environments. It shows how social interactions get under the skin and influence physiological processes, and vice versa: how physiological responses motivate fitness-enhancing behavioral adjustments,<sup>23</sup> as well as how all of these responses and motivations function within a specific, encultured, and culturally constructed worldview. Since social susceptibility is a phenomenon that all human populations experience, it represents a rich area of potential research with implications for diverse fields.

## **2.1 A Biocultural Evolutionary Framework: Tinbergen's Model**

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<sup>22</sup> To evaluate my training and perspective on evolutionary studies as well as some important clarifications and definitions, see *Appendix: Chapter 2: 2.1 Evolutionary Theory Background*.

<sup>23</sup> The “sensory, motivational, and bodily changes [model] emphasize[s] that one way to shape the evolutionary and developmental function of the brain is not just changing the brain directly, but changing the body’s sensory and other physiological systems and targeting basic motivational brain systems that can yield large differences in behavioral interactions and control” (Downey and Lende 2012:106).

The original conflict between my questions and Osei's answers (in 1.1 Ethnographic Breakthrough), unbeknownst to me at the time, was that I was asking *how* an interpersonal interaction or a ritual behavior altered a physiological state whereas Osei was answering *why* this problem arose and *why* the ritual process solves it. Yet, direct and indirect causes are not mutually exclusive, but rather complementary. They constitute two types of questions: proximate and evolutionary (sometimes referred to as ultimate)<sup>24</sup> explanations. Proximate questions seek out explanations for a behavior that demonstrates *how* something works by describing its structural mechanisms or developmental processes. Ultimate or Evolutionary questions try to explain *why* something exists and is the way that it is by uncovering the phylogenetic or integrative history of that behavior and the selective advantage it bestows.

Proximate and ultimate explanations were part of Nobel prize winner and ethologist Tinbergen's Four Questions Model (1963)<sup>25</sup> in which he argued that there are four different types of categories for the explanation of behavior (ontogeny,<sup>26</sup> mechanism,

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<sup>24</sup> "To properly understand behavior, we must obtain both ultimate and proximate explanations. Put briefly, ultimate explanations are concerned with why a behavior exists, and proximate explanations are concerned with how it works. These two types of explanation are complementary and the distinction is critical to evolutionary explanation" (Scott-Phillips et al. 2011).

<sup>25</sup> "Tinbergen's Four Questions: 1. What is the mechanism? 2. What is the ontogeny of the mechanism? 3. What is the phylogeny of the mechanism? 4. What selection forces shaped the mechanism? The first two are proximate questions. An answer to the first question describes every aspect of the mechanism from its chemical constituency to its regulation by environmental cues. The second question is the other half of a proximate explanation; it traces the ontogeny of the mechanism in the individual, from DNA to cell migrations to the final trait under examination. The other two questions are evolutionary: question (3) is about the development of the trait over evolutionary history, its precursors, and the forces that shaped them; and question (4) is about function. How does this trait offer a selective advantage? Why do individuals with this trait on average have more offspring than others?" (Neese 2009:159).

<sup>26</sup> Ontogeny is the development and life history of an organism from DNA to death and all of the variables that impact that process. It is basically the developmental history of structural change in an individual and includes the entire sequence of events involved in the development of an individual over the course of a lifetime. It also refers to growth and development beginning in utero and across the life course and all of

phylogeny,<sup>27</sup> and adaptation)<sup>28</sup> and that answering all of these questions leads to a greater understanding of behavior than any singular analysis.

This framework is crucial to explaining complex and often competing constraints and motivations for behavior (Dewsbury 1999; Alcock 2001). There is one major problem, however, with this model. It was developed to incorporate all of the different integrative *biological* explanations for non-human animal behavior but does not include the *sociocultural* interactions so vital to understanding human behavior.<sup>29</sup>

Culture, for humans, is not just an ontogenetic variable of causation. It has its own adaptations and inter-generational history of development and change. Each culture has its own unique beliefs, expectations, behaviors and practices (e.g., cultural ontogenetic developmental and its attendant enculturation effects on individuals within that culture). Culture is influenced and constrained by genetic evolution but cultural evolution also changes the pressures and consequences fueling natural, sexual, and social selection.<sup>30</sup>

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the environmental variables which influence that process. We might have inherited genes based on natural and sexual selection in our evolutionary tree, but whether or not and to what degree those genes will be expressed or inhibited depends largely on our developmental environment.

<sup>27</sup> Phylogeny is the evolutionary development and history of a species and its connections to other related lineages. It is basically the developmental history of structural change in a species and includes the entire sequence of events involved in the development of a species over the course of evolutionary history—including evolutionary relationships and the similarities and differences between species.

<sup>28</sup> See *Appendix: Chapter 2: 2.2 Tinbergen's Model and Appendix Figure 2.2* for a deeper discussion, literature review, and diagram of this model.

<sup>29</sup> This model has been applied, albeit slightly modified (and not as widely received or used), to the ontogeny, mechanism, phylogeny, and adaptation of sociocultural behaviors. Researchers in transdisciplinarity and interdisciplinarity in the human sciences, mostly in recent German, Swiss and Russian schools of thought are beginning to do this by using Tinbergen's model in a matrix with distinct levels of analysis: molecule, cell, organ, individual, group, society, natural environment (Hartman 1964; Riedl 1984; Medicus 2005). See *Appendix: Chapter 2: 2.3 Models of Transdisciplinarity* for more discussion on this.

<sup>30</sup> Dual-Inheritance Theory argues that humans are products of not only biological *and* cultural evolution but the interaction between them as well (Richardson and Boyd 2005). For more on the different types of selection, see *Appendix: Chapter 2: 2.1 Evolutionary Theory Background*.



Thus, an explanatory model which views sociocultural adaptation as a subsidiary rather than an equally influential primary level of inquiry or causation in the study of human behavior, is inherently flawed.<sup>31</sup> Instead of creating a macro-interdisciplinary model of causation, this dissertation focuses on taking seriously Tinbergen's four questions for both biological *and* sociocultural phenomena. "For decades, we have been fancied as set apart from the rest of life by our capacity for cultural change, as if this lifts us outside the orbit of evolution. Once we realize that this capacity is a product of genetic evolution and itself an evolutionary process, the need for Tinbergen's four questions becomes doubly needed—to explain both the capacity and the specific products of cultural evolution" (Sloane Wilson 2011).

Since ritual healing does not often use "active" pharmacological treatments (as established by standards of biomedical efficacy), it represents a uniquely positioned opportunity to zoom in on the biological consequences of sociocultural expectations and behaviors in medical settings.

Biological knowledge, which has expanded so rapidly during the past four decades, has been incorporated only incompletely into a science of health—personal and social. Since biological factors have psychosocial effects and psychosocial factors have biological effects, a better understanding of health depends on expanding knowledge of the interaction of biological and psychosocial processes. Research in this relatively unexplored area will clarify many important questions regarding human health (Moore et al. 1980: v).

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<sup>31</sup> "Integrated and holistic theories such as niche construction force us to think of sociality in a new light—not as an independent category, but as an interrelated aspect of a generated niche. It highlights how social living encompasses the cognitive developmental environment; social resources and competition for those resources; alteration of the selective landscape (while being continuous with the natural environment); material culture in humans and some of the apes; and an extension of cognitive capacities into distributed systems of multiple individuals" (MacKinnon and Fuentes 2012:76-77).

A proponent of Tinbergen's, Ernst Mayr, argued that "biology consists of two only sometimes intersecting threads, one the study of how things work, the other of how they got to be the way they are" (Mayr 2004). My research follows Mayr's line of inquiry. How do Asante indigenous ritual healing ceremonies work and how did they get to be that way? Tinbergen's model--combined with other socially-centric biocultural interaction theories<sup>32</sup>—is the best framework I have found to work through the complexity of those questions.<sup>33</sup> It sheds light on the rich evolutionary vestiges our bodies carry with them during every medical encounter and how those biological and cultural processes interact and influence each other.<sup>34</sup> A framework that takes seriously the evolutionary and proximate biocultural interactions that take place during a medical encounter can uncover some of the "specific mechanisms and processes through which [culture] get[s] 'under the skin' (Leatherman and Goodman 2011:34).

## **2.2 Social Susceptibility**

### **2.2.1 Caveat**

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<sup>32</sup> Such as, dual-inheritance or co-evolutionary theories (Boyd and Richardson 1985), connectionist theories (Sobo 2013), interactionist theories (Lewontin 2000), constructivist theories (Fuentes 2009), and critical medical anthropology theories (Leatherman and Goodman 2011). A more detailed description and literature review of these theories can be found in *Appendix: Chapter 2: 2.4 Biocultural Interaction Theories*.

<sup>33</sup> "Each question can be answered independently to a degree but they are best answered in combination. This is the kind of integration that is far more advanced for the biological sciences than for human-related subjects. Even the biological sciences are still a work in progress. It is common for evolutionists to reason on the basis of ultimate causation without paying much attention to proximate causation. It is even more common for biologists who concentrate on proximate causation, such as molecular biologists, to ignore ultimate causation. Phylogenies are often constructed without reference to the selection pressures that partially brought them about. And the so-called modern synthesis that formed in the 1940's largely ignored development, which is why "evo-devo" became a new field of inquiry in the 1980's. Research programs that provide answers to all four questions are awesome in their scope and explanatory power...most biologists would agree that this is the ideal to strive for, even when it is difficult to achieve for particular study systems" (Sloane Wilson 2011).

<sup>34</sup> In each medical encounter there are overwhelmingly complex biocultural factors involved. This manuscript is neither exhaustive or conclusive in parsing apart *some* of those biocultural interactions that take place in Asante medical encounters. They are necessary, but not sufficient for a holistic understanding of the biocultural interactions in Asante medical encounters.

This chapter outlines important evolutionary processes that contribute to mind-body medicine and biocultural interactions in Asante medical contexts, it *does not* attempt to make any novel contributions to evolutionary theory or claims of scientific precision. Rather, *The Social Life of Placebos* applies established evolutionary literature to mind-body medicine in original and, it is hoped, illuminating ways.

### **2.2.2 *Nkate***

“How do you feel?” seems like a simple question. It is very common and used regularly by caregivers around the world. But it assumes a couple of premises about individuals, bodies, and perceptions that are interesting to note. For example, this question presupposes: that the subjective experience provides information that objective measurement alone cannot, and that perception through physical sensation is an accurate indicator of internal states. It also presumes that the subjective lived experience of illness or pain is a worthwhile “unit of analysis” and that its expression and interpretation can be shared and understood between individuals. These are actually quite controversial assumptions.

In fact, “How do you feel?” is literally a misleading question. No one is asking *how* someone is able to feel things; rather, the question posits *what* specific sensations someone is experiencing. This distinction—between how we feel and what we feel—becomes very vivid in a discussion about semantics. Due to the nature of my research site—and the nature of qualitative ethnography in general—I had to pay close attention to the types of language I used and the way I phrased questions in interviews at hospitals and indigenous healing settings. I had to regularly transition between using English and

*Twi* and I saw how different variations of a question produced different answers. For example, in both English and *Twi* the verb “to feel” or “*nkate*” means to perceive through the physical sensations of the body. What is different about the *Twi* version, however, is that it offers a new interpretation of the concept.

Let us break down the word *Nkate* (*ṇkátē*) into its constituent roots *ṇ* and *kátē*: *n*+ low tone (*ṇ*) is an optative imperative prefix or negative command that means doesn’t, isn’t, won’t. It represents the negative or opposite of the following word. *Kátē* (pronounced kah-tee-aye) is a verb that means to harden, dare, brave, defy; to be forward, refractory, obstinate, hard, opposite of soft, inflexible, stubborn and impenetrable and “hard, of the face or rather the mind or will,” (Christaller 1881:226). Combined *n* + *kate* literally means the opposite of that long list. It means to be soft, malleable, penetrable and flexible. Thus, in *Twi*, “to feel” means to perceive *something* that influences the mind or will through the physical sensations of the body (See the detailed *Twi* language breakdown in *Appendix: Chapter 2:2.5 Twi Translations*). The focus of the definition is not actually on *what* is being felt. In *nkate*, the focus is on *how* one feels and how one *is able* to feel and this includes the intensity of that capacity as well as its amplification or dampening as perceived by the individual. While I use different words like adaptability, plasticity and differential susceptibility in order to show how these ideas map onto the current scientific literature, *nkate* helps us examine closer the culturally contextualized conditions in which patients’ experience, interpret and express how or what they feel. It adds another element to feeling: levels of penetrability or physiological perception.

But what does it even mean to be physiologically “perceptive,” “penetrable,” “porous” or “malleable?” Susceptibility is not a foreign concept in medical anthropology. However, it is usually discussed in terms of the political economy of health (how inequality and poverty increase health vulnerability) or symbolic healing (how some cultures perceive the body as being porous),<sup>35</sup> but it is rarely discussed in terms of the actual ways in which psychosocial triggers elicit physiological responses, why this capacity would have evolved, and how it impacts sickness and healing. It raises the question: could sociocultural beliefs and techniques make patients more or less physiologically impervious or vulnerable to external stimuli?

### **2.2.3 Introduction to Social Susceptibility<sup>36</sup>**

The purpose of this chapter is to introduce readers to the evolutionary underpinnings of why and how human bodies have evolved to be responsive to social cues and interactions. All of the subsequent chapters in *The Social Life of Placebos* are based on

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<sup>35</sup> For example, “under certain circumstances invisible (or sometimes visible) entities, such as souls, spirits, or even malevolent or envious thoughts, can either enter the body, or leave it. This is very different from the Western view, which usually regards the skin as the impenetrable boundary of the body and self—a bulwark against both humans and natural environments. In some cultures, however, the skin is regarded as much more ‘open’ to outside influences and in some circumstances, forces or objects can ‘enter’ the body via the skin... This view of the porous self is much less common in Western, industrialized countries, where ‘body’ and ‘self’ are seen as essentially the same thing, and the ‘individual’ is thought of as an entity bounded, and contained, by its impenetrable boundary of skin, even though it can sometimes be penetrated by ‘germs’, the natural environment, or invisible radiation.” (Helman 2007:270).

<sup>36</sup> This hypothesis combines a few of the prevailing evolutionary theories about why our brains and bodies developed to be susceptible to psychosocial activation: economy of intelligence and metabolism (Deacon 1997), social intelligence (Byrne 1997; Byrne and Whiten 1989; Dunbar 1998; Flinn et al. 2005; Barrett et al. 2003; Alexander 1990; Price et al. 2002), cultural evolution or niche construction (Boyd et al. 2011; Tomasello 1999; Tooby and DeVore 1987; Sterelny 2011; MacKinnon and Fuentes 2012), perceptual and emotional self-regulation (Gross 1999; Turner 2000a; Stout 2005; Tomasello et al. 2005; Downey and Lende 2012) and mind-body regulation, ethnographic healing (Fabrega 1976a, 1976b, 2011; Kirmayer 2011) and placebo phenomena (Kaptchuk 2002, 2011; Moreman 2002; Miller et al. 2009; Price et al. 2008; Thompson et al. 2009). Extensive research on the proximate mechanisms of placebo and nocebo responses and detailed ethnography in Asante medical contexts actually buoys up the last theories which are “less well-elaborated” (Downey and Lende 2012:120). All seek to “incorporate modern evolutionary theory with anthropological methods” (MacKinnon and Fuentes 2012:87-88).

two major principles evidenced in great detail in this chapter. First, sociality is a major (if not **the** major) selective pressure on human development and has created the conditions under which, second, human bodies experience rapid physiological responsivity to perceived conditions in the social domain. I introduce the phrase *social susceptibility* mainly as shorthand for the combination of selective pressures, social adaptations, and cultural constructions that produced our extensive (neural, developmental, genotypic, phenotypic, and behavioral) plasticity and reactivity to cues in the social environment. This concept is key to understanding *why* and *how* sociocultural stimuli can influence physiological processes.

Ultimately, as the constraints of our physical environments exerted less selective pressure, our social environments became increasingly important. Differential fitness transitioned from traits that were best suited for a particular ecology to traits that were best suited to navigating complex social interactions.

Once hominins achieved ‘ecological dominance’—a state in which extrinsic factors exerted less selective pressure on our ancestors than internal competition—brain growth could slough off a set of prior constraints, such as the dangers of an underdeveloped nervous system for infant mortality. This relaxed external pressure unleashed directional selection for brain development due to social competition, both within and between groups of humans, which were no longer balanced by countervailing selective pressures, sparking a kind of cognitive arms race in areas like communication, self-awareness, theory of mind, and the ability to form coalitions (Downey and Lende 2012:121).

Major human evolutionary transitions like increased social group size,<sup>37</sup> brain size<sup>38</sup> and cooperation mitigated the costs of resource availability, predation and inter-group

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<sup>37</sup> See Appendix: Chapter 2: 2.6.1 Benefits and Costs of Group Living for more on this.

<sup>38</sup> Many scholars (Silk 2002 and Shultz and Dunbar 2007) argue for the primacy of the social brain hypothesis, where increased social complexity and intelligence capacity “become[s] a primary tool of

aggression,<sup>39</sup> which reduced the selective pressure of our physical environments, allowing our ancestors to attain a level of ecological dominance. **Ecological dominance, basically made humans, “their own principle force of nature”** (Alexander 1989: 469) **where selective pressure shifted from the ecological domain to the social domain** and where the fitness consequences of social adaptability outweighed those of ecological adaptability. This was a key evolutionary moment for our ancestors, in which recognizing and being responsive to cues in one’s social environment became a primary mechanism of selection. “Unlike static ecological challenges, the hominin social environment became an autocatalytic process, ratcheting up the selective advantage associated with the ability to anticipate the social strategies of other hominins and to mentally simulate and evaluate potential counter strategies” (Flinn et al. 2005: 16). These changes occurred anywhere between 500 kya and 200 kya (Ruff et al. 1997).<sup>40</sup>

Key ecological transitions in human evolution increased the fitness consequences of sociality. Navigating complex relationships and in-group status became so critical to our survival and reproduction that we developed sophisticated social adaptations (each of which is discussed in great detail later in this chapter) that made neurobiological

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adaptive success” (MacKinnon and Fuentes 2012:86). For example, we know there is a direct correlation with the increased size of the neocortex and group size; the larger the society, the larger the brain (Dunbar 1992; 1993) (See *Appendix: Chapter 2: 2.6.3 Social Brain Hypothesis* for a more detailed discussion on this). While it was previously believed that the size of a social group correlated with the size of the neocortex (Dunbar 1992, 1998 and 2002) it is now understood that it is both the size *and* complexity of social groups that contribute to increased neocortices (Dunbar and Shultz 2007). See *Appendix: Chapter 2: appendix Figure 2.2* for a diagram of this.

<sup>39</sup> See the full discussion of these processes in *Appendix: Chapter 2: 2.6 Evolutionary Processes of Social Susceptibility*.

<sup>40</sup> For a deeper discussion on social versus ecological determinants for brain size, see *Appendix: Chapter 2: 2.6.2 Social Versus Ecological Determinants*.

processes (endocrine, immune, nervous and limbic systems) responsive to stimuli in the social environment. This had significant benefits in our ability to learn, cooperate, and innovate, but it also left human bodies susceptible to psychosocial manipulation because survival and reproduction was no longer tied directly to one's ability to avoid predation or attract mates, it was now dependent on one's ability to navigate complex and sophisticated social interactions and group dynamics.

The absence of constant and individual vigilance to dangers in one's physical environment allowed human infants to become more and more dependent and vulnerable for an extended period of time.<sup>41</sup> Prolonged infant dependency, increased life history demands (e.g., dependent infants, prolonged juvenility, extended brain development, longer interbirth intervals, etc.) and increased parental investment are all needed to create large and highly plastic brains; brains capable of navigating and manipulating complex social relationships. Heightened selective pressure in the social domain and amplified developmental plasticity created the conditions under which human brains and bodies became increasingly responsive to external stimuli.

Genes are switched on or off, silenced or promoted, by the environment via the epigenome. In other words, so-called instincts, skills, and certainly our preferences are shaped, this way or that, depending on environmental conditions and what they do to our epigenetic and, thus, our genetic systems....Genes are 'not just units of heredity...they are themselves exquisite mechanisms for translating experience into action'; 'they are the servants of experience' (Sobo 2013:61).

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<sup>41</sup> There is a long discussion about the consequences of encephalization, longevity, infant dependency, and increased life history demands in *Appendix: Chapter2: 2.6.4 Challenges from Encephalization and Increased Life History Demands*.



Moreover, bipedality, increased infant dependency, and longer juvenility<sup>42</sup> created the conditions in which infant survival became entirely dependent on others.<sup>43</sup> Without healthy relationships with caregivers who could understand and respond to basic cues, human infants would most likely perish or experience developmental consequences.<sup>44</sup> In fact, the link between dependency and survival is so great, that *both* infants and parents display extreme physiological reactions when separated from each other during those critical early years (Bowlby 1969; Tooby and Cosmides 1990). The more stable and predictable that care, the less often separation and distress signals are triggered for both parties.<sup>45</sup> Therefore, infant dependency provides the motivation, and plasticity the mechanism, whereby **the primary human challenge is to be able to recognize and respond appropriately to social signals.**

Those pleasurable and uncomfortable sensations (or rather the hormonal cocktails eliciting those sensations) are adaptive mechanisms designed to reward fitness-enhancing pro-social behaviors and punish fitness-destroying anti-social behavior, thereby increasing our chances of survival and reproduction.<sup>46</sup> “would help to establish a

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<sup>42</sup> See *Appendix: Chapter 2: 2.6.4 Challenges from Encephalization and Increased Life History Demands* for a deeper discussion on these topics.

<sup>43</sup> See *Appendix: Chapter 2: 2.6.5 Hyper Attachment Adaptations* for more on this.

<sup>44</sup> “With the longest periods of dependency and socially mediated learning among mammals (Deputte 2000; Harvey and Clutton-Brock 1985; Harvey et al. 1987), the attachments that young primates form with their mothers and members of the group are of primary importance for successful ontogeny (Hawkes et al. 2003; Hrdy 2009; MacKinnon 2011)” (MacKinnon and Fuentes 2012:82). In Chapter 6, we will talk more about the epigenetic consequences of early childhood stress such as the concepts of stunted dwarfism and fluctuating asymmetry.

<sup>45</sup> “Separation appears to cause drug withdrawal-like pain, whereas reconnection appears to act like a painkiller. Additionally, infants and caregivers show a reciprocal devotion that fits the description of addiction” (Leiberman 2013:49-50)

<sup>46</sup> Infants unaffected by separation (which is rare) and mothers nonresponsive to distress calls (also rare) would have been selected against. In fact, there are studies that illustrate this in rats by severing the dACC (dorsal anterior cingulate cortex) and thus the pathway for social and emotional response in rat mothers,

motivational structure that need not focus exclusively on selfish short-term tactics” (Downey and Lende 2012: 124). This motivational structure made cooperative behaviors pleasurable in themselves and not just for their concomitant benefits like resource sharing or alliance building. Likewise, it created the conditions in which being ignored or rejected from the group produced painful sensations unrelated to ecological consequences. These are the building blocks of social susceptibility; or why disruptions in the social domain influence physiological processes.<sup>47</sup>

Pain and pleasure are two of the major evolutionary motivational tools that ensure all mammals are concerned with their social worlds. The animal kingdom is full of species that successfully avoid threats that may cause harm, and they are drawn to potential rewards that can help them survive and reproduce...what is surprising is that these basic pain and pleasure motives have been co-opted to serve our social lives as well. The single most important need of an infant mammal is to be continuously cared for by an adult. Without this, all other needs of the infant go unmet, and it will die. Creating ways to keep us connected is therefore the *central problem of mammalian evolution*. **By making threats to our social connection truly painful, our brains produce adaptive responses to these threats (for example, an infant’s crying, which gets a caregiver’s attention). And by making the care of our children intrinsically rewarding and reinforcing, our brains ensure that we will be there for our children even before we are needed** (Lieberman 2013: 98).

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resulting in maternal nonresponsiveness and infant mortality, which is primarily responsible for “social and emotional problem detection and management” (Eisenberger and Lieberman 2005, Lieberman 2013:56). When the dACC is severed, the neurobiological “alarm” of “unpleasant physical sensations triggered by the emotional displays of others” (Ibid.) does *not* go off and those mothers do not respond to their infant’s distress calls. Not surprisingly, these infants have very high mortality rates. Thus, “the difference between life and death for the pups was literally determined by whether their mothers had an intact cingulate or not” (Lieberman 2013:56).

<sup>47</sup> “We don’t find babies cute because they are *intrinsically* cute; rather, we are the descendants of people who nurtured and protected their babies and were intrinsically rewarded (through cuteness detectors, let’s say) for doing so. If we find the smell of rotten food or feces disgusting, it is not because they really and truly smell bad (in any objective sense), but because those of our ancestors who had a genetic mutation that caused them to avoid these things (by co-opting their olfactory sense) were those who fared better in the genetics arms race to pass on their genes. When we find something pleasurable or displeasurable, it is often because tens of thousands of years of brain evolution have *selected* for those emotions; natural selection has favored them because they led to a motivational state that served our ancestors well in the competition for resources, mates, and health” (Levitan 2008:90).

These reward/punishment motivations were naturally selected to help humans survive in a complicated social world. But as a consequence to social dependency and constant social vigilance, human bodies became highly responsive (some might even say, physiologically susceptible) to cues in the social domain.<sup>48</sup> “Social selection<sup>49</sup> increases the magnitude of pro-social traits until the benefits of getting more and better partners are balanced by personal costs incurred by creating displays, following norms, fulfilling commitments, and helping others. The positive feedback in this process offers an explanation for how selection could have shaped such extraordinarily costly social traits” (Neese 2009:147).

Large slow growing brains are designed to be highly responsive to the conditions of their physical environments. “Such flexibility has been a component of primate evolutionary success in myriad habitats...highlight[ing] the role of cognitive functioning and behavioral plasticity in anthropoids...[and] are intricately tied to being able to deal with fluctuating resources and shifting environmental elements” (MacKinnon and Fuentes 2012:71). But more than this, our brains are highly responsive to the conditions of their social environments as well. “The anthropoid brain, in particular, found in

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<sup>48</sup> “These [social] adaptations intensify the bonds we feel with those around us and increase our capacity to predict what is going on in the minds of others so that we can better coordinate and cooperate with them. The pain of social loss and the ways that an audience’s laughter can influence us are no accidents. To the extent that we can characterize evolution as designing our modern brains, this is what our brains were wired for: reaching out to and interacting with others. These are design features not flaws. These social adaptations are central to making us the most successful species on earth. Yet these social adaptations also keep us a mystery to ourselves. We have a massive blind spot for our own social wiring. We have a theory of ‘who we are,’ and this theory is wrong...These [social] connections lead to strange behaviors that violate our expectation of rational self-interest and make sense only if our social nature is taken as a starting point for who we are” (Lieberman 2013:9 and ix).

<sup>49</sup> See *Appendix: Chapter 2: 2.6.6 Social Selection* for a deeper discussion on this.

monkeys, apes, and humans, contains extensive neural networks dedicated to processing social interactions. **In part, this neural circuitry is likely related to the success of social plasticity as an adaptive mechanism in primates**” (MacKinnon and Fuentes 2012:70, emphasis added).<sup>50</sup>

Large neocortices and slow development are crucial features in mind-body interactions. Extended development and neural plasticity provide for physical and social environments to shape genotypic and phenotypic development. Prolonged post-natal development “may provide...an extended period to develop the knowledge and skills shaped by life experiences that are crucial for complex social interactions” (MacKinnon and Fuentes 2012:81) and “**makes human brains especially responsive to the environment and susceptible to enculturation**” (Downey and Lende 2012:117, emphasis added).

This capacity, also called plasticity or adaptability, is one of the most unique features of the human species. It is what has allowed us to occupy diverse habitats across the world and the neural foundation of social learning, cultural construction, and creativity. Our ability to interpret and react (in fitness enhancing ways) to the conditions of our environments (be they ecological or social) is, arguably, one of the greatest superpowers that humans possess. And it begins young, “because infants depend on these social

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<sup>50</sup> Behavioral plasticity is directly related to primates responses to social, not just ecological, conditions and problems, because primates respond to similar ecological conditions and problems in socially specific ways; “the genus shows a high level of behavioral plasticity and even intraspecific variation in areas that are ecologically very similar” (MacKinnon and Fuentes 2012:72). Social conformity, socially mediated behaviors and culturally specific traditions are found across primate societies, especially human societies.

motivations in order to receive the care they need to survive, these urges are built into our operating system and stay with us for a lifetime” (Lieberman 2013b).

In fact, hundreds of thousands of years have selected sophisticated attachment adaptations that increase the probability of recognizing and responding to social cues. One of these is the Perceptual-Action Model (PAM) (Preston and de Waal 2002). Based on motor behavior with the same name, “PAM allows one to perceive environmental conditions and to incorporate them into an action plan, being an open mechanism, based on mirror neurons, which supports the flexible relation between perception and action (Preston and de Waal 2002). PAM is co-opted in highly social species in order to evaluate social environments, detect opportunities or challenges, construct a mental plan of action, and enact fitness-enhancing behavioral adjustments. Theories about social susceptibility, adaptability, and situational appraisals in human evolution are not new (Arnold 1960; Frijda 2006). “They begin with the assumption that organisms are constantly alert to changes in the situation that might have implications for their well being” (Neese and Ellsworth 2009:134).

As the fitness consequences for pro-sociality increased, body systems once designed to adapt to ecological challenges were co-opted<sup>51</sup> to respond to dangers in the social domain.<sup>52</sup> Adaptive warning signals like pain, emotion and stress activate pleasant or unpleasant bodily sensations based on cues in the social environment. Biochemical

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<sup>51</sup> For a more detailed discussion on co-opted body systems see *Appendix: Chapter 2: 2.10.1 Co-opting Body Systems: Warning Systems Overview*.

<sup>52</sup> For example, via the pain overlap theory discussed in Chapter 4, “affective neuroscience argues that the proximate mechanisms of social attachments piggyback onto the physical pain system through opioid processes” (Pankepp 1978).

reward/punishment mechanisms respond to perceived conditions in the social environment to reward pro-social behavior and punish anti-social behavior. These processes leave our bodies open to psychosocial influence, and many cultural adaptations in the form of medical techniques and healing rituals exploit and enhance these bio-social feedback systems (McClenon 2006).

It is important, but obvious, to note that social, cultural and behavioral responses to external stimuli take place on a different time scale than genetic responses. They are more rapid. “Human populations exhibited many more developmental or ontogenetic responses than genetic responses to environmental stressors. Thus, human adaptability and biological plasticity were...keys to understanding the adaptive process” (Leatherman and Goodman 2011:31).

Nor is the adult phenotype solely a function of the genome. We have evolved a series of mechanisms which allow the environment in early life to mold our mature phenotype through the processes of developmental plasticity. Furthermore, inheritance involves more than genes: it may involve epigenetic<sup>53</sup> marks and it certainly involves cultural inheritance. The mature phenotype is thus a construct of inheritance, including genomic and non-genomic inheritance, and the result of developmental plasticity, itself informed by environmental history, and is defined further by the interaction with the current social, physical, and biotic environments” (Gluckman et al. 2009:258).

As we discuss these social adaptations here and later in this chapter, it is important to keep in mind that

one adaptation did not follow the other in simple linear fashion; numerous connections within and between systems were implicated. The adaptations that contributed to *Homo*’s evolution linked up with each other through multiple, multidirectional feedback loops. Locomotion, breathing systems,

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<sup>53</sup> See more in the *Appendix: Chapter 2: 2.6.8 Epigenetics* for a deeper discussion and literature of epigenetics and how it impacts our physiological susceptibility to stress and adverse environmental conditions.

brain size, food sharing, diet, tool-making skills, and so on all changed in self-reinforcing—and sometimes self-limiting—ways (Sobo 2013:74). For example, life history, ecology, group size, type of competition and food availability all interact to produce specific fitness enhancing physical and social variations.<sup>54</sup> The transition to higher quality food allows for this metabolic trade-off but it also requires changes in the social system in order to monopolize high quality resources.<sup>55</sup> High quality food availability that can be monopolized requires strong, cooperative dominance hierarchies in order to defend the territory. Thus, high quality food enables larger brains and more cooperative social relationships but it also creates complicated in-group competition over who gets access to and control over those food sources. Thus, something as seemingly simple as one's food source has far-reaching consequences on sociality, development, selective pressures, and the ensuing fitness-enhancing adaptations.<sup>56</sup>

The sensory, motivational, and bodily adaptability to perceived cues in our ecological and social environments is clearly advantageous. But there are evolutionary trade-offs of for this adaptability. There is a tricky balance between traits that increase our status and fitness *at the cost* of others (deception, cheating, etc.) and traits that increase our status and fitness *because of others* (trust, alliances, cooperation, coalitions, allies, etc.). There are potentially devastating consequences of the former being discovered by the latter. All

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<sup>54</sup> See *Appendix Chapter 2: 2.6.1 Benefits and Costs of Group Living* for a deeper discussion on food availability and contest versus scramble competition.

<sup>55</sup> See *Appendix Chapter 2: Scramble Versus Contest Competition* for more on this.

<sup>56</sup> “The other primates also create spheres of sociality—niches—that form a developmental milieu, partially buffering them from direct ecological forces and shifting the way that ecological (and social) selective pressures affect individuals. This relationship can create new selective forces both within intraspecific populations and between species in larger communities (e.g., modifying rates of predation, variable use of scattered resources)” (MacKinnon and Fuentes 2012:87).

primates mediate between these motivating pressures, “the need to balance gains from collective living with the dangers of evolutionary ‘free riders’” (Downey and Lende 2012:121).

Furthermore, the brains and bodies we have today are actually hundreds of thousands of years old. Genotypic change is extremely slow and it is important to remember that our brains and bodies developed at a time when our physical and social environments were very different than they are now. Our guts were never designed (or rather naturally selected) to process genetically modified food. Our brains were never designed (or rather naturally selected) to handle the size and sophistication of modern sociocultural systems. As our social group size rapidly expands with modern technology, we become socially susceptible (via pain, emotion and stress signals) to exponentially more triggers (the quantity of social media “friends” one acquires can activate physiological reward or punishment sensations).

The problem is that these social adaptations—and their concomitant physiological responses—were never intended (or rather naturally selected) for prolonged or continual activation. Pain was an adaptive warning system that helped our ancestors avoid dangerous situations, protect compromised body parts and get to safety. It was never supposed to be chronic.<sup>57</sup> Emotions like fear, anxiety, and sadness due to rejection helped our ancestors to behave in ways that were socially advantageous. These emotions were never meant to be constant, activated by watching news reports (of people whom you have never met, whom you will never meet, and who live millions of miles away), or

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<sup>57</sup> See Chapter 4: Pain for more on this.



medically treated.<sup>58</sup> The stress response helped us respond instantaneously to acute threats such as predation and is now activated on a persistent basis via work deadlines, credit card debt, and road rage.<sup>59</sup> Ultimately, the consequence of adaptability, social dominance, and developmental plasticity is that the human body and brain is highly susceptible to the conditions of its social environment (which includes being manipulation, illusion, deception, guidance, suggestion, and circumstance).

I am trying to convey two main points in this section. First, social adaptations in our evolutionary history have made us more physically susceptible to the cues, threats, and conditions of our social environments. And, second, when triggered continuously (as happens often nowadays), they can actually cause or exacerbate sickness and disease.<sup>60</sup> The latter is particularly significant because medical therapies that are able to mediate social cues and conditions or lessen the occurrence and course of these types of social adaptations can influence the processes of sickness and healing. Understanding the evolutionary development and proximate mechanisms of social susceptibility helps us to see that part of the therapeutic efficacy of indigenous medicine is regulating these systems through action on social relationships and meaning.

### **2.3 The Evolutionary Processes of Social Susceptibility**

There are specific evolutionary transitions and adaptations that leave human bodies susceptible to social cues, threats, and conditions. Due to space constraints, I provide a

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<sup>58</sup> See Chapter 5: Emotion for more on this.

<sup>59</sup> See Chapter : Stress for more on this.

<sup>60</sup> For example, stress inhibits the immune system. If it persists a long time it can leave the body vulnerable to bacteria, viruses, and harmful pathogens. It is also a predictor of: obesity, heart disease, diabetes, and hypertension.

detailed discussion and literature review of the following *social susceptibility* ecological, social, and morphological transitions in human phylogenetic history in *Appendix*:

*Chapter 2: 2.6 The Evolutionary Processes of Social Susceptibility:*

- Benefits and Costs of Group Living (2.6.1)
- Social Versus Ecological Determinants of Brain Size (2.6.2)
- Social Brain Hypothesis (2.6.3)
- Challenges from Encephalization and Increased Life History Demands (2.6.4)
- Hyper-Attachment Adaptations (2.6.5)
- Social Selection (2.6.6)
- Developmental Plasticity (2.6.7)
- Genome, Epigenome, Epigenetics (2.6.8)

**2.4 Evolutionary Medicine**

“Unfortunately, much of modern medical practice demonstrates a misunderstanding of the evolution of physical responses to stresses that were faced by our ancestors” (Trevathan et al. 1999: 2). This is one of the biggest problems facing medical researchers and practitioners today. The previous sections in this chapter set out to explain how and why our bodies evolved to be highly responsive to stressors in our social world, which created the conditions in which developmental and behavioral plasticity rapidly expanded. The ability to perceive the world and respond in fitness enhancing ways via one’s physical senses, or physical susceptibility to social triggers, was selected for because it encouraged pro-social and discouraged anti-social behavior. While all of these social susceptibility adaptations were advantageous to our survival and reproduction in the Pleistocene and led to our overwhelming success as a species, they also result in evolutionary trade-offs and mismatches with modern environments that are harmful to our health (See *Appendix: Chapter 2: 2.10.6 Modern Mismatches of Social Susceptibility* for a deeper discussion on evolutionary mismatches in modernity). They leave our bodies

susceptible to psychosocial intervention. This knowledge is the foundation from which we can build a better understanding of the sophisticated biocultural interactions at work in mind-body medicine.

In *The Social Life of Placebos*, I want to show that key features of Asante indigenous ritual healing ceremonies are well suited to counteract some of the health problems exacerbated by social susceptibility. Because many of the stressors faced by the Asante are culturally specific (e.g., witchcraft and familial obligation), healthcare that target those specific psychosocial etiologies themselves, and not just the biological symptoms, can impact the healing processes.

“Cultural ideologies, values, and the socialization experiences of medical researchers often prevent disease and human disorders from being conceptualized in evolutionary terms, even in the face of much relevant data that make it necessary and logical” (Trevant et al. 1999:5-6). Evolutionary medicine uses a more holistic framework that analyzes the development of the brain and body, incorporating phylogenetic trajectories and the selective pressures of ecology and sociocultural niche construction. It “involves the application of evolutionary theory to understand...diseases in the past and...what they may tell us about contemporary health issues” (Brown 1998:2-3).

Since all human societies have had to cope with sickness and healing as well as social susceptibility, research particularly focused on culturally constituted stressors and methods of alleviation (or, arguably, ways that the stressor-alleviation cycle is continually reinforced) via medical rituals represents a rich field of study, creating “a

feedback loop from behavior to environment to selection in ways that are not generally represented in most evolutionary scenarios” (Downey and Lende 2012:118).

The mechanistic model of modern biomedicine represents the body as a machine—a system of processes, interactions, and connections that can be analyzed, broken apart, and put back together. While this approach to medicine has proven effective in many areas, it is not a very realistic portrayal of the human body. Individual machines are devoid of history, variety, culture, or community. They don’t yet adapt to circumstances, have expectations, exhibit individual temperaments, respond to environmental changes, or mimic other machines. Another theoretical model is that of evolutionary medicine. This perspective represents the human body (as well as pathogens) as the result of millions of years of small adaptations to environmental pressures where variation in any given trait (including genotypic, phenotypic, and epigenetic, as well as psychological, social, and cultural) within a population leads to differential fitness where those traits most suited to a particular environment (or sexually selected for) survive and reproduce at higher frequencies in subsequent generations. Since sickness and disease are problems that have existed throughout evolutionary history all organisms have had to develop adaptive responses to those problems.

Evolutionary medicine<sup>61</sup>—which “involves the application of evolutionary theory to understanding diseases in the past and to understanding what they may tell us about contemporary health issues” (Brown 1998:2-3)— incorporates the ecological, historical

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<sup>61</sup> Go to *Appendix: Chapter 2: 2.7 Evolutionary Medicine* for more. This has also been called Darwinian medicine, dual inheritance theory, and gene-culture co-evolution.

and sociocultural environments and interactions in which sickness and disease develop and the sociocultural adaptations and technologies that have evolved to maintain health and wellbeing over time. In the last decade, researchers have begun to uncover the biocultural evolutionary determinants of health and the modern ecological mismatches of many other health problems.<sup>62</sup> This field incorporates evolutionary knowledge in order to understand and treat sickness and disease in modern health contexts and explores motivating and constraining influences on the human body's physiological response to disease over time and to therapeutic behaviors across cultures.<sup>63</sup>

#### **2.4.1 Evolutionary Medicine of Medical Therapy**

The application of biocultural evolutionary theory “use[s] evolutionary models to examine both the physiological responses of the human host to a disease organism and the physiological responses to medical therapies” (Brown 1998:3). It is important to highlight that research in evolutionary medicine (and even paleo and biological anthropology)<sup>64</sup> has been overwhelmingly focused on the former aspect, the evolution and physiological response to disease, and has largely neglected the latter aspect, the

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<sup>62</sup> Such as: addiction (Smith 1999; Lende 2007), allergies (Barnes et al. 1999), anxiety and mood disorders (Neese 2011), asthma (Hurtado et al. 1999), back pain (Anderson 1999), breast cancer (Eaton and Eaton III 1999), colic (Barr 1999), chronic degenerative diseases (Gerber and Crews 1999; Ewald 2007), congestive heart failure (Weil 2007), lactose intolerance (Wiley 2007), depression (Neese 2009), diabetes (Moalem 2007; Lieberman 2007), eclampsia/preeclampsia (Robillard et al. 2007), malaria (Moalem 2007), neonatal jaundice (Brett and Niermeyer 1999), premenstrual syndrome (Doyle et al. 2007), infertility (Nunez-de la Mora and Bentley 2007; Pollard and Unwin 2007), and sexually transmitted diseases (Ewald 1999; Foxman and Neese 2011).

<sup>63</sup> See *Appendix: Chapter 2 2.7 Evolutionary Medicine* for more on this topic.

<sup>64</sup> For example, “Paleoanthropology can provide a window on disease evolution over long periods of time and highlight the main reasons for the appearance of specific diseases” (Roberts and Manchester 2005; see also Larsen 1997). “Biological/medical anthropology focused on living populations can provide a better context for the many factors responsible for disease occurrence in populations today” (McElroy and Townsend 1996; Sargent and Johnson 1996).

physiological response to medical therapy. This is my biggest criticism of the field. It has not paid adequate attention to role of medical systems in influencing our socially susceptible bodies. This is a major oversight because highly plastic, hyper-reactive, context dependent brains and bodies provide an ideal lens, especially when combined with extensive ethnographic specificity, into psychosocial-physiological mutual reactivity; or how social and cultural things get under the skin.

While most research in this area focuses on the evolutionary mechanisms of illnesses and disease or the mismatch between our stone-age bodies and modern environments, this manuscript highlights a less explored aspect of evolutionary medicine that focuses on the evolutionary roots of culturally specific medical behaviors, beliefs, expectations and therapies; to focus not only on the illness itself, but on how people have coped with sickness and disease over time and across cultures. Furthermore, because of human developmental plasticity and social susceptibility, scientists better equipped via evolutionary models to recognize and evaluate the influence of social and cultural behaviors and expectations on the body “can draw on the increasing evidence of how neuroplasticity plays a role in social and cultural dynamics” (Lende and Downey 2012:24).

In fact, the most renowned books on evolutionary medicine during the last twenty years<sup>65</sup> focus almost exclusively on disease and largely ignore ethnomedical therapies and physiological responses to medical therapy. One rare exception is an article on

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<sup>65</sup> Neese and Williams 1996; Ewald 1996; Trevathan et al. 1999; Boaz 2002; Sapolsky 2004; Moalem 2007; Stearns and Koella 2008; McKenna et al. 2008; O’Higgins and Elton 2008; Trevathan and McKenna 2008; Gluckman et al. 2009

“Evolutionary Paediatrics” by Helen Bell in O’Higgins and Elton’s 2008 book *Medicine and Evolution* in which Bell describes the field of ethno-pediatrics, which compares parent-infant behavior cross-culturally in order to discover how different caregiving styles impact health and disease in children. Bell then combines both ethno-pediatric and evolutionary medicine to argue for an evolutionary pediatric “approach to infant and child health that draws upon cross-species, cross-cultural, historical, and palaeoanthropological evidence to inform critical examination of Western postindustrial and biomedical models of infant care” (Bell 2008:128).

*The Social Life of Placebos* attempts to fill in the lacuna left by evolutionary medicine’s neglect of biocultural evolutionary analyses of ethnomedicine and medical therapies. I want to follow Bell’s model and argue for an “evolutionary ethnomedicine” which compares medical therapies cross-culturally in order to discover how different practices affect health, wellbeing and survival.

What would an evolutionary medicine approach to medical therapies look like? First, it would assume that all medical systems, including biomedicine and all medioreligious practices worldwide that deal with sickness and healing, are “ethnomedicines”<sup>66</sup>— where “disease is a construct created and reproduced by any/all medical systems on the basis of some generally agreed upon criteria which do not necessarily privilege knowledge based upon ‘visible democratic facts’” (Nichter 1992). Ethnomedical studies presumes that the

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<sup>66</sup> Ethnomedicine “entails a study of the full range and distribution of health related experience, discourse, knowledge, and practice among different strata of a population; the situated meaning the aforementioned has for peoples at a given historical juncture; transformations in popular health culture and medical systems concordant with social change; and the social relations of health related ideas, behaviors, and practices” (Nichter 1992: ix).

underlying coherence and practice of medical therapies are socioculturally situated, geopolitically motivated and ecologically and historically constituted. Moreover, an evolutionary medicine approach to ethnomedicine would presuppose that therapeutic interventions—much like diseases themselves—evolved and adapted over time, are aggregated and increasingly complex, bear the remnants of previous forms, and encounter trade-offs with competing pressures and mismatches between our Environment of Evolutionary Adaptedness (EEA)<sup>67</sup> and modern environments.

There are many different approaches to the study of ethnomedicine<sup>68</sup> which is broadly conceived as the study of everyday life, perceptions of the normal and natural, the desirable and feared, and that form of embodied knowledge known as common sense as it emerges in efforts to establish or reestablish health as one aspect of well-being...how well-being and suffering are experienced bodily as well as socially, the multivocality of somatic communication, and processes of healing as they are contextualized and directed toward the person, the household, community and state, land and cosmos (Nichter 1992: x).

An evolutionary medicine approach to ethnomedicine works in conjunction with previously established types of ethnomedical inquiry: comparative studies of illness beliefs and therapeutic techniques in search of cultural universalism or cultural relativism, cross-cultural comparative physiological studies where culture is the mediating or confounding variable and studies of therapeutic efficacy where healing techniques and procedures are contextualized via content, performance, expectations and criteria of assessment (Nichter 1992:xi). This approach is necessarily biocultural and

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<sup>67</sup> The term Environment of Evolutionary Adaptedness (EEA) was originally coined by John Bowlby in *Attachment and Loss* (1969) and refers to the ancestral environment, including all of the adaption-relevant properties (Tooby and Cosmides 1990) and selection pressures, in which humans evolved. For further information see: Foley 1995.

<sup>68</sup> For an excellent extended review see Nichter 1992: x-xi, which outlines twelve main forms of inquiry in ethnomedical studies: symbolic, descriptive, historical, ethnographic, continuity versus change, health care seeking and patterns of resort, illness classification, illness beliefs and reinforcing social order, the political economy of health, cultural comparative, biological comparative, and therapeutic efficacy.



demands not only serious evaluation of both the biological and cultural elements of a healing encounter, but also the interactions, dialectic relationship and dynamic process between them.

Disease-focused studies in evolutionary medicine are necessary but not sufficient. They explain how a disease or pathogen evolved, adapted, and interacts with environmental pressures and human bodies. They elucidate how adaptations advantageous to human fitness can make us vulnerable to sickness and disease, but they do not explain why human physiology is so susceptible to social, cultural and ritual manipulation or how psychosocial phenomena influence physiological states. Disease-focused studies do not explain cross-cultural variation in therapeutic care, and/or how therapeutic interventions influence and interact with the diseases themselves--which obfuscates attempts at comparative studies. Disease-focused studies presuppose illness categories and classifications which may or may not be cross-culturally relevant and tend to be biomedically-centric. Finally, disease-focused studies neglect the ritual and religious health “assets” that people often draw upon to cope with their resource-deprived, conflict-heavy, unhealthy political and economic circumstances; and that can transform these “conditions that produce ill-health” (Cochrane 2007:6).

An evolutionary medicine approach focused on ethnomedical therapies, on the other hand, assesses how therapeutic behaviors evolved, adapted and interact with environmental pressures and human bodies. It explains how pro-social adaptations that are advantageous to fitness can simultaneously make us vulnerable to social manipulation, verbal suggestion, psychosocial stress and the negative health effects of

social pain. In addition, therapy-focused studies go further than disease models of specific endogenous physiological pathologies because they also examine the proximate mechanisms by which non-physical variables influence physiological processes.

Understanding the macro-historical, ecological and geopolitical context of the evolution and adaptation of particular medical systems is critical to comprehending cross-cultural variation in therapeutic care, and how those variations impact the course, pathology and manifestation of sickness and disease, as well as different healing techniques. Finally, ethnomedical therapy-focused studies inherently incorporate local knowledge and cultural particularity, which is a step in the right direction toward avoiding hegemonic bias.

There are many problems inherent in comparing different medical systems, especially in regard to assessing therapeutic efficacy (See *Appendix: Chapter 2: 2.7.1 Problems in Therapeutic Efficacy* and *2.7.2 Why Compare?* for more). Yet there are also many insights not otherwise obtained. By triangulating comparisons of ethnomedical therapies via an evolutionary perspective we eliminate some of the biomedicine-centric biases and highlight techniques societies have developed to deal with universal health problems, and how these impact sickness and healing today. My hope is that situating both biomedicine and Asante indigenous healing within a biocultural evolutionary approach to ethnomedicine will de-exoticize Asante ethnomedicine, making it more understandable, commensurable and therefore, applicable to broader problems in sickness and healing as well as providing a critical gaze upon dominant biomedical practices and current theoretical ideologies.

Medical anthropology<sup>69</sup> has a long history of analyzing current medical problems from the perspective of their biocultural evolutionary history. These types of studies have focused on subjects such as the modern obesity epidemic and shown how adaptations which were naturally selected in our EEA might be maladaptive in our current ecology. This mix of physiological and cultural adaptations, evolutionary by-products and trade-offs, and constraints inherent in complex biocultural interactions over time have significant consequences and implications for modern health problems, such as obesity, heart disease and diabetes: the leading causes of sickness and death in the United States today. Medical models that do not take into account the ultimate interactions between phylogeny,<sup>70</sup> ontogeny (including how our brains and bodies develop in specific cultural contexts), mechanism, and adaptation will offer a limited understanding of the processes that affect sickness and healing (For a great example of this see *Appendix: Chapter 2: 2.8 The Malaria Case Study*).

Evolutionary medicine includes not only our phylogenetic past, but also the evolutionary trajectory of pathogens, bacteria, viruses and all other plants and animals as they interact with human hosts. It also includes the impact that changes to our bodies over the course of our evolutionary trajectory (i.e., increased intellectual,<sup>71</sup> social and

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<sup>69</sup> Medical anthropology is “a biocultural discipline concerned with both the biological and sociocultural aspects of human behavior, and particularly with the ways in which the two interacted throughout human history to influence health and disease” (Foster and Anderson 1978:2-3). “Medical anthropology is an interdisciplinary field that currently unites biological and sociocultural anthropology in terms of a biocultural evolutionary model” (Anderson 1990:20).

<sup>70</sup> Phylogeny refers to the evolutionary history, development and interrelations of a species or taxonomic group as they change through time.

<sup>71</sup> For a more detailed description of the development and consequences of increased intellectual complexity see *Appendix: Chapter 2: 2.10.5 Increased Intellectual Complexity*.

emotional complexity<sup>72</sup> and physiological receptivity to social threats, etc.) and environments (i.e., larger social groups, increased psychosocial stress, obesogenic environments, technology, etc.) have on the distribution and manifestation of sickness and disease. “Most still treat culture as an external variable—as an add-on to an essentially biological system. Most fail to present a model of biocultural diversity that gives adequate weight to the cultural side of things” (Sobo 2013:8). However, “if, as I have suggested, those specific ways of acting, perceiving and knowing that we have been accustomed to call cultural are incorporated, in the course of ontogenetic development, into the neurology, musculature and anatomy of the human organism, then they are equally facts of biology” (Ingold 2001:25).

*The Social Life of Placebos* argues that understanding how our bodies evolved, how diseases evolved *and* how our medical systems interact with and even sometimes counteract those evolutionary processes is important. These processes affect not only the questions we ask about sickness and disease, but also how we measure therapeutic efficacy, and the approach we take to treatment. We must also analyze the cultural interventions humans use to manage health, manipulate psychological and physiological processes, and cope with our evolutionary trade-offs and mismatches. “In addition to efforts to eradicate epidemic and pandemic health threats, we might further explore the possibility of culturally manipulating features of the environment that support attenuation in problematic pathogens” (Sobo 2013:183). Different than the study of host-pathogen

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<sup>72</sup> For a more detailed description of the development and consequences of increased emotional complexity see *Appendix: Chapter 2: 2.10.2 Increased Emotional Complexity*. Also, see Chapter 5: Emotion and the corresponding appendices.

relationships, but isn't this what Osei was talking about when he explained how Asante indigenous ritual healing ceremonies work? His job was to *manipulate features of the environment that support attenuation in problematic psychosocial stressors*. "The solving of these problems should be conceptualized as a process of neurological remodeling via the social interface" (MacKinnon and Fuentes 2012:86). **If human bodies evolved to be highly responsive to environmental stressors, especially threats in the social domain, eliminating and exacerbating those threats would have a significant role in how bodies perceive and respond to medical encounters.** The "human adaptive advantage is not simply superior intelligence or the individual's brain, but rather the species-specific ability to create a 'cultural niche' full of information, socially transmitted adaptive strategies, and the necessary social scaffolding to acquire environmentally appropriate toolkits" (Downey and Lende 2012:122).

## 2.5 Cultural Niche Construction

How an organism responds to and manipulates its ecological environment to meet its needs (i.e., via material culture or socio-behavioral flexibility) and then how that organism's body is, in turn, affected by that manipulation is the process of cultural niche construction.<sup>73</sup> Cultural niche construction refers to the ways in which humans alter their environments and, thereby, the selection pressures and stimuli they respond to. "We humans make cultural interpretations of given biological processes and, in turn, manage and thereby modify these processes culturally, including through culturally infused forms

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<sup>73</sup> "*Niche construction* is defined as modification of the functional relationship between organisms and their environment by actively changing one of the factors in that environment" (MacKinnon and Fuentes 2012:73; original emphasis) or modifying their surroundings.

of social organization...Cultural modes of management affect our physical existence... [which] alter our bodies in patterned, population-specific ways”(Sobo 2013:9). Niche construction<sup>74</sup> provides an “exciting opportunity to examine the mutual interplay of culture and biology across multiple levels of analysis, from genes and brain to mind and behavior, across the life span” (Ambady and Bharucha 2009: 345).<sup>75</sup>

## **2.6 Health Systems**

“Health and disease are measures of the effectiveness with which human groups, combining health and cultural responses, adapt to their environments” (Liebman 1973:1031). Health represents a rich area in which to study these brain-body-environment interactions. It is especially significant for understanding the interplay between physiological systems and psychocultural constructions in sickness and healing, for a couple of reasons. Foremost of these is that our body systems are designed to respond to our social environments with short term *and* long term changes. This means that our bodies not only make context-specific physiological adjustments to stressors in the social domain, but they also respond via epigenetic and developmental alterations over the course of one’s lifetime—especially during early childhood—to social constraints and pressures. Furthermore, we acquire as members of our society a set of shared cultural beliefs and expectations about the world which shapes our immediate perceptions and

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<sup>74</sup> See *Appendix Chapter 2:2.11 Cultural Niche Construction* for a literature review and deeper discussion on this subject.

<sup>75</sup> See also: “The brain actually grows and wires itself over developmental time, where gene expression, epigenetics, neuronal selection, and experience-dependent growth all help shape the brain’s functionality from infancy to adulthood and old age. This slow unfolding of human brains over the life course means that evolution can largely work through changing the developmental dynamics of the human brain, whether in internal fashion or through brain-body-environment interactions. We outline niche construction as a way to understand those brain-body interactions” (Downey and Lende 2012:105).

responses to our environment as well as our long-term physiological development. We are encultured in how to “feel” and “heal.” For example, there are

populations with distinctive neuroendocrine and autonomic responses to basic human sensations, such as feeling compassion, pain, or fear. These cases suggest that limbic systems can be affected by patterns of early experience, and are provoked (or suppressed) by symbolic situations, social contexts, or even learned techniques for self-manipulation, such as reappraisal (Lende and Downey 2012:48).

Moreover, what are considered normal or abnormal physical sensations is culturally relative. Acceptable levels of pain and discomfort for things like menstruation, childbirth, and menopause are culturally relative. What might be normal in one culture is considered a sign of ill health or medicalized in another.

Another reason why understanding specific social dynamics and networks and cultural expectations and behaviors in biocultural interactions is particularly important in discussions of health is because the biological consequences, and the psychosocial conditions and pressures themselves, are malleable.

All primates are shaped by the interplay between our physiological (i.e., central nervous system, endocrine system) and the social and biological environments in which we live. In particular, information crucial to our survival is disseminated through social networks, and those networks influence how we experience the world... We know that the interactions between social effects (e.g., perception of status, dominance rank, etc.) and physiology (e.g., endocrine and cardiovascular systems, the central nervous system; learning and memory) are well documented and are dynamic, experience-influenced, malleable systems (MacKinnon and Fuentes 2012:83).<sup>76</sup>

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<sup>76</sup> For example, “We even see that what is assumed to be ‘species-typical’ in terms of social structure or social characteristics can change in a very short period of time. Take the case of a highly despotic olive baboon (*Papio anubis*) society in Kenya, studied since 1978, that underwent a sort of extreme ‘social bottleneck’ event when tuberculosis struck the troop in the mid-80s and the most aggressive and dominant males succumbed to the outbreak. The cohort of unaggressive subordinate males that were left became part of the new founding population, and the troop has displayed a more egalitarian set of social behaviors to this day. New males transferring into this group quickly adopt the social norms displayed by its members (e.g., higher grooming rates, increased affiliation with females, a relaxed dominance hierarchy, and lower cortisol levels among low-ranking males), all of which are counter to what is typical for this type of baboon” (MacKinnon and Fuentes 2012:83 referencing Robert Sapolsky’s (2002) *A Primate’s Memoir*).

### 2.6.1 Health resource allocation

While all of these topics are fascinating, how do they impact health? More specifically, how can they help us to better understand the biocultural interactions involved in Asante medical encounters? This section is one of the most important concepts in *The Social Life of Placebos*. Understanding health resource allocation and how our bodies use cues about our access to quality healthcare and trusted caregivers is essential to understanding how evolutionary processes, placebo effects, and Asante rituals fit together. “Mechanisms underlying pain have evolved to be much more complex in humans than in other animals. Whereas, in other less complex animals the level of pain is determined simply by the amount of bodily damage, in humans it is also influenced by a whole range of factors in the social environment. Among these factors...is the availability of medical help” (Evans 2004:111, speaking about Wall’s 2000 arguments in *Pain: The Science of Suffering*).

Basically, in instances of sickness and healing, our bodies use cues from the environment to determine the allocation of critical endogenous resources. For example, perceived conditions about the context of care (e.g., access to resources, trust in health practitioner and medical system, etc.) determine which and how many endogenous resources to divert toward repair and healing because healing can often leave the body feeling sick, weak, dependent on others, and vulnerable.<sup>77</sup> It is that perception of how much access you have to food, money, healthcare, caregiving, rest, downtime, and safety

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<sup>77</sup> And in the Asante case, due to cultural ubiquity, one could argue attacks on your spirit via witchcraft as well.



that triggers the internal diversion of resources toward healing and determines *how much* metabolic energy your body will devote to fighting the illness or ailment and for *how long*. Thus, any factors that affect that perception (such as poverty, alienation, fear, stress, conflict, insecurity, etc.) impact those health resource calculations, and, ultimately affect how quickly you get well and how much long term damage occurs in the process. Dr. Nicholas Humphrey in “Great Expectations: The Evolutionary Psychology of Faith Healing and the Placebo Effect” (2002) “postulates the existence of a ‘health governor’ in the brain, which acts like a hospital administrator, forecasting the body’s future needs and allocating costly resources (from immune responses to self-generated symptoms, such as pain or fever) appropriately” (Marchant 2016:260).

Health resource allocation balances physiological adjustments between what is helpful in the moment versus what is helpful over the life course. Basically, our ability to “heal” is not a one-size-fits-all. The intensity, duration, and allocation of resources for those healing processes are dependent on an individual’s perceived conditions about their physical and social environment.

we assume that an individual has a disease which is potentially life threatening and that the effort put into recovery can be chosen from a continuous scale. By assuming two possible sources of mortality, the disease and other sources, we show that recovery effort level will often positively correlate with how good the individual perceives the world to be (e.g., probability of food supplies). In other words, **if an individual believes (falsely or not) that its situation has improved, it can be expected to put more resources into fighting the disease; i.e., the placebo effect should be induced...The effort put into health should change according to the perceived environmental conditions.** (Trimmer et al. 2013:10, emphasis added).

Similarly, there are health resource allocation adjustments every time we “feel” sick. Our bodies dedicate resources toward healing depending on the conditions in the environment-- and that includes our perceptions of status, resources and access to quality caregiving. Being in a state of endogenous maintenance and repair leaves us vulnerable. We are unable to provide for or protect ourselves. Thus, *only* when we have sufficient aid and protection will our bodies go into what medical anthropologists call sickness behaviors and biomedical doctors call an acute phase response: lethargy, apathy, loss of appetite, and increased sensitivity to pain, etc.<sup>78</sup> Much like a fever, these sickness behaviors were naturally selected over the course of hundreds of thousands of years (possibly many millions) in order to facilitate endogenous healing mechanisms and restorative processes. “The various components of the acute phase response are not themselves pathological. On the contrary; they are actively produced by the body itself as part of the healing process. They may feel unpleasant, but they are actually good for you. In fact, feeling unpleasant is a vital part of their function” (Evans 2004:45).

Perception can activate, amplify or decrease the resources allocated toward healing based on “expected worth of getting better (be it through paying a lesser cost for fighting

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<sup>78</sup> “When medical care arrives on the scene, such mechanisms would be able to suppress not just pain, but all the other aspects of the acute phase response too—from swelling and fever to lethargy and loss of appetite....The mechanisms that suppress the acute phase response are as little understood as those involved in the placebo response. It is known, however, that the body possesses a number of potent chemicals that inhibit the generation and operation of the key cytokins involved. The precise role of endorphins in this process is not well understood, but they too may help damp down the acute phase response. In the normal run of events, the acute phase response generally subsides between three and four days after infection or injury. But if the mechanisms responsible for suppressing it can be activated by the arrival of social care, then the placebo effect may simply be a way to bring forward the normal process of termination. In fact, this may even be the evolutionary origin of the placebo response” (Evans 2004: 112-113).

the ailment or altering priorities)” (Trimmer et al. 2013). Because endogenous healing processes, like a fever, can make us feel more sick and leave us more vulnerable to other health problems, expectations of assured care, safety, food, sleep and time are needed before the immune system jumps into action. This is why people rarely get sick during the actual moment of stress but often afterwards when they have time to heal.<sup>79</sup>

Perceptions of care and resources can “turn on” endogenous healing processes that have evolved for hundreds of thousands of years to fight off infections and repair and maintain our health. On the other hand, perceptions of care or external intervention can direct the body to conserve or devote energy elsewhere because something or someone else is doing the healing and/or there is no immediate rush to get better. This can “turn off,” dampen or slow endogenous healing mechanisms. “A perceived deterioration in the environment (expecting stressors to become more likely) can trigger the body to fight an illness” (Trimmer et al. 2013). The absence of these assurances of care, resources and time to heal can trigger immediate allocation of health resources and endogenous healing mechanisms toward the problem. While ideal environmental and social conditions are advantageous for health in the long run, adverse conditions or perceived stressors can activate immediate health resources. What all of this means is that an individual’s perception about its social environment can determine how much energy their body will devote to fighting disease.

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<sup>79</sup> For example, illnesses and deaths seem to spike around or after Christmas, students tend to get very sick after final exams, and people often admit to “keeping it together” in traumatic situations until they see a parent or a loved one (a caregiver and social cue of safety) then they “fall apart.”

As a result, medical encounters are more than just where healing takes place, they are the locus around which bodies (unconsciously) make calculations about their external and endogenous health resources, current and predicted health, and immediate and future physical and social environments, which determine metabolic allocation directed toward solving the health problem. Any interactions that affect any of these conditions, consequently, change the calculations. **Thus, Osei’s explanatory model becomes, once again, quite lucid: you can activate, increase or decrease the amount of endogenous resources allocated toward health by changing a patient’s perceived social and environmental conditions.** More specifically, you can “affect the optimal amount of effort put into health by” modifying perceptions about the external physical and social environment, costs of getting well, pay-offs of getting well (value of being well vs. remaining unhealthy) and current situation vs. how they are likely to be in the future. Likewise, you can increase endogenous health resources by making someone believe that their access to or potential to get quality and quantity resources and predictive care were higher than they really are. In addition, any prompts which refocus or shift priorities create a new model of resource allocation, so regular physically or emotionally intense prompts have stronger effects than one-off or forgettable prompts (Trimmer et al. 2013; Neese 2005; Neese and Keller 2005). In short, adaptive internal healing processes in human bodies have evolved to be responsive to the provisions and contexts of care. Since this ability has been present in our *Hominin* lineage for anywhere from 2.5-1.5 mya,<sup>80</sup> it

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<sup>80</sup> Lorna Tilley provides an excellent breakdown of the origins, history, and development of human caregiving behaviors in her 2015 dissertation turned book, “Theory and Practice in the Bioarchaeology of Care” (Tilley 2015).

would follow that cultures have discovered ways to cope with sickness and healing via practices and techniques that influence health resource allocations.<sup>81</sup>

### **2.6.2 Cultural Management of Health**

Humans have a powerful trick up our sleeves. Our bodies are designed to perceive and adapt to signals in our environment. But unlike many of our non-Hominid relatives, we do not have to rely *only* on physiological adaptability. We can navigate and respond to environmental or social challenges with “cultural adaptations” (tools, innovations, rituals, signals, and status signifiers, etc.), adaptations that have played a significant role in human development for hundreds of thousands of years and have led to a very unique problem: a phenomenon where culture becomes both an adaptive resource *and* a selective pressure of itself (Downey and Lende 2012: 122)--especially in modernity.<sup>82</sup> For example, in our current environments, our bodies are adapting to dietary (e.g., Twinkies), material (e.g., political-economic inequality), and social (e.g., Facebook) conditions that are “man-made.” Thus, in a sense, in modern life, our bodies are mostly evaluating and responding to culturally constructed phenomena. This fact underscores the importance of understanding the dense ethnographic context of any experience of sickness and healing, including the meanings and expectations of the healing system itself, in order to decode biocultural interactions in medical encounters. Without including this cultural lens, we

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<sup>81</sup> See *Appendix: Chapter 2: 2.11 Cultural Management of Health* for a deeper discussion on the ways in which cultural adaptation and innovation has impacted healthcare systems.

<sup>82</sup> “An evolutionary account of the human brain needs to consider more than just adaptation. Increasingly, geneticists, comparative neuroscientists, paleoanthropologists, and evolutionary psychologists take into account a range of other factors, including constraints, genetic and developmental mechanisms that generate ‘evolvability,’ and the role of human actions in transforming selective pressures over our evolutionary history” (Downey and Lende 2012:104).

neglect much of the information our bodies are perceiving and responding to. Humans have a “collective ability to amass, transfer, improve upon, and deploy information, strategies, skills and technology” (Downey and Lende 2012: 123). We evaluate circumstances around us and respond via sophisticated fitness-enhancing physiological, emotional, intellectual, social, and cultural strategies in ways that increase our survival and reproduction, or in modern life, our access to high quality and quantity resources and relationships.

There will be a thorough discussion of the evolution, elicitation, and explanation of the placebo effect in the next chapter. What is important to note here is that Asante medical encounters incorporate many of these methods of encouraging optimal health resource allocation and activating and enhancing placebo responses. Because placebo (and nocebo) responses are not unique, they are part of a much larger phenomenon; that of human evolved physiological susceptibility to social conditions. Cultural niche constructions, health resource allocation and placebo responses are not “adaptations” in the traditional sense but rather our sociocultural and physiological *attempts* to navigate among the many competing social selection pressures in a modern world. By changing the actual or perceived environment or prompting meaning reprioritization, health practitioners and rituals activate these ancient biosocial feedback systems. We read cues in our environment in order to know how to respond in the most optimal way. These cues activate fitness enhancing physiological responses *or* motivation structures that incentivize fitness enhancing behavioral responses. As a result, if the conditions or cues in our environment and/or the actual or perceived resources individuals have access to in

order to deal with those conditions change, so too may our physiological and behavioral motivating responses.

These processes are mostly unconscious and often predictive. That is one of the reasons why expectations have such powerful biological consequences. Our bodies are designed to respond not only to expected environments, but also to accurately anticipate and respond to predicted environments. Furthermore, we need to respond, not only to the material conditions in our environments, but also the social conditions. This means being able to anticipate, evaluate, and respond to the thoughts, intentions, and actions of others. As we recall from the earlier Pleistocene hunting example, these anticipatory reactions were essential for survival and social cooperation. Social “adaptations intensify the bonds we feel with those around us and increase our capacity to predict what is going on in the minds of others so that we can better coordinate and cooperate with them” (Lieberman 2013: 9). Accurate prediction of our environment and those around us was so essential to our survival and reproduction that we have inherited some prediction-accompanying adaptations such as pattern recognition, statistical regularity, and environmental predictability. That perception-physical sensation system has evolved for hundreds of thousands of years to help us recognize threats in our ecological and social environments and to respond appropriately. They “prepare biologically adaptive behavioral responses (e.g., to freeze, fight, or flee), enabling humans to be as well prepared as possible for the occurrence of dangerous events in the environment” (Stevens and Byron 2007: 511).

But how do we know *if* we respond correctly? There is also a perception-physical sensation system or rather a pleasure/pain motivational structure that “cause[s] us to act

(or refrain from acting) in particular ways. [Emotional] pain is one of nature's ways of preventing us from doing things that are harmful; [emotional] pleasure is a way to motivate us to undertake actions that will increase our adaptive fitness" (Levitin 2008: 89-90). Through enculturation, we learn to expect specific patterns in social interactions and we learn what behaviors are within the bounds of social norms. When we respond inappropriately or predict incorrectly there is an unpleasant physiological sensation. We *feel* bad. Bad *feelings* feel unpleasant so that we don't repeat the action that caused them. This is the case with incorrect prediction. An adaptive rush of positive hormones rewards us when we predict things correctly. These predicted expectations are based on conditioning, expectancy, and pattern regularity and are culturally and contextually dependent.

Manipulating emotions through music, storytelling, folk lore, religious belief and more recently movies, books and concerts, etc. allows us to "invoke tension in a safe, nonthreatening context, react to it, imagine new forms of tension and our reactions to those, and prepare a repertoire of responses, all from the safety of the campsite, from the safety of our minds" (Levitin 2008: 104-105). Prediction is so important, in fact, that when we are not thinking about anything else, our minds practice via the "social default system" predicting imaginary scenarios-especially the thoughts, feelings and goals of others.

The final three ethnographic chapters in *The Social Life of Placebos* illustrate how Asante medical encounters activate, amplify and dampen physiological responses via



action on modifying patients' perceptions about the social world and where they fit within it.

#### **2.6.2.1 Psychoprophylaxis**

Understanding how ritual ceremonies influence patient physiology is a central problem in studies on indigenous healing. This challenge is particularly poignant in cultures where the existing literature does not account for many of the key characteristics of the healing process. For example, in Ghana, the prevalence and efficacy of indigenous healing has often been associated with psychotherapeutic techniques (Field 1960; Brautigam & Osei 1979; Mendonsa 1982; Mullings 1984) through analyses of divination ceremonies. While this focus is helpful, it ignores many of the other distinctive features of Asante indigenous ritual healing ceremonies (such as, witchcraft mediation, spirit possession, animal sacrifice, ancestor worship and poli-rhythmic drumming, dancing, and chanting). Therefore, psychotherapy is not a very comprehensive, accurate, or equivalent framework for all of the biocultural interactions in Asante indigenous healing rituals. One of the goals of this chapter was to find a better explanatory model— like that of psychotherapy— that is more comprehensive and includes all of the other key components of ritual healing.

At present, most medical interventions can be broken down into two categories: therapeutic (treatment) and prophylactic (prevention). While both are very important to positive health outcomes and present in almost every healthcare interaction, therapeutic aspects of medicine are discussed more often and are better understood. Therapeutic treatment is what most people think of when talking about healthcare. It is prescribed in

response to a manifested ailment,<sup>83</sup> usually not administered to healthy patients, and can come in many forms: active medication, physical therapy, psychotherapy, etc. The goals of therapeutic medicine are to help, cure, ease, and/or fix existing ailments. Prophylactic treatment is different in that it seeks to prevent ailments from occurring, prepare the body for anticipated ailments, protect the body from further sickness, and prepare the body for optimal healing. Prophylaxis is a major feature of all medical encounters and yet it underrepresented in literature on placebo studies, ethnomedicine, indigenous medicine, and cross-cultural comparisons of different medical systems.

Psychoprophylaxis is the process of preparation, prevention, and protection against an ailment through psychological input and seeks to mediate the negative health effects of stress and pain through the process of educating patients about expectations, setting or modifying expectations, preparing the body through conditioning, eliciting relaxation, and promoting self-regulation. Psycho prophylaxis is founded on the idea that socio-cultural and psychological factors can impact physiological ones (Arney and Neill 1982: 5). Psychoprophylaxis is very similar to regular prophylaxis. Its goal is to prevent, prepare, and protect the body from sickness. The difference is that regular prophylactics are material objects or substances used to accomplish these goals, i.e. condoms, pills, and specialized diets, etc.<sup>84</sup> *Psychoprophylactics* are *non-material* interactions used to

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<sup>83</sup> I am using ailment in its broadest sense including, sickness, disease, illness, physical injury or trauma, malady, mental illness, etc.

<sup>84</sup> For example, condoms are used to prevent pregnancy and STD's. Malaria prophylaxis, such as Lariam, Doxycyclin, and Malarone are given to healthy patients to prepare their bodies in case they contract malaria. The medication does not prevent one from being bitten by plasmodium carrying mosquitos, but it prepares the body to fight off those invaders immediately so that malaria contraction is not as virulent or deadly. Vaccines are given to healthy individuals in order to prepare the body against viruses by giving patients a less potent or inactive version of the virus which prepares their body for future attacks by

accomplish these goals, i.e. rituals, communication, behavior modification, expectation regulation, etc. It is comparable to the difference between the prescription of a pill for a mental disorder (therapeutic medicine) and psychotherapy (psychotherapeutic medicine). A great example is the difference between the administration of an epidural to prevent pain in childbirth (prophylactic medicine) and the application of a specific birthing philosophy—Lamaze, Bradley, Hypnobirthing, etc.— (psychoprophylactic medicine) to prevent pain in childbirth.

Psychoprophylaxis has been studied most often (and proven extremely efficacious) in childbirth.<sup>85</sup> Although he was expelled for suggesting it in 1933, British obstetrician Grantly Dick-Read claimed that much of the pain of childbirth stemmed from society's attitude of fear associated with birthing. He argued that because fear induces a fight-or-flight response—constricting blood flow from the uterus to locomotive muscles— it also accentuates the pain felt in birthing. In 1951 Fernand Lamaze, a French obstetrician, reached this same conclusion and created a solution to control the amount of stress and pain felt in birthing where patients are educated about what to expect, how to induce relaxation, and how to control physiological processes. More specifically, Lamaze techniques or this form of psychoprophylaxis, addresses social attitudes and expectations toward birthing, culturally conditioned responses to emotion, and the patient's own ability to influence physiological reactions. And it works. "In virtually every obstetric

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creating antibodies. Patients are often encouraged to eat healthy foods, exercise regularly, and reduce their stress in order to protect the body from future ailments or prevent exacerbating existing ones.

<sup>85</sup> Dick-Read 1942; Pavlov et al. 1963; Beck 1978; Beck et al. 1979; McCraw and Abplanalp 1982; Spinelli et al. 2003; Shilling et al. 2007

performance category, these data suggest that the Lamaze method is beneficial” (Young 1978: 173) These techniques argue that: 1. Most of the fear and stress during child birth is due to socio-cultural factors which increase stress and, thereby, pain and, 2. that patients and practitioners have the power to control the impact of these social factors through education, expectation modulation, conditioning, relaxation, and self-regulation. This is very similar to what Osei said in Chapter 1. He is able to impact the processes of sickness and healing by: protecting patients from sociocultural threats, preventing future attacks, and preparing the body to “do what it naturally knows how to do if it is not being afflicted.”

For example: 1. Much of the fear and stress in Asante patients is due to socio-cultural factors such as witchcraft, occult cursing, and ancestor and familial obligations. This fear increases physiological and psychological tension, anxiety, and pain (See ethnographic chapters for examples), and 2. Patients have the power to control, mediate, and alleviate the impact of these physical, psychological, spiritual, and sociocultural stressors through active participation in Asante medical encounters. According to psychoprophylactic techniques, pain, stress, and negative emotion are significantly lessened by medical therapies that include: educating patients about the causes and expectations of their illness, promoting relaxation through the social, musical, and religious elements of the ritual healing ceremony, and giving patients active control and self-regulation through the treatment process. Since patients approach every medical encounter with their own bundle of expectations and fears, this is true for biomedical examples like childbirth, as well as culturally-dependent contexts of care like witchcraft.

Childbirth is just one example of how social and cultural factors (i.e. attitudes toward treatment, emotions of fear or expectations of pain, and doctor/patient roles) can impact physiological processes. Many other medical encounters are influenced by these same factors as well. This raises some important questions: If psychoprophylaxis is so good at reducing stress, pain, and anxiety in medical encounters, why isn't it being used more? Is it used outside of biomedical healthcare? Can it account for the efficacy of some traditional healing methods or the elicitation of placebo responses? And what is the impact of ignoring evolutionary medicine and psychoprophylactic techniques?

#### **2.6.2.2 Practical Implications**

Understanding the biocultural evolutionary underpinnings of disease and medical therapies, as well as psychoprophylactic techniques, is not only crucial to any study on biocultural interactions in medical encounters, but there are also practical implications for modern biomedical healthcare practices as well.

For example, it is adaptive for contractions during labor to stop when threats are perceived. Childbirth leaves both mother and infant vulnerable to their surrounding conditions. Labor was naturally selected to “turn off” if a mother senses less than ideal environmental conditions (e.g., the presence of a predator, lack of social and physical support, and/or unsafe or threatening social and physical circumstances).

Yet in modern biomedical case studies of childbirth and labor, in the United States for instance, stressors that “turn off” labor have little to do with the presence of a predator and more to do with novel or unpredictable environments. For many Americans, childbirth is the first time someone is a patient at a hospital for an extended stay. Often

the psychosocial environment is completely new because witnessing childbirth is not a regular part of our enculturation. From the clothing the patient wears (to the medicalization of a natural process by calling the mother a “patient”) to the physical exertion expected of a mother in labor, so many aspects of childbirth are new. Expectant mothers are often unprepared, uncertain, and fearful in the very moment when their bodies are evaluating if the conditions of their environments are optimal for birth.

Since feeling stress during labor halts contractions and redirects blood-flow from the cervix (where it is needed) to the arms and legs in preparation to flee or fight, this actually makes birth more difficult and more painful. It is no wonder, then, that over 41% of mothers feel enough stress in hospital births that their labor stops (Declercq et al. 2013). In these settings there is a mismatch between how our bodies evolved (e.g., stress stops labor) and our current biomedical niche construction. There are two main ways to solve the cessation of labor: 1. Get rid of the stressors inhibiting contractions (via education, expectation modulation, conditioning, relaxation, and self-regulation) or 2. Medically induce contractions via a pharmacological agent. Despite the fact that medically induced contractions are very different than natural contractions (they are more intense, have a longer duration, and are closer together) and they have serious side effects (they can cause the fetal heartrate to drop and are positively correlated with cesarean surgery), this is by far the most common solution in American biomedical hospitals (per 2013 national birth statistics). In fact, only “2% of mothers received care practices that promote normal birth and are endorsed by Lamaze International” (Declercq et al. 2013).

There are consequences to ignoring biocultural evolutionary psychosocial-physiological feedback loops and psychoprophylactic techniques. “In our times, sophisticated technology, intended to provide advantages for human kind, sometimes has had unforeseen adverse effects on human health” (Moore et al. 1980: v). There are many trade-offs of our evolutionary history that have significant impact on the course and development of sickness and healing (or in this case, childbirth). Likewise, many of our medical niche constructions that were designed to deal with these problems carry their own trade-offs and side effects, i.e., healer obligation (see Chapter 6 for a deeper discussion of this), pharmacological dependence, and iatrogenic effects.<sup>86</sup>

I am not arguing to get rid of biomedicine or to use evolutionary medicine and psychoprophylaxis alone. I am merely creating a case for the very real physiological effects of social and cultural variables on medical encounters. In this case, a clear understanding of evolutionary medicine or psychoprophylactic techniques would help healthcare practitioners to work *with* the body’s evolved social susceptibility in order to reduce stress and activate endogenous mechanisms.<sup>87</sup> We cannot underestimate the impact that these biocultural interactions have on medical encounters.

### **2.6.2.3 Dysevolution**

Incorporating these evolutionary theories into a discussion of sickness and healing reframes many of the problems and questions in mind-body medicine in new ways.

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<sup>86</sup> The term iatrogenic, a Greek word meaning “coming from the physician,” refers to the adverse effects of therapy caused by the medical facility, treatment, diagnosis, medical encounter and/or the practitioner’s activity, procedure, or manner, including any negative or unpleasant effects resulting from professional care.

<sup>87</sup> Endogenous mechanisms have also been called “Endogenous modulatory systems” (Colloca and Benedetti 2016).

Instead of viewing pain, stress and unpleasant emotions in a negative way, we can view them as “evolved strategies that allow for the identification and avoidance of specific problems, especially in the social domain” (Henriques 2000).

There is a reason why we feel bad when we make a social *faux pas*. We are supposed to. Our bodies respond to social information in order for us recognize and adjust our behavior accordingly. This is a design feature, not a design flaw. **Social motivating and warning adaptations were integral to our evolutionary development and are advantageous in negotiating complex social relationships.**<sup>88</sup>

However, these social warning systems can also be detrimental to our health if prolonged, exacerbated and/or triggered too often and biomedicine can often treat only the physical symptoms of a social problem (e.g., prescribing pills to reduce hypertension without changing the source that is causing the heightened stress in the first place). This is called dysevolution and there is a deeper discussion of this in *Appendix: Chapter 2: 2.12 Dysevolution*.

## **2.7 Conclusion**

Viewing the body within this evolutionary framework allows us to see *why* and *how* humans have become physically susceptible to conditions in our social environments. This concept is critical to understanding how cultural meaning and social interactions can

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<sup>88</sup> Primates that live in social groups have an intricate web of social relationships to remember. Each relationship has its own particular history of ongoing social dynamics, including positive and negative reinforcements, possible kinship and familiarity factors, and differential reciprocity...An ability to simultaneously navigate through and manipulate such a complex landscape has become our adaptive advantage, and is the result of feedback systems between neurosocial networks and social and biotic environments woven together in our phylogenetic histories and ongoing evolution (MacKinnon and Fuentes 2012:79).



impact the processes of sickness and healing. Patient perceptions about the conditions of their environment can help determine everything from health resource allocations to the onset, intensity and duration of pain, stress, and negative emotion. Culturally constituted fears and stressors can trigger or exacerbate health problems and there are negative health consequences of our ancient bodies and brains in our modern environments. Therefore, medical therapies may not need to act directly on the pathophysiology of a disease to impact its course. Action on cultural meaning and social relationships can influence numerous body systems. We should not under-emphasize the impact of culturally contextualized strategies of care, especially in places where they make up a large majority of the environmental and social cues shaping patients' perceptions. Specific attention should be paid to those medical therapies that (unconsciously) tap into our social susceptibility adaptations and employ psychoprophylactic techniques, like Asante medical encounters. Chapters 4-6 discuss how social susceptibility influences the ailments many patients suffer from and the treatments that many healers employ in a local context. But first we have to understand some of the neurobiological mechanisms that may be involved in those biocultural interactions during Asante medical encounters.

This chapter outlined many evolutionary explanations for *why* human bodies evolved to be susceptible to psychosocial stimuli, in beneficial and adverse ways. This biocultural evolutionary foundation of social susceptibility is crucial in the next chapter, as we explore the proximate mechanisms of *how* psychosocial stimuli can elicit specific physiological processes.

Placebo responses involve positive therapeutic effects of symbolic stimuli that may be mediated by changes in cognition and attention as well as

psychophysiological mechanisms. Ethnographic studies of healing point to additional social and cultural processes that may mediate and modulate placebo responding, including: (i) the cognitive and social grounding of believed-in-efficacy and expectations; (ii) interpersonal processes of narrating and re-negotiating symptom and illness experience; and (iii) the embedding of healing in cultural ontologies, values and social institutions that define positive health outcomes and that govern the esthetics and rhetorical power of healing interventions (Kirmayer 2011:112).

## **CHAPTER 3: PROXIMATE MECHANISMS & PLACEBO STUDIES**

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### **3.0 Chapter Overview**

The last chapter investigated why human bodies have evolved to be physiologically responsive to psychosocial cues and elucidated the evolutionary processes that have made the placebo/nocebo phenomena possible. This chapter is dedicated to the proximate mechanisms of mind-body medical encounters; or how psychosocial expectations and behaviors impact physiological processes. Mind-body medicine is a relatively new and disparate field. Explanatory models for how psychosocial variables influence physiological processes range from psychoneuroimmunology, psychoprophylaxis and behavioral endocrinology, to psychosomatic medicine, psychogenic illness and symbolic healing. Each of these perspectives contributes to a greater understanding of the

proximate mechanisms involved in biocultural interactions in sickness and healing, but not one of them alone provides enough clinical depth or theoretical breadth to adequately explain the context specific physiological effects of the ritual of medicine and the provisions of care.

The closest field we have that measures these effects and uncovers their acute neurobiological mechanisms is placebo studies, which uses Random Controlled Trials (RCTs), to isolate “only the improvement that is attributable to psychosocial factors” (Benedetti 2009:5). Placebo studies research has proliferated in the last two decades, but it is still a relatively young and largely inchoate field. It lacks theoretical substance, avoids behavioral science and is unclear about the perimeters of its definition and scope. Lydia Temoshok (1986) illustrated this problem by comparing our use of the term placebo to *phlogiston* (a Greek word that means “burning up”), an obsolete 18<sup>th</sup> century chemistry term used to explain the odorless, tasteless, colorless, and massless substance in all combustible matter released during burning. Once oxygen was discovered and the process of oxidization became known, phlogiston was seen as an erroneous attempt to explain one small feature of a much larger, more important, and widespread phenomenon. Oxygen doesn’t only exist as a by-product of fire, even though it is easier to recognize and measure during the burning process. In fact, limiting oxygen to phlogiston neglects some of the most important and far-reaching implications of the phenomenon itself. Temochok asks if placebos are our phlogiston. We are so focused on a narrow vision of the effect of psychosocial stimuli on medical encounters, that “the placebo concept hides our ignorance and perpetuates partial truths about clinical work

and outcomes, while at the same time obscuring a better understanding” (Peters 2001: xiii) of the therapeutic relationship and mind-body interactions. Just as oxidization is but a small feature, even a side effect, of the properties of oxygen, so too are facets of the placebo response captured thus far in clinical research. They make up a small fraction—a side effect— of a much larger phenomenon: human physiological adaptability to psychosocial cues. Thus, while the concept of placebo responses (as it currently stands) does not do an adequate job of encapsulating the scope of this phenomenon, it is our best scientifically sound way of recognizing and measuring parts of it. RCTs and placebo studies are the necessary but not sufficient “fire” that helps us legitimize and validate often dismissed but potent biocultural interactions.

Unfortunately, with some very special exceptions... most of the work which we *can* draw on to understand these issues has not been done explicitly to learn about the role of meaning in medicine, but as a contingent element of other investigations in pharmacology or physiology. Given the possibility that there is such a wide range of similar phenomena—where biology is so fully engaged with experience, culture, and meaning—why is it that these matters are so often neglected, rejected, and despised? (Moerman 2002:134-5).

This chapter sets out to both expand and subordinate the placebo. By promoting a malleable human biology fully responsive to emotional, social and cultural environments, *The Social Life of Placebos* extends the scope of inquiry, methodology and theory in placebo studies beyond clinical, medical or pharmacological trials, where they are misunderstood, neglected, and often useless. Yet at the same time this research intends to subordinate “the placebo” as nothing more than smoke. Its role, like burning oxygen, is to make invisible processes more apparent and to elucidate acute biocultural interactions. This depreciation forces us to pay closer attention to the other interactions in medical or pharmacological encounters that *do something*; that activate physiological responses. For

example, “rituals trigger specific neurobiological pathways that specifically modulate bodily sensations, symptoms and emotions. It seems that if the mind can be persuaded, the body can sometimes act accordingly. Placebo studies may be one avenue to connect the biology of healing with a social science of ritual. Both placebo and ritual effects are examples of how environmental cues and learning processes activate psychobiological mechanisms of healing” (Kaptchuk 2011:1856).

### **3.2.1 Why Placebos?**

“Under normal conditions the research scientist is not an innovator but a solver of puzzles, and the puzzles upon which he concentrates are just those which he believes can be both stated and solved within the existing scientific tradition” (Kuhn 1977: 234).

Mind-body medicine is in many ways a mystery, which can neither be fully stated nor solved within any *one* existing scientific tradition. Each discipline produces vital pieces of the puzzle, but the gestalt picture remains largely inchoate and unconnected.

Fortunately, compelling new research is increasing the number and quality of those puzzle pieces, so much so that we are approaching a time where the puzzle of mind-body medicine can be stated and solved by connecting pieces from many different disciplinary and scientific traditions.

My purpose of this chapter is not necessarily to create new puzzle pieces, but rather to connect previously disparate interdisciplinary research in new and significant ways--ways that contribute to the explanatory model of mind-body medicine. “Acknowledging the eco-social origins of biological maladies is the easy part. The hard work is unraveling the myriad ways that the eco-social becomes local and gets under the skin. How is the eco-social embodied?” (Goodman 2009: xiv). To that end, I have introduced the general

concept of social susceptibility in order to explain the evolutionary and proximate processes that make human bodies particularly susceptible to psychosocial influence. In this chapter we will examine how those biocultural interactions play out in specific ways and contexts, especially via the placebo response.

“Placebos are the ghosts that haunt our house of biomedical objectivity, the creatures that rise up from the dark and expose the paradoxes and fissures in our own self-created definitions of the real and active factors in treatment” (Harrington 1999:1). Placebo responses are, by oxymoronic definition, not a great starting point for any research. They are complicated, non-specific, misunderstood and considered a nuisance in the medical establishment. Their utility has been limited to clinical research and the majority of research we have on placebo responses is in drug trials with the primary goal of limiting them. Yet, “the closest biomedicine comes to the study of ritual is with placebo studies” (Kaptchuk 2011:1855). Placebo responses represent a unique unit of analysis that bridges interdisciplinary fields and, regardless of whether or not we should have to, proves the measurable, scientifically significant, physiologically-influencing role of social interactions and cultural beliefs in healing processes.

The idea of placebo is a biomedical construction because it is only in the disenchanted world of scientific medicine that the therapeutic effectiveness of words, symbols and rituals can be viewed as suspect. When only direct chemical or physical effects are recognized as causal agents then the power of symbolic interventions requires special pleading. Placebo research has clearly shown that symbolic stimuli and positive expectations set in motion specific physiological processes that mediate a wide range of placebo effects. These mechanisms vary according to the type of symbolic stimulus or context and the resultant expectations (Kirmayer 2011:120).

Although the current state of the field lacks a unifying theory and a delineated scope, placebo studies is a keystone for understanding the interplay of environmental conditions

and physiological systems. It is a starting point for parsing apart what, how, and why these biocultural interactions operate. Moreover, placebo studies is one of the most scientifically significant, empirically grounded approaches to mind-body interactions.<sup>89</sup> It provides us with measurable evidence of the physiological effect of various psychosocial elements such as expectations, learning, meaning, interpersonal interaction, and emotion. Likewise, it helps us to understand some of the embodied processes at play in oft disregarded healing techniques that are difficult to measure in natural ethnographic settings. “Without conceptualizing (and, I would argue, reconceptualizing) the placebo as central to our understanding of healing...it becomes impossible to understand the efficacy of traditional medicine” (Waldram 2000:617).<sup>90</sup>

“From the standpoint of the lived body, humanistic concerns are no longer secondary, a matter of mere ‘bedside manner’—rather, they become core to every aspect of medical thought and practice” (Pohlman et al. 2013: 33). Laying out a biocultural evolutionary foundation of human sociality and adaptability illuminates that there are socially activated placebogenic potentialities in all medical encounters (and arguably, beyond). Because social cues can activate biological processes, inasmuch as treatment is social, they have physiological and psychological consequences. Therefore, it is important to

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<sup>89</sup> Rather than attempting to cover every conceivable avenue by which the mind might heal the body, from hypnosis to relaxation, I have chosen to focus on one particular phenomenon—the placebo response. The advantage of focusing on this process, rather than any other, is that science has something to say about it. While it is certainly possible that there are other processes that allow the mind to heal the body, next to nothing is known about them. This is not to say that scientists have a complete picture of the placebo response—far from it, in fact. But there is just about enough scientific research to enable some reasonably solid hypotheses to be developed and tested. And more data is accumulating, as more funds are increasingly devoted to elucidating the mechanisms that underlie the placebo response (Evans 2003:xii).

<sup>90</sup> See also: Dow 1986; Kirmayer 1993; Moerman 1979; Waldram 1997



study medical encounters from a “social centered” approach to determine what, how, and why socio-cultural influences elicit physiological responses.

This reconceptualization forces social scientists to take biology more seriously, and the medical establishment to reconsider the effects of culture. “In this way, something that started out as a humble humbug in medicine just could end up being an impetus both for a foundational rethinking of legacies that no longer work, and for the imaginative development of new research programs that have more room for all of what we are as human beings, inside and outside, mind and body, meaning and mechanism” (Harrington 2002:50-50).

### **3.2.2 Placebo and Nocebo Terminology**

“Although the placebo concept is fraught with confusion, the terminology of ‘the placebo effect’ and ‘the placebo response’ is entrenched in the language of biomedicine and unlikely to be abandoned in the near future” (Miller, Colloca, and Kaptchuk 2009). In fact, most articles and books on placebo responses begin by defining the term because we are working with a word that literally means the opposite of the phenomenon itself. Placebos are by definition inert and yet administering them to patients can elicit consistent, powerful and measurable physiological effects.

Placebos have been defined as “an effect in which individually or culturally based expectations for a treatment are contributory to physical or psychological improvement after such a treatment” (Andersen 1994: 1642). Thus, while placebos are inert, they can become an “active therapy within a psychosocial context” (Price et al. 2008: 567)<sup>91</sup> which

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<sup>91</sup> When placed within the context and meaning of the rituals of medicine and the provisions of care, for example.

elicit many powerful patient physiological responses. “This has the virtue of encouraging us to think about all of the aspects of the clinical context that might contribute to beneficial physiological, cognitive, emotional, and social responses to any treatment” (Kirmayer 2011:211).<sup>92</sup>

A sugar pill doesn’t do anything. What does something is the context of healing. It’s the rituals of healing. It’s being in a healing relationship... But the placebo pill is a wonderful tool, or a saline injection is a wonderful tool, to isolate what is usually in the background, take it away from the medications and procedures that medicine does, and actually study just the act of caring. That’s, I think, what we’re measuring when we study placebo effects (Kaptchuk 2012).

The “placebo response” is the body’s response to the context (or ritual) of medicine, the social interactions in the medical encounter, and the endogenous healing mechanisms activated by patient’s perception of the conditions of their environment. In many cases, the “placebo effect” in most medical encounters is a physical response to a situation, not an inert substance. Placebo responding reflects the ways that people think, act, feel and respond physiologically to an intervention they believe and expect will be of help” (Kirmayer 2011: 121).

We must realize that virtually every time a healer administers a treatment to a person with an illness, or every time an individual treats herself for an illness with some healing substance or process, the individual receives messages from the environment which, if they possess the correct symbolic significance, may trigger a placebo response” (Brody 2000:13-14).

The term “placebo response”<sup>93</sup> refers to the large amalgam of non-pharmacological variables—meaning, actions, and interactions— that activate endogenous healing

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<sup>92</sup> More specifically, “by definition, if no placebo is administered, the effect that follows its administration cannot be called a placebo or nocebo effect. However, it has become clear in recent times that the term placebo effect is too restrictive and does not help explain the underlying mechanisms... Indeed, there are several placebo-like effects, whereby no placebo is given, which are due to the influence of the context surrounding the treatment on the patient’s brain” (Benedetti 2009: 36).

<sup>93</sup> Instead of “placebo effect” I use the term “placebo response” throughout *The Social Life of Placebos* because I think it better describes the varied, complex, and numerous responses that can be activated by placebos. Similarly, leading placebo researcher Fabrizio Benedetti uses the term “placebo response” over

mechanisms. Brody (2000:9) describes the placebo response as “a change in the body (or mind-body unit) that occurs as the result of the symbolic significance which one attributes to an event or object in the healing environment.” Or, according to Shapiro (1997), the placebo response is “any therapy (or that component of therapy) that is intentionally or knowingly used for its nonspecific, psychological, or psychophysiological therapeutic effect, or that is used for a presumed specific therapeutic effect on a patient, symptom, or illness but is without specific activity for the condition being treated” (Shapiro 1997). If that therapeutic intervention produces beneficial treatment outcomes attributable only to psychosocial factors (Benedetti 2009:5), it is called a placebo response; if it produces adverse outcomes it is called a nocebo response (See *Appendix: Chapter 3: 3.1. Placebo and Nocebo Terminology* for a more detailed discussion and literature review on placebo and nocebo terminology).

"The discovery of neurobiology has made physicians in the medical community more comfortable that something is going on that they have to pay attention to...Before it was just the imagination. Now, the imagination has a real neurobiology" (Kaptchuk in Schiller 2013). While placebo studies are moving in the direction of more holistic (Ritenbaugh et al. 2003), comparative (Kaptchuk 2011), and evolutionary (Humphrey 2002, 2005; Miller et al. 2009; Trimmer et al. 2013) approaches, there is still a lot that we

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the more common “placebo effect,” because the latter is an oxymoron. Placebos, by their very nature of being inert, have no effect (Silberman 2009).

do not know and interdisciplinary collaborations are not as common as placebo researchers had hoped (Guess et al. 2002).<sup>94</sup>

Fortunately, in contemporary placebo studies “the focus has shifted from the inert content of the placebo agent (e.g., starch capsules) to the concept of a simulation of an active therapy within a psychosocial context” (Price et al. 2008:567). Inert placebos can be activated when they are placed in a meaningful cultural context. The *Meaning Response*, a concept coined by Daniel Moerman, a renowned anthropologist, is defined as “the psychological and physiological effects of meaning in the treatment of illness” (Moerman 2002: 14). The *Meaning Response* argues that “inasmuch as treatment is meaningful it has physiological and psychological consequences. It is, therefore, important to study medical encounters from a “meaning centered” approach to determine what, how, and why socio-cultural influences elicit physiological responses.” Extending Moerman’s concept of the meaning response, this manuscript argues that the selective pressures of our evolutionary history make humans highly physiologically responsive to changes in our perceived social environments and as such inert placebos can be activated when placed in social contexts. Since every medical encounter has social components,<sup>95</sup> those social interactions carry physiological and psychological consequences.

### 3.2.3 History

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<sup>94</sup> “Despite growing scientific interest in the placebo effect and increasing understanding of neurobiological mechanisms, theoretical conceptualization of the placebo effect remains poorly developed. Substantial mechanistic research on this phenomenon has proceeded with little guidance by any systematic theoretical paradigm” (Colloca and Miller 2011).

<sup>95</sup> Even hidden injection RCTs—computers that decide when to deliver placebo or active medication—have human social interactions via enrollment, instructions, evaluations, etc.

Throughout the history of medicine and across cultures placebos have been used regularly for a wide array of ailments (Harrington 1999, 2008). In fact, some argue that the history of medicine is really a history of the placebo effect. “The great lesson, then, of medical history is that the placebo has always been the norm of medical practice, that it was only occasionally and at great intervals that anything really serviceable, such as the cure of scurvy by fresh fruits, was introduced into medical practice” (Houston 1938). The trial and error nature of medical practice throughout the history of sickness and healing make placebo response elicitation a large part of every medical system. “Placebo effects then are part of every medical treatment and may account for a substantial part of any observed benefit. Calling a treatment a ‘placebo,’ while often meant as a dismissal, actually points to the endogenous healing capacities of human beings, which deserve intensive study and systematic incorporation into every aspect of medical care” (Kirmayer 2011: 212).<sup>96</sup>

#### **3.2.4 Defining Placebogenic Perimeters**

Despite consistent attempts in placebo studies to define the scope and definition of what is and what is not a placebo response, the perimeters of placebogenic phenomena are still unclear. Furthermore, placebo research, terminologies, and explanatory models have not extended much beyond medical research and the focus on mechanism over theory has limited their appeal for and application in other disciplines. Thus we see a proliferation of theories across disciplines to explain what I consider to be, arguably, the same phenomenon: psychological, social, and/or cultural influence on physiological

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<sup>96</sup> To conserve space, the rest of this section on the history of the placebo concept can be found in *Appendix: Chapter 3: 3.2 Placebo History*.

processes. Currently, numerous and sometimes confusing compounded disciplines all seek to “provide[] both the concepts and the mechanisms for studying and explaining mind-body relationships” (Ray 2004: 35).

As both medical anthropologists and clinicians struggle to view humans and the experience of illness and suffering from an integrated perspective, they often find themselves trapped by the Cartesian legacy. We lack a precise vocabulary with which to deal with mind-body–society interactions and so are left suspended in hyphens, testifying to the disconnect of our thoughts. We are forced to resort to such fragmented concepts as the bio-social, the psycho-somatic, the somato-social as altogether feeble ways of expressing the myriad ways in which the mind speaks through the body, and the ways in which society is inscribed on the expectant canvas of human flesh (Scheper-Hughes and Lock 1987: 10).

One of the main arguments in *The Social Life of Placebos* is that the “society” component of those interactions, the ways that culturally-specific sociocultural features influence human (epigenetic, neural,<sup>97</sup> and physical) development and trigger physiological responses, has been largely neglected in mind-body research. “In mind-body medicine we are confronted not with an integrated vision or program but with a patchwork of approaches and understandings that pull in many different directions” (Harrington 2008: 19) (See *Appendix: Chapter 3: 3.4 Defining Placebogenic Perimeters* for a literature review and description of many of these fields).

Therefore, we must simultaneously challenge and embrace the concept of “the placebo” and placebo studies in order to get closer to a more comprehensive interdisciplinary model of both the large scale patterns and specific neurobiological

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<sup>97</sup> The field of epigenetics has become quite popular in the last decade. An emerging field coming to light today is that of connectomics. Much like the genome and the epigenome, connectomics is a field that studies neural synaptic connections and how environmental conditions impact those connections in ways that influence genotype, phenotype, and behavior. See *Appendix: Chapter 2: 2.6.8 Genome, Epigenome, epigenetics* for more about the topic of Epigenetics and see section *2.6.8.1 Connectome, Connectomics* for more on the topic of Connectomics.

mechanisms of psychosocial-physiological interactions. Furthermore, a deep analysis of the ultimate and proximate mechanisms of placebo responses (see below for more) illustrates that many of the primary mechanisms of placebo responses did not evolve specifically for sickness and healing. Adaptive warning systems, resource allocation, motivational structures, perception-physiological response feedback loops, and prosocial adaptations, to name a few, evolved for many other purposes, in quite different environmental conditions, and are used in many instances outside of health contexts.

Not all placebo effects are related to healing (or contrary to healing, as in the nocebo effect): e.g., placebo effects that mimic the rewarding effects of drugs of abuse. that produce enhanced performance in sports...that stimulate alertness and arousal, as in placebo caffeine...Nevertheless, the major impetus to studying placebo effects is to understand the mind-body connection in health and illness, making it reasonable to focus on the placebo phenomenon as it relates to health” (Miller et al. 2009:10).

#### **3.2.4.1 Is it even a placebo response?**

Another major limitation in the field of placebo studies is defining specific cause and effect relationships. “True placebo effects are not inevitable and may be totally absent in certain clinical situations” (Ernst and Resch 1995:552). Not all changes that occur to participants in the placebo arm of a clinical trial are due to placebo responses. The impression of a placebo effect can be created via many other means.<sup>98</sup> Placebo-like

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<sup>98</sup> For example, “False impressions of placebo effects can be produced in various ways. Spontaneous improvement, fluctuation of symptoms, regression to the mean, additional treatment, conditional switching of placebo treatment, scaling bias, irrelevant response variables, answers of politeness, experimental subordination, conditioned answers, neurotic or psychotic misjudgment, psychosomatic phenomena, misquotations, etc.” (Kienle and Kiene 1997). Also, “...at least two kinds of artifactual placebo response. One has to do with the motives of raters at the trial site. If the site is under pressure to rapidly enroll patients, raters may inflate their scores at the beginning of the trial; later, under more accurate measurement, the apparent improvement of subjects receiving placebo will artifactually magnify the placebo response. A second potential source of artifactual placebo response is statistical “regression to the mean,” whereby the patient has a rapidly fluctuating course of illness, and enrolls in the trial when it is at its worst. Then, if the illness improves over the course of the trial, one can again see what looks like, but is not really a placebo response (Lakoff 2002:74).

responses can also be caused by the natural course of the disease, time effects, parallel interventions, and the Hawthorne or investigator effect, etc. For example, one might attribute positive treatment outcomes of the flu to alternative or home remedies when, in fact, regardless of any interventions the natural course of the illness would produce positive health outcomes after a few days.

Furthermore, it is extremely difficult to isolate and measure placebo responses.<sup>99</sup> True versus perceived placebo responses, artifactually motivated and magnified placebo responses, and the myriad other efficacious components of placebo responses all represent the complex problem of isolating and measuring specific mind-body interactions.<sup>100</sup>

#### **3.2.4.2 Psychological and Neurobiological Mechanisms**

Placebo responses are infamously branded as nonspecific— pharmacological parlance for too complex to break down into constituent parts. Yet at the same time all placebo responses share some interesting components. They: a) have specific biochemical pathologies, b) can be divided up into basic categories, and c) are geographically, culturally, and socially relative. There is no such thing as a single placebo response. Instead there are many principle and secondary context dependent mechanisms of placebo responses and “different systems and apparatuses as well as different diseases

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<sup>99</sup> “A placebo response has been claimed to be a fixed constant amounting to about 30% of any given treatment effect. This is misleading. Neither the true nor the perceived placebo effect is such a constant. The extent of the true placebo effect depends on, among other factors, the attitude of the doctor or therapist (towards the treatment and the patient), on the attitude of the patient (towards his or her own health, the doctor or therapist, the type of treatment), on the conditioning of the patient (his or her suggestibility), and on the type of treatment (its mechanism as well as impressiveness, invasiveness, perceived plausibility, experience, cost, etc)” (Ernst and Resch 1995:552).

<sup>100</sup> See *Appendix: Chapter 3:3.5 Isolating and Measuring Placebo Responses* for a detailed analysis of this topic.



and treatments are affected by placebos in different ways...the placebo effect is a general phenomenon that involves different mechanisms” (Benedetti 2009). Furthermore, “placebos may affect practically any organ system in the body” and influence many if not most conditions (Helman 2007: 197). There is no single theoretical or methodological model in placebo studies, rather, particular explanations and tools are used to isolate and measure specific interactions. In reality, there are “are multiple regulatory systems involved and, in most treatment contexts, multiple systems will be activated and interact to give rise to any observed effects” (Kirmayer 2011:118).

The brain is very susceptible, not only to these specific pharmacological locks and keys, but to contextual variables besides. Moreover, not all systems in the brain are equally susceptible to alteration of contextual variables. Systems dealing with pain and affective states may be much more responsive to interpersonal and contextual variables than, say, systems that produce a brain tumor, which may be why we tend to focus on apparently more stable phenomena like that. But in fact, I would think the whole point of having a mammalian brain is to be able to adapt and to be able to learn, and that means being highly sensitive to signals and information from the context (Harrington 1999: 235).

For example, expectancy and conditioning are two of the main ways through which placebo responses operate, but they both function quite differently and exemplify the diversity and (sometimes unrelated) specificity of the neurobiochemical processes involved in mind-body medicine. Expectation works by inducing cognitive adjustment and physical responsivity to predicted outcomes or perceived environments. Think of this figuratively as the hardwiring of expectancy. Our perceptions of our environment and expected treatment outcomes will activate appropriate neurobiological responses. However, one’s cultural paradigm (including memory, past experience, social observation, desire and emotion) largely determines how an individual will evaluate a

perceived environment. So culturally specific meaning systems or laboratory conditions (as in the case with animals) represent the softwiring of expectancy and explain why placebo responses are so context dependent. Similarly, though all humans have hardwired motivation systems, the elicitation of reward and punishment hormones is dependent on perceived predicted outcomes, which are often culturally constituted. Even in placebo animal trials of expectancy, we see that “dopaminergic cells...respond to both the magnitude of anticipated rewards and deviations from the predicted outcomes, thus representing an adaptive system modulating behavioural responses” (Benedetti 2009:41).<sup>101</sup> Expectancy is considered a principal placebo response mechanism because it operates on many different ailments using a variety of different neurobiological mechanisms to induce, for example, analgesia, anxiety reduction, and mood elevation.

Expectations generally involve cognitive models or frameworks and affective attitudes or stances. **These models can be encoded as stories, propositions, metaphors or images that may be explicit (conscious) or implicit (non-conscious). Both implicit and explicit cognitive models can direct thinking in ways that amplify or diminish symptomatology and distress.** Indeed, cognition can influence symptoms through the ways in which sensations are focused on, interpreted, labeled and attributed. . . **These processes represent levels or sites where the symbolic effects of placebos may exert effects.**

Because attributional processes are central to symptom experience, any suggestion, instruction or contextual cue that shifts attention, attributions and coping responses will, in turn, change symptom experience. These shifts can occur through reattribution, engaging with new images or metaphors, or re-narrating distress in a new story frame” (Kirmayer 2011:115, emphasis added).

Conditioning, in contrast, operates by associative learning where an inert stimulus is repeatedly paired with an active stimulus, which results over time in the body’s conditioned “active” response to the inert stimulus even when no active stimulus is present. The hardwiring is a predictive, often unconscious physiological response to a

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<sup>101</sup> See also: Setlow et al. 2003; Tobler et al. 2005

learned condition, and the softwiring is the laboratory or psychosociocultural specifics of the repeated association. In this way the placebo response can be “dosed,” increasing in potency when paired with sequentially more powerful active stimuli, “thus indicating that the placebo effect is a learning phenomenon” (Benedetti 2009:43). Conditioning is a common feature of animal studies (Pavlov 1927; Voudouris et al. 1989; McMillan 1999; Wilson et al. 2006; Munana et al. 2010). For example, Ader and Cohen (1975) paired a saccharin-flavored drink with an immunosuppressive and nausea-inducing drug (cyclophosphamide) and afterwards the control group who received the saccharine flavored drink sans the drug continued to die at high rates, proving that not only can you trigger nocebo effects in rats, but also that immune systems can be “taught” or conditioned to respond in a particular way (Harrington 1999).

Medical and placebo researchers call this classical conditioning.

Classical conditioning is based on adaptive responses (e.g., salivating in anticipation of eating to aid in the digestion of food) that can be linked to new contextual stimuli. Physiological responses that are linked to stimuli by classical conditioning tend to have a compensatory physiological function that reflects specific regulatory systems...For example, a sensory cue that has been linked to the presentation of food, triggers the release of insulin in anticipation of eating. Other classically conditioned responses are based on linking symbolic stimuli to specific responses of regulatory systems....Classical conditioning has been shown for a wide range of physiological responses involving motor, autonomic, endocrine and immune systems, each of which may mediate specific types of placebo response...These mechanisms could build associations between particular environmental cues and physiological responses that have clinical significance. The strength and direction of these responses will depend in part on each individual’s learning history, which in turn will reflect culturally-patterned frameworks of meaning, as well as shared and idiosyncratic experiences. Classically conditioned effects constitute forms of non-conscious expectations or predispositions to respond that are part of each individual’s enculturation and personal biography. Similarly, other forms of operant and sensory-associative learning can link salient stimuli to bodily responses...These embodied processes of learning can contribute to placebo responding even in the absence of awareness (Kirmayer 2011:114).

Both expectancy and conditioning suggest that specific physiological regulatory responses become associated with specific cultural interpretations and meanings (either consciously or unconsciously; and usually it is both), such that certain sensory information will trigger culturally-contextualized perceptions and, vice versa, particular perceptions may trigger associated sensory responses.

What is important here is not necessarily that the activation of specific psychosocial-physiological feedback loops in mind-body medicine are culturally relative (which they are).

Things that people know and understand shape the way that medicine has its effects. People ‘know,’ for example that a particular kind of aspirin is really good because they have seen it advertised on television. But much of this knowledge that people have of the world does not have such an explicit source or origin. Much of what we know we simply grow up with, as matters of culture; there are ways of knowing the world...these different ways of knowing the world can show up in the different effectiveness of medication and of meaning in matters of health” (Moerman 2002:72).

Or that placebo responses have culturally-specific triggers and associated sensory responses (which they do). “Placebo effects have been widely mislabeled as ‘nonspecific effects,’ when they are, in fact, highly specific effects that stem from what are currently nonspecific elements of treatments (i.e., relieving pain via specific pathways, alleviating depression, healing an ulcer, etc.)” (Thompson et al. 2009:117). It is our duty to better understand the relationship between non-specific psychosocial triggers and specific physical responses, especially because many of those “nonspecific elements of treatments” are culturally and contextually dependent.

For example, in the Asante context, witchcraft is an extremely powerful “non-specific” element that produces patterned, culturally produced, and socially shared “specific” responses. There is an Asante normative behavioral response to being cursed

by a witch or accused of witchcraft. As we will discuss more in Chapter 5 on Emotion, while many anthropologists argue over the literal reality of witches, shamanic power, and spirit possession, is not necessarily useful in a placebo context. Witches, for example, do not need to objectively exist in order to influence physiological processes. If patients *perceive* an environment in which witches affect health, resources, or relationships, witches become an “active” ingredient in health outcomes and it is perceptually and physiologically problematic for anyone to dismiss witchcraft from diagnosis and treatment plans. Thus, it is imperative to understand the cultural paradigms and explanatory models of patients in order to assess their perceptions and, therefore, physiological triggers. Though our perception-reaction capacity is evolutionarily hard-wired, it is our sociocultural contexts that shape how we understand and even sense the world (Geurts 2003).

Sensory orders vary based on cultural tradition, and hence sensoriums may be different from one cultural group to the next....Sensoriums also encode moral values in the process of child socialization. Such embodied forms and sensibilities are learned (acquired, internalized, developed) at an early age through child-socialization practices....Sensoriums help shape notions of identity and of the person....Sensoriums also help to shape understandings and experiences of health and illness” (Geurts 2003: 17-18).

Other important psychological mechanisms of placebo responses include “learning, memory, motivation, somatic focus, reward, and anxiety reduction” (Finniss et al. 2010:2; Price et al. 2008; Benedetti 2008). Personality traits, social learning, expectation-induced activation of the brain reward circuitry, anxiety mechanisms of the nocebo response (Enck et al. 2008), and interpersonal dynamics in the doctor-patient relationship also play a part, along with many other personal, cultural and environmental influences (Harrington 2002:49). Imitation interventions can elicit placebo responses as well as

practitioner biases and practitioner behavior. Similarly, patient health history and personal preferences play a part in eliciting placebo responses. The nature of the illness, the treatment parameters, and the medical setting (including form, type, color, and brand) influence positive treatment outcomes. Perceptual filtering, attribution theory, and emotional processes that inhibit anxiety and promote hope, have an effect. As do individual and collective meaning making (Harrington 2002:49), enhancing positive emotions and optimism, reducing anxiety and other negative emotions that cause distress, and shaping attentional and attributional processes that give meaning to experience (Geers et al. 2005).<sup>102</sup>

Some of the most common neurobiological mechanisms of placebo responses are: opioids, neurotransmitters, neuromodulators, dopamine release, basal ganglia adjustment, thalamic neuron firing, and changes in metabolic activity in the brain (Finniss et al. 2010:2). Context-dependent activation of body systems (autonomic, endocrine, and immune for example) also has an influence, both consciously and unconsciously (Stewart-Williams and Podd 2004) and often involves the activation of ancient evolved endogenous mechanisms. For example, the release of endogenous opioids can relieve pain, promote relaxation, reduce cortisol and insulin, alleviate digestive disorders, and increase circulatory and respiratory function. Placebo-based dopamine activation affects mood, motor function, and cognitive ability.

Opioid painkillers are supposed to work by binding to endorphin receptors in the brain. This mechanism isn't affected by whether we know we've taken a

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<sup>102</sup> See also: Kirmayer 2011; Benedetti, 2008; Benedetti, Carlino, & Pollo, 2011; Linde, Fässler & Meissner, 2011; Meissner, 2011; Pollo, Carlino & Benedetti, 2011; Pollo, Finniss & Benedetti, 2008; Kirmayer 2011:212

particular drug...in addition to this mode of action, such drugs will also work as placebos—they trigger an expectation that our pain will ease, which in turn causes a release of natural endorphins in the brain. This second pathway does depend on us knowing we have taken a drug (and having a positive expectation for it). Incredibly, Benedetti found that some drugs previously thought to be powerful painkillers *only* work in this second way. If you don't know you've taken them, they are useless (Marchant 2016: 17).

In spite of all of this research, understanding of the neurobiological mechanisms of placebo responses is still in its infancy.

In recent years, the neurobiological study of the placebo effect has yielded important information about the influence of psychological factors on several body functions... the placebo effect represents a good model for understanding the intricate mechanisms underlying complex mental functions. However, what triggers the release of these endogenous substances during a placebo procedure is still a matter of debate (Benedetti et al. 2003).

Technological advances continue to increase our knowledge and the field shows no signs of slowing down. That said, placebo experts<sup>103</sup> have not done a great job of making their findings comprehensible to interdisciplinary audiences.

In this sense, part of the reason for placebo's negative image, for the ways in which biomedicine dismisses the importance of physician-patient relationship and the power of narrative, is that most people are bad neuroscientists and think, if I can't explain the phenomenon using a rigid, lock-key algorithm, then it's nothing but mystical hokum... So to admit a role for interpersonal and contextual variables in healing is not to admit that you believe in magic; there really is a neurobiology here that we should be able to study, that engages neural circuitry and so on. To think about the mechanisms involved in these variables is not only to target an interesting research domain—I think more research of this sort may also liberate physicians in the clinic to embrace these kinds of factors much more wholeheartedly, to stop being ashamed of them, and indeed try to maximize their efficacy” (Harrington 1999:235).

### **3.3 Placebo Problems**

It is clear from the vast array of physiological mechanisms and possible activators highlighted above that there are many problems in studying “placebogenic phenomena,”

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<sup>103</sup> Minus Ted Kaptchuk and Harvard's Program in Placebo Studies (PIPS) who have done an excellent job engaging with popular media and speaking free of jargon while still increasing scientific literacy.

such as, 1) finding the specific neurobiological mechanisms of these non-specific responses, 2) creating a comprehensive theory that more accurately incorporates all of these varied and diverse responses,<sup>104</sup> 3) explaining the evolutionary trajectory of these endogenous responses and its impact on psychosocial-physiological feedback processes, and 4) understanding the cross-cultural frequency and variation in placebogenic triggers and responses.

I will leave the first problem to the medical and clinical researchers who have learned more in the last decade than we have known for centuries about the specific neurological and biochemical mechanisms of placebo responses (Price et al. 2008:566; Benedetti 2009). Since this is the dominant focus in placebo studies and requires controlled clinical methodology, I will make no attempts to contribute to this research. Instead I want to highlight three important problems in placebo studies: the underrepresentation of culture, evolution, and theory (See *Appendix: Chapter 3: 3.6 Placebo Problems, 3.6.1 Cross-Culturally Limited, 3.6.2 Evolutionarily Deprived, and 3.6.3 Theory Deficient* for a long discussion on each of these problems and a literature review on what has been done so far).

### **3.4 Solutions<sup>105</sup>**

The rest of the chapters in *The Social Life of Placebos* are dedicated to ethnographic thick descriptions and large cultural patterns in patient and practitioner behavior that creates a map of some of the non-specific interactions, rituals, meanings, relationships,

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<sup>104</sup> i.e., Do they occur outside of healing encounters? Are they a part of religion, music, and even regular social interactions? What do non-health related placebo responses look like? Is there such a thing? What features would a placebo or nocebo response have to have in order to be considered part of the larger phenomenon?

<sup>105</sup> For a deeper background on solutions to some of the placebo problems, specifically whether to focus on complexity and interaction between variables or isolation and independent variables, See *Appendix Chapter 3: 3.7 Solutions*.



and symbols in Asante indigenous medicine with placebogenic potentiality to influence sickness and healing. This choice, to focus on sociocultural learning and meaning of various aspects of the health care system as well as culturally-contextualized patient-practitioner expectations and behaviors and how those conditions impact health outcomes, was a conscious decision designed to show the enormous complexity and interconnections present in any medical encounter and to illustrate the importance of environmental factors (social, cultural, epigenetic, neural) on sickness and health.

Human behavioral, dietary, and social variation exceeds that of all other living animals. Patterns of pairbonding and mating, intergroup associations and transfer, communication networks, intra- and inter-group alliances and coalitions, social hierarchies, politico-economic systems, and all manner of social structures vary around the world. Humans are among the slowest-developing primates, with extensive social learning integral to a convoluted developmental sequence involving symbolic and linguistic instruction. Manufacturing of material artifacts and technologies, along with massive manipulation of the environment, is ubiquitous in all human groups; social and biological-medical niche construction and alteration are ongoing, and now more recently and regularly at an accelerated rate across local, regional and global levels (MacKinnon and Fuentes 2012:86-87).

Thirty years ago White, Tursky, and Schwartz (1985) argued for the need of an integrated synthesis of placebo studies and fifteen years ago in a conference organized by the National Institute of Health for this purpose, participants proposed specific research recommendations to advance the science of placebo studies:

Research is needed to: elucidate the role of psychosocial moderators of placebo effects (for example, qualities of the contextual setting and characteristics of patient-provider interactions that enhance or diminish beneficial effects on health and wellbeing). Such research should include studies of classical conditioning and the role of suggestion/expectancy and other cognitive, emotional, and perceptual features of the therapeutic encounter. It should also examine meaning and related socio-cultural aspects of interpersonal relationships, using ethnographic studies...[Research is needed to:] develop conceptual and research tools that enable the integration of biological, psychological, and social findings into the study of mechanisms of mind-body effects....To enhance applications of placebo effects in clinical practice research should determine:... the characteristics of providers in relation the placebo process and responses [and] the dynamics of patient-provider interactions, including the roles each plays and the various props, costumes, communications, and settings, and how these affect placebo responses....To address issues on the use of placebos in...procedural, and behavioral interventions, research is needed to: Develop new methods or new applications of existing methods of study design and analysis (Guess et al. 2002: 29-30).

I have included these recommendations because of their clarity and pertinence to this project. The research design, methods, and goals of this manuscript are directly linked to advancing the science, enhancing the applications, and expanding the use (and I would like to add, developing the art) of placebo responses and I have incorporated and attempted to follow these recommendations where applicable in my own research design. In the decade since these goals were proposed, basic questions about placebos remain unanswered—mainly, what they look like in natural settings and why this capacity evolved.

### **3.4.1 Comprehensive Theory: The Social Life of Placebos**

#### **3.4.1.1 An Evolutionary Medicine Approach to Placebo Responses**

My interest in evolutionary and social explanations for placebo phenomena increased in December 2010 after a new study had just been published by Kaptchuk et al. on Irritable Bowel Syndrome (IBS) claiming that deception might not be a necessary component for placebo responses. In short, they showed that you can tell a patient that they are receiving an inert open-label placebo and still see a positive placebo treatment

outcome. Though this study was nuanced in its claims when it was published, it was touted in the media using bold and definitive statements.<sup>106</sup> The media storm sparked cross-disciplinary conversations and raised many important questions. However, the study was limited in many ways. While the authors were trying to come up with an ethical way to harness the power of the placebo without deceiving patients, they still could not isolate out the effect of the meaning response (this will be discussed in greater detail in subsequent sections). For example, although practitioners told patients that the placebo pill was inactive and contained no active medication they also explained that “placebo pills...have been shown in rigorous clinical testing to produce significant mind-body self-healing processes,” “the placebo effect is powerful,” and the body has conditioned and automatic responses that can be triggered via the pill (Kaptchuk et al. 2010). These statements, while more honest than deceiving patients into believing they were receiving active medication, still contain meaningful information known to induce placebo responses. “The structured communication between doctor and patient activates a therapeutic potentiality that exists within individuals. Accordingly, in the therapeutic setting, the drug is both substance and symbol, and this duality is one of a number of elements that cannot be neatly untangled” (Lakoff 2002).

More than verbal communication, cognitive evaluation, and meaning responses, patients in this 2010 trial were still participating in a ritual of medicine, receiving provisions of care, and experiencing an empathetic doctor-patient social interaction.

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<sup>106</sup> i.e., In Forbes “Sugar Pills Work Even When People Know They Are Fake” (Langreth 2010), in Discover “Evidence that Placebos Could Work Even if you Tell People They’re Taking Placebos” (Yong 2010), and in NPR news “Fake Pills Can Work, Even if Patients Know it” (Knox 2010).

Furthermore, via the social susceptibility adaptations we discussed in the last chapter, patients were perceiving and physiologically responding to cues in their physical and social environments that have *real* effects on the body as well as on the corresponding health resource allocations.

Though patients were told that the pharmacological agent they were receiving was inert, that cognitive knowledge did not negate the physiological effects of the social and emotional cues being perceived in that medical encounter. The assumption, held by some medical experts and the public alike, that the power of the placebo comes primarily from the cognitive domain, i.e., expectation, belief, and meaning, etc., is a bias that needs to be shifted. Being told that the pill they were receiving was inert was only one of myriad cues patients experienced in that setting, and its verbal communication does not ensure it was the strongest.

All of these thoughts were swirling in my head when a colleague asked, “how can a placebo work if someone knows they are getting it? Isn’t belief the reason that placebos work?” The answer I came up with makes up the basic premise for the theoretical arguments found in Chapters 2 and 3 of *The Social Life of Placebos*. I explained to my colleague that our bodies evolved to be highly responsive to cues in the social domain, more so than changes in cognitive specificity because the fitness-consequences of sociality far outweighed those of logical consistency; so much so that changes in degree of care received would produce stronger psychological and physiological reactions than changes in our degree of knowledge about the treatment process.

Moreover, the degree to which knowledge about the treatment process impacts health outcomes also depends on the patient's health resource allocations, which are based on their perception of their access to quality and quantity resources and relationships of care. In other words, the meaning response and the social response (see below for more) can be dosed due to our evolved endogenous health resource allocation system (see Chapter 2). The presence of trust, verbal suggestion, clear diagnosis, assurance of positive treatment outcome, intense therapeutic interventions, social support and many other placebo components (see below for more) increase placebo outcomes. The absence of these elements (and many more) can produce negligible placebo outcomes and even trigger nocebo responses. Our bodies evolved to be highly sensitive to our perceived environments and to rapidly process information in our physical and social surroundings. In many instances, these perceptions determine the allocation of health resources and make physiological adjustments accordingly. An evolutionary perspective helps us to see why meaning and social cues have such a powerful effect on our bodies—especially when we are vulnerable. Furthermore, it allows us to analyze more strategically how to manipulate healthcare environments to achieve ideal health resource allocations. Due to space constraints, I've moved the detailed discussion of how adaptability and perception impact placebo responses (See *Appendix: Chapter 3: 3.8.1 Always Adapting* and *3.8.2 Perceptual Power*).

#### **3.4.1.2 Ways to Modify Perceptions**

“A simple way of expressing what we know about the placebo response is that the human brain seems to be hard-wired to get better in illness, and that certain sorts of mental stimuli seem capable of turning on this hard-wired system to produce symptom

relief. The elements that make up ritual seem to be especially effective in turning on the wiring circuits” (Brody 2010:163). Based on the malleability of perception and health resource allocation theory, there are evidence-based ways to change perceived environmental conditions and, therefore, “increase the optimal amount of effort put into health” because “a placebo in this case amounts to a change in expectation not directly related to the illness (or treatment) but to whether it is worth reprioritizing tasks. One realistic cue for reprioritization of tasks is a perceived change in the environment” (Trimmer et al. 2013:11). In a fascinating article by Dr. Olympia Panagiotidou (2016), she walks us through how the Asclepius cult is able to modify meaning and perceptions, inducing placebo responses that patients view as miracles.

Personal experiences of people, social information about the Asclepius’ healing powers and the confirmation of this information by human doctors would have influenced how people “lived” an illness or a disease infliction, “appropriated” the religious beliefs in Asclepius, and experienced cures at the asclepieia. These cures could have derived from patients’ self-healing mechanisms, but would have been perceived and conceptualized as “healing miracles” performed by the god (Panagiotidou 2016: 260).

Much the same way, Asante patients experience healing miracles on a regular basis, which reinforce their belief in the treatment process and the health practitioner (See Levi-Strauss’ Shamanic Complex in “The Sorcerer and His Magic” 1963 for more on this relationship). Skilled healers are able to modify patient perceptions and appraisals about their current situation, which has the ability to inhibit or amplify endogenous modulatory systems and healing mechanisms. Recent studies on practitioner behavior show that caregivers can manipulate the placebo response by altering their “performance style” (Czerniak et al. 2016), going so far that they experimentally test the impact of stage direction, scripting, attentiveness, strength of verbal suggestion, and non-verbal

communication in a doctor-patient interaction during a medical ritual, arguing that “structured manipulation of physician’s verbal and non-verbal performance, designed to build rapport and increase faith in treatment, is feasible and may have significant beneficial effect on the size of the response to placebo analgesia” (Czerniak et al. 2016: 874). These are all things taking place in Asante medical encounters in patterned and consistent ways.<sup>107</sup>

To save space, I have included a detailed list of over fifty-five things that practitioners can do to mediate patients’ perceptions in *Appendix Chapter 3: 3.9 Ways to Modify Perceptions*. This list is neither exhaustive nor comprehensive, but represents some of the major ways that practitioners can mediate patient perceptions and subsequent physiological responses. Each of these fifty-five placebogenic elements appears in Asante indigenous ritual healing. The following chapters create thick culturally contextualized ethnographic descriptions of these components in Asante medical encounters. Often the act of modifying perceptions is covert or tacit. Usually it is not a conscious goal of practitioners. However, every once in a while, a case appears in which practitioners are aware of their “usage of placebo interventions” and can explain what, why, and how they used them. This is what happened with my host father, the local eye doctor, Dr. Joshua Boeme.

#### **3.4.1.2.1 Modifying Perceptions: Case Study**

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<sup>107</sup> See Proofs of Power and Authority in the appendix for examples of how Asante healers increase faith in their power and authority and in the treatment process itself, as well as a description of some of the “performance” styles.

I had been trying, unsuccessfully, to discuss the concept of the placebo effect with biomedical doctors at the local Asantamon health clinic, but the word “placebo” created an instant hurdle. Practitioners were instantly offended that I thought they weren’t doing “real” medicine, and when I explained my study they hastened to prove their perfect compliance with the *Standard Treatment Guidelines for Health Practice in Ghana Handbook*. I had just completed daily rounds at the local biomedical district hospital where I followed doctors, nurses, and patients throughout the day observing and asking questions. Dr. Joshua had worked a full day as the only eye doctor within a hundred-mile radius of a local village health clinic. We met at the clinic so he could show me around. On our way home we both crunched into the front passenger seat of a tro-tro and I began informally telling him about my work.

“I am trying to understand the ways that doctors help patients without medication. Not first aid or biology, but things that maybe aren’t ‘technically’ helpful, but which they do anyway.”

He was nodding as I talked and said immediately, “I do that.”

“You do?” I said in surprise. It hadn’t occurred to me to talk to an eye doctor about placebo use.

“Yes, of course,” Dr. Joshua replied. “We all do.”

Seeing my confused look, he explained, “Sometimes patients believe that injections will help them. So after consultation if we do not see anything wrong, we just give them a healthy injection<sup>108</sup> and they get better. This is also why pharmacies can’t restrict drugs

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<sup>108</sup> A “healthy injection” is just saline or water.



too much. Patients expect to leave the hospital with something. Always. Or else why would they go? We need to give them something even if their problem will go away on its own.”

“Does this happen often?” I asked.

“Well, we know that people in the hinterland use herbal remedies and they have been proven to work. These people have nothing else.”

“Do you ever do this?” I asked.

“The thing is,” said Dr. Joshua, “I am an eye doctor. I see many patients who feel like if they cannot see, why should they live. They have no hope. Sometimes I give them something to give them hope. I had one patient, an old lady. She had glaucoma and I knew if I told her there was nothing to do about it, that she would lose all hope to life, so it is better to give her something. Another patient had a broken blood vessel in the white part of his eye. It would go away with time. But people don’t want to accept this and they feel better if given eye drops, even if they are just full of saline.”

In essence, most healthcare practitioners, whether consciously or not, look for ways to solve patients’ problems and make them feel better. A New York Times article a few years ago shocked the nation when it claimed that over half of all American doctors regularly and knowingly prescribe placebos to patients (Harris 2008). But is this really a surprise? If you have the ability to alter someone’s medical experience in beneficial ways, and without any adverse side effects, shouldn’t you attempt this? “Placebo research can help with conditions where self-appraisal is important. ‘You can change a person's sense of the symptoms. The only thing we know for sure is that the ritual of medicine

changes subjective outcomes and that there's a biological substrate to that''' (Kaptchuk in Schilling 2013).

#### **3.4.1.3 Cultural Components**

Culture, in general, is widely-accepted as something that impacts health outcomes.

The value of cultural competency and translation are regular features of most biomedical training, and social and cultural determinants of health were represented for the first time in the *2012 Medical College Admission Test* (MCAT). Yet, to outsiders, cultural beliefs and behaviors can often be viewed as illogical, suspect, and/or bizarre.

It should be noted that many bizarre and ineffective therapies persist today...For example, today there are many concoctions, procedures and even talismans that are as bizarre as those used centuries ago. There is the widespread belief among many people that these treatments are effective, even though they have not passed the rigorous tests of modern science. Therefore, the oddity, nonsense, eccentricity, and irrationality of many medicaments is not a feature of the past, because they pervade our society outside mainstream science (Benedetti 2009: 3).

Thus, despite accepting the powerful role that cultural meaning has on placebo response rates, we are still a long way from legitimizing the psychologically and physiologically influential role of "strange" cultural practices to affect underlying biological substrates. For example, concepts of spirit possession, witchcraft, cursing, animal sacrifice, and polyrhythmic drumming are so foreign to medical researchers that their therapeutic value is often dismissed without critical regard. Even when serious scholars contemplate the physiological consequences of ritual healing, they often make the same mistake of biomedical-centrism by comparing the therapeutic efficacy of ritual healing, for example, via biomedical definitions and methods of measurement. This leaves out many of the most powerful placebogenic features of ritual healing ceremonies.

However, it is a biocultural evolutionary perspective which puts Asante ethnomedicine on equal evaluative footing; a perspective in which indigenous and biomedical therapies are compared, not based on either's metrics of success, but on something more universal like ability to alleviate and mediate the negative health consequences of environmental mismatch, for example.

Another route toward the serious study of placebo responses in culturally-contextualized settings is to create a thick description of the culturally specific expectations, behaviors, and meanings associated with certain symbols and interactions. It is important for anthropologists to understand *what* stimuli are salient and *what* bodily responses they may activate. "The capacity to modulate endogenous systems and heal by learning presumably would enhance survival. Placebo effects may be favoured directly by natural selection" (Colloca and Miller 2011:1865) because culturally constructed and socially produced information acquired over the course of a lifetime becomes the measure through which individuals evaluate the conditions of their environment.

In Chapter 6, for example, we examine which aspects of Asante indigenous ritual healing ceremonies and biomedical clinical practice alleviate psychosocial stress. These frameworks and questions go a long way toward shifting the hegemonic power of biomedical efficacy, while still uncovering important variables impacting modern health problems. What makes Asante indigenous ritual healing ceremonies particularly important as a case study is that medical pluralism and hierarchy of resort preselect the types of ailments and patients attending shrine. As a result, *Okomfor* do not treat mainly biological pathologies with clear pharmacological solutions; instead they often represent

the hinterland of medical care—treating those diseases that biomedicine is unable to cure. A similar phenomenon is happening across American and Europe. Biomedicine has been so good at discovering biological pathologies and treating them with pharmaceuticals in this 1-1 mechanistic process, in eradicating infectious disease and in complicated surgeries and operations, that it has actually led to a biomedical crisis (Helman 2007). As biomedicine continues to treat certain sickness and disease (largely those ailments unresponsive to placebos) so quickly, the most persistent health problems are becoming those ailments with complicated or unknown etiologies, non-specific symptoms, and psychosocial triggers that don't easily respond to biomedical methods such as mental illness or chronic pain. People are turning more and more to complementary and alternative medicine for more holistic relief from these types of ailments.

#### **3.4.1.4 Much Ado About Meaning**

Culture becomes a principle element in all of sickness and healing because human bodies respond to the conditions in their perceived environments, and what we perceive is determined by our enculturation.

Illness and healing, while they clearly require a neurobiology, require a culture as well, because cultures provide both the material conditions (from sickbeds to toxic dumps) and the immaterial beliefs that directly affect human health. Indeed, a culture so powerfully shapes and modifies our experience that individuals always reflect, even if they resist, its influence. It is in this sense that a full theory of placebo will necessarily be biocultural....[This] is exactly where placebos may have their most important function. In demanding a model that goes beyond cultural or biological explanations alone, placebos insist on a comprehensive explanatory visions that amounts almost to a new way of thinking...It regards human beings and complex human events like health and illness as constructed at the intersection of culture and biology (Morris 1999: 200-201).

That amalgam of all the elements that make up the “softwiring” of placebo responses—the culturally specific meanings and associations that patients acquire as members of

society and that influence every medical encounter in culturally patterned ways--is called the meaning response. This concept was coined by anthropologist Daniel Moerman (2002) to refer to “the physiologic or psychological effects of meaning in the origins or treatment of illness” (Moerman 2002: 472), and revolutionized the field of Placebo Studies. It provided a theoretical model through which to assign physiological relevance to symbolic milieu. It showed, unequivocally, that placebo responses were culturally relative (Moerman and Jonas 2002; Moerman 2000; Lock 1993, 1998) and it supplied a language to medical researchers through which they could discuss the messy “non-specific” noise of placebo responses. “The social-psychological processes involved in placebo responding are not specific to placebos; they apply to any treatment. Moreover, individuals' psychological and interpersonal responses are embedded in larger sociocultural systems that give meaning to experience. Changes in the social meaning of specific treatments can, in turn, reshape expectations vastly increasing or undermining confidence and hope” (Kirmayer 2011:115).

Meaningful elements in medical contexts have been proven to affect treatment outcomes (for example, adherence (Moerman 2000), pain analgesia (Benedetti and Amanzio 1997) and even surgery (Cobb et al. 1959; Dimond et al. 1960; Beecher 1961; Johnson 1994; Moseley et al. 1996; Lange and Hillis 1999; Kaptchuk et al. 2000). For example, in a four-arm trial of unbranded and branded placebos and aspirin, all subjects reported improvement but branded products (both placebo and active) produced better outcomes than unbranded ones. This trial illustrates not only the effect of the meaning behind taking a pill but also the effect of preconceived “webs of significance” wrapped

up in a brand. “The [placebo] pills were inert, the ‘taking a pill’ wasn’t inert, and the brand name wasn’t inert” (Moerman, 2002:19).

Moerman argues that each time someone takes a pill, the patient “recalls” the entire medical experience (2002, p. 121). We must stress that the connection goes beyond the patient’s cognitive connection with a past medical experience. In fact, the pill is a metonym (part representing the whole) for all of biomedical technology. Each time the patient takes the pill, he/she indexes the technological and symbolic power of biomedicine” (Thompson et al. 2009).

#### **3.4.1.3.1 Modifying Meaning: Example**

One example of how meaning is modified via culturally-specific contexts in Asante indigenous healing rituals is the use of talcum powder. Talcum powder is used in every ritual ceremony I have ever attended. As most shrines are outdoors, the boundaries of the shrine are often outlined in talcum powder and rarely disturbed. Once healers become possessed, the first thing shrine workers bring them is a big bowl of talcum powder. They use this talcum powder every step they take to show that their footsteps and movements are not their acts, but the *Abosom* possessing them. They walk around the shrine, observing its state and pouring talcum powder over everything they touch, see, or step on. During divination, the kola nut or cowrie shell is often covered in talcum powder before being thrown on the ground. Once an egg is broken, talcum powder is used to designate its final resting place and once it is interpreted a line is slashed in talcum powder across the designated area. *Okomfor* will often pour talcum powder across their eyes after possession to signify their spiritual state. When another person becomes possessed--usually a patient being treated--talcum powder is poured over his/her eyes to signify this. Sometimes healers are kidnapped by *mmoetia*<sup>109</sup> or other spirit mediums and taught about

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<sup>109</sup> *Mmoetia* are spiritual guides who educate the *okomfor*. They are small dwarflike creatures whose feet are on backwards.

herbal remedies in the rainforest. This is signified by being bound and tied by twigs with talcum powder representing that it was spiritual, not earthly beings, who did this. Healers will also use the talcum powder as a remedy. One patient was given a bag of talcum powder used in the ceremony and told to bath with it twice a day to relieve side pains. Another patient, a drummer for the ceremony, had a hurt ankle. During spirit possession the healer called him out into the shrine and poured talcum powder over his leg. Ultimately, one of the first things that happens in the ritual process is when healers coat their eyes and hands in talcum powder. Many interviews with healers and shrine workers have taught me that the whiteness of the powder residue represents anything the gods see or touch. The powder becomes the material presence of the gods themselves, as anything covered in this substance has been seen or touched by the gods.

The use of talcum powder is extremely common throughout the ritual process. Because of its ubiquity I assumed that talcum powder was a holy or special substance. However, in interviews I learned otherwise. Most *Okomfor* were surprised by my questions and some even laughed. “You buy talcum powder at the store like anything else,” said Gyami. “Do you use it for anything else?” I pushed for more details, wondering at his brief hesitation and slight blush until I realized it was embarrassment. “You use it after bathing, of course.”<sup>110</sup>

Of course, the actual talcum powder is inert (at least in its claims during Asante rituals). However, during the ritual ceremony it becomes invested with spiritual power.

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<sup>110</sup> It is not customary, and is sometimes taboo--depending on the circumstance--for men and women to talk about bathing.

The only difference between the inert talcum powder and the powerful talcum powder is the ritual process. Once placed into an indigenous ritual healing context, talcum powder is a visual representation of spiritual presence that is invested with meaning, power, and authority. These symbols, while seemingly unrelated to somatic processes, have the capacity to alter the ways that patients perceive their internal and external environmental conditions as well as a lifetime of learning (or conditioning) that can trigger specific neurobiological processes (See learning model below).

#### **3.4.1.3.2 Ways to Modify Meaning with Ritual**

The long list of modifying perceptions in the appendix highlights the many ways that practitioners can influence patient perceptions about their internal and external conditions and access to quality resources and relationships of predictive care. Since endogenous health resource allocation and, arguably, placebo response rates are highly correlated with patient perceived conditions it is important to understand that many medical rituals and behaviors act on those perceptions and/or conditions. But what specific “modifications” alter perceptions and why? This is where anthropologists come in and, fortunately, we have some good evidence of specific “meaningful” elements that carry physiological consequences.

In *Appendix: Chapter 3: 3.10 Ways to Modify Meaning with Ritual* I provide a detailed list of over twenty-seven “units of meaning” that influence placebo responses. This list is not exhaustive, rather it highlights some of the ways that symbolic meaning and ritual behavior directly influence placebo responses (via conditioning, learning, expectancies, memory, and somatic, attentional or attributional focus, etc.). It also



illustrates how changes in these meanings can indirectly modify patient perceptions about the conditions in their physical and social environments. These units of meaning

represent levels or sites where the symbolic effects of placebos may exert effects. Because attributional processes are central to symptom experience, any suggestion, instruction or contextual cue that shifts attention, attributions and coping responses will, in turn, change symptom experience. These shifts can occur through reattribution, engaging with new images or metaphors, or re-narrating distress in a new story frame (Kirmayer 2011:115).

While the meaning response is a useful concept, it cannot encapsulate all of the many mechanisms of placebo responses, and it has limitations. For starters, meaning is present in every facet of life. Perceiving and interpreting signals and assigning them “meaning” is an adaptive feature of most species. In what way do we define “meaning?” In what ways is the “meaning” of chemical communicative signals in bees different than the “meaning” of verbal and nonverbal communication in doctor-patient interactions? Are we only talking about referential or symbolic meaning and not instrumental communication? Can non-human species experience placebo responses and meaning responses? Or are they unique to humans because of our capacity for symbolic communication?

#### **3.4.1.3.3 Animals and Placebo Responses**

“Nonhuman animals can manifest placebo effects, which cannot be explained in reference to grasping symbolic meaning” (McMillan 1999). As we discussed earlier (see psychological and neurobiological mechanisms above), non-human animals, especially in laboratory settings, have been found to show placebo response rates in both expectancy and conditioning. Placebo animal trials based on expectation show that reward anticipation and predicted outcomes alter physical and behavioral responses (Benedetti 2009:41; Setlow et al. 2003; Tobler et al. 2005). Furthermore, recent research on the placebo effect in epileptic canines has argued that “in veterinary studies, the placebo

response can be because of effects on the animal, but more importantly maybe be a result of expectations of the pet owner regarding treatment. It is likely that the expectations of the owner might play a greater role in a study like this” (Munana et al. 2010). Similar to single-blind clinical trials, owner expectations might influence their dog’s responses and/or the placebo results might be due to owner expectancies (as they are the ones doing the observing and reporting) rather than actual changes in canine physiology.

Many animals can detect and then physically and behaviorally respond to repeated signals and contexts, which produce “learned” expectancies. These same “adaptive responses that are linked to new contextual stimuli” produce conditioned responses (Kirmayer 2011:114). Conditioning is a widespread phenomenon in placebo animal studies and argued to be the main mechanism through which animal placebo responses operate (Evans 2004; Voudouris et al. 1989; McMillan 1999; Wilson et al. 2004; Munana et al. 2010; Ader and Cohen 1975). In fact, nothing is more associated with the term conditioning than Pavlov’s dogs (Pavlov 1927). “Many mammals seem to be subject to something like the placebo effect. To be specific, rats, mice, guinea pigs and dogs have been shown to be susceptible to a phenomenon known as immune conditioning” (Evans 2004). These animal trials, though rare, attempt to isolate out the large host of sociocultural phenomena which contribute to any healing context (i.e., meaning, enculturation, learning, etc) and discover the unique aspects of placebo responses in humans (Guo et al. 2010). For example, “although rats and dogs are susceptible to immune conditioning, the subtleties of verbal information are lost on them” (Evans 2004:102).

Aside from expectation and conditioning we also see the placebo response mechanisms of opioids and therapeutic relationships in animals. Administration of naloxone (an opioid blocker) works to prevent pain analgesic placebo responses in both humans (Mayer et al. 1977) and animals (Pomeranz and Chiu 1976). Therapeutic signals or caregiving contact has measurable effects on positive health outcomes in animals, i.e., petting can reduce heart rate in horses and dogs (Gantt et al. 1966; Lynch 1974), increase dairy production in cows (Gross 1980), and increase reproductive rates in pigs (Heinsworth et al. 1981). Positive placebo responses of alternative medicine in animal trials, i.e., acupuncture on horses, have been explained as working through these handling mechanisms (Wilson et al. 2004; Ramey 2008). So there are placebo responses that take place outside of learning, conditioning, and expectation that have to do with caregiving and social support. These interactions need to be parsed further.

Another mechanism of placebo responses is manipulating health resource allocation by modifying perceptions (see previous sections). While we do not have any placebo animal trials on this subject, we do know that animals regularly modify perceptions to achieve particular results. For example, chimpanzees will stand bipedally, pound on hollow tree trunks, and make aggressive facial features, gestures, and vocalizations to demonstrate dominance in order to (unconsciously) show costly signals of quality leadership and strength and avoid potentially life threatening dominance contest competitions (or so we infer). During mating season, male fiddler crabs will surround themselves with smaller crabs to appear larger in contrast and attract mates via the Ebbinghaus illusion (Kelly and Kelly 2014). While these are not examples of placebo

responses, they are examples of the ways that species manipulate perceptions for specific outcomes.

Likewise, in some way or another, most species have the capacity to detect and physiologically respond to signals in the environment. For example, vervet monkey alarm calls elicit different types of “on alert” responses in their companions depending on the type of predator in the vicinity. Vervet warnings calls of snake threat are different than those of bird or leopard threat—to the degree that a snake call causes vervets to look down and an eagle call causes them to look up (Seyfarth et al. 1980). Here we see that different signals communicate particular meanings that not only affect physiology but also behavioral responses. This phenomenon begs the question; is every detection and appropriate response to signals in the physical or social environment a “meaning response?” The vervet call produces a culturally specific meaning that is understood by members of a group and which they respond to (it has been shown that there are different “cultures” found in geographically isolated species of non-human primates) (Boesch 1996; Goodall 1986; McGrew 1992; Sugiyama 1997; Whiten 2000). Is this meaning? Communication? Both? We see the same widespread problems with the perimeters of what makes up a “meaning response” in humans as our physiological and behavioral responses to meaning exist in different, geographically isolated, cultures (and not always restricted to medical encounters).

Since placebo responses are so closely tied to human psychology and sociocultural contexts, animal studies represent important comparisons because they “undermined the frequent assumption that placebo effects were a product of peculiarly human

interpersonal processes and unconscious wishes” (Harrington 1999:6). Animal placebo studies are rare (Munana et al. 2010), but essential because they show that many of the “meaning responses” that are consistent features of human medical contexts are not components of animal placebo response elicitation. At the same time, they show that some placebo responses work on basic social attachment adaptations (i.e., rats experience separation distress calls and have complex, life-or-death, social attachment processes and responses depending on caregiver behaviors) and operate through activation from social stimuli (see the social response below). In fact, in a recent study on caregiver placebo pain analgesic responses in cats, Gruen et al 2017 discovered that more than any other factor (cat age, weight, activity, original pain score, or study type) “the caregiver placebo effect across these clinical trials was remarkably high” (Gruen et al. 2017: 473). While “the meaning response” is not usually associated with these types of studies, “the social response” could be. The social relationship between cat and caregiver shows statistically significant positive placebo outcomes. Studies like these are the reason we need to talk about powerful placebo triggers beyond the meaning response and take a look into those biocultural interactions of sociality that evolved many, many years ago.

#### **3.4.1.3.4 Perimeters of The Meaning Response**

We see similar problems in regard to the perimeters of the meaning response. All social interactions are imbued with meaning and that meaning can have an influence on both physiological and behavioral responses. “The placebo effect is merely a particular instance of a phylogenetically widespread behavioral phenomenon, and not a manifestation of man’s special symbolic capacities” (Hernstein 1962: 678). Since placebo responses have evolved in largely social environments it would be highly unlikely that

the stimulation of these responses is restricted to health contexts or medical settings. Thus, the phenomena exist well beyond the scope of medical contexts. We would not refer to the reduction of anxiety, pain, or stress via meaning found in a movie or book as a “meaning or placebo response.” So is it only a meaning response in a medical context but not when there are “physiologic effects of meaning” in different contexts? “Meaning is a pervasive feature of human life, as all forms of human communication involve the perception and expression of meaning. Hence ‘the meaning response’ is too broad a label to specifically characterize healing connected with the contexts of the clinical encounter” (Miller, Colloca and Kaptchuk 2009).<sup>111</sup> Moerman even agrees with this critique by saying that “It is also important to note that these matters, where meaning has an influence on health and even mortality, can occur well outside the ordinary bounds of the clinic” (Moerman 2013:127).

“The ‘meaning response’ implies an explanatory psychosocial hypothesis relating the placebo effect to perception of symbolic meaning. While attention to meaning—especially the hope and expectation for relief based on contextual features of the clinical encounter—plays a prominent role in eliciting placebo effects, there is abundant evidence that this phenomenon may be evoked by classical conditioning” (Siegel 2002), therapeutic relationships, interpersonal interactions (Miller 2009), compassionate touch

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<sup>111</sup> “There are many ways to unpack the meaning of meanings, and unfortunately, Moerman uses the term ‘meaning’ uncritically as a ‘catch-all’ for everything that cannot be accounted for by the verum effect or natural history of the disease. Throughout his work on placebo all incidental and preliminary elements of therapy are attributed to “meaning”. Only at the very end of his book does he mention that “meaning” encompasses a number of complex and varied representations and relationships— identifying the metonymic relationship (part for whole), the iconic relationship (based on resemblance), and the symbolic relationship (an arbitrary relationship between two things) (Moerman 2002: 148-9)” (Kirmayer 2003: 288).

(Kerr et al. 2014), “handling” (Wilson et al. 2004; Ramey 2008), and “placebo response as deriving from processes of decoding psychosocial signals” (Colloca and Miller 2011: 1860).<sup>112</sup> Since placebo responses are culturally relative we know that encultured and socialized symbolic meaning affects their elicitation, but we also know that observational or social learning has a similar effect. “Prior experience of those who interpret placebos as sign vehicles have differential impacts on the formation of placebo responses” (Colloca and Miller 2011: 1863). So, following the pattern of genome/epigenome, humans have the capacity for shared, patterned, and largely predictable meaning, but also have individual variation based on a priori exposure to specific meaningful situations. For example, those with patient histories full of medical encounters may have different meaning detection systems than those with little medical experience.

#### **3.4.1.3.5 Cognitive Bias**

One final critique of the meaning response is that it has a cognitive bias. “Like the psychology-oriented scholars of the placebo effect, Moerman privileges the way patients consciously interpret the healing encounter or therapy over other ways of knowing” (Thompson et al. 2009); so much so that other ways of knowing (i.e., signal detection, sensation, pro-social motivation, and adaptive warning systems, etc. for example), are recast as significant for what they consciously mean to participants and how that meaning influences the healing encounter, rather than being significant and influential in and of themselves.

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<sup>112</sup> See also: Allan and Siegel 2002; Miller and Colloca 2010

The stimuli or cues that activate the endogenous healing systems are not strictly “mental” (in the sense of being located in our psychological processes) but also social and their power and evocativeness derive from larger cultural systems of meaning. Ritual healing is not simply a matter of turning on endogenous self-regulatory or healing systems, but an ongoing process of modulation of experience that involves interpersonal interactions that can reinforce or undermine the therapeutic effect (Kirmayer 2006; Kirmayer 2011:119). For example, in an open/hidden<sup>113</sup> trial on pain Benedetti and Amanzio (1997) found that placebos given with a 6-8-word explanation of pain relieving qualities had higher placebo response rates than the same injection administered in a hidden format with no words. “That’s the only difference between the two groups. Yet the open saline group shows a persistent decline in pain reports while the hidden infusion group shows a continued rise in pain. Let me qualify this: Does this show us that placebos have effects? No, *because both groups got placebos*. The difference between the two groups was *words, language, meaningful utterances*” (Moerman 2011, original emphasis). Here Moerman distills the many elements of an open trial with placeboogenic qualities down to “words, language, and meaningful utterances” obfuscating the many socially potent interactions that influence physiological processes. There are many other elements missing between the two trial arms. The hidden group experiences isolation, a lack of social interaction, the loss of touch, and the absence of social observation signals (i.e., reading the social cues tacitly communicated in social interactions via empathetic

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<sup>113</sup> Open/hidden research designs compare placebo responses in open administration (i.e., practitioner administers a placebo intervention with instructions) versus hidden administration (i.e., the patient is hooked up to a machine which administers the placebo intervention intravenously).



understanding, emotional and social intelligence, and mirror neuron activation). While meaning is a significant component of the ritual of medicine, it is but one of the many contributing components in placebo responses.<sup>114</sup>

In fact, it can be argued that our long history of social selective pressures and adaptations would make humans more susceptible to signals in the social domain (regardless of conscious understanding) than those in the cognitive domain. Reflecting back on our conversation earlier about illusions and accuracy, our brains and bodies evolved to respond in pro-social ways that increase our predicted chances of survival and reproduction. They did not necessarily (or rather predominantly) evolve to respond in rational, logical, or even cognitively consistent ways. In the Cuna or Malay childbirth case studies above, research shows that rather than a meaningful interpretation or explanatory model of suffering, positive childbirth outcomes increase with psychoprophylactic techniques (in the form of education, participation, and self-

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<sup>114</sup> Although he is dealing with powerful symbolic, affective, aesthetic and performative dimensions of healing, Moerman focuses his analytic attention on what happens in the conscious mind of the individual in terms of knowledge, belief, and understanding. For example, Moerman employs Levi-Strauss' oft-cited secondary analysis of Cuna shamanistic curing during difficult childbirth (2002, p. 94). Following Levi-Strauss' interpretation Moerman argues that psychotherapy—like Cuna healing—“evokes meaning responses” by providing a coherent theoretical lens through which the patient can view his or her suffering. This interpretation, however, has been thoroughly criticized in anthropology. Both Briggs (1994) and Atkinson (1987) have critiqued Levi-Strauss' analysis on the very grounds that it places undue emphasis on the *meaning* of the narrative incantation, thus neglecting the social and performative force of the ritual. Citing their field experiences, they independently argue that the curing process operates beyond the patient's cognitive interpretation of the text—which may not even be accessible to the patient. Rather, when the *social construction of the body* is of central concern, healing may not be limited to the physical body of the patient. Along similar lines, Laderman, looking to Malay birth incantations to critique Levi-Strauss' textual interpretation, argues that “incantations cure by analogy, not through their specificity but by their ‘fan’ of meanings, their multi-layered nature and the ambiguity of their symbols” (1987, p. 301). By uncritically following Levi-Strauss' analysis, Moerman collapses the complexity of symbolic and performative healing and defaults to an overly-simplistic explanation of the practitioner providing an ‘understanding’ for the patient in order to invoke his model of the ‘meaning response’. In short, Moerman neglects many tools anthropology has to offer and falls back on what is already known about the placebo effect. (Thompson et al. 2009).

regulation as seen in Lamaze, Bradley and hypno-birthing techniques) and the presence of trusted individuals (in the form of family, social support, and birth attendants). In fact, research on doulas (certified childbirth attendants) shows that their presence shortens labor time, reduces epidural and Pitocin usage, lowers cesarean rates, and decreases the incidence of complications (Hodnett et al. 2012).<sup>115</sup> Even in “sham” doula trials, where the doula is merely present as an observer in the room and not an active participant in labor or birth, we see a reduction of labor time, epidural and Pitocin usage, cesarean rates, and birth complications (Kennell et al. 1991)<sup>116</sup> (See Figure 3.1).

	CONTROL (No Doula)	DOULA (Observing only)	DOULA (Active Supporting)
Length of labor ( <i>hrs</i> )	9.4	8.4	7.4
Epidural	55%	23%	8%
Pitocin—to augment labor	43%	32%	17%
Cesarean birth	18%	13%	8%
Forceps	26%	21%	8%
<b>Figure 3.1: Sham Doula Outcomes (Kennell et al. 1991)</b>			

What this study illustrates is the measurable effect of trusted social support during labor and birthing. It is actually a good thought experiment to see this research as analogous to the open/hidden models where “meaning” was not sufficiently isolated because observing doulas provided no “words, language, or meaningful utterances” (Kennell et al. 1991). Yes, being present represented meaning for birthing mothers, but the main mechanism of positive health outcomes could not be meaning responses as the

<sup>115</sup> See also: Sosa et al. 1980; Klaus 1986; Zhang et al. 1996; Scott et al. 1999; Hofmeyr et al. 1991

<sup>116</sup> One of the greatest aspects of this study is that the women were assigned randomly to the different groups, negating any previous meaning or trust built over time that is usually associated with doulas or birth attendants.

observing doulas provided no meaningful explanatory models. However, their presence alone altered patients perceived conditions and provided a “social response.” We need more studies like this to isolate and measure the physiological effect of sociality.

From a biocultural evolutionary perspective, this explanation is much more compelling. Childbirth puts women in a vulnerable position (unable to feed, care for, or protect themselves), making them reliant on others for their and their infant’s survival. The difficult circumstances of human birth (as described in Chapter 2) would favor mothers with strong relationships of predictable caregiving and resource sharing. Even today, infant mortality rates are impacted by socioeconomic status. The offspring of mothers with access to relationships and resources survive at higher rates. In fact, studies in a chimpanzee context have shown that “high-ranking females were shown to have significantly higher infant survival, faster maturing daughters, and more rapid production of young” (Pusey et al. 1997). While a subject that has been less studied, it would make sense that natural selection would also favor mothers who were able to start and stop their labor based on cues in their social lives, e.g., safety, protection, food, etc. Individuals with bodies more responsive to social cues and who had access to quality resources and relationships would have survived and reproduced at higher rates than those without, and these traits would be present in subsequent generations in greater frequencies. The fitness consequences of sociality (especially with the Cuna and Malay Levi-Strauss and Moerman examples of childbirth) far outweigh those for meaning and, therefore, we would see much more detection sensitivity and physiological/behavioral responsivity to cues in the social rather than cognitive domain. In short, during times of physical

vulnerability and dependency, assurance of resources and caregiving would have a profound effect on patient perceptions, health resource allocations, and even the pathophysiology of disease (or in this case labor).<sup>117</sup> We would also expect to see a “dosed” desire, belief, expectation model at work here where any cues (such as a trusted individual present during birth) that confirm the desire, belief, and expectation of future resources and caregiving would influence physiological responses, i.e., how much of health resources to give to the labor, birth, nursing, and infant versus how much to reserve for self-healing and future providing.

It is difficult to separate and measure the effect of meaning versus social conditions. Do patients show positive placebo rates just from signing up to the trial because of cognitive or social expectations? Do placebos work when patients know they are receiving them? An ideal study would be a derivation of an open/hidden design where meaningful information is not given to group A, is given by a computer to group B, and is given by a human in group C. Do we see a difference in placebo rate outcomes? Is it the words, language, and meaningful utterances that make the difference or the social interactions and assurances? So far we do not have many studies attempting to isolate and measure the social aspects of placebo elicitation. One study that attempted to do this was

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<sup>117</sup> Labor and childbirth are important examples because they have adapted to respond to perceived external conditions. If a mother senses danger, the autonomic response stops labor and prepares the mother to flee. This is an advantageous trait if giving birth in the Pleistocene amidst the constant threat of predation. Mothers whose labor was not responsive to environmental cues would have made themselves and their babies easy prey and their genes would not have lasted long in the population. However, in modern maternal and infant health contexts, stress is a common feature of labor and birth and when labor stops as a result (as it is designed to do) it is seen as a negative thing and many medical interventions and birth complications are attributable to restarting or speeding up labor via “active” pharmacological or surgical interventions.

Smyth et al. 1999, which “dealt primarily with altering the social component” (Jonas 2011:1901) of two RCTs: asthma and rheumatoid arthritis.

In one group, the patient described a significantly difficult conflict or secret about past traumas, injury, rape or abuse to the clinician in a single session. In another group, they simply talked about superficial things like the weather or what they had to eat the day before. At the four-month follow-up, asthma patients who had been randomized to the trauma stories showed significant improvements in forced expiratory volume compared with the control group. Those with rheumatoid arthritis showed significant improvements in pain compared with the controls. Thus, enhancing the therapeutic alliance through storytelling can alter the meaning and context of a treatment and produce significant and objective clinical improvements. (Jonas 2011:1901).

While this study does not isolate the social component as well as it could have (storytelling is very meaningful), it shows how patient vulnerability (i.e., sharing past traumas) makes them more malleable or susceptible to enhanced placebo responses (See *Nkate* example in Chapter 2), especially those in the social domain. Anthropologists have significant contributions to make to studies like that of Smyth et al. 1999. For example, a biocultural evolutionary perspective would argue that uncertainty of resources and lack of quality relationships (e.g., loneliness or trauma) combined with physically debilitating circumstances (e.g., childbirth or illness) force people into roles of dependency (or perceived dependency) on others for their health and survival. Unpredictability, vulnerability, and dependency trigger negative emotions, social pain, stress, fear, and anxiety. These unpleasant sensory feelings are adaptive designs, not flaws, warning and motivating individuals to secure resources (or access to resources through reciprocity) and relationships of predictable care. Those who lack quality resources and relationships are vulnerable to many of the internal conditions (social pain, stress, fear, anxiety, loneliness, and negative projections and expectations) and external conditions (nutrition,

protection, shelter, safety, and care) that cause, exacerbate, and prolong sickness and that inhibit optimal health resource allocations. Thus, healing contexts that strengthen perceptions about the patient's access to provisions of caregiving would elicit robust placebo responses. Here we see a model where our stone age bodies respond to social adaptations in sickness and healing in ways that are not purely cognitive or meaning-based.

**The stimuli or cues that activate the endogenous healing systems are not strictly “mental” (in the sense of being located in our psychological processes) but also social and their power and evocativeness derive from larger cultural systems of meaning. Ritual healing is not simply a matter of turning on endogenous self-regulatory or healing systems, but an ongoing process of modulation of experience that involves interpersonal interactions that can reinforce or undermine the therapeutic effect.** In terms of placebo as healing ritual, this means that the impact of any intervention extends beyond the clinical interaction or moment of treatment administration to include later processes of socially-mediated reflection, narration, re-interpretation, and re-evaluation. Closer attention to particular “Placebo” names a social situation not a substance. Placebo responding reflects the ways that people think, act, feel and respond physiologically to an intervention they believe and expect will be of help. Defined in this way, placebo responses clearly are based on beliefs and expectations. **But beliefs and expectations themselves are complex and only partially dependent on individual cognitive processes. Beliefs and expectations may follow from bodily experiences, enactments, contexts and commitments more than any explicit cognitive model. Indeed, these same aspects of embodiment may give rise to placebo responses in the absence of explicit beliefs and expectations** (Kirmayer 2011:121, emphasis added).

Evolutionary and mind-body regulation theories are crucial to deciphering the hierarchy of impact or degrees of intensity of various placebo response mechanisms because they are not all equal. Some placebo components and mechanisms are more powerful at eliciting placebo responses than others. “Social interaction is a powerful vehicle for conveying treatment expectations” (Kirmayer 2011:115). This manuscript posits that our distinctive evolutionary history makes us particularly susceptible to information in the social domain—perceiving and responding (via physiological and/or

behavioral adaptability) social signals. As a result, I would argue that the social appraisals in medical contexts are more persuasive than cognitive appraisals (i.e., our bodies are more sensitive to detection and quick to respond to social versus cognitive information). The fitness consequences of status, belonging, ostracism, and access to quality resources and relationships of predictable care far outweigh the fitness consequences of cognitive coherence, logical consistency, rational calculation, and even accurate perceptions. That said, culturally specific meaning, learning, and social interactions work hand in hand.

There may be complex social patterns of anticipation that depend on interactions with others, social contextual cues, and cultural systems of meaning which are taken for granted or used more or less automatically because they are embodied and embedded in social practices. Based on cultural and personal meanings, people may invest in a treatment because it is consonant with their values and motivations and respond positively because of the emotional meaning of the treatment (Kirmayer 2011:115).

If placebo studies has taught us anything in the last three decades it is that pharmacological agents are not the only active ingredients in medical encounters. While biomedicine continues to rely almost exclusively on pharmacological solutions to health problems, this is a limited and inaccurate paradigm and, quite frankly, a model vulnerable to larger political and economic agendas. “Although most research on placebos has focused on psychological and psychophysiological processes, studying the social contexts of healing can illuminate the interpersonal and wider social determinants of placebo response” (Kirmayer 2011:211). As hominids achieved ecological dominance, social environments became the locus of selective pressure. As such, our bodies are highly responsive to pro-social and anti-social cues. Entire body systems are co-opted to monitor, react and motivate actions in the social domain (see Chapter 4 for more on the

co-opting of pain neural pathways for social pain). We do not see the same types of environment-body feedback loops to incent cognitive alignment as we do for social alignment.<sup>118</sup>

We are more compelled by psychosocial stressors and culturally adaptive mechanisms of alleviation than by abstract desires, goals, or beliefs due to our long biocultural co-evolutionary development in social environments where belonging and ostracism had much more of a survival impact than logical consistency. It was advantageous for our ancestors to participate in rituals regardless of their belief in the cosmological or ideological claims. Participation is a costly signal of group commitment, loyalty and trust. If our ancestors fully participated in the ritual process even if they didn't believe there would be little fitness consequence. If, however, our ancestors stopped participating in the ritual because it was not cognitively compelling, it would significantly impact their survival and reproduction. Thus, the fitness consequences of cognitive belief were negligible compared to those of social interaction. Furthermore, humans are imbued with a host of unconscious, tacit, kinesthetic, corporeal, and sensorial modes of perceiving the world. Each of these can trigger corresponding physiological, psychological, and behavioral responses.

placebo responses can [also] reflect embodied learning and contextual responding that are independent of consciousness awareness. The symbolic, affective and esthetic responses to treatments cannot be reduced to expectations; they are part of cultural performance and participation...This means that responses to placebos or other treatment interventions need not be based on

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<sup>118</sup> There is no non-social equivalent of separation anxiety for intellectual disagreement and cognitive distress usually occurs when one's beliefs are not consistent with the perceived social or environmental conditions and expectations. In fact, the cognitive foundation of human nature as rationally rather than socially motivated is crumbling in many of the social sciences (Habermas 1984; Etzioni 1988; Sutherland 1992; Garces 2009; Ariely 2012; Lieberman 2013).



cognitive models or representations carried by the individual but may be part of a performance that involves distributed knowledge and that therefore can only be enacted through concerted social action. These enactments depend on interactions with others who are essential to create the context and shape the response. In this sense, placebo responses may be understood as social phenomena that depend on embodied experience, socially distributed or embedded knowledge, and situated practice” (Kirmayer 2011:115).

### **3.5 My Comprehensive Theory: *The Social Life of Placebos***

The meaning response alone is unable to provide “explanatory hypotheses for how the clinician-patient encounter promotes healing” (Miller, Colloca and Kaptchuk 2009).

The effect of these social relationships on the body has not been neglected in placebo studies. Research on therapeutic relationships, doctor-patient communication, and interpersonal healing is expanding. Interpersonal healing situates the placebo phenomenon within social interactions, connects therapeutic relationships to health outcomes, and argues that placebo interventions work via the healing efficacy model of palliative or symptomatic relief instead of affecting disease pathophysiology. While these theories make valid points about the role of consciousness, patient participation, and other-generated responses, they suffer from the same limitations as other placebo studies “theories,” which are really just integrated mechanistic research wrapped up in a broad title with little explanatory power. For example,

Even if endorphins did mediate some kinds of placebo analgesia, that analgesia was not thereby explained [...]. endorphin release, rather, became just one more placebo-generated phenomenon to be explained—and we still did not understand the processes whereby a person’s belief in a sham treatment could send a message to his or her pituitary gland to release its own endogenous pharmaceuticals (Harrington 1999:5).

Placebo researchers are aware of this problem. Most rarely overstate their claims and often caveat any theoretical positions, i.e., “orienting concept” (Miller, Colloca and Kaptchuk 2009:9), “reframing” (Jonas 2011:1896), and “orchestrat[ing] common themes in the placebo literature with the aim of articulating a unified account of the

phenomenon” (Colloca and Miller 2011: 1859).<sup>119</sup> Regardless, these theories are unable to answer basic explanatory questions about: the scope of placebogenic phenomena, why this capacity evolved, how it works (not at the level of proximate neurobiology, but through adaptive body systems), and what specific interpersonal behaviors produce what specific physiological responses (and why those specific feedback interactions developed, how they work, and in what particular circumstances are they activated). Now, to be fair, the social sciences is not fairing much better. When contributing to mind-body medicine, they tend to “leave behind the behavioral theoretical frameworks that make them unique...In fact, theory may represent one of the most distinctive contributions [the social sciences] can bring to the health sciences and medical practice (methodological expertise is another)” (Suls et al. 2011:16). Without this knowledge of the complex culturally contextualized components involved in interpersonal interactions during medical encounters, methodological and theoretical exegesis is like stabbing in the dark.

While modern medicine has considerable respect for biological and biochemical theory, physicians tend to be quite skeptical about *behavioral* theories. Many are unaware of or have no ready access to efficacious, effective, and professionally relevant psychosocial interventions. Physicians are pragmatists who functionally practice within the biomedical model, even if they have awareness of psychosocial factors” (Suls et al. 2011:15 *Original emphasis*).

Behavioral and social scientists ought to be on the forefront of elucidating these other ways of knowing. We should work (and provide useful theories) to explain how evolutionary processes and cultural components interact in ways that affect the body’s response to sickness and healing during medical encounters. For example, a patient’s

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<sup>119</sup> “Substantial mechanistic research on this phenomenon has proceeded with little guidance by any systematic theoretical paradigm” (Colloca and Miller 2011).

personal health history and exposure to medical therapies, their socioeconomic status and social support network, the thoughts and opinions of trusted allies, their lifestyle, career, and coping mechanisms, and national health policies and systems are just a few of the factors that contribute not only to the incidence of disease, but also its duration, intensity, speed of recovery, and vulnerability to psychosocial mediation. The brain and conscious cognitive processes that provide an explanatory model to help patients understand their suffering are important, but just one of the many contributing factors in health outcomes.

This metonymic use of the brain for the person is increasingly common in popular and scientific discourse...Of course, placebo effects do involve alterations in brain chemistry and function...Generally speaking, though, it is not the brain that is afflicted and that gets better in healing but the *person*. This distinction is important because the person is much more than a brain and its regulatory systems. The person includes cognitive processes that are embodied, socially embedded, and enacted and hence, not reducible to the brain... Moreover, it is not simply illness that is modified by ritual healing but *sickness* — that is, the sufferer's social identity as a person with an affliction... This is why healing may be judged successful even when symptoms and disability continue (Kirmayer 2011:118-119).<sup>120</sup>

“Although scientific investigation has accelerated in the past decade, with particular attention to neurobiological mechanisms, there has been a dearth of attention to developing a comprehensive theory of the placebo effect” (Miller, Colloca and Kaptchuk 2009). As such, *The Social Life of Placebo* focuses on the biocultural evolutionary and proximate mechanisms of biocultural interactions in medical encounters in order to construct a broad theoretical framework in which placebo responses can be situated. This framework is in conjunction with, not in exclusion of, current theories in the field (See *Appendix: Chapter 3: 3.6.3 Theory Deficient* for a literature of current theories). In fact, most of these theories are not mutually exclusive. They can be combined to explain

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<sup>120</sup> See also: Vidal 2009; Benedetti 2011; Kirmayer and Gold 2011; Young 1992

different aspects of the larger phenomenon of physiological susceptibility to perceived conditions—a phenomenon, I argue, that is rooted in the social susceptibility.

For example, the *therapeutic relationships* and *interpersonal healing* theories<sup>121</sup> are both grounded in the idea that social relationships impact physiological processes. They root the “active” element of placebo responses in the effect of a physician’s empathetic understanding, trust, suggestion, and social support on patient health outcomes (Kleinman 1988).<sup>122</sup>

“In sum, the distinctive features of seeing the placebo effect as a mode of interpersonal healing are that it locates this phenomenon within the context of the clinician-patient relationship; it denotes a causal connection between this context and therapeutic outcomes; and this theory hypothesizes that the predominant, if not exclusive, impact of the placebo effect is to relieve illness, rather than to modify disease beyond symptomatic relief” (Miller et al. 2009:10).

Top placebo studies researchers are beginning to ask questions about the role of biocultural evolution on placebogenic phenomena. Fabrizio Benedetti (2009) inquires, “a further challenge is to determine whether socially activated placebo mechanisms emerged during evolution as a defense system of the body (in the same way as the immune system and wound healing evolved). Are placebo and placebo-like effects related to trust, beliefs and hope that emerged in social groups?” (Benedetti 2009:53). And Horacio Fabrega (2011) posits, “It may be useful to examine...mind-body regulation...from an evolutionary perspective, namely, as an adaptive response pattern of *Homo sapiens*. One

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<sup>121</sup> See *Appendix: Chapter 3: 3.12 Therapeutic Relationships and Interpersonal Healing* for examples and sources on these two theories.

<sup>122</sup> “It is of the utmost importance that physicians achieve the highest possible placebo effect rates. To do this, doctors must establish relationships that resonate empathy and genuine concern for the well-being of their patients....The chief sources of therapeutic efficacy [and positive placebo outcomes] are the development of a successful therapeutic relationship and the rhetorical use of the practitioner’s personality and communicative skills to empower the patient and persuade him toward more successful coping” (Kleinman 1988, p.247).

can thus suggest that...placebo phenomena...ethnographic healing...and [mind-body regulation] were exemplified and played out differently in differing human biological and medical environments” (Fabrega, 1976a, 1976b, and 2011:169).

*Mind-body regulation (MBR)* might be the closest theory, I think, to the ultimate mechanisms of placebo responses (see synopsis of MBR in *Appendix: Chapter 3: 3.13*) by summarizing the large diversity of psychosocial-physiological feedback loops into one concept—the evolved capacity for mental perception and physiological regulation. This theory makes imperative our evolved capacities as influencers in placebo effects beyond meaning, expectation, and conditioning. In *MBR*, human bodies have regulatory processes that are sensitive to mediating mechanisms. I called the former “hard-wiring” and the latter “soft-wiring” earlier. This might not be a great descriptor, but it illustrates that *MBR* is made up of both vestigial, panhuman processes and culturally-specific, learned stimuli.<sup>123</sup>

Jonas (2011) updates and adds to this model using an evidence-based review of the literature specifically with the goal to construct an *optimal healing environment model* that reframes the placebo and seeks to maximize its use in clinical practice. Jonas attempts to categorize the many different mechanisms, processes, and mediators of placebo responses into a tripartite model, i.e., inner environment, interpersonal environment, and external and behavioral environment. He also outlines a list of 18 American biomedically-specific factors that “enhance [the] healing response based on the

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<sup>123</sup> Laurence J. Kirmayer (2004) argues that human physiological regulatory processes are (to different degrees) influenced by psychosocial “corresponding mediating mechanisms,” such as meaning, cultural beliefs, social interactions, etc. (Kirmayer 2004; 2011).

placebo literature in a scientifically based and ethically feasible way” (Jonas 2011:1900; Walach and Jonas 2004).

All of these models do a good job of organizing the vast diversity of placeboogenic triggers and responses and highlighting the importance of the medical context and healing environment. This was the goal a decade earlier with Papakostas and Daras (2001)’s work on *the response to the healing situation*, which concentrated on the effect of context and argued that a contextual or environmental “placebo” was “any effect attributable to the symbolic importance of a treatment, treatment, setting, or treatment process (Papakostas and Daras 2001:1619).

The importance of context in shaping placebo mediators, regulatory processes, and responses becomes very vivid in the Trimmer et al. article on “understanding the placebo effect from an evolutionary perspective” (2013) via the *health resource allocation* model. More specifically, Trimmer et al. argue you can “affect the optimal amount of effort put into health by” modifying perceptions about the external physical and social environment (i.e., the costs of getting well, pay-offs of getting well, value of being well versus remaining unhealthy, current situation versus how likely conditions in the future, etc.). “We have shown that, rather than fight diseases unconditionally, it can be adaptive to wait for (what is perceived to be) a better opportunity. Placebos may act as cues that a better opportunity now exists... **What is adaptive is the general responsiveness to cues, not the responsiveness to useless pills**” (Trimmer et al. 2013). Thus, “the human capacity to develop and respond to resonant, rather than precise, healing triggers (‘the

placebo response') is adaptive and catalyzed in a multitude of ways by pluralistic healing systems'' (Thompson et al. 2009).<sup>124</sup>

Viewed in this way, from a biocultural evolutionary model where health resource allocation is adaptive and conditional cues are learned, the theories of *symbolic healing*<sup>125</sup> and *the meaning response*<sup>126</sup> not only tell us why our bodies have evolved to be vulnerable to psychosocial manipulation but also how that process may operate.

Social attitudes and elements of interpersonal context seem to be important determinants of the formation of a human placebo response. The ability to experience placebo responses may be a byproduct of the social solidarity of early human communities and the prolonged nurturance of human infants, both of which have a survival value. There are some analogues to this in human precursors like macaque monkeys that spend a large time in parental nurturing and in inter-animal practices of grooming to build up alliances and reciprocal altruism...Also relevant in humans is the prolonged process of dependency in infancy and childhood that gives more salience to parental nurturing, thus laying a strong foundation for projecting the relief of suffering that children receive from their parents' intervention onto the interaction with healers. This may explain why some internal mechanisms of symptoms' relief so often take the intervention of a healer...and do not kick in spontaneously when an animal or an individual is at rest and is doing what is needed to avoid further damage to the organism (Colloca and Miller 2011:1866).

Anthropologists have not always been great at explaining why our principle theories and methodologies like cultural phenomenology and person-centered ethnography are so

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<sup>124</sup> See *Appendix: Chapter 3: 3.14 Health Resource Allocation* in *Placebo Studies* for more on this discussion.

<sup>125</sup> "Healing rituals, including the techno-scientific practices of biomedicine, are not only performative acts but also emotionally engaging social events in which both healer and patient are active. As such, healing involves processes of thinking, feeling and imagining one's way into new modes of experiencing. A more complete account of the effects of symbolic healing will therefore require theories of the psychophysiology of imagination and of the sociopsychology of rhetorical persuasion (Kirmayer, 2006)" (Kirmayer 2011:119).

<sup>126</sup> There may be complex social patterns of anticipation that depend on interactions with others, social contextual cues, and cultural systems of meaning which are taken for granted or used more or less automatically because they are embodied and embedded in social practices. Based on cultural and personal meanings, people may invest in a treatment because it is consonant with their values and motivations and respond positively because of the emotional meaning of the treatment (Hyland & Whalley, 2008) (Kirmayer 2011: 115).

necessary to understanding bicultural interactions, especially in medical contexts. A

*learning model* does this.<sup>127</sup> For example,

processes may facilitate the spread of adaptive knowledge over generations, by being able to recognize vital life skills, to cultivate successful social relations and prosocial behaviours. Thus, it is possible to argue that the human placebo effect is based on an innate ability to learn with obvious survival value, which is made use of in healing in light of the human situation of prolonged dependency, social interactions and features of cultural evolution. (Colloca and Miller 2011:1866).

The learning model, though, needs to be combined with previously highlighted

theories because it does not provide a great explanatory model for “why” social learning

developed besides gene polymorphisms. Another example of the placebo researcher’s

tendency to dilute social phenomena down to their smallest neurobiological components

and attempt to extract explanations from this mechanistic feature when “genetic

investigation can only partially elucidate the formation of learned placebo effects”

(Colloca and Miller 2011:1865). In contrast, anthropologists provide more thorough

theoretical frameworks, but often neglect the actual evidence-based science of whether or

how those processes operate. Neuroanthropologists are making great strides in providing

rich theory in regard to both the how and the why of the learning model that pays

attention to the development and interactions of biocultural mechanisms:

The implication for neuroanthropology is obvious: forms of enculturation, social norms, training regimens, ritual, language and patterns of experience shape how our brains work and are structured. But the predominant reason that culture becomes embodied, even though many anthropologists overlook it, is that neuroanatomy inherently makes experience material. Without material change in

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<sup>127</sup> “Despite many factors and variables that combine to induce a placebo response, making the placebo effect a highly complex phenomenon, recent evidence supports the idea that placebo responses may be associated with specific polymorphisms. For example, serotonin-related gene polymorphisms have been found to influence the individual placebo response in social anxiety, both at the behavioural and neural levels (as indicated by amygdala activity during a stressful public speaking task). Also, genetic polymorphisms modulating monoaminergic tone (catabolic enzymes catechol-O-methyltransferase and monoamine oxidase A) have been related to degree of placebo responsiveness in major depressive disorder” (Colloca and Miller 2011: 1865)



the brain, learning, memory, maturation, and even trauma could not happen. Neural systems adapt through long term refinement and remodeling, which leads to what we see as deep enculturation. Through systemic change in the nervous system, the human body learns to orchestrate itself. Cultural concepts and meanings become neurological anatomy (Lende and Downey 2012:37).

The learning model (when situated within a biocultural evolutionary framework) does an excellent job of elucidating the importance of *cultural contextualization* in placebo studies. “Examining the parallels between ritual healing and placebo administration can advance our understanding of the mechanisms of placebo response.” (Kirmayer 2011:118). There is a lot that we can learn from indigenous medicine. For example, how social and cultural interactions trigger physiological mechanisms and how to make use of this process more effectively. “The placebo effect may involve social learning as well, as expectations of future positive or negative outcomes may have a major effect in social learning” (Benedetti 2009:46; Bootzin and Caspi 2002). The ritual process is an encultured learning schema that sets and modifies expectations via both verbal suggestion and imitative social observation.<sup>128</sup> “Modeling and observational learning can result in placebo effects that are stronger than those elicited by direct verbal suggestion” (Kirmayer 2011:115).

Incorporating ethnographically grounded and cross-culturally comparative perspectives in placebo research necessitates broader boundaries of what constitutes

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<sup>128</sup> looking at observational learning, we have seen that social interactions are also involved in the formation of placebo responses by integrating the basic emotions with environmental and contextual cues. Although, the investigation of social learning is only in its infancy, and more mechanistic research is needed, future clinically oriented research in this area may be promising. Patients are, inevitably, not only confronted with their own expectations and experiences but are strongly influenced by beliefs of their families, peers, clinicians, and cultural elements. Gathering knowledge regarding the role of social observational learning across different bodily systems and diseases may represent an important and clinically relevant extension of placebo research (Colloca and Miller 2011:1866).

health and efficacy (social, psychological, spiritual, etc.). It incorporates local interpretations of healing processes, contextualized measurements of health outcomes, and forces the suspension of “our usual belief and cultural commitment to the mind/body, seen/unseen, natural/supernatural, magical/rational, rational/irrational, and real/unreal oppositions and assumptions” (Scheper-Hughes and Lock 1987:6); culturally and historically specific dichotomies that do not apply to many indigenous medical settings and practices.<sup>129</sup> In order to understand sociocultural ways of manipulating and coping with our evolved physical vulnerability to psychosocial factors, or placebo and nocebo effects, as they are experienced in Asante contexts as well as societies in the past and across the globe, we may have to use imperfect, inadequate and biomedically-centric terminology, but we do not have to buy this particular mechanistic approach to the body wholesale. Cross-cultural perspectives provide wider definitions of therapeutic efficacy and wellbeing, larger boundaries of the etiologies and treatments of sickness and disease, and critical assessments of the biomedical model.

Many of the key components of indigenous medical experiences— nonspecific ailments, spiritual-physical interactions, culturally constituted belief systems, conditioned responses, socially conditioned behavior, group involvement, and charismatic leadership, to name a few—elicit placebo responses. Combined, these concurrent interactions can produce enhanced placebo responses. We know that patients can recover, often with

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<sup>129</sup> “One of the assumptions that has been so paradigmatic to biomedicine and that shapes so much of scientific thought more broadly is the much-noted Cartesian dualism that separates the body from the mind and the real (visible, measurable, evidence based) from the unreal (supernatural, religious, unprovable). This dichotomy, however, is a culturally and historically specific construction that is not universally shared” (Adler 2011:4).

fewer side effects, with placebos. However, case studies on how culturally specific social interactions influence physiological mechanisms are rare. Many components of the placebo response are found in indigenous medicine and Asante indigenous religion and healing rituals are an ethnographic case study of the value of indigenous knowledge. These rituals exemplify one way to make use of the potent social and cultural aspects of medicine more effectively.

A view of biomedical treatment as ritual healing leads us toward a model that bridges the psychological view of placebo responding as based on endogenous healing processes with a social view that focuses on cultural models of affliction and healing. Mediating these two poles of experience are symbolic (especially metaphoric) processes of communicative action that link bodily processes and social discourse. The mechanisms of ritual healing involve both sociopsychological (persuasive, rhetorical) and psychophysiological processes of imaginative engagement. Unpacking the mechanisms that subserve these processes can provide the basis for an integrative theory of symbolic healing that includes the many varieties of placebo response alongside the social, psychological and biological processes that accompany every biomedical intervention (Kirmayer 2011:121)

While clinical research is best suited to understanding the neural and biochemical mechanisms and pathologies of mind-body interactions, anthropology provides necessary methodological and theoretical tools to understanding the cultural diversity that exists in affective categories and social stimuli and the relationship between individual variation and socially shared signal responses and how this knowledge is currently being applied in non-biomedical healthcare settings.

Unfortunately, nocebo responses—negative health outcomes triggered by negative sociocultural input—utilize the same neural pathways and pathologies (Adler 2010). Just as positive expectations of recovery or an empathetic relationship with a caregiver can drastically improve your health, negative expectations or relationships with caregivers

can harm your health. Since “the characteristics thought to enhance the placebo effect (and any active intervention) seem to be fully operational in the offices of alternative medicine” (Kaptchuk 2002:819), understanding the inner workings and applications of the placebo *and* nocebo responses can literally be a matter of life or death. The same social susceptibility exists regardless if the stimuli is positive or negative. Just as placebos can influence the processes of sickness and healing based on psychosocial input (though chemically inert), so too can nocebos.

Furthermore, cultural beliefs and medical therapies are not always positive. Just as many elements of the ritual process can be placebogenic, so other beliefs, expectations, and behaviors can be nocebogenic. For example, *Okomfor* sometimes exacerbate or make problems worse. As one of my *Twi* translators Eugene said, “I don’t like attending shrine” (this is a colloquial expression for going to ritual healing ceremonies with *Okomfor*) “no matter what they will find a problem and then that is the only thing you can think about.” Likewise, a common scenario I witnessed was someone who couldn’t afford full payment to the *Okomfor*. Often *Okomfor* will make an agreement that the patient does not have to pay the fully amount now, but is required to pay upon receipt of surplus money or else a curse will befall them. Because the terms are so subjective, many friends and neighbors feared that they were being cursed for their lack of repayment any time a misfortune befell them. The culture of fear, witchcraft, and familial obligation among the Asante create the conditions for socially-triggered nocebo effects. Thus, any discussion about the biocultural evolution and sociocultural elicitation of placebo responses needs to also include a serious examination of the nocebo effect in context and

the negative health outcomes these expectations and behaviors promote (see Eunice and Mercy's witchcraft case in Chapter 5 and Abena's infertility case in Chapter 6 for more on this).

It is easy to see that a review of these theories resembles the disparate descriptions of Temoshok's phlogiston—often talking about the same thing, or features of the same phenomena, in different ways. I think that combining theories in a biocultural evolutionary lens maintains the integrity of the specific claims each one posits, while getting us closer to the essential elements and properties of the placebo phenomenon. Furthermore, this broad model raises questions and applications outside of the clinical context which shine a light on the many different signals, responses, mechanisms, and evolutionary adaptations that contribute to placebo responses. It shows that placebogenic elements are a part of all medical encounters, even the “real” response arm of the most tightly controlled RCT--because regardless of research design “interactions between different therapeutic ingredients” (Bootzin and Caspi 2002:449) are a fundamental fact of placebo responses.

### **3.5.1 New Model**

Ultimately, I agree with Miller, Colloca and Kaptchuck that “the placebo effect has the potential to revitalize the art of medicine and discuss ethical issues relating to the use of placebo interventions in clinical practice and in research on the placebo effect...Developing a theory of the placebo effect will provoke debate and alternative conceptualizations and theoretical hypotheses in service of promoting a deeper and more fruitful understanding of this elusive phenomenon” (2009). In order to condense all of the vast interdisciplinary placebo literature into a coherent argument, I've created a synopsis

below as well as a new model of conceptualizing the placebo phenomena that includes biocultural evolution and anthropological theory (see *Appendix: Chapter 3: 3.15 A New Model*).

### 3.5.2 Synopsis

I argue that (1) **Adaptability (the ability to detect, assess, and adapt to environmental conditions) underlies the ultimate mechanisms of placebo responses.** Our body systems adapted<sup>130</sup> through natural selection to identify, evaluate, and adjust to contextual signals. This capacity is what helped our ancestors survive predation and thrive in new habitats. Key transitions in hominid evolutionary history like ecological dominance, increased brain and group size, and prolonged infant dependency created the conditions in which social selection exerted the principal selective pressures on human development. As the fitness consequences of sociality increased, our ancestors must have had to develop more finely tuned abilities to perceive and respond to cues in the social domain. The shift away from the primacy of ecology resulted in sophisticated prosocial adaptations.<sup>131</sup> If adaptability makes up the primary foundation for the placebo phenomenon, then (2) **social adaptations, I argue, make up the secondary mechanisms or the psychosocial-physiological feedback relationships of placebo responses and explain *how* psychosocial elements (i.e., meaning and social interactions) “get under the skin.”**

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<sup>130</sup> Or exaptations, preadaptations, byproducts, genetic hitchhikers, etc. I am not making a claim for these to be defined as adaptations, rather, I am simplifying the language for non-specialist readers.

<sup>131</sup> Placebo researchers are beginning to think along these lines. “We have previously inquired into the evolution of human placebo responses with a strong foundation in patient–healer interactions, suggesting a biological function of the phenomenon as a form of interpersonal healing, which favours survival in the face of immediate threats to life and ameliorates symptoms that are not counteracted by the body’s automatic mechanisms of self-healing” (Colloca and Miller 2011:1864; Miller et al. 2009).

All primates are shaped by the interplay between our physiological (i.e., central nervous system, endocrine system) and the social and biological environments in which we live. In particular, information crucial to our survival is disseminated through social networks, and those networks influence how we experience the world... We know that the interactions between social effects (e.g., perception of status, dominance rank, etc.) and physiology (e.g., endocrine and cardiovascular systems, the central nervous system; learning and memory) are well documented and are dynamic, experience-influenced, malleable systems (MacKinnon and Fuentes 2012:83).

“Since the placebo has no immediate biological activity, if it has some physiological effect, this must be through some causal chain of psychophysiological processes that translate symbolic meaning [and social cues] into physiological response” (Kirmayer 2011:212). Human brains and bodies evolved to be highly responsive to information in the (physical and social) environment. As a result, (3) **changes to environmental conditions (or perceived conditions) can trigger physiological responses.** This is the most basic explanation for *why* (and *which*) evolutionary processes have left human bodies susceptible to psychosocial manipulation (See Chapter 2 for more).

The combination of social susceptibility (physiological adaptability and plasticity to social signals) and prosocial adaptations (i.e., prolonged development,<sup>132</sup> increased frontal lobe intelligence, and social observational learning, etc.) mean that human brains and bodies develop within and mold to specific sociocultural conditions. Accordingly, (4) **culturally specific signals and interpretations are *what* determine *which* particular secondary mechanisms are activated and to what degree.** For example, a local patient might sense ulterior motives in a doctor (based on enculturated tacit, social, and

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<sup>132</sup> “With the longest periods of dependency and socially mediated learning among mammals (Deputte 2000; Harvey and Clutton-Brock 1985; Harvey et al. 1987), the attachments that young primates form with their mothers and members of the group are of primary importance for successful ontogeny (Hawkes et al. 2003; Hrdy 2009; MacKinnon 2011)” (MacKinnon and Fuentes 2012:82).

emotional intelligence) via signs that are imperceptible to a foreign patient.

Consequently, the local's perception of a social threat might activate stress as an adaptive warning system and/or elicit an unpleasant emotion as a motivational incentive to be careful whereas the foreigner's perception of a prominent ally might activate empathy (we might guess, an exaptation of mirror neurons and "Theory of Mind") and/or elicit a pleasant sensation as a motivational incentive to trust and adhere to what the doctor suggests. Also these (5) **sensations and signals shape patients' perceptions about their internal and external conditions and determine which, how much, or how many health resources will be allocated toward healing.** Furthermore, (6) **the degree of doubt or trust felt by patients can dampen or amplify their physiological susceptibility or responsivity to verbal suggestion and other medical interventions.** "In particular, genetic make-up and social context may interact in controlling behaviours and promoting adaptation via proximal causes. Genes modify an organism's vulnerability to environmental features and situations" (Colloca and Miller 2011: 1865).

Practitioners also have the power to influence these processes in beneficial and adverse ways. (7) **Specific practitioner behaviors can trigger specific psychological mechanisms of placebo and nocebo responses (i.e., expectation, conditioning, desire-reward, anxiety-reduction, and attentional focus, etc.)** as well as (8) **specific neurobiological mechanisms (i.e., "release of various endogenous mediators, such as opioids, dopamine, or serotonin, and antagonism of cholecystokinins on the neurobiological level"** (Benedetti 2009). Moreover, healthcare practitioners have the ability to manipulate contextual and social symbols in order to redirect or magnify their



influence over desired treatment outcomes by modifying patient perceptions. (9) **Since primary, secondary, and tertiary placebo mechanisms are largely determined by patients' perceptions about their internal and external conditions, practitioners have a great deal of influence over the elicitation, degree, and type of placebo response— (10) as well as optimal health resource allocations— by modifying actual or perceived conditions.**<sup>133</sup>

Ironically (since placebo responses are notoriously “non-specific”) (11) **the cultural specificity and contextualization of psychosocial factors in medical encounters creates an ideal space for anthropologists to use their training, theories, and methods to uncover the encultured expectations, behavioral script, emotional intensity, social significance, and cultural meanings behind specific signals.**

Ultimately, we have the opportunity to contribute to placebo studies in entirely novel ways. The future possibilities of cataloguing, recording, analyzing and testing placebo and nocebo interactions in culturally specific contexts are limitless.

Understanding the complexity of mutually-influencing biopsychosociocultural factors interacting during medical encounters and the powerful role that health practitioners play in guiding and mediating these processes, (12) **might incentivize medical systems and individual practitioners to maximize beneficial placebo responses and minimize adverse nocebo responses.** It is understandable that placebo connotations based on deception or non-specific nuisance result in dismissal and avoidance. But a coherent, systematic theoretical framework that explains the why, how, and what of placebo

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<sup>133</sup> See list of 55 *Ways to Modify Perceptions* in the *Appendix: Chapter 3: 3.9*

responses (13) **can inspire an ethical imperative to deliver the best possible care for patients. This necessitates understanding and tapping into social susceptibility processes, which are operating (in helpful and harmful ways) whether or not practitioners are aware of or seek to modulate them! The question cannot be avoided:** is it unethical to cause harm by omission or to deny help through ignorance?

There is, it appears, a placebo paradox. It may be unethical to use a placebo because so much of its potency demands deception, but it is also unethical “not to use something that heals” (Newman 2008).

Arguments for the benefits of the deceptive use of placebos in medical care tend to be based on a narrow, instrumental view of the doctor–patient relationship as well as limited understanding of the nature of placebo responding. The clinical encounter involves dimensions of empathic recognition, relationship building, trust, education and advocacy that may contribute to the efficacy of specific treatment interventions, including placebos... (Kirmayer 2011:120).

This is one of the reasons that more placebo research on the social, ritual, and meaningful aspects of placebo responses is needed. We can bypass deception by understanding and modifying culturally-specific perceptions rooted in social, cultural, and emotional information. “Strengthening the components of placebo responding inherent in clinical effectiveness will insure maximum benefit for patients and maintain the credibility and fidelity of medical practitioners and institutions” (Kirmayer 2011:112). We do not need patient informed consent to purposefully design hospitals in ways that increase positive health outcomes, for example using evidence-based interior design (Ulrich 2004) and views of nature (Shanahan et al. 2015). We do not need to employ deception to incorporate culturally-specific behaviors of care that modify patients’ perceptions about their access to social support and resources. Understanding

and incorporating evidence-based rituals of care is a way to avoid the ethical paradox altogether.

Small changes in how drugs are delivered can improve a patient's well-being... That puts more responsibility on the medical community to provide care, rather than just relying on drugs to do the work. Placebo is about how we improve care independent of medication. It really puts the onus on the physician, because it says, 'if you're not doing this, it's actually bad care.' In the pharmaco-centric world that medicine is, it's about finding the right drug. Placebo research begins to shift that whole concept (Kaptchuk in Schiller 2013).

A broad framework rooted in evolutionary and ethnographic evidence expands the scope of the placebogenic phenomenon. Legitimate psychosocial-physiological feedback interactions are no longer contained in the arbitrary boundaries of modern biomedicine. They are a reality of being human, the leftovers from our phylogenetic heritage. We can begin to examine how these processes play out in other contexts, including investigating the health consequences of social susceptibility. Human intellectual, emotional, and social complexity continues to exponentially increase at alarming rates. Never before in the history of humankind have we been so globally connected. At the same time, the occurrence of mental illness is increasing so rapidly that many of our most trusted health policy agencies are wondering if mental illness will become a “pandemic” (WHO 2005; Whitaker 2010; Angell 2011).

From our hyperactive immune systems in germ free environments to our overwhelming social adaptation trade-offs (i.e., exacerbated and prolonged social pain, negative emotions, and stress responses), our stone-age brains and bodies are ill-matched to our current environments. Our bodies were not designed to handle the amount and intensity of modern social susceptibility triggers and the burden is increasingly unmanageable, especially for low status individuals. (14) Due to this mismatch, **many of**

**our modern health problems are not rooted in physical etiologies, but stem from obesogenic, culturogenic, and psychogenic conditions. This dysevolution, a phenomenon where phylogenetic adaptations have become maladaptive in modern environments, creates the conditions in which placebo responses do more than affect only the symptomatic elements of an illness. Action on social relationships, status, meaning, lifestyle, coping habits, etc. might actually influence the etiology (or at least contributing factors) and pathophysiology of these kinds of ailments.**

For example, in biomedicine “the drug is understood to operate directly on a physical problem through its biochemical effects on the body of the patient” (Lakoff 2002:73). Pharmacological agents and medical interventions have active chemical properties with specific targeted drug effects. By contrast, chemically “inert” agents like meaning, ritual and social interaction operate indirectly on the physical problem by activating endogenous biochemical processes in the body of the patient. The “active” properties and specific targeted effects of psychosocial interventions are less known and more difficult to isolate. Thus, in this framework, the issue becomes more about the definition of “the problem,” specificity, directness and measurement than one of efficacy.

Of course, nurturing is no replacement for science — care won’t shrink a tumor or set a broken bone. But mainstream medicine could stand to learn something important about caring from the alternative forms. Suffering people reflexively seek care, but in mainstream medicine, “care” tends to mean treatment and nothing more. Many patients who really need empathy and advice are instead given drugs and surgery. It’s reasonable to think that the act of caring may be what led to the improvements... Whether we acknowledge it or not, we all yearn for care when we suffer. When we can’t get genuine caring, we seek out the medical version” (Johnson 2013)

Both types of intervention have the ability to alter patient biochemistry. The degree to which this works is largely dependent on the nature of the affliction. Certain ailments are

more affected by chemical agents (e.g., infectious disease) and others respond more robustly to psychosocial “agents” (e.g., depression). The latter is also limited by our current model of measurement as many of the most potent psychosocial components are purposefully excluded in the RCT research design. As mentioned in the last paragraph, how we define the problem determines which type of intervention is working directly or indirectly on the physical problem. If we can agree that both chemical and psychosocial interventions influence patient physiology, and the degree of that impact is largely dependent on the nature of the illness and the persuasiveness of the culturally-specific psychosocial component, then our focus shifts from whether or not indigenous healing systems “work” to what culturally-specific triggers and placebo mechanisms are at play in specific indigenous medical encounters. Because if we don’t understand how our bodies evolved or what culturally-specific triggers and treatments our bodies have adapted to<sup>134</sup> we are, at best, neglecting and often interrupting and/or impeding endogenous healing mechanisms and, at worst, exacerbating, intensifying and even triggering prolonged suffering.

Furthermore, many of our “environments” have culturally adapted for so many years that our bodies are actually responding to man-made conditions rather than natural settings. “In the complex built environments and anthropogenic ‘natural’ settings that humans have inhabited for a very long time, using fire, hydraulic alterations, game management, selective culling of trees and plants, animal husbandry or varying

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<sup>134</sup> The biocultural evolutionary approach outlined in *The Social Life of Placebos* includes “complex applications of gene-culture coevolution” (Lumsden and Wilson 1985) and “biologically prepared learning (Ulrich 1993)” (Morris 1999:200).

intensities, and other techniques to subsist, the line between the ‘environment’ and ‘culture’ can blur” (Downey and Lende 2012:119).

Because sociogenic and psychiatric problems are more susceptible to psychosocial intervention than other ailments and show increased placebo response rates, modifying perceived environmental and social conditions to maximize placebo responses is needed more than ever. Finally, **person-, meaning-, and socially-centered rituals of healing and provisions of caregiving (grounded in evidence-based placebogenic methods) offer beneficial defense/coping mechanisms against negative mental and physical health problems and provide a healthy alternative to modern coping mechanisms (i.e., substance abuse, addiction, eating disorders, self-harm, etc.) rife with debilitating and even deadly side effects.**

## SECTION 2

### **Chapter 4: Pain**

- 4.0 Section Overview
    - 4.0.1 Chapter Overview
  - 4.1 Introduction to Asante Pain Management
  - 4.2 Asante Acute Pain Behavior and Social Responses to Acute Pain: Case Studies
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  - 4.9 Conclusion
    - 4.9.1 Synopsis
- 4.0 Section Overview**
- The Social Life of Placebos* has focused so far on explaining complicated biocultural processes and interdisciplinary theories, using Asante ethnographic case studies only as examples for clarification or cultural specificity. In Section 2, we do the opposite. We will begin with detailed ethnographic cases, demonstrating the complexity and confusion of person-centered, lived experiences and the ethnographic research process itself. We turn to evolutionary and proximate mechanisms only to connect what is happening in the field to broader biocultural processes.

I witnessed and recorded hundreds of Asante medical encounters over the course of my extended fieldwork. These left me with an overwhelming amount of ethnographic information, and it was extremely difficult to narrow down which case studies and topics to include. I decided to focus on large patterns of shared expectation and/or behavior. Some of these patterns map onto biosocial co-evolutionary explanatory models very well, as in the case of pain, emotions, and stress as adaptive warning systems that have been co-opted to respond to threats and incentivize fitness enhancing behavior based on conditions in our social environments. Through these stories of broken legs and broken hearts we begin to see that the question “how do you *feel*?” really explores how our body perceives and responds to external stressors, especially those in the social domain. It is easy to see how actions that manage those perceptions *or* those relationships can have an impact on a patient’s physiological responses during medical encounters. Constant social vigilance—avoiding threats and cultivating trust and status—is necessary for our survival and reproduction; but it can be an overwhelming psychological burden, especially in large-scale modern societies. These ethnographic chapters describe a world where social evaluations influence physiological responses and Asante practitioners manage those responses through actions in the social world. The examples and explanations are not exhaustive, but rather selected to help us look at biocultural interactions in medicine in new ways.

#### **4.0.1 Chapter Overview**

This chapter shows how biocultural interactions play out at the local level. It follows Asante ethnographic case studies of acute, chronic and social pain, tracing the lived experience and phenomenological explanations of patients and practitioners in Asante



medical encounters answering the question: How do people manage pain in a land where pain medication is unavailable? In this chapter we meet Emmanuel, Prince, Precious, Richard, Lawrence and Kwame. We find them in terrible moments of acute physical pain. We learn of particular Asante rules of conduct and behavioral scripts for culturally appropriate responses to pain. We see these values being taught to infants, reinforced to children and teenagers, assumed in adults and personified in the elderly. Similarly, we recognize clear patterns of socially acceptable responses to seeing someone else in pain. Throughout the spectrum of Ghanaian medical pluralism, with healthcare practitioners ranging from doctors, nurses and administrators to *Okomfor*, faith healers and bonesetters, we see standard emotional and behavioral patterns displayed towards individuals in acute pain. These behaviors become noticeable largely when the tacit rules are broken, as in the case of my student Jamie, who created a ruckus when she tried to comfort a Ghanaian patient the “wrong” way; or when the purpose of the behavior is no longer relevant, as in the cases of Thomas and Ebenezer, whose wounds became too critical to manage behaviorally. Along the way we see how seemingly bizarre Asante social responses to pain become not only understandable but potentially efficacious at managing pain in circumstances where pain medication is unavailable. We also see that sometimes these seemingly counterintuitive Asante pain responses only make sense when situated in a biocultural evolutionary framework.

#### **4.1 Introduction to Asante Pain Management**

My education in the difference between the English word *sorry* and the Twi word *sore* began at the border crossing between Burkino Faso and northern Ghana. I was on a bus from Ouagadougou to Accra and exiting to go through the visa check point when I

tripped and fell down the stairs. I sliced my knee open and it started bleeding profusely. I probably should have gotten stitches, but nothing but the most basic first aid was available at the time. I was shuffled off to the side of the road to the sound of many people repeating “*sore, sore, sore*” and surrounded by a mix of Ghanaian and Burkinabe bus mates and border officers. The blood dripping down my bare leg made the wound look much worse than it was and this wasn’t helped by a border worker who found a bottle of gentian violet (known for its antiseptic properties as well as its deep purple permanent staining) and proceeded to rub it into my wound and down the tracks the blood had made, effectively tattooing my lower leg deep purple. I understood the worried stares of my entourage when I looked down at the contrast of my light skin and the enormous oozing purple wound that now appeared much worse than a simple knee abrasion. I did my best to clean and cover the cut and as soon as I had finished applying a band aid I was lifted up and told to stand and walk around. We were not leaving for a while and I found this demand odd. I could have sat and relaxed until the bus left, but instead I was being led around by my new friends. The earlier looks that I assumed were compassion quickly changed to stares of urgency and I was dragged through the streets to the repeated mantra of “*sore, sore, sore.*” Instead of concern, the words and gestures now communicated a commanding and almost cold affect.

The pronunciation difference between the Twi word *sore* and the English word *sorry* is negligible. Add in the tonal British-inflected Ghanaian accent and the two words sound interchangeable. However, their meanings could not be further apart. The word *sorry* in English is used to communicate regret, sympathy, pity, or sorrow. It is used to redress

wrongdoing, assuage guilt and express empathy. This is what I originally thought people were communicating to me. However, the Twi word *sore* literally means to get up, wake up, stand up, arise. It is an action-based word used regularly to communicate more than just ascendance. It is often used after someone falls, is hurt or has a visible wound. It is typically reserved for overt instances of pain and communicated by anyone in the immediate vicinity in quick repetition. “*Sore, sore, sore, sore*” is a common response to witnessing someone fall, noticing an abrasion or perceiving someone in pain. Instead of communicating empathy, pity or sorrow the almost instinctive response by most Asante to witnessing someone in pain is to assure resolve, resilience, and strength; to normalize the pain and tell someone to handle it with strength and stoicism.

It took me years to realize that the “sorry, sorry, sorry” I heard regularly in hospitals, indigenous ceremonies, and community health clinics was actually “*sore, sore, sore.*” The meanings behind these two words—sympathy vs. expectation management—are critical to the experience and management of pain in medical contexts. I learned this lesson over and over through a series of harrowing ethnographic experiences of Asante pain behavior and the social response to pain in ritual healing and biomedical healthcare settings. After a description of these occurrences, this chapter will incorporate evolutionary explanations of the role of pain with recent research on placebo analgesics and the proximate mechanisms of pain experience, to illustrate how the evolutionary trajectory of the pain response leaves the body susceptible to psychosocial manipulation. Ultimately, in medical settings where medical pain management is nonexistent, people improvise informal strategies of care. These strategies take advantage of our evolved susceptibility

to social cues by mediating aspects of the psychosocial environment to lessen pain perception and intensity and to increase resilience.

#### **4.2 Asante Acute Pain Behavior and Social Responses to Acute Pain: Case Studies**

During my twenty-six months of fieldwork in the Asante region of Ghana, West Africa, my days fell into fairly predictable patterns. I attended indigenous ritual healing shrines on Mondays, Wednesdays, Sundays, and during any festivals or holidays; and I did rounds with doctors at local biomedical hospitals or clinics on most of the other days. I also took advantage of any opportunity I had to visit with other healthcare practitioners in the area: Muslim Malams, bone-setters, herbalists, blood tonic chemists, pharmacists, and traditional birth attendants. I tried to stay out of the way, respect patients' privacy, and follow the practitioner in each of these settings. It took a while to find the right balance that we all—patient, practitioner, and anthropologist—felt comfortable with; but over time I became embedded into these social systems and my presence became expected and of less note at the shrine, hospital, and clinics. Many of the traumatic pain examples described in this chapter are from a local health clinic in the village where I lived. Due to the size of the village and capacity of the clinic, it functioned mostly to offer limited community health resources— eye care, pre-natal, post-natal, first aid, and primary care consultations. It was ill equipped to deal with anything more severe, and such cases were sent either to the district biomedical hospital about an hour away or the larger regional hospitals located in Kumasi about two hours away. However, it was geographically and economically difficult to go to these larger hospitals and this small health clinic was the primary trauma care site for accidents and injuries of everyone within reach. The clinic became the first stop and subsequent therapeutic care site for a

number of horrendous accidents, injuries and infections, and I was able to observe how pain was experienced and responded to in cases of acute trauma with very little in the way of available healthcare resources. What I had not realized until later reflection was that **I was also acquiring a sort of intelligence** (whether it is emotional, social, or cultural intelligence is uncertain) **about shared norms, values, expectations, and behaviors during Asante responses to pain that were very different than my childhood enculturation of American responses to pain.**

It was during these cases of traumatic injuries that I most saw fission between my seemingly instinctual, but actually enculturated, American response to pain and the response of my Asante colleagues. When I saw someone in pain I could not help but dwell on the injury site and how we could fix the wound and alleviate pain, completely avoiding any thought or talk about the circumstances behind the trauma. I immediately wanted to comfort, empathize, and communicate my sincere concern. I wanted to reassure with words and/or touch that this was a safe place and to assure recovery via my social support.

In contrast, when my Ghanaian friends or healthcare practitioners saw someone in pain they immediately chastised the patient for whatever behavior contributed to this injury, laughed at the stupidity of it, and clicked their tongues loudly while discussing the details of the circumstances behind the injury. They talked about similar cases they had seen before and almost seemed to avoid looking at or talking about the actual injury. They normalized the ailment by focusing on other things and trivialized the pain by reproaching any patient behaviors that acknowledged pain, such as moving, screaming,

complaining, or crying. The rebuke incurred for veering from the “silent and stoic during pain” Asante cultural script was so strong that I witnessed practitioners, nurses, bone setters, birth attendants and healers slap, yell, shake, laugh at and even ostracize patients who dared to cry, scream, or moan, even in cases of extreme pain such as setting a broken bone, giving birth, and changing skin-covered gauze bandages for 3<sup>rd</sup> degree burns.<sup>135</sup>

Over time I realized that there was a consistent pattern spanning across demography, geography, and health care system in how Asante respond to pain. Patients were stoic, reticent, silent and obedient to practitioners. They showed something that is difficult to describe but felt like surrender or acceptance of circumstances (possibly *nkate*, the ability to be malleable that was described in Chapter 2). These cultural patterns are not easy to identify. It took extended time in the field and large numbers of diverse medical encounters of patients experiencing pain across many different healthcare settings in order to determine what behavioral patterns are unique to a particular healthcare system, practitioner, or patient and what behavioral patterns are shared throughout the society. These pain “norms” then need to be validated by locals as well as analyzing any exceptions to the rule. In fact, in order to confirm all of these patterns that I saw in the field, I have stayed in contact with many of my informants and healers over the years and we communicate regularly. In an email exchange on May 19th 2017, I asked an *Okomfo*

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<sup>135</sup> It must be noted that a similar phenomenon has been found in many healthcare systems (though not to this degree) and it is associated with lower empathy-related behaviors in healthcare practitioners due to exposure, desensitization, and burnout. Hojat et al 2015 found that when doctors view photos of people in pain they have less brain activity in the “empathy” parts of the brain than a control sample of non-medical professionals. Thus, *some* of the lack of empathy witnessed might be due to professional rather than cultural circumstances.

friend to validate and weigh in on these Asante pain behaviors and social responses to pain that I am writing about. He said,

“It is not taboo to cry while in pain or hurt. But we always try to manage the pains. So, those who scream or cry, they should rather hide the pains because afterwards people will look down on you. Also the environment that we live in makes you feel different after crying and screaming. So in short, they are supposed to hide it and manage the pains. For example, if I had personally been hurt, no matter how much the injury or pains I am going through, I cannot cry in public. I have to hide it” (Personal email with my friend, Agyare 2017).

While finding and confirming these patterns takes a lot of time, I believe,

discovering culturally-specific patterns of expectations, values, and behaviors for specific contexts, like acute physical pain, is crucial to providing the much needed “specificity” to what medical researchers otherwise label as “general” and “non-specific.” In fact, specific behavioral patterns that are present across many contexts (e.g., I witnessed these pain behaviors in the market, at a shrine, at a hospital, at church, in the home, etc.) raise some important questions: How do people learn these expected pain-behavior norms? What happens if you deviate? And why of all the possible reactions to pain, has stoicism spread and persisted so overwhelmingly in Asanteland?

#### **4.2.1 “Normal” Asante Pain Behavior and Social Responses Pain: Cases**

##### **4.2.1.1 Emmanuel and the Broken Leg**

A case that exemplifies the normal pattern of Asante pain behavior is that of Emmanuel, a farmer who was caught in a rainstorm when a tree fell on his leg, cracking his fibula and tibia in half. In order for his bones to set properly at the local district biomedical hospital, the biomedical doctor had to drill a hole through the entire width of his heel, insert a piece of string and tie the string to a heavy board, which acted as a suspension weight to keep muscle stretched and the bones apart long enough to recalcify. For weeks this man sat with his leg over the side of a bed and a large board hanging from

a hole in his heel. Yet, he never cried. He never complained. He never screamed. And he never once received any pain medication! Even when doctors would poke and prod and squeeze the injury site to feel if the bones were setting properly (there were no x-ray machines), Emmanuel sat stoically through the process. The only evidence he was experiencing any pain at all was his avoidance of eye contact with the doctor manipulating his leg and his scrunched up facial expression--communicating, arguably, universal “pain expressions.”

#### **4.2.1.2 Linda the Teenager in Natural Childbirth**

A case that describes the typical reaction of Asante healthcare practitioners to witnessing someone else in pain is Linda’s birth story. Linda was a 15-year-old girl in the village who had gotten pregnant, and who went to the local health clinic when her labor started. I was accompanying rounds at the clinic and was asked to come to the maternal health wing. When I arrived I was told that a woman was in advanced labor and was invited to watch the birth. What I remember the most from that experience was being disturbed by how this woman was treated. During labor, she was obviously in pain. It was clear from her body movements and facial expressions that she was suffering. Yet, she was mostly ignored. It was during this long and difficult process that the “normal” Asante social responses to pain became clearer.

Linda was laboring alone, naked, lying on the plastic pad of the delivery room bed. Jane, an older nurse, was watching a Nollywood<sup>136</sup> movie at the nurse’s station. Every fifteen minutes or so Jane would slowly walk down and check on Linda’s progress by

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<sup>136</sup> Nollywood is what locals and Africanist scholars call Nigerian made film industry, which has a very unique style and content, much like Indian Bollywood films.



lightly tapping her thigh and reaching in to check between her legs, see no signs of immediate birth, and walk off, never having talked to or comforted the woman. The entire exchange was silent. It became clear as labor progressed that Linda was managing the pain on her own (via zoning out, humming quietly to herself, and grunting and adjusting during contractions) and that Jane's interruptions (either her actual physical breach or her social presence) caused Linda to lose focus and look to Jane to take away the pain somehow. During one particularly difficult contraction, Linda screamed out and Jane slapped her and very sternly said (almost as one would discipline a child), "Hey. Stop that. How do you think we all come into the world?" From that point on Jane stayed in the delivery room and monitored Linda's progress. She would allow a little more vocalization in the middle of contractions and pushing, but the second it got too loud or out of control she would hit Linda on a leg or arm (not hard, but sharply) and use harsh tones to get her to quiet.

After things progressed, every time Linda made a noise during a contraction or attempted to complain between contractions, she was talked about by the nurses and midwives, who had now all gathered to assist with the birth. Their lighthearted chatter, juxtaposed with Linda's suffering, was a jarring experience to witness. Some of it was empathetic, as in "remember when we gave birth and experienced something similar," but it was communicated with a harsh tone, discounting flippancy, and ruthless mannerisms that seemed at odds with the obvious pain Linda was experiencing. At one point during pushing when she almost began to scream a nurse slapped her upper arm and

chided her, commanding her to be quiet and effectively halting her scream before it even left her throat.

She was allowed a little more leeway in moving and vocalizing when she was actually in the pushing stage, but the minute her baby was out, she was ignored. No one comforted her. No one congratulated her. The baby's airway was checked, and he was callously rubbed all over to remove the vernix, swaddled tightly in cloth, and set alone on the counter. The attention was now back on the mother, who was shaking and soporific. Her legs were parted, she was commanded to wake up, and someone began crudely pushing on her stomach and uterus. She tried to swat them away with one hand and was censured. Her eyes glazed over as she let them knead her body until the placenta emerged. I could barely pay attention to what was happening with the mother because I was so concerned that this minutes-old newborn was just casually set on the edge of a counter and left alone.

I was confused by what I had just witnessed, and sat thinking about the sharp contrast between this soft, vulnerable, and innocent new mother and baby and the cold, hard, and unsympathetic nurses and midwives--with whom I normally laughed and exchanged pleasantries. It was clear that I didn't understand the Asante practitioner response to seeing someone else in pain. It seemed to be the opposite of my instinctual (or learned) response. This contrast made me curious and I wanted to know more. It shifted my thinking from the immediate, isolated, and individual experience of pain to the larger social contexts of pain and how that experience of pain fits into broader cultural frames associated with the significance of core virtues in Asante society (Throop 2010: xvii).

Emmanuel and Linda represent just two cases of hundreds I witnessed that all shared consistent patterns of cultural consensus in how Asante manage pain themselves and how they react to others in pain.<sup>137</sup>

#### **4.2.2 Pain and Childhood Socialization: Case Studies**

While my tolerance for and stoicism in witnessing other peoples' pain grew over the years, it was never easy to watch the enculturation of these pain behaviors. Seeing young children in pain is not fun no matter where you are, but watching young Asante children learn how to control their pain responses (or rather, be censured into controlling them) was agonizing. Mainly this was because children had not yet become immune to pain the way that their parents had – or *seemingly* had.

Young children would often protect their wound, scream, and cry without self-censorship. For all the hospitality, generosity and cheerfulness that was typical of most Asante, people's responses to pain were resolutely cold, removed, and harsh. These behaviors were on display during two case studies of babies that elucidate this lack of self-censorship and control followed by didactic teaching and punishment. While I share only two examples, the childhood enculturation of Asante pain behavior was ubiquitous.

##### **4.2.2.1 Prince's Botched Circumcision**

During the summer of 2004 I rented a room from a local family in a small village in central Ghana. One night I was awoken by the painful and inconsolable screams of their six-month-old baby, Prince. The next morning, I saw the reason for Prince's outburst. He had recently been crudely circumcised by a local priest without any initial or follow-up

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<sup>137</sup> See Consistency Checks and Informal Cultural Consensus methodologies in *Appendix: Chapter 1: 1.2 Qualitative Methods* for more on the ethnographic methodology of determining consistent meaning behind signs and signifiers across a culture.

pain medicine. From the look of the red, swollen and expanding wound the priest had not done a very good job of removing the foreskin or protecting the gash, and the sore was infected. I watched Yaa, Prince's mother, try to comfort him by nursing, rocking and distracting him from the pain. When that did not work and he continued to wail she would slap his leg, discipline him sternly, and yell "Hey! stop crying!" loudly into his face so he could see her seriousness. For weeks Yaa went back and forth between these strategies. After about a month the scare tactic was the primary method of dealing with Prince's pain. All Yaa had to do was look at him sternly and raise her hand and he would halt his crying. A few times he would not even get a sound out before Yaa noticed that he was feeling pain, based on signals communicated in his scrunched-up face. She would then threaten, slap, or yell at him, "Hey. Don't you cry," and he would stop before he even started.

#### **4.2.2.2 Meredith's Sickness and Diarrhea**

During the summer of 2006 I lived with a host family in a compound of another small village. My next-door neighbor Ruth had an infant baby girl named Meredith. We shared the same courtyard and often spent many hours cooking and talking together. Meredith got sick when she was about four months old. She had a consistent runny nose and diarrhea and she was perpetually crying. Rachel dealt with this in much the same as Yaa had. She would rock Meredith, breastfeed her, and shake her slightly to distract her, but when Meredith persisted in crying she would spank her bottom and with an authoritative voice, look her in the eye and loudly say, "Stop! Right now! Stop it!" It was clear that Rachel was worried about how long the sickness lasted. She had taken her to the doctor, she was trying to feed her liquid foods, and she was asking for help from those around

her. In fact, even as Rachel was harshly telling Meredith to stop crying, you could tell visually that she was afraid of the fact that Meredith was still sick. Rachel's fear elucidated an important point. It was not as if Asante mothers lacked compassion (though I sometimes wondered, seeing such harsh treatment of babies in legitimate pain). Though Rachel was clearly terrified and trying everything she could to help Meredith feel better, she also never waned in inculcating very harsh pain response socialization. Sometimes, Rachel would even raise her hand as if to hit Meredith very hard, and when she stopped crying Rachel would look up to those of us around and laugh that her harsh warning was enough to stop the crying.

Meredith and Prince's reactions were how most babies around the world would react to being in pain. But the punishment they received for those behaviors and the expectations that quickly developed regarding Rachel and Yaa's behavior (i.e., the warning hit) were ways to socialize Asante children from infancy in the appropriate way to respond to pain. Rachel's training was a consistent feature of Asante child socialization, but it didn't stop at the mother. Often, healthcare workers also responded to children's pain in similar ways and with a teaching directive.

#### **4.2.2.3 Precious' Burns**

For example, Precious was a tiny 6-year-old girl who had gotten severe burns down her neck and back when she was carrying hot cooking oil on her head and the pot fell. She had already gone to the larger district hospital to receive immediate care after the incident but was now at the clinic to receive follow-up care. She needed to have the gauze bandages removed, her skin cleaned, and fresh bandages reapplied to her burns every day. It was clear that by the time I had arrived at the clinic Precious had been there

to change her gauze a few times already. The nurses were talking amongst themselves, ignoring her pleading and worried looks. They were teasing one of their colleagues for over-eating and loving food too much. Their laughter and humor seemed out of place next to the obvious terror in this little girl's eyes.

When Precious cringed and instinctively recoiled from the nurse who moved closer to begin taking off the gauze, she was scolded with a loud click of the tongue and "Hey!" as the nurse lunged at her in an intimidating gesture. The nurse was inches away from Precious, hovering nose to nose, pointing her index finger in her face and staring her down. She did not move from her dominant position until she saw Precious tacitly acquiesce and allow the nurse to pull off the gauze and her raw skin in the process. The whole time Precious was attempting not to move or scream. I noticed the control that the little girl was trying to gain over her exposed body. I also noticed for the first time that the nurses were affected by the little girl's pain. Their jovial expressions from moments earlier were replaced with strained conversation and the lead nurse winced when she pulled a particularly large piece of skin off with the gauze.

I noticed that despite the earlier challenge, the nurses allowed Precious to struggle with tiny movements and swallowed screams while they were working. She was the youngest patient I had observed in the trauma room and they gave her more leeway than any other patient I had witnessed in pain. Only if the movements were large or the cries loud did they censure. It was as if they were trying to teach her how to manage the pain "the Asante way" by allowing her to struggle. They ignored her small tremors and internal sobs. They even ignored it at first when tears started silently rolling down

Precious' cheeks, something I had never seen in an Asante adult's response to pain-- regardless of the severity of the ailment.

Crying and tears were not allowed in almost any social setting outside of the exaggerated wailing performance during funeral rites, but especially not when associated with pain. Crying was a taboo response to pain, and any breach was met with physical and verbal assault until the tears stopped. When Precious' crying became unavoidable and sobs were audible, the nurses stopped her immediately by yelling at her to "Stop crying!" and then laughing at her for weeping. She stopped at once and continued her quiet struggle as they cleaned her wounds and covered her back and neck in clean gauze. The rest of the encounter was filled with the nurses' discussing how stupid it was to carry hot oil on her head and how she needed to be more careful from now on. While my heart ached for the pain that Precious was obviously experiencing, I was surprised how much better she handled the pain toward the end of the process. She looked stronger, more in control and less fearful. It seemed that not only had Precious learned to conduct herself closer to the expected Asante pain behavior, but that when she did it, it actually assuaged some of her pain.

I began to consider the possibility that Asante pain behaviors and social responses to pain might be culturally adaptive pain management techniques. Keep in mind that there was not any pain medication or pharmacological pain management used in all of these ethnographic examples: no anesthesia, no epidurals, not even an Advil or an Aleve. It made me wonder, in cultures without access to pain medication, what do they do to

manage pain?<sup>138</sup> And might those culturally conscripted Asante pain behaviors and social responses to pain act to alleviate or diminish the experience of pain?<sup>139</sup>

#### **4.2.3 Bullying into Bravery**

##### **4.2.3.1 Richard, the Bike, and the Machete Gash**

Shortly after Precious' accident a young boy named Richard came into the health clinic with a large gash across his calf. He had been carelessly carrying his machete on his leg while he was riding a bicycle with friends. The bike crashed, he got entangled in the wheels, and his leg was sliced open by the machete. The wound was large and obviously recent. The boy was wincing in pain as nurses tried to clean it out. They were relentless in their aggressiveness toward this boy—grabbing his leg sharply, squeezing it between their fingers, wiping out the wound without hesitation or care, and lecturing him the entire time. They persisted in telling him what a stupid boy he was and how dumb it was to carry his machete while riding a bike. They so mercilessly chided this young boy for his mistake that I pulled aside one of the nurses, Adeline, and asked, “Why are you being so hard with him? He is obviously in pain. Why are you all scolding him?” She was

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<sup>138</sup> I need to add a small caveat here. While there was no access to anesthesia or any pharmacological pain analgesics such as opioids, there was over the counter types of pain relief available at the local health clinic. I know this because after witnessing a handful of these cases, I donated entire suitcases filled with pain medicine to the clinic. What is surprising, is they rarely ever used it. Even the over the counter medicine. It was kept under lock and key in a supply closet that only the doctors had access to and saved for “only the truly bad cases.” In none of the examples in this chapter did I witness any exchange of pain medication: prescription or over the counter. However, keep in mind that herbalists, bone setters, and healers have their own tonics and poultice concoctions that may or may not have analgesic properties.

<sup>139</sup> While the literature has not necessarily addressed this exact question, there is an abundance of ethnography on culturally-specific pain behaviors in many cultures (Hispanic, African American, Japanese, Chinese, Caucasian American, etc.) (Zborowski 1952; Kleinman 1986; Zatzick and Dimsdale 1990; Good et al. 1994; Juarez et al. 1998; Lasch 2000; Edwards et al. 2005; Jackson 2005; Lovering 2006). There is also much consensus on the large role that culture plays in mediating pain tolerance (Alvarado 2008; Fortier et al. 2009; Campbell and Edwards 2012). At the moment, most of these studies are focused on how to solve racial inequalities and health practitioner bias in pain management solutions because huge ethnic discrepancies exist (Riley et al. 2002; Green et al. 2003; Ezenwa et al. 2006).



not offended by what I asked and stated firmly, “He has to be more careful. He could have had a much worse condition. He could even get an infection and die tomorrow. He has to be scared so that he never does it again, so he and his friends cannot repeat his mistake.” Adeline made it clear that part of her job was trying to prevent future accidents and injuries from happening by reprimanding people who made poor choices. So one of the outcomes of these practitioner responses to pain, much like our adaptive warning systems, is to help you not make the same mistake twice.

While Adeline did not explicitly communicate that part of her job was also to train kids how to respond appropriately to pain, it was clear from all my encounters with children and pain management that healthcare providers were teaching the young how to better manage pain. Instead of letting them give in to passive behaviors, self-pity or ruminating thoughts, practitioners from across the various healthcare sectors spent time communicating (albeit harshly) self-regulation, active participation in pain relief and social confidence in the patient’s ability to withstand pain. Interestingly, none of the nurses ever discussed or mentioned to the patient how serious the leg wound was. Aside from completing their task of cleaning and wrapping the abrasion they paid very little attention to the actual injury site. They spoke about unrelated topics and teased each other, which I now realize had the added benefit of normalizing the experience for Richard and distracting him. Their conversation, attention and even eye contact avoided the actual wound, and I realized that this distracted the young boy from focusing on the locus of his physical pain. Furthermore, he was being bombarded by insults about his

intelligence and the intelligence of his friends, effectively diverting his concentration from the physical to social realm.

#### 4.2.3.2 Lawrence, the Bone Setter and the Broken Arm



**Photo 4.1: The Bone Setter and the Broken Arm**

After this incident, I became more aware that a common feature of the Asante response to pain was to deflect someone's physical pain by introducing social teasing and insults. This realization came from an experience attending the consultations of a local bone setter. Lawrence, a young nine-year old boy, had fallen off his bike, and it appeared that he had broken his radius and ulna. His arm hung to his side and he was wary of anyone close to his left side. Soon it was his turn to consult and he looked wary of the bone-setter Kwadwo, who had been apprenticing with his mother and was taking over her practice slowly. The young patient did not seem to trust this laughing, smiling and strong man with his sensitive arm and moved away from him on the wooden chairs in the middle of Kwadwo's outdoor family courtyard. Kwadwo did not take this affront lightly. His face turned from jovial to harsh in an instant. He clicked his tongue, grabbed the

young man's seat and dragged him closer on the bench. "*AdEn*<sup>140</sup>?" Kwadwo humphed.

"*Wo kɔ hɛn*<sup>141</sup>? I am helping you. *Bra*<sup>142</sup>."

Kwadwo held out his hand and demanded this young boy surrender his wounded arm. The boy hesitated for a moment and then reluctantly raised his arm to Kwadwo's outstretched hand. Kwadwo unwrapped the thin sheets of cloth wrapped around the boy's arm and removed some of the herbs still stuck on his skin. He surveyed the arm. It was straight on both ends with a large raised mound in the middle. Kwadwo turned to me and explained that at the last visit his mother had set this boy's arm and now they were checking the alignment and then they would massage it with special herbs and then rewrap the arm until next visit. The boy looked terrified when he heard Kwadwo say the word "massage." Kwadwo felt him cringe and pull his arm away and responded by swatting his head, reprimanding him and then making fun of him to the rest of the waiting patients and family in Twi, saying "I haven't even begun yet and this boy is already moving." He looked at them and they all laughed in tandem. While Kwadwo began massaging the boy's arm he continued to tease and make fun of the boy for his earlier behavior. During this time, the boy became sullen and numb, cringing when Kwadwo's movements were directly above the break or too rapid, but mostly resigned to his fate. The teasing of the group meant that he had no other option but to sit there, stay

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<sup>140</sup> Twi word meaning, *why*, and used often to connote displeasure, surprise, and reprimand at socially and culturally inappropriate behavior. It usually is accompanied with an animated hand signal, raising one's hands and twisting them outwards in a questioning manner, in the philosophical sense of the word, "Why is this happening?", "Why God?", "Why would someone do that?", etc.

<sup>141</sup> Twi phrase meaning, *where are you going?*

<sup>142</sup> Twi word meaning, *come*.

quiet and not move during his treatment. Kwadwo smiled and talked throughout the process but did not mention anything having to do with the actual injury or pain experience, i.e. the arm, the healing process, the pain, etc. Only after he had rubbed an herbal lotion on the boy's arm and wrapped it in a sling did he address the boy directly and talk about the arm. It was as if he used social teasing to get the boy's compliance and to distract him from the painful experience.

#### **4.2.3.3 Kwame's "Funny" Infection**

Only once did I see this type of teasing of an adult in severe pain. A similar incident occurred at the local biomedical district hospital when a man came in with what seemed to everyone at the hospital a very funny injury. In an indigenous remedy gone awry, he had soaked his scrotum in kerosene and the skin completely disintegrated, leaving him with sensitive, painful and exposed testicles. Over the course of the next couple of weeks as I went on rounds with the doctors, no one ever failed to laugh and make fun of this man for his predicament. Each day when the nurses were changing his gauze, he endured their ridicule as well as the pain of new flesh being torn away with old bandages. This man was made a public example of what not to do, and the laughter was at his expense. He was an older man and exhibited proper Asante pain behavior by never wincing or even acknowledging his pain. During one instance, in fact, he laughed at himself for "being so stupid." This teasing was clearly a way to change or reinforce a behavior, but also a great technique to distract and normalize.

#### **4.2.4 "Abnormal" Asante Pain Behaviors**

At the beginning of my fieldwork, these behaviors confused me. It seemed nearly impossible to react to one's own severe trauma or pain with stoicism and silence, and it

felt counterintuitive to respond to someone else's suffering with harshness. Over the years, however, it began to seem less strange. I wasn't as conflicted, it actually felt normal, and I realized I was beginning to expect these responses from Asante patients and practitioners; so much so that over time, the only patients who stood out were those who broke the "tacit rules" of expected behavior and whimpered or cried out. Because of the rarity of these cases, I began to recognize some patterns.

Most patients displayed normal Asante pain responses (i.e., reticence, stoicism, quietness, and docility). There were three main categories where this was not the case. First were cases of extreme pain, when patients would involuntarily react or scream out and then either control themselves or be cajoled by healthcare workers via censure or taunting back into the normal pain response. The second were cases when foreigners would come into the hospitals and clinics. Patients from surrounding countries reacted differently than Asante patients. This was both observable and communicated by healthcare workers during rounds. "That one is from up north. That is why they act that way," Hawaa, the nurse, said to explain why an elderly female patient had just vocalized her pain. Foreign pain behaviors were met with neither censure nor ridicule. Attempts at instruction were half-hearted "*sore, sore, sore*" expressions and I saw many shoulder shrugs as if to say, "They do things differently there. Not our problem." Contrast this with the forceful intensity of the social censure to overt pain responses in children and the link between learning, social observation, and socialization of enculturated pain responses becomes quite clear. The only other cases where I witnessed "abnormal"

Asante pain responses all had something in common, but we need a little more background in the concept of social pain before we begin parsing them apart.

#### **4.3 Social Warning Systems**

Pain is an evolved adaptive warning system that signals to the body that something is wrong. “Pain is a warning sign of injury, but for such a sign to be useful, pain must influence human behavior in a way that increases survival. Thus, pain must be intimately tied to brain functions that govern behavior and decision making, including expectation, attention and learning” (Fields 2009). As a result, how that signal is experienced, interpreted and embodied is dependent on environment and enculturation. The same wound is experienced differently in an environment of safety or danger, social support or loneliness. Furthermore, even though the acute sensation of pain feels wholly physiological, pain responses are learned.<sup>143</sup> Often, when toddlers fall, the typical response is to look toward a caregiver to see how they should respond. A caregiver’s cues communicate to the child how to respond. We tend to see limited pain responses (e.g., decreased crying, attentional focusing on the wound, heightened emotional reactions, changes of behavior, etc.) when parents and caregivers normalize the experience (e.g., explaining what happened (or what will happen), distracting the child, not paying much attention to the wound, etc.). If the caregiver highlights the experience via intense emotional response and extraordinary caregiving, the child often responds accordingly and we see exacerbated pain responses. In fact, recent studies in early childhood pain management argue that parental or caregiver behavior is the strongest predictor in child

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<sup>143</sup> “The ways in which a culture represents pain have much to do with how people will experience it” (Morris 1999:191), not only the subjective sensation but also the neurobiological pathology.

anxiety and distress levels during a pain event (Dahlquist et al. 1994; Frank et al. 1995; Chorney et al. 2009; Leerkes et al. 2009; Mahoney et al. 2010; Bearden et al. 2012). When parents, caregivers, or healthcare practitioners display anxiety, distress, or heightened emotion during a pain event, it is positively correlated with greater patient pain indicators and vice versa (Racine et al. 2016). For example, “it is the parent’s behavior rather than the actual pain level of the shot that increases a child’s anxiety in the vaccination room” (Dalrymple 2016).

The scientific word for this response is: “anticipatory distress” and it basically means that the same process of enculturation (that we experience with other aspects of culture) takes place during pain. We *learn* how to respond to painful stimuli. Just as we learn our fear of needles (Du et al. 2008) and how we are supposed to respond during a pain event. It is important that we know how best to respond to stimuli in our environments—both physical and social. Someone who over-reacts to pain might exhaust the caregiving resources of others. Someone who underreacts might suffer irreparable physical trauma. Culturally shared normative responses to pain are important ways that we order information about bodily changes and determine how many health and social resources to divert into health management. These agreed-upon degrees of emotional intensity in pain expression are hard-to-fake costly signals which motivate caregivers into providing support and endogenous mechanisms into diverting resources toward healing. There are significant costs to faking or inappropriately responding to a painful experience. Deceiving someone into giving you resources unnecessarily or diverting critical energy toward healing in the middle of a dangerous environment could mean death. Thus, shared patterns of culturally

specific pain behaviors (the behavior of the person in pain) and social responses to pain (how people respond to witnessing someone else in pain) can tell us a lot about the interaction between environment and optimal health resource allocation. Because perception of the quality and quantity of access to resources and relationships of predictive care determine how much energy one's body will devote to fighting disease (Trimmer et al. 2013, see also Chapter 2), encultured expectations and behavioral interactions have a significant influence on one's physiological responses to pain. "Psychological factors play a huge role in pain perception...the interaction between the pain message and the brain centers that mediate motivation and learning accounts for the powerful effect of a person's state of mind on the severity of pain he or she experiences with any injury" (Field 2009).

#### **4.3.1 Ways to Behaviorally Manage Pain**

These behaviors became explicable only when I viewed them within the context of the bicultural evolutionary framework of social susceptibility and placebo and nocebo responses. In areas where pain medication is unavailable, people rely on psychosocial factors to manage pain. Stated another way, one's social environment strongly predicts the duration, intensity, and distress of a pain event. For this reason, behavioral pain management represents an ideal topic for understanding biocultural mind-body interactions, or how social behaviors and cultural meanings "get under the skin" (Goodman 2009: xiv). We just learned of the vast literature on the impact of parental and practitioner behavior in childhood pain management. Not surprisingly, this relationship between our social environment and our experience of pain does not go away as we age. There is a rich literature on behavioral pain management techniques, many of which we see in Asante medical contexts. To save space, I've created a very detailed list of these,



including peer-reviewed sources, in the appendix accompanying this chapter. For now, let's discuss some of the behavioral pain management techniques that we've seen so far in our cases of acute pain. Asante practitioners and medical contexts may:

- Set into motion encultured pain alleviating expectations and behaviors,
- elicit pain alleviating endogenous opioids and morphines,<sup>144</sup>
- activate shock inhibiting cortisol and adrenaline hormones by inducing social stress responses in small amounts in a controlled settings,
- initiate the release of analgesic endogenous opioids and morphines by manipulating expectations via verbal suggestions of certain expectancies of pain relief (or analgesia),<sup>145</sup>
- normalize the trauma and distract and encourage the patient to control their pain by enhancing suggestibility through outwardly apathetic practitioner behavior<sup>146</sup> and attentional focusing,<sup>147</sup>
- lessen, numb and redirect the sensation of pain by instigating threats to social status and, thereby, activating social pain processes, which decrease physical sensitivity, increase pain tolerance and generate emotional numbness,<sup>148</sup>
- modulate patient negative emotions, engender trust in the therapeutic relationship and activate mirror neuron imitation by displaying costly signals of dominance, competence and authority,
- lower patient distress by issuing direct commands,<sup>149</sup>
- provide psycho-prophylactic regulation of pain-exacerbating and pain-alleviating expectations and emotions by altering patients' perceptions about the conditions and threats in the environment and their ability handle it, and
- increase endogenous health resources by shifting patients' belief that their access to or potential to get quality and quantity resources and predictive care were higher than they really are, as well as via prompts which refocused priorities toward a more optimal model of health resource allocation.

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<sup>144</sup> A more common name for endogenous morphines is: endorphins

<sup>145</sup> "Verbal suggestions that induce certain expectations of analgesia induce larger placebo responses than those inducing uncertain expectations (Price 2008). What Price's research posits is that practitioner certainty and verbal suggestion are psychosocial variables that can be 'dosed' and lead to predictable placebo responses (Ibid: 570). Overt suggestions for pain relief can increase placebo analgesia to a magnitude that matches that of an active agent" (Verne et al. 2003; Vase et al. 2003; Price 2008).

<sup>146</sup> "Modeling and observational learning can result in placebo effects that are stronger than those elicited by direct verbal suggestion" (Colloca & Benedetti 2009; Kirmayer 2011:215).

<sup>147</sup> "Focusing attention on discomfort can intensify symptoms and, conversely, distraction, or absorption in other sensations, imagery or activity can markedly reduce symptoms like pain, nausea and other forms of discomfort (Pennebaker 1982; Kirmayer 2011:215).

<sup>148</sup> "Our results provide consistent and conclusive evidence that social exclusion produces decreased sensitivity and increased tolerance to physical pain, which in turn led to emotional numbness" (Dewall 2006:41).

<sup>149</sup> Vague commands from caregivers, parents, and healthcare practitioners during pain are positively correlated with increased distress. More specific direct commands are associated with lower levels of distress (Dahlquist et al. 2001).

These are just a handful of the many different ways that pain might be mediated by Asante practitioners and medical contexts. What the literature concludes is that even things as small as “facial expression[s], tone, and verbal content during pain” (McMurty et al. 2010) impact the sensation of pain and level of distress a patient feels and the particular pain behavioral patterns found in Asante patients and practitioners are strongly suited to decrease both the distress and the acute sensation of a pain event. While many of these traits are common in stoic pain cultures (versus emotive pain cultures) (Zborowski 1952; Zatzick and Dimsdale 1990; Lovering 2006), each society has unique culturally constricted defense mechanisms and, as such, culturally-specific behavioral responses and coping mechanisms for pain represent a rich field of study that unlocks many deep and often tacit cultural patterns.<sup>150</sup>

The topic of pain is full of mind-body dualisms and distinctions. Biomedicine tends to privilege the physical, objective reality of measurable pain: how social cues, encultured expectations and physical signals are expressed somatically. Psychology can often focus on the mind, the subjective experience of individual pain expressed verbally. Anthropology tends to highlight the interpersonal and learned aspects of pain, i.e., cultural constructions, social productions and explanatory models. All these “traditions tend to ignore how a person’s immediate experience of pain unites its bodily,

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<sup>150</sup> In fact, Lovering 2006 argues, “The concept of pain has been studied from a cultural perspective, however, much of the research is focused on minority group behavior in the context of Western culture or the Western health care system. There has been little research conducted on cultural attitudes toward pain within a non-Western health system. Lasch (2002) noted that research on pain within a cultural context is underdeveloped and weak from a methodological standpoint, with failure to distinguish between ethnicity, culture, and race” (Lovering 2006; 390).

psychological, and social origins” (DelVecchio 1992: 10; Brodwin and Kleinman 1987).<sup>151</sup>

#### **4.3 Exceptions to the Rule**

Often we learn from contradictions and exceptions to the rule, just as much as the patterns themselves. In *Appendix: Chapter 4: 4.5* there is an analysis of two different cases that I witnessed where patients and practitioners did not follow the conscripted Asante pain behaviors and practitioner responses to pain. *Appendix: Chapter 4: 4.5.1 Thomas’ Car Accident Trauma* and *4.5.2 Ebenezer’s Gangrene* explain the circumstances in which Asante practitioners are soft, kind and comforting. I learned about these exceptions to the rule when one of my students made a mistake in the *field* by comforting a patient (See *Appendix: Chapter 4: 4.5.3 Jamie’s Fax Pas*) this led to some interesting discoveries about the proximate mechanisms of comforting and acquiring emotional intelligence.

#### **4.4 Enculturated Gene-Enculturated Pain**

Expectations and behaviors about pain are learned. They are culturally constructed and socially produced. Due to our long brain growth, epigenetic adaptability, and developmental plasticity, these behaviors also influence the ontogeny, pathology, and expression of pain. Because of the learned, conditional, and culturally-specific mechanisms of pain, the study of pain makes an ideal lens through which to view biocultural interactions.

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<sup>151</sup> “Both the experience and the straightforward treatment of pain are culturally embedded. Moreover, the symbolic processes that interrelate body and self with meanings and relationships change as part of wider society and cultural transformations (Kleinman 1986). Pain and suffering have thus also changed over time. Charting the causes, features, and implications of this astonishing transformation in the human condition in the West and contrasting it with other societies and other times should be what distinguishes the anthropology of pain from the biology and psychology of pain” (DelVecchio et al. 1992:14).

Duana Fullwiley's "The Enculturated Gene" (2011) is a book that asks similar questions. It is about scientists who argued that Senegalese sickle cell anemia must be a milder genetic strain of the disease after observing the understated pain behavior of West African patients. Because these patients did not exhibit as severe pain manifestations as those with the very painful blood disorder in other countries, it was assumed there was a genetic explanation for the "better-than expected health outcomes.... [of the] population's measured biological success" (Fullwiley 2011). The first evaluation by sickle cell doctors and researchers was that Senegalese patients had a less virulent, less painful, less problematic version of the disease. Only after much genetic and ethnographic research did Fullwiley discover otherwise. She argued that the genetics and pathophysiology of sickle cell is exactly the same across cultures, but the sociocultural systems of management vary greatly. All of our early assumptions of variable biology ought to be criticized for obfuscating the very powerful role that social and cultural variables play in mediating sickness and healing.<sup>152</sup>

Over time, ethnographic case studies elucidated the fact that the Asante relied on enculturated psychosocial and behavioral pain management techniques that alleviated pain and increased resilience. "The interaction between the pain message and the brain centers that mediate motivation and learning accounts for the powerful effect of a person's state of mind on the severity of pain he or she experiences with any injury" (Fields 2009). As such, the experience of pain is highly contingent on conditional cues

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<sup>152</sup> "This genetic discourse has blotted from view the roles that Senegalese patients and doctors have played in making sickle cell "mild" in a social setting where public health priorities and economic austerity programs have forced people to improvise informal strategies of care" (Fullwiley 2011).

about the environment. “While pain appears at one moment as an unmediated and unmistakable fact, the next moment it seems produced by a dialectic interaction of biological and social processes” (DelVecchio et al. 1992:8). Learned reticent-stoic patient pain behaviors and harsh-didactic practitioner caregiving behaviors are ideal coping mechanisms for socioculturally managing severe acute pain that would otherwise be unmanageable.<sup>153</sup> In fact,

catastrophizing, or interpreting pain as unbearable and likely to worsen, tends to increase the experience of pain. Patients who score high on catastrophizing on a standard questionnaire tend to experience more severe pain after surgery and show more sensitivity to experimentally induced pain than do those who score low on the questionnaire. Catastrophizing may worsen pain by making a person concentrate on it and attach additional emotion to it...[Studies] link...pain catastrophizing to increased activity in brain areas related to the anticipation of pain, attention to pain and emotional aspects of pain perception” (Fields 2009).

Furthermore, the concept of pain becomes much more malleable when viewed in a biocultural evolutionary framework where placebo responses are predicated on conditional health resource allocations based on perceived environmental conditions. In this way, pain is experienced and understood by Asante only in a socioculturally-specific way and, moreover, these experiences influence specific physiological responses (whether through expectation, learning, or conditioning mechanisms). In fact, we might

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<sup>153</sup> Alto mothers’ grief behaviors seem similar: “I do not wish to suggest by the foregoing that Alto mothers never suffer the loss of their infants. Indeed, amidst the generally passive and emotionally flat narrations of their lives as women, workers, and mothers, the pain of a particularly unresolved or poignant loss would break through and shatter the equanimity and resignation that is the norm. There would be memories of particular babies in whom a mother’s hopes for the future had been in-vested, and she would weep in the telling of that death of all the deaths and losses she had endured. In the presence of so “deviant” a response I would be at a loss for how to proceed or, indeed, whether to proceed at all. But invariably my Alto assistant, Irene, or another woman would come to the rescue. “No, Dona Maria,” she would scold the grieving woman, “of course you will not go mad with grief. You will conform. You will go on. You have your own life ahead.” (Scheper-Hughes 1985). See *Appendix: Chapter 4: 4.2 Motherhood and Emotional Resilience* to learn more about Alto mothers, Scheper-Hughes’ argument and for a deeper discussion on this topic.

argue that Asante contextually-relative pain responses and pain management techniques “socially produced rather than determined by a psychobiological script of innate or universal emotions such as has been suggested in the biomedical literature” (Scheper-Hughes 1985).<sup>154</sup>

#### **4.5 Social Pain**

As a child, I remember chanting on the playground, “sticks and stones may break my bones, but words will never hurt me.” This is a common American idiom meaning that while physical actions can lead to bodily damage, immaterial behaviors, such as social and verbal assault, are unable to cause harm. It was with this paradigmatic presumption—that physiological mechanisms are separate from and largely independent of psychosocial interactions—that I first went into the field to Ghana, West Africa. Over the course of the subsequent decade, no other assumption has been as radically altered as this one. That eleven-year journey, from my assurance of the disparate nature of sociocultural and biological variables to my current Asante-based perspective on the powerful, interdependent, and even constraining relationship between mind-body interactions, makes up the backbone of this manuscript.

In Chapter 2 we discussed the consequences of increased human emotional, social and intellectual complexity. In brief, one of the costly trade-offs of large brains is that humans have highly developed social attachment adaptations, which makes us physically

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<sup>154</sup> See a fascinating argument by Scheper-Hughes about culturally-different levels of resilience in motherhood grief and coping in the face of the death of a child. Her arguments were hotly debated, but her conclusions, that culture can provide emotionally protective resilience and pain management in a land where grief and pain are common, are interesting to compare to Asante pain management techniques. See *Appendix: Chapter 4: 4.2 Motherhood and Emotional Resilience* for this discussion.

susceptible to psychosocial stimuli. For example, heartbreak, loss, grief, separation, rejection, ostracism, sadness, fear, anxiety, anger, guilt, disappointment and loneliness are all unpleasant sensory and emotional experiences designed to “signify and prevent the danger of social separation” (Panksepp et al. 1978a, 1978b; Panksepp 1998; Nelson and Panksepp 1998; Eisenberger and Lieberman 2005).

In recent years a basic definition of pain—“an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Merskey 1964; International Association for the Study of Pain 1979: 249)—has expanded to include the experiences of social pain, which are not associated with or described solely within physiological terms, but rather those unpleasant sensory and emotional experiences associated with actual or perceived social threats (Eisenberger and Lieberman 2005: 112). The concept social pain has been postulated to encapsulate negative psychosocial responses and physiological sensations that arise because of actual or perceived social threats.

We conceptualize social pain as analogous to Bowlby’s description of the separation distress that occurs when an infant feels distress due to separation from a caregiver...In a similar manner, we define social pain as *the distressing experience arising from actual or potential psychological distance from close others or from the social group*” (Eisenberger and Lieberman 2005: 112, original emphasis).

We still have a robust social pain system that senses social disconnection or threats and sends warning signals throughout our bodies to make positive behavioral adjustment. Negative social responses can be seen as advantageous. “In situations that decrease fitness, negative emotions are useful and positive emotions are harmful” (Neese and Ellsworth 2009: 129).

While social pain is present in all cultures, African cosmologies tend to highlight the powerful influence and effect of social interactions, viewing the pain of a social wound as akin to that of a broken bone (Lieberman 2013) whereas American cosmologies tend to continue in the tradition of “sticks and stones will break my bones but words will never hurt me.” While a bit overstated, Tambiah (1990) describes this dichotomy well:

African cosmologies have for their purpose the explanation of the vast diversity of everyday experience in terms of the action of a few kinds of forces. The forces in question are the personalized gods. Like atoms and molecules and waves in modern scientific theories, concepts clothed in an impersonal idiom, the gods clothed in a persona idiom in Africa are really theoretical constructs that stand for, or introduce, the constraints of order and regularity. The African theoretical idiom is in a personalized mode because for Africans social relations are the main source of concern, and of their sense of order, while the world of nature is alien and beyond their control. The modern Western Scientific idiom is in an impersonal mode because the reverse is true—nature and its workings are better understood, and they provide the idiom of causation even with regard to social relations, for these are less understood and less predictable (Tambiah 1990: 90).

#### **4.6 Pain Overlap Theory**

Pain responds to the presence or possibility of physical damage and recruits attention once something has gone wrong in order to fix it. Based on human “infants’ lengthy period of immaturity and their critical need for substantial maternal contact and care, it seems possible that the social attachment system, the system that keeps us near close others, may have piggybacked onto the pre-existing pain system, borrowing the pain signal to signify and prevent the danger of social separation” (Eisenberger and Lieberman 2005:111).<sup>155</sup>

In fact, Social Pain / Physical Pain Overlap Theory (SPOT) (Riva et al. 2011; Eisenberger and Lieberman 2005) proposes that social pain--the pain that we experience

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<sup>155</sup> See also: Panksepp 1981, 1991, 1998; Nelson and Panksepp 1998; Eisenberger et al. 2003; Eisenberger and Lieberman 2004; Eisenberger 2012.



when social relationships are damaged or lost--and physical pain--the pain that we experience upon physical injury--share parts of the same underlying processing system (neural circuitry and computational processes). This system is responsible for detecting the presence or possibility of physical or social damage and recruiting attention once something has gone wrong. Clearly, the sensation or experience of physical pain “feels” differently than that of social pain. It is not the same exact experience. “Thus, even though physical and social pain share some of the same underlying neural substrates, they are not interchangeable. Here, people do not confuse a broken heart with a broken bone, just as they do not confuse a bee sting with a stomachache. However, there is a common experiential element to all of these experiences, and that is the affective component of pain—the distressing experience associated with these threats that motivates individuals to terminate or escape the negative stimulus” (Eisenberger 2015:621).

Evolutionarily, this overlap makes good sense. The fitness consequences and selective pressures of sociality are so strong in humans that robust psychosocial-physiological feedback loops motivating appropriate behaviors and compelling others to trust, care for, and support us would have been selected for. Positive rewards and emotions would accompany behaviors that strengthen social relationships and increase social support and status (i.e., marriage, childbirth, promotion, acceptance, etc.). Negative sensations and emotions would accompany behaviors that threaten social relationships and status and sever social support (i.e., break-ups, death, deceit, abuse, etc.).

Husband and wife duo Matthew Lieberman and Naomi Eisenberger are contributing the most cutting edge research on the Physical Pain/Social Pain Overlap Theory. The

connection between physical and social pain becomes very clear in a fascinating study where participants' brains were analyzed while they were playing a computer game of catch called "cyberball" with other computer players (Eisenberger et al. 2003; Eisenberger and Lieberman 2004). Researchers manipulated the game so that eventually players stopped passing the ball to test subjects, and then measured what happens to the brain in moments of social rejection. What they discovered was that those who felt the most rejected had the most activity in the part of the brain that processes physical pain. "The most interesting part of the study is how human brains process the social rejection. To the brain, social pain feels a lot like physical pain—a broken heart can feel like a broken leg" (Smith 2013). Holding two brain images side by side, one of physical and one of social pain, Lieberman argues in his 2013 social neuroscience book *Social*, that "without knowing which was an analysis of physical pain and which was an analysis of social pain, you wouldn't have been able to tell the difference" (Lieberman 2013). In fact, "pain researchers [ ] find that precisely the same central pathways are involved in pain of diverse origins...and even from words or other social stimuli like interpersonal rejection" (Kirmayer 2011:120).<sup>156</sup> On the other hand, brain scans are not the same thing as the phenomenological, lived experience of the sensation (or differentiation) of physical and social pain. Thus, person centered ethnography on both physical and social pain (in a culturally-contextualized setting) is needed in conjunction with these social neuroscience findings.

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<sup>156</sup> See also: Eisenberger and Lieberman 2004; Gatchel et al. 2007; Melzack and Katz 2007; Richter et al. 2010

Here is where the pain-overlap research gets even more intriguing and where we draw even closer to discovering the interactions between psychosocial factors and neurobiological correlates. Dewall et al. showed in a 2010 study that acetaminophen reduces psychosocial, behavioral, and neural evidence of social pain much as it reduces many of the symptoms of physical pain. Participants given Tylenol previous to cyberball sessions experienced less reported social rejection and “showed significantly less pain-related activity in the dACC and anterior insula in response to social exclusion than participants who had been taking the placebo” (Eisenberger 2012: 45; Dewall et al. 2010). What these studies bring to light, as do many other placebo studies, is the underlying neurobiological mechanisms of psychosocial processes like social acceptance and rejection. The development and elicitation of our physiological systems co-evolved with the constrictions and motivations of our sociocultural systems (see evolutionary explanations below).

We have known for a while that there is a connection between physical and social pain, but as with the trajectory of placebo studies, until recently we have not had the ability to isolate, measure, and prove the underlying neurobiological mechanisms. In fact, while holding concepts of human nature in which we are rational decision makers, we have struggled to explain cases in which people purposefully inflict pain on themselves or others. Rationally, we seek out behaviors that give us pleasure and avoid those that cause pain. In fact, many of our evolved motivational structures endogenously operate to motivate prosocial behaviors by the production and release of a rewarding cocktail of hormones when we do something that increases our social status and/or connections and

an unpleasant cocktail of hormones and emotions when we do something that threatens our status and connections. So why would people ever consciously cause pain?

One explanation of this odd behavior is that pain is a costly signal or honest indication of group commitment and power and authority. Since genuine expressions of pain are difficult to fake, they signal a degree of intensity attached to the honest, costly, or significant meaning behind a painful action.

#### **4.6.1 Self-Harm**

Another more recent explanation, based on the Pain Overlap theory, is that because social and physical pain occupy the same neural pathways, you can reduce social pain by inflicting physical pain.

Our results provide consistent and conclusive evidence that social exclusion produces decreased sensitivity and increased tolerance to physical pain. Across five experiments, we found that social exclusion causes numbness to physical pain, which in turn led to relative emotional numbness...[and] decreased empathy toward others' suffering. (Dewall 2006).

A good example of this is people who self-harm in order to manage the amount and intensity of social pain they are experiencing. We have good evidence that self-harm occurs most often when someone is experiencing strong negative emotions (Klonsky 2007) and unwanted feelings (Nock and Prinstein 2004). Self-inflicted physical pain overwhelms these neural pathways. As one self-harming patient put it, “you don’t feel like you’re hurting yourself when you’re cutting. You feel like this is the only way to take care of yourself” (Strong 1998). Because the “brain cannot really tell the difference between ‘feeling hurt’ physically and ‘feeling hurt’ emotionally [or socially]...*feeling a reduction of physical pain*, such as relief that follows a self-injury episode (i.e., pain offset), may be interpreted by the brain as a reduction in emotional pain too” (Franklin

2014: 2, original emphasis). Basically, the acute, sharp physical pain of a self-injury such as a cut, can numb the more dull and omnipresent sensation of social pain or rather concentrate pain receptors and warning signals toward one clear, obvious injury. Then, patients report that the immediate relieve of that injury (the cessation of cutting for example) makes them feel like *all* their pain has disappeared—including their social pain (Franklin et al. 2013; Franklin 2014). The placebo pain analgesic mechanisms of reward, desire, and anticipation operate similarly in self-harm because “once whatever is causing the pain is removed or even reduced slightly (i.e., once the pain is offset), it causes people to feel better” (Franklin 2014:1). The removal of self-inflicted pain after cutting or self-injury is desired and anticipatorily rewarded, and good feelings are produced (Franklin et al. 2013).

These studies provide good evidence of the Pain Overlap theory and give us better understanding into why people engage in self-harm. This knowledge has significant implications for how practitioners should treat individuals who self-injure. Most patients engage in self-harm due to overwhelming negative feelings to begin with, and then experience even more shame and guilt afterwards for engaging in such socially unacceptable behavior. Interestingly, self-harm is a culturally-bound syndrome that is learned (i.e., we see clusters of self-harming behavior that are socially contagious) from others as a way to cope with negative feelings (Favazza 2011; Chapman et al. 2006; Lau et al. 2002). This sociocultural coping mechanism is much like Asante pain behaviors, Senegalese sickle cell behaviors, and Alto mothers’ grief behaviors: specific social and cultural expectations and behaviors employed to cope with and mediate pain.

Self-injury is an extremely sophisticated coping mechanism that taps into our ancient neural wiring in order to manage social pain. Obviously, patients are not aware of the neurobiological processes underlying their behavior; nevertheless, they have stumbled upon quite a complex and in some ways a partially effective coping strategy. **Helping patients who self-harm to view their behaviors in this light could reduce some of the stigma of the behaviors, redirect patients toward the root cause of their problem (i.e., social and emotional distress), and provide a clearer evidence-based model for why and how they alleviate social pain via self-inflicted pain. This understanding might begin to facilitate the use of a less harmful coping mechanism.** Another reason why this research is so important is that placebo responses and psychosocial management of pain are often disregarded as affecting just the symptoms of a disease or problem and not actually influencing the pathophysiology of the ailment itself. However, if we begin to see (especially in cases of social pain) that many of the root causes of distress and pain are sociogenic, then social solutions affect the etiology and not just the symptoms of the problem (see dysevolution in Chapter 2 for more). If people experience more and more social pain in our modern environments, treatment plans that incorporate social solutions should see increased positive health outcomes. The implications for this research in clinical practice are quite significant and *The Social Life of Placebos* represents one of the first recorded cases of the opposite causality of the pain-overlap phenomenon (e.g., inflicting social pain to lessen physical pain).

There is evidence that physical pain and social pain are both adaptive warning systems and that the body and brain experience both as unpleasant physical sensations

motivating specific pain-alleviating and fitness-benefiting behaviors. Though they often “feel” different, the physical pain from something like a broken arm will trigger an unpleasant physical sensation which motivates individuals to seek protection and avoid using the wounded arm. The social pain from something like making a social misstep will trigger an unpleasant physical sensation which motivates individuals to seek restitution and to avoid making the same social mistake in the future. The difference between physical and social pain is whether the stimulus was a physical or social injury. Once triggered, however, the pathophysiology is the same because they use the same biochemical hormones and neural pathways. This is one of the reasons why paying attention to the social elements in a medical encounter is essential—because these elements have enormous influence over the activation and manifestation of pain. “Although surprising in some ways, this co-opting of the primitive physical pain signal to indicate the possibility of broken social bonds highlights the critical role that social ties have played in the survival of our species” (Eisenberger 2015:623). This theory also highlights how deeply embedded social interactions are to even our most instinctual physiological processes, such as pain, and it brings us closer to understanding why changes in the social domain can lead to changes in the physical body.

#### **4.6.2 Lawrence and the Bone Setter**

The Pain Overlap theory caused me to reevaluate some of my field experiences in a new way. Though we have a lot of scientific evidence that physical pain induction and reduction alleviates social pain, we do not have research on the opposite effect: the induction and reduction of social pain to alleviate physical pain. Can you cause social pain--thereby “switching off” physical pain receptors, turning on “social pain receptors”

and numbing the acute sensation of intense pain via sociocultural expectations and interactions? If the research above is accurate, then both types of overlap should influence the felt experience of pain and more research is needed on the use of social pain to reduce physical pain. **One of the most significant findings in *The Social Life of Placebos* is ethnographic evidence of people using the Pain Overlap to inflict social pain in order to manage physical pain.** Discovering this consistent patterned behavior--the induction of social pain as a way to behaviorally manage physical pain--in natural settings in the field is important because, "To date, no studies have experimentally manipulated physical pain to investigate the consequences for social pain or have manipulated social pain to investigate the consequences for physical pain" (Eisenberger and Lieberman 2005:119).

One of the most memorable examples of this was the case of Lawrence, the nine-year-old boy who broke his arm and was being treated by the local bone setter, *Kwadwo*. The treatment process was to unwrap the arm bandages and massage the injury site to check that the bones were set properly, and then rub the arm with herbal ointments and rewrap it with a poultice. Clearly, this entire process was extremely painful. Lawrence knew or expected as much and before the process had even begun, when *Kwadwo* reached out to unwrap the bandages, Lawrence shifted away from him, protecting his wounded arm. This is a natural adaptive pain response—to protect the injury site. Lawrence's reaction triggered sympathetic feelings in me and I wanted to calm and comfort him. It triggered an opposite reaction in *Kwadwo* who smacked the side of the boy's shorn head and laughed loudly. He grabbed Lawrence's injured arm and held it



steady despite Lawrence's shifting and whimpering and yelled out loudly to those nearby, "Look at this silly boy who is afraid." Then *Kwadwo*, and the other people nearby (family, patients, and locals) all laughed. You can even see the smiles on the faces of everyone but Lawrence in Photo 4.1. Lawrence's visage observably changed after this exchange. He looked around slightly and appeared embarrassed. From that point on he rested his head on his other arm, gazed into space, maintained a stoic expression, and stopped reacting to the treatment process.

*Kwadwo*'s social censure radically changed Lawrence's outward behavior. Might it also have changed his experience of pain? Could the induction of social pain occupy pain neural pathways and alleviate social pain? Would the reduction of social pain, i.e., when following the cultural script of appropriate Asante pain behaviors, also reduce physical pain much like the induction and reduction of physical pain in self-harm? We don't have scientifically significant evidence either to confirm or deny these claims. Even subjective measurements were hard to come by. After the medical encounter, Lawrence was in no state to answer my pestering questions and follow up interviews are subject to misremembering, which would affect the validity of the answers. But the Pain Overlap theory and ethnographic evidence would suggest that pain can be socially mitigated.

Now, I am not suggesting that *Kwadwo* consciously inflicted social pain in order to mediate Lawrence's physical pain. Just as people who self-harm are not consciously aware of the reasons behind why they are doing it and how it works, so responses to another's pain may be unconscious. Rather, I am arguing that some of the harsh, censoring behaviors of Asante practitioners' responses to pain might be coping

mechanisms to manage pain when medical analgesics are unavailable. These behaviors would be learned, passed on, and acquired through a lifelong process of enculturation and would thus be culturally-bound. Specific elements of this Asante pain management learning process (i.e., inflicting social humiliation and censure) mediate specific neurobiological processes (i.e., physical pain and social pain overlap) and placebo pain analgesic mechanisms (i.e., expectation and conditioning). With this argument, I am also not suggesting that healthcare practitioners around the world should start smacking and belittling their patients, but rather that

In a land where pain medication is not available, Asante healers have devised powerful behavior-based analgesic techniques. Smacking the boy [may have] activated and/or increased the stress response, which elicited a powerful cocktail of pain-reducing hormones, including adrenaline and endorphins. The bone setter then distracted the boy from his pain by teasing him and forcing him to focus on all of the people around him. He normalized and even lessened the pain by laughing and bringing up other weaker patients, thereby altering this boy's expectations (one of the most powerful placebo triggers). The bone setter also numbed pain by threatening the boy's status and making him anxious and embarrassed about his social position, which triggers a social pain response and physically co-opts acute pain. Finally, the bone setter expressed his own dominance and competence, which allowed the young man to trust him and experience all of the endogenous healing mechanisms of interpersonal neurobiology and the therapeutic relationship (Eng 2013, quoting author Chelsea Shields).

#### **4.7 Evolutionary Explanations**

These ethnographic case studies raise some interesting questions: Why did pain evolve? How is it advantageous for survival and reproduction, or in the case of humans, social success? Is pain a panhuman reality or is it culturally relative? Why is pain so susceptible to psychosocial manipulation? Do Asante expectations and behaviors during medical encounters alleviate pain, and if so, how? The next two sections of this chapter look at some of the evolutionary and proximate mechanisms involved in pain from the perspective of the Asante cases above, and attempt to answer a few of these questions and

help us better understand some of the culturally-specific behaviors we observed in the fieldwork descriptions above. A detailed discussion of these questions covering the following topics can be found in Appendix: Chapter 4: 4.6 Evolutionary Explanations:

- Pain (4.6.1)
- Social Pain (4.6.2)
- Pain Perceptions (4.6.3)

#### **4.8 Proximate Mechanisms**

It is important to understand some of the proximate mechanisms of pain and social pain in order to see how psychosocial expectations and behaviors influence physiological processes in medical encounters. Returning to the question posed at the beginning of this chapter, these are the types of evidence-based behavioral pain management techniques that you can use to help your friend suffering from a broken leg until help arrives. Also, these are the types of proximate mechanisms that Asante healthcare practitioners use to manage pain in Asante medical encounters. In order to save space, I provide a list of thirty-seven thoroughly annotated proximate mechanisms that influence the experience and sensation of pain in *Appendix: Chapter 4: 4.1 Proximate Mechanisms in the Sociocultural Management of Pain*. This list is neither exhaustive nor comprehensive of all of the proximate mechanisms and sociocultural mediators of physical and social pain, but it does represent some of the major categories and biocultural interactions that influence pain experiences. To sum up a few of these in less medical language:

Placebo analgesia can be produced through stimulus-response conditioning that brings about beliefs and expectations of analgesia. Other studies have suggested that observational learning and context are also causally relevant to placebo analgesia. Furthermore, open-hidden studies reveal that, even when people are in fact receiving an analgesic treatment, their beliefs about whether they are receiving the treatment significantly impact the overall analgesic effect of the treatment. Thus, the treatment context and the rituals that others dismiss as artifacts in the cause-consequence relationship are incredibly important in

determining efficacy. Placebo analgesia, moreover, is increasingly being shown to have [ ] neurophysiological components. The fact that naloxone blocks placebo analgesia just as it blocks the analgesic effect of morphine suggests that the aforementioned **psychological and social factors influence the body's endogenous opioid system in producing analgesia**. Neuroimaging studies are increasingly revealing that placebo analgesia and other forms of analgesia recruit similar regions of the brain. This suggests that placebo and active agents are in effect no different when it comes to producing pain relief. This nuance as others have thought is actually using the same circuits in the production of pain and in the relief of pain (Lefebvre and Bednar 2016: 200).

The processes and mechanisms described above and listed out in great detail in the appendix are present in Asante medical encounters. Broken down in this way (and limited to the topic of pain alleviation) Asante pain behaviors and social responses to pain, as well as the cultural management of health via indigenous ritual healing ceremonies, can be seen to influence pain outcomes by magnifying patients' social susceptibility, eliciting placebo responses and dampening the sensation, intensity, and duration of a pain experience.

#### **4.8.1 Proximate Mechanisms in Asante Medicine**

In a way, indigenous ritual healing stacks the deck. Most people don't even attend shrine unless they have tried many other methods (See *Appendix: Chapter 4: 4.4 Hierarchy of Resort*). Unlike biomedical practitioners, *Okomfor* do not have to follow objective diagnostic criteria, ethical reviews, or even standard protocols. They are not restricted to physiological assessment and treatment. They are believed to access power beyond the human capacities of science, training, and manuals. As a result, they have more leeway to manipulate informational, contextual, social, and spiritual conditions, actual or perceived. *Okomfor* can make general statements, i.e., "Who do you think would want to curse you?" and non-specific treatment goals, i.e., "You are required to pay only after your problem goes away" which can have extremely broad, indeterminate,

therapeutic targets and therefore, at least from a cultural view, “in some sense cannot fail” (Kaptchuk 2002:819-20, Csordas 1983). Similarly, they are not held to Hippocratic oaths which prohibit deception—even if that deception could promote a positive placebo response or more regularly and without impunity promote positive expectations. The spiritual nature of their practice means that they do not have to know about every disease or biological ailment in order to treat it. They can require lifestyle changes, i.e., familial conflict resolution, debt management, altered eating or bathing routines, etc. and engender patient adherence in numbers or degrees that would astound biomedical practitioners. Furthermore, they have methods (arguably problematic and nocebo-inducing) for assuring that adherence, i.e., “Follow these treatment and lifestyle guidelines or else you will be cursed in the future and bad things will happen to you.”

In fact, I remember one particularly engrossing case where a Ghanaian man was able to relocate to Germany after going to the Mmpria Shrine and asking the gods for assistance so that his visa application would pass and he could travel. His desires were granted, but they held the stipulation that he pay back the shrine when he made it to Germany or else he would be cursed. Years later, I overheard his conversations with the *Ɔkomfo* at Mmpria, Kwabena, lamenting that he was running into incident after incident of bad luck and realized that it was because he never paid back the shrine. His calls from Germany (and subsequent generous donations) were in restitution of that mistake. The *Ɔkomfo*’s warning always hung over his head and was top of mind whenever anything bad happened in his life.

Other ways that Asante indigenous ritual healing ensures successful outcomes are patient preferences and the nature of illnesses. Patient preferences contribute significantly to treatment outcomes. If patients prefer a specific type of treatment, they will participate and adhere more to that regimen. Interventions that are patient-centered and/or participative are even more susceptible to this placebo component. Patient preferences are argued to increase placebo responses as well as improve therapeutic outcomes (Brewin and Bradley 1989, Wennberg 1990, McPherson et al. 1997). What is more, in medically pluralistic societies, just the act of going to a particular practitioner or medical system increases trust, adherence, and positive expectations. “The reasons that patients choose alternative medicine may also potentiate a placebo response” (Kaptchuk 2002:818).

**Furthermore, indigenous healing systems attract the very ailments that are the most susceptible to placebo responses. These illnesses fall into a few basic categories: nonspecific symptoms, chronic conditions, affective disorders, and self-limiting ailments.** “What all of these disorders have in common, however, is that they engage the higher cortical centers that generate beliefs and expectations, interpret social cues, and anticipate rewards.<sup>157</sup> So do chronic pain, sexual dysfunction, Parkinson’s, and many other ailments that respond robustly to placebo treatment” (Silberman 2009).<sup>158</sup>

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<sup>157</sup> “A brain region called the nucleus accumbens plays a critical role in both signaling reward and controlling pain. Inactivating this region, which contains mu receptors, prevents animals from experiencing pleasure from either recreational drugs or natural rewards such as food and sex. What is more, injecting rewarding substances into this region can suppress pain responses” (Fields 2009).

<sup>158</sup> The context of this quote is that Silberman was illustrating how susceptible certain ailments are to placebo responses, so much so that these are continuously beating active drugs in FDA approval RCT’s. He continues, “To avoid investing in failure, researchers say, pharmaceutical companies will need to adopt new ways of vetting drugs that route around the brain’s own centralized network for healing” (Silberman 2009). Rather than learning how to bypass our body’s endogenous ability to heal, why don’t we find ways to understand, work with, facilitate, elicit, and enhance this mechanism?

Nonspecific symptoms are usually highly subjective, lack particular diagnostic criteria, and have unclear physiological pathologies and uncertain etiologies, which are all very common in Asante indigenous medical encounters (and other indigenous and non-biomedical healthcare systems).

One example is what are commonly referred to as “waist pains.” Many patients come to *Okomfor* for help with pains in the waist area. Usually there are no secondary factors (i.e. spiritual or familial causes) in the diagnosis and treatment of waist pains. Because of a lack of specificity, each patient refers to a different area on the abdomen as the location for waist pains and their non-specific nature means that biomedical doctors often have a hard time diagnosing and treating patients with waist pains. However, *Okomfor* have many herbal remedies for this problem and do not need to link waist pains to any specific organ, etiology, or pathology. Waist pains are also closely linked to waste pains—or pains resulting from bowel problems. Interesting, bowel problems, like irritable bowel syndrome, have a long history of high response rates to placebos. Having a clear diagnosis, treatment, and acknowledgement of the pain can modify patients’ pain experiences and enhance placebo responses during ritual ceremonies. Part of the divination process in Asante indigenous medicine (see next chapter for more on this) is a dialogue where patient and healer move, using divinatory means like cowrie shells, kola nuts, eggs, and animal sacrifice, from uncertainty to specificity in diagnosis and treatment.<sup>159</sup>

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<sup>159</sup> This is an important point in research on divination, see David Parkin, Susan Reynolds Whyte, and Rosalind Shaw’s articles in Philip Peek’s “African Divination Systems” (1991): “Diviners had to establish an interpretation which the inquiring party recognized as true...through divinatory dialogue between the

Interestingly, chronic conditions are also often non-specific. The symptoms, occurrence, and degree of pain regularly fluctuate and can be highly mediated by placebo and nocebo responses. In fact, the etiology of chronic pain is often assumed to be “psychogenic,” or originating in one’s psychology, not their physiology. “The term ‘psychogenic’ assumes that medical diagnosis is so perfect that all organic causes of pain can be detected; regrettably, we are far from such infallibility...All too often, the diagnosis of neurosis as the cause of pain hides our ignorance of many aspects of pain medicine” (Melzack 1996). The distinction between psychosocial and physiological etiologies of pain is a very important factor in societies where the medical system privileges objective physical symptoms. Often chronic pain sufferers are left without a clear diagnoses and have to deal with accusations of faking and psychological invention where the pain is “all in your head.” Conversely, this physical/psychosocial causation is also extremely important in societies where psychosocial factors can influence the physical world. In places like Ghana, “psychogenic” is not seen as a rare, less powerful, or even a bad etiology. It is assumed that psychological, social, and cultural factors can trigger or increase one’s pain. Patients in these medical systems may benefit in two major ways. First, they do not experience the added social stigma of an undetermined diagnosis, nor practitioner skepticism due to the absence of an objective physical etiology for their pain. Second, indigenous medical systems are often capable of diagnosing and treating psychogenic factors. So chronic pain sufferers in more personalistic medical systems

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two, an attempt was made to resolve uncertainty in favor of a specific interpretation of reality” (Whyte 1991: 153-154).



have both an explanation for their pain as well as a treatment plan—even for the more psychogenic etiologies.<sup>160</sup>

Patients with chronic ailments benefit from practitioner attention, empathy, and validation. Unlike biomedical practitioners, *Okomfor* highly value their patients with chronic conditions because they are some of the few recurring customers. Sometimes an *Okomfo* will give an assurance of recovery based on elaborate treatment plans and when the symptoms reappear, they blame patient adherence rather than their own ability. This keeps some patients continually returning to the same *Okomfo* in order to complete the treatment. Also, some patients will come to *Okomfor* knowing that their condition will never be cured, but that it can be alleviated via ritual healing. Some examples of chronic conditions found in Asante indigenous ritual healing ceremonies that are highly susceptible to placebo responses are: back pain, chronic pain, fatigue, headaches, arthritis, heartburn, hypertension, insomnia, digestive problems, and infertility. Chronic illnesses consistently respond better to alternative medicine because the cultural expectations and social interactions allow more chances of the enhanced placebo responses and action on the possible psychosocial etiologies of persistent pain than conventional medicine. After negative or ineffective encounters with biomedicine, patients with chronic ailments often turn to indigenous medicine (Zollman and Vickers 1999).

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<sup>160</sup> See George Foster's (1976) excellent treatise on naturalistic vs personalistic medical systems where in a naturalistic system, illness is caused by environmental conditions and in the personalistic system, illness is caused by an agent whether it be a germ, virus, supernatural being, or jealous friend.

Affect disorders like anxiety, depression, and impotence are also predisposed to respond radically to placebos. In fact, U.S. Pharmaceutical companies are struggling to create narcotics for affective disorders that can outperform placebos! In fact,

From 2001-2006, the percentage of new products cut from development after Phase II clinical trials, when drugs are first tested against placebos, rose by 20 percent. The failure rate in more extensive Phase III trials increased by 11 percent, mainly due to a surprisingly poor showing against placebos. Despite historic levels of industry investment in R&D, the US Food and Drug Administration approved only 19 first-of-their-kind remedies in 2007—the fewest since 1983—and just 24 in 2008. Half of all drugs that fail in late-stage trials drop out of the pipeline due to their inability to beat sugar pills (Silberman 2009).

Affect disorders make up a large proportion of alternative medicine cases and this is no different in Asante indigenous ritual healing ceremonies. In fact, the word for anxiety in *Twi* is *haw* and it is associated with many cultural factors not present in U.S.-based anxiety disorders. *Haw* means to bother, to aggravate, to trouble, to afflict, to molest, to persecute, to worry. In English, *Twi* speakers usually summarize *haw* as “to worry.” However, the longer definition illustrates that *haw* means more than general anxiety. It has to do with feelings of persecution, affliction, molestation, bother, and trouble; all words associated with witchcraft and curses. In this sense, the nature of the affective disorder *haw* is directly suited to Asante socioculturally-specific problems and *Okomfor* expertise.

In the following chapter I discuss in greater detail the powerful anxiety-reducing nature of this ritual process—particularly polyrhythmic drumming, social cohesion, self-regulation, culturally constructed defense mechanisms, etc. Interestingly, placebo responses used to be called the relaxation response (Benson 1976) because so many of the placebo components trigger the body’s parasympathetic or relaxation response.

Asante indigenous ritual healing ceremonies also elicit significant relaxation responses, as well as components we already discussed which facilitate the alleviation of affective disorders, such as clear diagnosis, assurance of recovery, patient interaction in treatment, etc. Interestingly, studies have also shown that patients will often report positive treatment even when their symptoms persist. Kleinman and Sung (1979), argued that the reason for this is that the positive behavioral and social interactions they experienced through the ritual process brightened their evaluations of the treatment.

One of the most powerful ways Asante social responses to pain alter pain perception, intensity and feelings of unpleasantness is by activating and extending the sympathetic or stress response. In cases of acute pain (immediate trauma or injury—not chronic or persistent pain), stress provides many hormones and endogenous opioids and endorphins<sup>161</sup> that have an analgesic effect. Without hope of immediate pain relief, increasing or exacerbating that stress response via yelling, slapping, chastising, humiliating, and/or harassing the patient is an adaptive way to flood the body with pain-alleviating hormones as well as distract the patient from the painful stimuli. Furthermore, stress often has immediate health benefits for acute trauma (increased strength, resilience, blood flow, willingness to follow or imitate someone you trust, ability to compartmentalize, disassociation, etc.). If the stress response is relieved too soon during severe trauma or injury, it can actually be detrimental and even deadly—as in the case of shock. Shock is a state of hyperventilation, low blood pressure, and less consciousness where the body lacks oxygen and can lead to heart attack and critical blood loss.

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<sup>161</sup> Remember that the word endorphin is a blend word of the combination: endogenous morphine.

However, if stress levels are managed, the acute sympathetic state helps in clotting blood, pain relief, and adrenaline (which takes the patient's focus off of the pain center and onto immediate needs for survival). Evolutionarily, there is a fine balance between the sympathetic and parasympathetic response during an acute injury. Practitioners able to navigate this balance are better able to give patients what they need, for example, knowing when a patient needs the life-saving hormones and processes of a stress response or the healing and repair mechanisms of a relaxation response and being able to elicit the correct physiological responses at the correct time. Furthermore, patient who are better able to read the conditions of their environment and respond appropriately (as in the health resource allocation response discussed earlier), might have higher likelihood of survival and recovery.

Acute pain, especially when associated with severe stress, trauma and shock, is life threatening. There is a fine balance between providing enough of a stress response, to activate and prolong endogenous analgesics and providing too much of a stress response which can lead to cardiac arrest, organ failure, and death. In survival studies (Sherwood 2010) people undergoing trauma who are too pessimistic or too optimistic tend to die faster than those who find a way to normalize the pain. It is important for people to be able to acknowledge the pain, seek proper care and find ways to take some control over their circumstances. Focusing on manifesting appropriate pain behavior, as in the Asante case study, by remaining silent and reacting as little as possible, is actually a very good way for patients to feel that they can control some aspect of the painful encounter. That control is essential to survival, because in extreme cases of pain and stress that are too

intense, prolonged or where patients have no meaningful explanatory system through which to make sense of or control the pain, the dorsal vagal break can over-activate, leading to death. Asante pain behavior and social responses to pain which are didactic, distracting, and normalizing are very effective ways to increase patient sense of control and mediate the stress response during acute pain.

Self-limiting ailments are problems that will run a natural course regardless of any intervention, such as colds, muscle spasms, sprains, etc. Alternative medicine attracts many self-limiting ailments because biomedical practitioners often see no point in intervening when the patient will get better by just waiting. Researchers unaware of the many placebo components in indigenous medicine will often argue that its efficacy is based on treating mostly self-limiting ailments. “In these cases, the natural course of the disease undoubtedly creates the appearance of treatment response and enhances the perception of unconventional medicine’s effectiveness” (Kaptchuk 2002:820). Because of the hierarchy of resort, patients usually do not go to Asante indigenous ritual healing ceremonies for acute or immediate care, but try other healthcare options first. This is not the case for all alternative medicine, but it is uncommon to see ordinary, self-limiting ailments at Asante indigenous healing ceremonies.

Asante indigenous ritual healing ceremonies are very patient-centered and participatory. In each step of the ritual process, patients exert a preference and this in turn influences how positively they respond to the treatment, as well as how closely they adhere to the prescribed regimen. In clinical settings, practitioners will often ask a patient if they have heard of a drug for their symptoms. If so, they will often prescribe that drug

even if there is a better drug on the market for their particular race, age, weight, gender, etc., (Kozinets 1999; Popa-Velea et al. 2015) because patients respond better to drugs they prefer and expect to work. Similarly, Asante patients sometimes get a choice as to their form of treatment, i.e. herbal bath, enema, drink, steam, poultice, etc.

An important factor in Asante social expectations of pain is that pain can be seen as normal and associated with effective cures. During childbirth, pain is not given any special treatment, no pain relief is available, and patients are laughed at and slapped if they cry too loudly. Pain is communicated as the normal and effective method through which children come into this world. Another example of how pain is seen as effective is the over-use of injections as the treatment method. During my research, I regularly heard it said around the hospital that, while patients disliked injections, they viewed them as powerful and effective because they were painful. One doctor even went so far as to explain to me that he sometimes gives out saline injections to people because they do not think that pills work as well as injections since they are not painful. In this way, pain is seen as potent and therapeutically efficacious. Or, the idea that effective treatments have costs, like pain. In fact, in placebo studies, patients have greater placebo rates when they see the treatment as effervescent, bubbly, smelly, arduous, or painful. There is something about the actual physical display of potency (e.g., a colorful, effervescent, bubbling concoction versus a tasteless, odorless, colorless concoction) (Moerman 2002; Speciali et al. 2010), cost (e.g., patients believe expensive pills and well-known brands are more effective than cheap or generic medications) (Espay et al. 2015; Kaplan 2015), or complication of treatment (e.g., patients believe small pills that you have to take every 4

hours are more potent than one large one you take every 24 hours) (Price et al 2008). Patients respond based on the color of the pill, whether it is a capsule, whether it is transparent, whether it tastes bad, etc. Something as benign as the packaging, design, logo, and description of the pills can affect treatment outcomes. Thus, it should be no surprise that patient placebo rates are higher after elaborate ritual processes and procedures, than when patients take a nondescript pill (Kaptchuk et al 2000; de Craen et al. 2000). In fact, treatment parameters are present in even non-medical cases. Many studies conducted on wine taste preferences show that more expensive wines do not taste better than less expensive wines, however, in a study that labeled the wines \$90 and \$5 the more expensive wine ranked significantly higher in spite of being the same exact bottle of wine (Lehrer 2008). “Because of such notions as ‘holistic medicine’ and ‘body, mind, spirit,’ alternative medicine can have extremely broad, indeterminate, therapeutic targets and therefore, at least from a cultural view, ‘in some sense cannot fail’” (Kaptchuk 2002:819-20).

This is the case with Asante indigenous ritual healing ceremonies. The treatments are complex, long, and require major sacrifices and obligations. They are very visible and elaborate. One example of this is animal sacrifice. In most Asante indigenous ritual healing ceremonies animals are sacrificed in either the divination or the resolution stages. During divination, the sacrifice is a way to get answers to specific questions. Chickens or goats bleat loudly and their vivid red blood is spilt on the dry brown earth. This blood is then wiped onto fetish talismans that contain the power of all of the animals whose blood has been coated onto them. During treatment, animals are sacrificed to appease the gods

or ancestors. These are ritually killed and then the meat shared among the village. I describe these events in detail in order to illustrate how vivid and immediate these rituals are. A combination which heightens placebo responses. Similarly, alternative medicine benefits from very vivid feedback loops. “To demonstrate ‘active’ intervention, alternative medicine treatments have unique feedback loops that are likely to facilitate, if not heighten, substantial placebo responses” (Kaptchuk 2002:820). Examples of these are back cracking, acupuncture pricks, massage therapeutic touch, energetic sensations, etc. An active feedback loop in Asante indigenous ritual healing ceremonies is spirit possession. Patients will often get lulled into and even possessed during the ceremony. These altered states of consciousness are very experiential, embodied, and exaggerated. These treatment parameters enhance placebo responses in Asante indigenous ritual healing ceremonies.

Another placebo enhancing factor in these rituals is their drastic difference from biomedicine. From drumming and spirit possession to animal sacrifice and ancestor piety, these extreme difference might act to decondition patients from previous unsuccessful medical encounters for their problem and increase positive expectation in novel methods. Similarly, “alternative medicine has the advantage of always having an intervention scenery. Therapeutic passivity is rarely an option, and practitioners can, at a minimum, offer something that is likely to have a placebo effect” (Kaptchuk 2002:820).

For example, the link between placebo pain alleviation and evaluations of social support and care becomes very clear if we view pain as an adaptive warning system and vulnerability as an impetus for seeking out (or relying on pre-established) relationships of



predictable reciprocity and caregiving. Keep in mind the fact that these adaptive responses developed long before we had access to modern medicine and pharmacological interventions. Although Benedetti (2009) is coming from a largely biomedical background of discovering the neurobiological mechanisms of placebo responses, he also sees the value in understanding why some of these feedback relationships evolved.

It has been suggested, for example, that the facial expression of pain evolved for eliciting medical attention from others...The acts of caring and curing must have become a powerful social stimulus that induced beliefs, trust, hope and expectations of recovery. If one member of a social group trusts just one other member of that group, he or she may have an improved quality of life and may survive longer...Expectation-related placebo effects may be part of the evolution of these complex social interactions. To become activated, these placebo responses require social contact with the person who is trusted. While the placebo effects require the act of curing (the placebo), the placebo-like effects occur without any act of curing, but simply with the human interaction, both verbal and non-verbal forms (Benedetti 2009:51).

“Placebo analgesia can be induced by both expectancy and conditioning....[which has] important implications for understanding the translation of psychosocial triggers into the neurobiological processes” (Price 2002).<sup>162</sup> Enculturation is a necessary condition for both expectancy and conditioning. Examples of Asante pain behaviors and social responses to pain highlighted previously illustrate how children are taught from an early age how to react and what to expect while experiencing pain. Patients are “conditioned” by physical and verbal punishment to respond in culturally appropriate ways. Pain expectancies are shaped by the verbal and tacit communications of healthcare practitioners. In many cases these practitioners give specific verbal suggestions and expectations normalizing and minimizing pain, i.e. “Stop crying. Everybody gives birth.

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<sup>162</sup> “Expectancy induced placebo analgesia results in an endogenous opioid response (indicated by reversal by naloxone), whereas conditioning results in *either* an endogenous opioid response *or* a nonopioid response depending on the unconditioned stimulus (Price and Sorensen, 2002)” quoted in Price (2002).

You are fine. This is nothing.” “Verbal suggestions that induce certain expectations of analgesia induce larger placebo responses than those inducing uncertain expectations (Price 2008). What the Price 2008 study suggests is that practitioner certainty and verbal suggestion are psychosocial variables that can be “dosed” and lead to predictive placebo responses (Price 2008:570). Overt suggestions for pain relief can increase placebo analgesia to a magnitude that matches that of an active agent (Vase et al. 2003; Price 2008).

Thus, Asante pain behaviors and social responses to pain mitigate pain and increase analgesic placebo responses by helping patients feel less anxiety and fear because practitioners provide a clear diagnosis, they normalize and distract, they focus on other factors outside of the pain site, and they understand that psychosocial factors may have physical consequences). Moreover, placebo rates increase as the goal for pain relief matches the expressed suggestion of practitioners and patient pre-conceived expectations and perceived environmental conditions (via normalizing, distracting, avoiding and under-emphasizing the injury, and focusing on social context rather than actual injury). These strategies lessen patient anticipation of expected pain and desire for pain relief. Previous experience (Colloca and Benedetti 2006), memory (Price 2008), and reduction of pain-induced anxiety (Evans 1985) are also ways to induce placebo pain analgesia and are related to Asante enculturation and sociocultural context of pain encounters. Asante pain behavior, the stoic-silent ideal, is a learned reaction to pain. The Asante social response to pain normalizes and distracts from the painful stimuli. All of these behaviors

contribute to expectancy conditioning, or the formation of expectations and conditioned responses to pain in future events.

There are a few Asante-typical characteristics of the types of social pain I witnessed being used during instances of acute physical pain in Ghana. In the Asante case study, the physical presence and social support of the group never waned. Patients were never left alone. **In fact, in over a decade of observing healthcare administration in medically pluralistic Ghana, I never once witnessed a patient alone in any of the healthcare systems.** Even in biomedical hospitals patients were in group rooms and in my few experiences with contagious individuals, patients were still accompanied and visited regularly by family. Social threats and fears of rejection were not based on actual ostracism, but censuring, which coerced patients into acceptable pain behavior (silent stoicism) and discouraged future accidents. Even in extreme cases when the entire group of patients and practitioners were teasing, laughing at and making fun of a person in pain, social exclusion was never a danger. However, for the patient, the only way to stop the reproof was to adapt to the sanctioned Asante pain behavior. Social threat is thus a culturally adaptive way to distract patients from their acute pain and assure pain-relieving behavioral control. The Asante I spent time with provide an ideal case study because they maintain the constant presence of social support throughout health encounters while relying heavily on social pain and social threats during these events. This is important because on top of the analgesic benefits of inducing social pain, there is significant pain reduction if the person experiencing pain has social support. “Experimentally

manipulating the presence of supportive others can reduce pain sensitivity” (Eisenberger and Lieberman 2005:121).

Certain behaviors in the Asante social response to pain cause the physiological alleviation of painful stimuli by manipulating the therapeutic relationship. These behaviors—overt confidence, commanding tone, direct language, and verbal suggestion—are symbols of social dominance. Harassment by a dominant individual increases the stress response which is necessary for pain alleviation of acute trauma. Evolutionarily, social dominance was a costly signal of inherent intellectual and verbal acuity, which communicated leadership capacity (Van Vugt and Ahuja 2011).

Subordinate individuals maintained their safety and belonging in a group by acquiescing to dominant individuals. We continue to have these interpersonal responses in medical encounters, especially in doctor-patient relationships. Numerous placebo studies (Kaptchuk 2002; Thompson 2009) illustrate how practitioner bias, preference, expectations and communication influence patient physiological responses throughout the therapeutic relationship. Survival studies show that during times of heightened stress, like acute trauma, individuals tend to follow vocal leaders, literally putting their lives into the hands of the most dominant (Sherwood 2010). In the Asante case studies, healthcare practitioners often use dominance displays to get patients to follow and trust them, to distract them, or to elicit the desired behavior. Future research is needed on the influence of dominance displays by health practitioners on placebo outcomes.

#### **4.9 Conclusion**

My paradigm shift in understanding pain experiences correlated directly with the difference between “sorry” and “*score*”—between empathy and resilience. In the social

context in which I grew up, where medicinal pain relief was readily available, there was little need for the psychosocial elicitation of placebo analgesic responses. Pain behavior consists of seeking out and following pharmacological solutions. The social response to pain was a passive acknowledgement of the abnormality of pain and its need to be extinguished. My home culture social response to pain communicated empathy toward another person's pain based on resonance with personal past experience, where my "sorry" is expressed to communicate a relationship, but ineffectual to the suppression of actual pain. In Asanteland, however, pain management is almost exclusively reliant on psychosocial and behavioral solutions. Medicinal pain relief, even in extreme cases of broken bones, abortions and blunt trauma, is rare. Instead, people grow up tacitly learning behaviors that suppress and inhibit the intensity, perception and duration of pain. They learn how to control and numb the pain experience and how to induce these sensations in others. Pain is seen as a normal, effective, and constant feature of daily life. The social response to pain is an active participation in which you have an influence on the magnitude of someone else's pain—where saying "sore" communicates a directive, an expectation, an example, a possibility, an intentionality, and an acknowledgment of mutually interpenetrative influence.

Analyzing Asante case studies provides a strong ethnographic suggestion that "pain itself may be transformed through the particular meanings, values, ideals, and expectations that we bring to bear in dealing with the existential possibilities and limitations that it evokes. As much as pain is a foundational aspect of our existence as humans, it is variegated in its forms of manifestation and significance" (Throop 2010).

But situating Asante behaviors within a biocultural evolutionary framework (using speculatively applied placebo studies research to uncover tertiary and neurobiological mechanisms unattainable via anthropological methods in natural settings) could perhaps run the danger Delvecchio warns against, “Pain as human suffering in the dominant institutions that deal with it in our times is a question of therapeutic *means*—analgesia, surgical procedures, rehabilitation, psychotherapy—not of human (or suprahuman) *ends*” (Delvecchio 1992:14, original emphasis).<sup>163</sup>

Although this chapter has emphasized the underlying physiological mechanisms of both physical and social pain, I want to make it clear that pain exists outside of these boundaries. Suffering and social responses to suffering are much more vast and deep than what happens in medical encounters.<sup>164</sup> The boundaries of pain behaviors, much like placebogenic phenomena, are uncertain. As it stands, one of the biggest critiques against psychosocial pain management is that it provides only palliative care,<sup>165</sup> which is a

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<sup>163</sup> Full quote: “What is so impressive about current forms of suffering is the relative weakening in the modern era of moral and religious vocabularies, both in collective representations and the language of experts. In their place we see the proliferation of rational-technical professional argots that express and constitute suffering in physiological, public health, clinical, psychological and policy terms. These secular discourses accomplish what Max Weber predicted early in this century they might achieve: namely, to replace the ‘looser,’ ad hoc, fuzzier talk about sentiment and tradition—for example, talk of yearning, misery, aspirations, and transcendence—with the much more systematic, routinized, quantified talk about biomedical and psychiatric and legal and policy issues. The transformation of language is notable, even within the social sciences, for leaving out the human spirit and the sacred” (Delvecchio 1992:14).

<sup>164</sup> To relieve pain is to alleviate suffering. When therapy fails, however, or even when it succeeds, the offer of personal and family support in face of the burdens of illness, bearing witness to the moral experiences of suffering, providing suffering with a coherent meaning, and preparing for a socially appropriate death and for religious transcendence are universal features of societal responses to suffering (DelVecchio 1992: 13).

<sup>165</sup> “While palliative care may seem to offer a broad range of services, the goals of palliative treatment are concrete: relief from suffering, treatment of pain and other distressing symptoms, psychological and spiritual care, a support system to help the individual live as actively as possible, and a support system to sustain and rehabilitate the individual's family” (Gombeski et al.. 1994).

specialized area of healthcare focused on relieving and preventing the patient: suffering, loneliness, pain, and stress without actually impacting the original etiology.

#### **4.9.1.1 Synopsis**

This chapter provides numerous ethnographic case studies of acute pain and explains how they represent a unique natural experiment.<sup>166</sup> Because active pain medication is not used, we can narrow down what caused the beneficial treatment outcomes. Often, that leaves us with a few factors: regression to the mean, natural history of the ailment, and placebo effects. These factors are difficult to parse in even the most rigorous of RCT's and I do not claim to have done it here, but this is where highly contextualized ethnographic case studies can shed some light on the relationship between the social and the physical--especially case studies on acute pain. The moment of traumatic pain is where we best see those factors that have an immediate, not eventual, effect on the patient. Uncovering these ethnographically contextualized ritual procedures, practitioner-patient interactions, enculturated conditioning and expectancies and sociocultural meanings has "important implications for understanding the translation of psychosocial triggers into the neurobiological processes" (Price and Sorensen 2002).

Enculturation is a necessary condition for both expectancy and conditioning and, thus, it is essential to examine these topics in ethnographically-grounded ways. Examples of Asante pain behaviors and social responses to pain illustrate how children are taught from an early age how to react and what to expect while experiencing pain. Patients are "conditioned" to respond in culturally appropriate ways through the use of physical,

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<sup>166</sup> They also represent "low tech/high touch" biotechnologies of care (Park and Fitzgerald 2011:xvi).

social and verbal punishment. Pain expectancies are shaped by the verbal and tacit communication of healthcare practitioners. In many cases these practitioners give specific verbal suggestions and expectations normalizing and minimizing pain. In *The Enculturated Gene*, Duana Fullwiley argues that Senegalese informal social strategies of care—including practitioner social responses to pain and patient pain behaviors and expectations—not genetic variation, are what have led to the “better than expected health outcomes” and “mild” categorization of Senegalese sickle cell. In much the same manner, this chapter demonstrates the many ways that Asante cultural meanings and social rituals influence the pain process.

But culturally constituted defense mechanisms are not the only way that Asante cultural behaviors manipulate pain warning systems—there are also culturally constituted fears. Cultural stress and social pain also affect health negatively. Just like all warning systems, social pain can become maladaptive in modern environments where it is activated regularly (such as in unstable social hierarchies) and can contribute to chronic pain. This is one of the reasons why long term biomedical solutions to chronic pain that focus exclusively on physical etiologies and pathologies have been largely unsuccessful. Which is why it is important to include social etiologies and therapies when treating ailments and body systems that are socially susceptible. Furthermore, highlighting the biocultural evolutionary foundations of pain and social pain leaves us asking important questions about how effectively our own medical and social institutions deal with pain in biomedical contexts (See a deep discussion about Palliative Care and Dysevolution



comparing biomedical and enthnomedical healthcare systems from a biocultural evolutionary perspective in *Appendix: Chapter 4: 4.7 Palliative Care and Dysevolution*).

## **CHAPTER 5: EMOTION**

### 5.0 Chapter Overview

#### 5.1 Ethnographic Case Study

##### 5.1.1 The Teenage Witches

##### 5.1.2 Healer Sincerity

##### 5.1.3 A Typical Asante Indigenous Ritual Healing Ceremony

##### 5.1.4 An Affective Ethnography of Ritual

##### 5.1.5 Anthropologist's Dilemma

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#### 5.3 Evolutionary Explanations

##### 5.3.1 Emotions and Social Susceptibility

#### 5.4 Asante Emotional Intelligence

##### 5.4.1 Asante Indigenous Religion

###### 5.4.1.4 *Social Dynamics*

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##### 5.4.6 Asante Emotional Intensity

###### 5.5.1.1 *Evolutionary layers*

##### 5.4.7 Methodological Considerations

#### 5.6 The Case of Eunice and Mercy

##### 5.6.1 Synopsis

### **5.0 Chapter Overview**

The first part of this chapter is about telling a story, a thick description of a rich ethnographic case study of one Asante indigenous ritual healing ceremony with a focus on the "emotional environment" in which participants interact. This story highlights the emotional encounters, or rather the collisions, where meaning becomes embodied and enacted for two young girls during their treatment process. Understanding the context and intensity of these emotions, as well as their physiological significance, is crucial to making sense of the features and impact of Asante indigenous medicine. To do so, readers are introduced to Eunice and Mercy, two Asante teenage "witches," who go

through a long and painful process of witchcraft accusation, confession, punishment and eventual reincorporation back into their families and society. We follow their story not only throughout the ritual healing experience, but also the social circumstances that led up to and follow this ritual. Whenever possible, I try to create an affective description of the people surrounding Eunice and Mercy: how they felt, what they experienced, and what they thought (captured via interviews, participant observation, and resonance methods).<sup>167</sup>

The second part of this chapter outlines the evolutionary and proximate mechanisms of why our bodies evolved to be susceptible to emotional mediation, or more accurately, why our behaviors and expectations are so reactive to emotional cues, and how that manipulation occurs. Similar to pain and stress, emotions are ancient adaptations that are highly reactive to environmental cues and were co-opted in social species to be hypersensitive to changes in one's social domain—both responding to and motivating expectations and behaviors via a host of physiological alterations. Eunice and Mercy's story highlights the important role of emotions and culture in medical encounters.

### **5.1 Ethnographic Case Study**

Some stories stand out more than others. Of the hundreds of Asante indigenous ritual healing ceremonies that I witnessed there is one encounter that I will never forget. The ceremony started out like any other- the drummers and chorus arrived at the outdoor shrine, sat on their benches under the palm frond roof, and began drumming.

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<sup>167</sup> See *Chapter 1: Appendix: 1.2 Qualitative Methods, 1.2.16 Resonance Methodologies* section for more specific descriptions.

Up to this point at the Atirimkyere shrine there had been nothing particularly unusual in terms of Asante indigenous ritual healing ceremonies.<sup>168</sup> This experience was essentially interchangeable with most of the Asante indigenous ceremonies that I attended multiple times each week. The drumming, spirit possession, consultation, divination, animal sacrifice, and talismans followed essentially the same structure with minor differences based on shrine, *Ɔkɔmfo*, and *Abosom* variation and preference. The following ritual process resembled in form and content most other Asante indigenous ritual healing ceremonies.

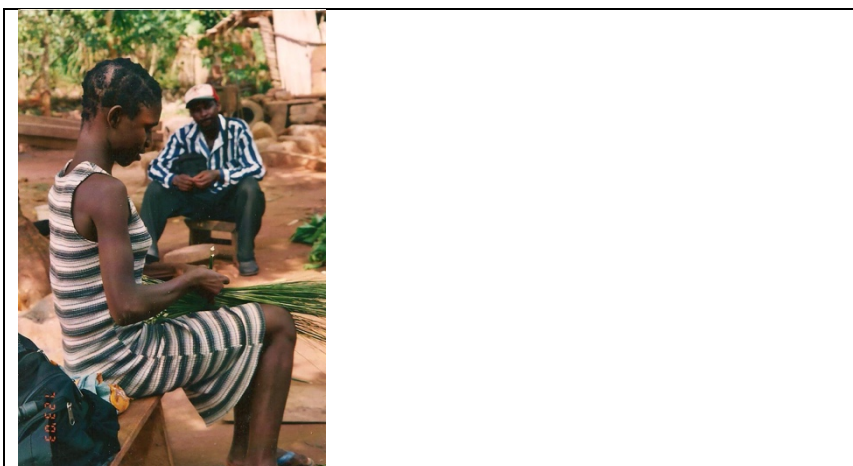
However, there was something about this particular ritual that felt different. It held a degree of intensity, danger, anxiety, and seriousness that I had rarely seen in any previous ceremony. It changed the way I understood the reality of Asante witchcraft and its effect on the wellbeing of Asante patients.

#### **5.1.1 The Teenage “Witches”**

I had met Eunice and Mercy a few months earlier. At first I just thought they were small village girls helping out at the shrine in Atirimkyere. Every Wednesday after observing Kwame perform and treat patients in an Asante indigenous ritual healing ceremony I would sit and talk with Eunice and Mercy. We would peel back the palm fronds to make brooms, sweep the compound, pound fu-fu, and laugh at the chickens pecking the barren ground.

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<sup>168</sup> For a more complete understanding of Asante indigenous ritual healing ceremonies, the role of *Ɔkɔmfo*, *Abosom*, *Onyame*, witches, and types of ailments and treatments see Chapter 6: *Stress* in this dissertation, Appendix: Chapter 5: 5.1 *Asante Indigenous Religion* and “Man Heals, God Cures” by Kwame Appiah-Kubi 1981.



**Photo 5.1:** Eunice making a palm frond broom at Atirimkyere Shrine.

They were like any other teenage girls from Ghana—obsessed with American culture and curious about boys. They would tell me about their lives and would ask about mine.

Eunice was fourteen years old, Mercy was twelve.

At the beginning of our friendship I was unaware that Eunice and Mercy were witches. Over time I learned their story. Eunice and Mercy were cousins. They were from a small close-knit family with relatively few children by Ghanaian standards. The girls enjoyed a cherished role in the family until their aunt gave birth to a little girl named Beatrice. They soon grew jealous of the attention and presents lavished on the new baby. They resented having to do more of the cooking, cleaning, and babysitting. They hated that Beatrice got new clothing and jewelry, and eventually Eunice and Mercy conspired together to use witchcraft in order to harm the baby. Using their jealous and malevolent thoughts, as well as a witchcraft trinket procured by trickery (they stole it from a local suspected witch),<sup>169</sup> the girls cursed the baby.

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<sup>169</sup> For a more complete understanding of the role, stigma, behavior, and curing of Ghanaian witchcraft see “The Practice of Witchcraft in Ghana,” by Gabriel Bannerman-Richter.

Shortly after, Beatrice got very sick. Her family took her to the hospital, but the doctors could not diagnose the problem. They brought her to the pharmacy, they took her to an herbalist, and they tried different medicines. None of these remedies helped, the family decided to visit the *Ɔkɔmfo* at Atirimkyere whom they had heard about on the radio. The family attended the shrine on a ritual healing day and Kwame, the *Ɔkɔmfo*, explained that Beatrice was being cursed by witches. He warned them that unless they discovered the witches' identities and where the source of their power lay, Beatrice would invariably die. During consultation, the family realized that the witches were Eunice and Mercy. The next week the entire family brought these girls to the shrine and accused them of witchcraft. The girls admitted their guilt and even wrote a confession on paper as proof.<sup>170</sup> Kwame said that the girls needed to remain at the shrine as his servants until he could cure them of their witchcraft.<sup>171</sup> From that point on the girls became property of the shrine and were at the beck and call of Kwame and his family. In our many talks the only subject that changed Eunice's perpetual happy curiosity into a state of morose nostalgia was a discussion of how long she had been at the shrine and when she would be able to go home.

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<sup>170</sup> At the time I had a neophyte's incredulity about witchcraft and the girls' servitude. To assuage my fears Kwame produced their confession letters for me to examine. In them the girls clearly stated their actions, remorse, and culpability. They both signed the letter.

<sup>171</sup> Although no one ever acknowledged it as such, at the time I wondered if this relationship was also part of *trokosi* or ritual servitude. *Trokosi* is a system in Ghana where families turn over young virgins to local fetish priests in exchange for forgiveness of an offense or protection from a curse. *Trokosi* girls are used as free labor around the shrine and often as sexual slaves or polygynous wives. However, each shrine treats *trokosi* girls differently and the distinction between when *trokosi* begins and witchcraft curing ends is ambiguous. Any direct questions about sex were routinely refused, although third parties were more open about its possibility.

At this point in our friendship neither Eunice nor Mercy was a part of any of the ritual healing ceremonies. We would hang out and do chores before the ritual began, they would run errands for Kwame and other patients while I observed the ceremony, and then we would talk as they prepared lunch afterwards.

### **5.1.2 Healer Sincerity?**

My relationship with the *Ɔkɔmfo* at Atirimkyere, Kwame, was more complex. My attendance at the shrine was both welcomed and celebrated by Kwame. Unlike other healers, who were wary of my intentions and took a long time to get to know me before inviting me to more intimate ceremonies, Kwame encouraged me from the start to come to his shrine as often as possible. He was a very popular *Ɔkɔmfor* and saw my attendance as a marker of his success. In fact, he was known to create radio advertisements for his healing ceremonies and in the latest ones he advertised that “*oburoni* clients” or foreign clients came to his rituals--a very rare occurrence in the “bush.”<sup>172</sup>

What Kwame lacked in sincerity he made up for in showmanship. He had the most elaborate clothing and changed more times per ritual than any other *Ɔkɔmfor* in the area. Kwame’s showmanship and lack of sincerity sometimes made me feel uncomfortable. For example, he would encourage me to take pictures and make sure to dance in front of me during spirit possession in order to get a good shot. Sometimes he would stop and wait while I adjusted my camera. Another time, during a consultation I witnessed, Kwame broke out of his possessed state to answer his cell phone in the shrine and used his normal voice and language (something that *Ɔkɔmfor* do not do during possession).

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<sup>172</sup> Many referred to the villages far away from major cities as the bush—a place devoid of tourism, commerce, and modern conveniences.

These actions often made me feel uncomfortable. At first I wondered if my dismay from his lack of earnestness stemmed from an ethnocentric notion that indigenous belief systems should be all-consuming, require a high degree of emotional investment, and not be taken lightly. I asked myself if it was fair to require that indigenous rituals be held to a standard that rituals from my own culture are not, e.g., I have seen professors, Catholic priests, and dancers “break” in their performance without doubting their sincerity. Yet these types of overt breaks in ritual performance were rare and something I had not experienced with other healers. Among the almost 100 Asante indigenous healers I had observed, some had overacted more when a camera was present, but Kwame was one the only one who broke during spirit possession and the only one who planned out his positions based on the location of the camera. When I compared the shrine at Atirimkyere to the other Asante shrines I had attended, Kwame’s performances showed a marked degree of disingenuousness that stood out from the rest. All of these factors caused me to feel different about Kwame’s level of authenticity and sincerity than I had about other *Ɔkɔmfor* I worked with, but I didn’t have any tools to discuss or measure the “feeling” of genuineness as a factor in ethnographic validity. The section below on Methodological Considerations will talk about this concept further, but for now what is important in the following story is that I did not fully trust Kwame or the sincerity of his actions.





**Photo 5.2:** Healer Sincerity? Kwame posing with me during spirit possession.

### 5.1.3 A Typical Asante Indigenous Ritual Healing Ceremony

The ceremony discussed below started out like any other: the drummers and chorus arrived at the outdoor shrine, sat on their benches under the palm frond roof and began drumming. Patients and attendants already at the shrine stopped their daily chores and sat down on the long bench to the left of the drummers. Soon clients started arriving from nearby villages and a few even came by taxis from the city. Kwame, the *Okomfo*, sauntered around the red earthen ground that made up the main part of the shrine in a pair of black slacks and a used championship T-shirt from some Midwestern college. He inspected the grounds and greeted guests. After about half an hour he went into the consultation room and changed into a *fugu*.<sup>173</sup> Upon emerging from the room Kwame immediately began walking quickly in a small circle. The drummers intensified their drumming and the chorus heightened their chanting. Kwame continued walking in this tight circle until he was possessed.

<sup>173</sup> A traditional smock made of long strips of gonja cloth. Fugu's worn by *Okomfo* usually have sewn on talismans and blood stains from previous animal sacrifices.

One could pinpoint the moment of possession because his demeanor changed. He straightened up, shook his body as though he was loosening up, his eyes glazed over and he blinked rapidly, signaling to the shrine workers to bring him his supplies. About six men of all ages ran to him with different supplies— an ox tail, a bowl of talcum powder, a change of clothing, an egg, and a blood talisman. Kwame grabbed a handful of talcum powder and wiped it all over his face then sprinkled it under his feet to signify that he was now possessed and that his movements from now on were not his own.



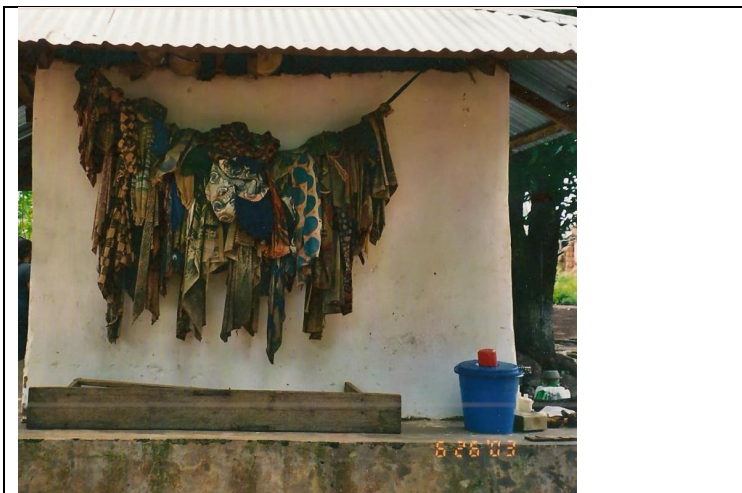
**Photo 5.3:** Kwame in spirit possession as signified by the white talcum powder rubbed on his body and face.

Everything Kwame touched from this point on in the ceremony was coated in white powder, symbolizing that his behavior was not of himself but of the *Abosom* possessing him.<sup>174</sup> Next he began an elaborate dance, stomping his feet rapidly, holding his arms in 90 degree angles with his hands in fists, spinning, whirling, and doing his signature move—bending his back as far as he could, then twirling around with a hop and landing with both feet on the ground and face looking up at the crowd’s reaction.

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<sup>174</sup> *Abosom*: Twi word meaning gods. There are many *Abosom* in Asante cosmology and they reside in specific villages, shrines, or natural locales. *Abosom* have the power to communicate to healers via spirit possession, influence human lives, combat occult powers, and make personal requests. Each *Abosom* has a distinct personality and can do good or evil.

The drumming and the dancing lasted for about fifteen minutes, but time is difficult to measure during the beginning stages of Asante ritual healing. The drums start long before the *Ɔkɔmfo* is ready and continue for about three to four hours. The poly-rhythms melt into each other and within minutes participants will experience a trancelike feeling. It was difficult for me to measure the amount of time spent on each of the different segments of the Asante ritual healing process—preparation, disassociation, consultation, divination, and treatment—because I inevitably lost track of time or got caught up in the moment. Thus, after a non-specific amount of time that seemed about fifteen minutes, Kwame went into the consultation room, which was a square concrete bare room full of ritual objects—blood talismans, sacrificial remains, witchcraft clothing, consultation equipment (cowrie shells, kola nuts, eggs, knives, etc.), changes of clothing, hidden and protected *Abosom* resting places, etc. On the back wall of the consultation room hung hundreds of pieces of cloth, the clothes of each of the witches that Kwame had cured.



**Photo 5.4:** An example of the witch cloth wall at an Asante shrine.

During the ceremony, patients come into the consultation room one by one. Kwame crouched surrounded by his workers on a little stool that sat on top of a dried goatskin. In front of him was a pile of cowrie shells and as each patient filed in they sat across from him and deferentially answered his questions. Each consultation began with Kwame mumbling indiscernible sounds and the oldest shrine worker translating these to the patient in the form of questions. Each healer-patient interaction was unique and specific elements varied depending on the *Okomfo* and the particular situation. However, the form that these interactions took was essentially the same. As the patient answered each question<sup>175</sup> Kwame would shake the cowrie shells and drop them on the hide. He could divine the course of the interrogation, the cause of the problem, and often the treatment or solution for that particular patient by interpreting the way the shells landed after each question.<sup>176</sup>

At intervals in between patient consultations and the different segments of the ceremony, Kwame would enter the consultation room with his shrine workers and emerge in a different ensemble, go back out to the audience, and dance again. His clothing and behavior changed depending on which *Abosom* possessed him. Each one had a different outfit, personality, and mannerism. For example, the *Abosom* that donned

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<sup>175</sup> Some of the most common questions were: Why are you here? How long has this lasted? Why have you disobeyed? Who is to blame? etc.

<sup>176</sup> Different healers used different methods of divination, such as tossing halved Kola nuts, cowrie shells, or eggs and analyzing how they landed. Some healers sacrificed chickens and analyzed how they moved after death. Each action had meaning and it was the diviner's job to analyse and explain what the movements of the shells or animal flops were. This occurs as a back and forth conversation happens with the patient. Often the divination techniques suggest possibility and meanings that neither the *Okomfo* nor the patient have ever thought about. It is those randomizers or "ways of knowing" (Peek 1991) that create a truly customized and meaningful experience for patients and their families.

the ritual *fugu* drenched in blood and talismans was a no-nonsense *Abosom* that usually danced a little and then got right down to business. The *Abosom* that wore the embellished grass skirt and covered his body completely in white talcum powder as if to appear white skinned had a sense of humor and often made movements intended to make the crowd cheer or laugh, communicated in English, and flirted with the *oburoni* visitors asking them to be his wife. The *Abosom* that wore a red outfit teeming with little white ribbons sticking out in every direction was a more modern *Abosom*, who liked highlife music and danced with the movements of the youth. Each shrine throughout the Asante region has different *Abosom* and, therefore, each ceremony and *Okomfo* have a different assembly of possible incarnations.

After consultation, patients are divided up based on the difficulty of their case. The simple or preliminary cases are immediately given treatment and instructions, and sent on their way. The more difficult cases graduate to more elaborate divination and sacrifice procedures. An interesting aspect of this segment of the ritual process is how the shrine functions in an almost acephalous fashion, each person independently doing a simple and seemingly arbitrary task which ultimately culminates in the fluid and successful enactment of the next segment of the ritual ceremony. Some shrine workers sort out the patients and begin the treatment process, i.e. pouring libation to the *abosom*, *mmoetia*, fertility objects, or shrine, going into the forest, finding specific plants, making herbal remedies and explaining their usage, and recording in the shrine ledger what was required of the patient, etc. Some shrine workers begin setting up the more extensive divination and sacrifice procedures, i.e. gathering chickens and goats, preparing the shrine for

sacrifice, and pouring libation, etc. Other shrine workers stay with the *Okomfo* and translate his muted mumbling to the workers outside engaged in the various patient cases. Depending on whether or not further divination is needed, some *Okomfor* will come out of possession during this stage.

The next stage of divination can take a couple of forms, determined during the previous cowrie shell consultation and divination. One way to glean more information is to rub an egg all over the body of the sick person and look through a mirror. Kwame explained later that during possession an *Abosom* can look through a mirror and see the spirit world behind him. This helps them communicate with other spirits, ancestors, and *Abosom*. Since the egg is able to absorb some of the illness, it can be broken and its contents analyzed.



**Photo 5.5:** Kwame wearing a *fugu*, in possession (as signified by the white powder on his eyes), and looking into the mirror to commune with the spirit world after rubbing an egg all over the patient's body.

Once the egg is rubbed all over the patient's body, the *Okomfo* spins in a circle or dances, tosses the egg into air, and interprets the diagnosis and treatment depending on how the egg shells land.



**Photo: 5.6:** An example of an *Okomfo* spinning with an egg in his hand and then divining the broken egg.

Another way to divine at this level is to sacrifice a chicken or goat and then interpret its movements once its throat has been slit. Does it die suddenly? Does it flop around? Each movement signifies different things to the *Abosom*. During this particular ceremony, Kwame did all three forms of secondary divination.

The last stage of Asante ritual healing ceremonies is usually less structured and feels more relaxed. Each patient takes care of their own diagnosis and treatment. Some people are required to give small coins to children, return home and bathe with particular herbs, and/or come back next week with a particular person. Others are required to give an animal sacrifice, make a large monetary contribution, and/or remain at the shrine for an undetermined period of time. During this time Kwame becomes unpossessed and then works with the shrine workers to answer patient questions and complete the requirements given to them by the *Abosom*. The shrine workers will busy themselves with different

patients, pouring libation, sacrificing animals, and rubbing sacrificial blood on the talismans symbolizing the imbuing of life and power into these ritual objects.

#### **5.1.4 An Affective Ethnography of a Ritual**

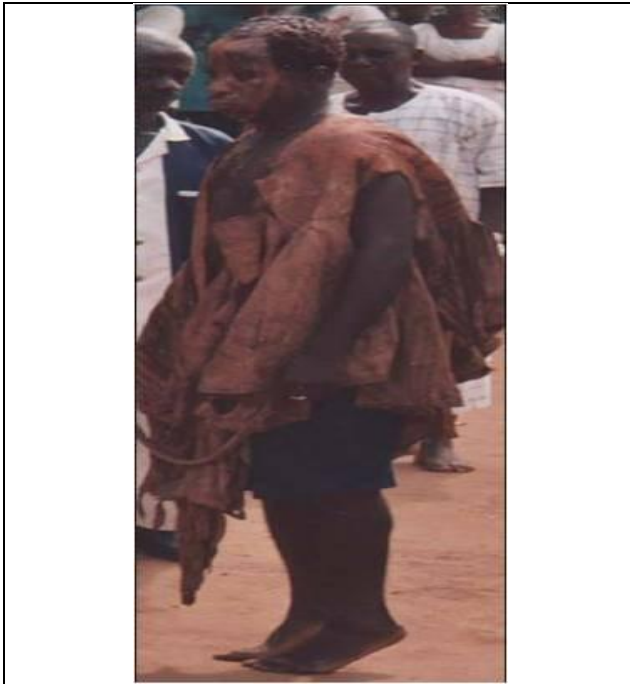
Up to this point there had been nothing particularly unusual in terms of Asante indigenous ritual healing ceremonies at the Atirimkyere shrine.<sup>177</sup> This experience was essentially interchangeable with most of the Asante indigenous ceremonies that I attended multiple times each week. The drumming, spirit possession, shrine, consultation, divination, animal sacrifice, and talismans followed essentially the same structure and while there were differences based on shrine, *Okomfo*, and *Abosom* variation and preference, the ritual process resembled in form and content all other Asante indigenous ritual healing ceremonies.

But then something changed. After divining with his last patient, Kwame changed clothing in the consultation room yet again. He emerged in an outfit I had never seen before. It was new to Kwame's repertoire and to any of the other healers I had worked with. He was draped in a torn muddy *fugu* and coated in red mud. Instead of the usual talismans in his hands he held a long ripped piece of rubber tire.

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<sup>177</sup> For a more complete understanding of Asante indigenous ritual healing ceremonies, the role of *Okomfo*, *Abosom*, *Onyame*, witches, and patients, and types of ailments and treatments see: "Man Heals, God Cures," and Chapter 6: *Stress* in this dissertation.





**Photo 5.7:** Kwame's muddied *fugu*, face, and tire whip.

Before the ceremony, Kwame had asked me to take pictures so that he could have copies and use them to advertise Atirimkyere shrine. I was intrigued at this new development and zoomed in a little bit. Soon my good friends Eunice and Mercy—who normally sat on the long bench observing or running errands for Kwame—started walking, in their finest clothes, toward the shrine. I hastily grabbed my notebook and started recording everything I saw. Up until this point Eunice and Mercy had not been a part of any ceremonies.

I thought about our many discussions while peeling palm fronds as I watched Mercy and Eunice walk out to the middle of the shrine. Mercy was wearing an elaborate cream dress made of satin and ribbon. It was lined in little brown flowers and had tulle underneath which made it bounce whimsically each step she took. The dress was so intricate that I had to smile, seeing it juxtaposed with the harsh environment of a village

red dirt shrine in the middle of a West African rainforest. Mercy marched out to the center of the outdoor shrine, her dress swaying along the way, and kneeled on the red earth with downcast eyes. Eunice soon followed in her long knit black and white striped dress that was just tight enough to see her imminent adolescence. She was more defiant in her slow walk and eventual kneel.

Kwame started dancing elaborately again, but this time with an intense anger I had never witnessed. This *Abosom* was full of rage. The movements were not humorous or skilled. There was no whirling or back bends, light-hearted banter or peering over at me. The *Abosom* jumped and stomped and hissed and whipped the long rubber tire piece around. As it whirled through the sky the rubber piece made an awful noise— as if the air were calling out in pain. Kwame's face was rigid and severe. I quickly grew very nervous for Eunice and Mercy. My anxiety mounted during each unyielding swinging movement and each step the *Abosom* took closer to the girls. It was then that I realized what this talisman was—a thick gruesome homemade whip. My worry increased. The *Abosom's* dancing became more eccentric as he bore down on the girls until finally he was right on top of them. I have never felt so much intensity, seen such suspense, witnessed as much baited breath, or experienced the shrine so singularly focused in all my ritual healing encounters. I looked up. The crowd had grown. A mix of patients, villagers, school kids, shrine workers, neighbors, and taxi drivers had gathered in large numbers and their joint attention created an impenetrable boundary around the shrine. The structure of the shrine, which was usually delineated on the red earth by lines of talcum powder, became literally reinforced by the social group. It was the lived experience of *communitas*, a moment

outside of time full of intense emotion and social cohesion where the normal roles and behaviors of the community were on pause in order to witness together something extraordinary.



**Photo 5.8:** An example of chalk delineations of the shrine boundaries

The *Abosom* was thrashing about wildly now without regard to the girls' penitent kneeling. I winced each time the whip swung closer, but somehow I thought that because I had never before witnessed physical harm at a ritual, the girls would be safe.

All at once the whip began lashing Eunice. It hit her in the arm first, then the head. She winced and moved and tried to avoid each lash. She got off her knees, running in place slightly, with hands balled into fists, and then quickly returned to her prostrate position. The *Abosom* danced as if he was unaware of the girls. He danced and the whip swung up and down, left and right, hitting the girls with unmitigated might and unpredictable movement. I unconsciously stood up. The girls were wincing, crying out in pain, and then quickly searching for the direction of the next blow. The whirring sound of the whip across the air was unbearable, the deep thump it made as it came into contact

with the girls was unforgivable. When I finally realized I was standing in front of the drummers I was at an impasse. What was I supposed to do? I could not watch them be brutally beaten but I could not stop it either. There was no anthropological lesson in my textbooks about this. All of a sudden an erratic swing of the whip whipped around backwards, touched the red earth and swung upwards, making contact with Mercy's left cheek. Her hand immediately flew up to her instantaneously welted face and for a brief moment her large brown eyes peered into the crowd and she whimpered. It was a look of incredulity--a look anyone in any culture could interpret. It was a look that said, "Why is no one helping me?"

#### **5.1.5 Anthropologist's Dilemma**

Something about that look haunted me. These girls were looking to their community to stop the beating and everyone just watched--with intensity and pained looks, but they just watched--as the whip hit over and over. I quickly gathered my things, walked just outside the outline of the shrine and left the ceremony. Did I do the right thing? Should I have stopped the ceremony? How could I take pictures of another's pain? Could that have contributed to the beating? Was he showing off because I was there taking pictures? Was this a normal ritual healing ceremony to cure witches? My guilt and confusion soon turned into anger. I was upset that my professional integrity was competing with my personal conviction. Little girls should not be publicly beaten as the community watches, right? What was the balance between universal human rights and cultural relativity? Was I too sensitive? Was I not objectively analyzing the ceremony from the emic perspective?

I retained these questions and self-doubt for a few days until I was summoned back to Atirimkyere. My abrupt departure from the ceremony had caused quite a stir. When I arrived I went first to find Eunice and Mercy like I normally did, but they sulked in the back of the shrine as if they'd been told not to talk to me. I was quickly directed into the consultation room to talk to Kwame. He was upset that I had left. It was a sign of disrespect. He thought I should have stayed. I explained that I was shaken that he had so severely beaten Eunice and Mercy. I felt as if my presence made me complicit in their abuse. He explained that in his culture witches need to be punished and cured of their witchcraft in order to be taken back into their community and family. I described how in my culture it was unacceptable to relentlessly beat defenseless children regardless of their misdeeds and it was impossible for me to sit through. We were at a standstill. We talked back and forth. I was honest. He was honest. Eventually we came to an agreement. He would continue treating Eunice and Mercy. I would continue attending the ceremonies and conducting interviews, and he would refrain from beating anyone in my presence.

I showed up to Atirimkyere the next week relieved at our arrangement. Waiting impatiently for me at the entrance to the shrine was Eunice. "Please don't go," she begged, her urgent brown eyes welled up with heavy tears<sup>178</sup> as she made the Ghanaian hand gesture for "I beg you"--right hand cupped into the left moving up and down. "Of course I won't," I said, as a surge of protectiveness coursed through my body. I had thought of little else since the last ceremony besides my inability to actually help Eunice

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<sup>178</sup> Crying is quite an anomaly. Displays of emotion are rarely shown publicly outside of public mourning at funerals. In response to pain, both social and acute, displays of emotion are not common and if they do occur the participant is usually scolded.

and Mercy and I could sense that I was not going to let that happen again. My assurance and calm gave Eunice noticeable relief and her demeanor changed back into the girl I knew. I monotonously helped her gather large palm fronds, strip off the sides, and collate the inner spines into local style brooms while we waited for the ceremony to begin. I was happy that we could so easily go back to our normal routines and I could tell Eunice was comforted in the knowledge that if I stayed she would not be beaten.

The drummers gathered, the chorus began chanting, and the dancers started gyrating to the polyrhythmic reverberations. The ceremony was underway. A taxi full of people arrived. Kwame changed into his ceremonial clothing—a plain cloth symbolizing that he was not yet in spirit possession. People were greeting one another all around the shrine. Minutes later Eunice appeared again, more frantic and upset than before.

“Please, I beg you. Can you leave?” she urged, slightly hesitating, hands begging again, although more fervently this time. “What? Why? You just asked me to stay,” I questioned. She explained, “My family has come. If I am not beaten they will not take me back.” I understood her verbal language but I was not certain what to do. Her body language made it clear that she didn’t want me to go. “Are you sure?” I asked again. She hesitated and Kwame appeared. He yelled at her in *Twi*. I only caught a couple words: *k-ɔ*, *fie*, *abusua*, and *ayɛm*. Go, home, family, and witch. I was shocked by the change in his tone and demeanor since we last talked and could tell something had changed. I could tell that he felt uncomfortable, that his professional reputation was on the line but so was his newfound agreement with me.

He asked me with a twinge of frustration, “What are you going to do?” To an outsider the words meant that I had a choice. To someone who could read the non-verbal dialogue underneath the surface, it was clear he meant that I needed to go. As I walked the two miles from the shrine to the main road all I could think about was the pain that Eunice and Mercy were experiencing in the moment. I was upset by a dilemma that many anthropologists face: how can we respect cultural practices that promote suffering? Where is the line between ethics and ethnocentrism? The only comfort I experienced on that walk was to think about how much Eunice and Mercy longed to return to their family. They were so happy seeing everyone, a big contrast to their typical despondency while living at Kwame’s shrine. Maybe that end justified the means?

This thought was confirmed a few days later when I returned to Atirimkyere. Before I had even reached the threshold of the shrine Eunice came bouncing up to greet me with the biggest smile I had ever seen on her face. She grabbed my hand and dragged me toward the shrine talking a mile a minute. She explained that Kwame was able to locate and extract the witchcraft talisman that Eunice and Mercy had stolen and used to curse Beatrice and because he did it in front of their family they believe that the girls are cured and can go home. She said all this exuberantly, almost jumping up and down with joy. I was somewhat confused. I had never heard of a talisman being extracted from a body before. I think Eunice noticed my reticence and ran into the consultation room. She came back with a professional photograph of the last ritual ceremony.

She was kneeling in front of Kwame, holding up an indistinguishable object and smiling ear to ear. “It was a millipede that was lodged in my stomach,” Eunice explained,

pointing at the talisman, and she copied her goofy smile in the photograph. We both laughed and I returned my attention to the picture. Kwame was standing behind her, arms on his hips, chin raised in a proud and powerful stance. “See!” she said pointing at the picture, “he removed the witchcraft. I am free!” The picture showed a resolute Kwame standing proud and a beaming Eunice holding a large millipede—the physical evidence that her witchcraft was removed.

With my now outdated film camera I captured a picture of that picture. I was upset when I got the film developed because it turned out blurry and undistinguishable. You can’t really see the millipede or any specific features of Kwame or Eunice. That said, for all its blurriness, Eunice’s broad smile is unmistakable and that is what stood out that day as well.



**Photo 5.9:** Photographic evidence of Eunice’s removed witchcraft

We discussed the ceremony in more detail. Eunice explained that they were beaten again and when I scowled she explained that this time it was okay because their families were there and could witness their punishment and curing. She said that this time during the ceremony the *Abosom* possessing Kwame was not only whipping them but he was



also walking around her body and pinching her skin. At one point he made her stand up and reached into her vagina and pulled out the millipede. He showed it to all of the people present in an elaborate dance and afterwards everyone praised Kwame's skill at curing witches.

Eunice was so proud of that photograph. She was cured and it was the proof. Beatrice was healthy again and with the photograph as evidence, their family would allow Eunice and Mercy to go home. Their joy at the upcoming homecoming confirmed for me that I had done the right thing in leaving that day.

I never saw Eunice or Mercy again. The next time I visited Kwame, the girls were gone. I tried to keep in touch, but my letters to their address never received a reply. I don't know if they are in school or married or what they are doing in their lives. I do know that they are probably in a better place than being *Trokosi*'s at Atirimkyere indefinitely, or worse. Compared to the witches that came before them who were killed for their actions or the ones from other tribes today that are banished to live a life sentence in a witch settlement, Eunice and Mercy were some of the lucky ones.

Upon arriving home from the original ceremonial beating of Eunice and Mercy I was explaining to my neighbor, George, why I was so upset from the proceedings. After listening carefully, he replied, genuinely curious, **“why would you fear a beating *when your life is at stake?*”** It is a question that has stuck with me throughout my research. It highlighted the fundamental disconnect between emic and etic perspectives, between what I thought and what my informants thought. All I could think of that night was a counter-argument that I kept to myself: **“but how can you fear something so much *that***

**your life is at stake?”** The rest of this chapter explores the disconnect between these two questions. It seeks to understand how emotions influence the processes of sickness and healing in order to better understand Asante emotions in general and particularly the emotions experienced during this ritual healing encounter.

## **5.2 Emotions and Health**

### **5.2.1 Cat Digestion or How Emotions Influence Biology**

Walter B. Cannon in 1915 was one of the pioneers who “formed the basis for much of our modern understanding of the physiological response systems involved in linking emotions, such as fear, with illness” (Sternberg 2002). He first discovered this link between health and emotions in the most unlikely of places--the digestive tract of cats--when he was attempting to see if the newly developed Rongen ray could be used to study animal digestion. After many trials and errors, some involving dogs ingesting buttons and geese swallowing balls, Cannon discovered that cats were the most suitable and that by adding metallic salts made of bismuth subnitrate, bismuth oxychloride, and barium sulfate to their natural food he could watch dark shadows move throughout the digestive system via what would later be called x-rays (Benison et. al. 1987).

One of the problems that Cannon kept encountering ended up more important than the digestion research itself. He noticed that changes to the affective state of the animal, i.e. fear, excitement, anger, surprise, etc., immediately stopped the digestive process. From this small but significant finding Cannon went on to conduct research linking emotions to health, and in 1915 he coined this neurophysiological-behavioral phenomenon the “fight or flight” response (See Chapter 6: *Stress*). Cannon laid the groundwork from which decades of research have been built showing the significant role

of emotions in sickness and healing (Temoshok 1986).<sup>179</sup> “Scientists are now proving in the laboratory what traditional healers have instinctively known: that the mind and body are intricately linked, and when either is weak, the other suffers. In fact, your emotions are so strongly connected to your physical being that they can elicit tangible physical responses” (Kelly 2014).

Negative emotions have been linked to the development of non-specific experiences of illness as well as specific disease conditions (Kiecolt-Glaser et al. 2002). A lack of expression of emotions (repression) (Pennebaker 1995), co-morbidity of negative emotions (Uskul and Horn 2015), and the inability to experience and interpret life experiences via positive emotions (Clark and Watson 1991) are associated with higher rates of illness and disease. More specifically, there are significant positive correlations between high rates of anger/hostility, depression, grief and shame with high rates of heart disease, cortisol, cancer, ulcers, arthritis, and cytokine activity (inflammation)--as well as negative behavioral coping mechanisms such as suicide, smoking, drinking, and abuse (Siegman and Smith 2013).<sup>180</sup> In contrast, positive social conditions (i.e., marriage, religious attendance, social outings, size of friend network, and low-stress job, etc.) are linked to increased physical health, quality of life, longevity, greater immune functioning, and healthcare satisfaction as well as decreased susceptibility to viral infections,<sup>181</sup>

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<sup>179</sup> See also: Freund 1990; Johnson 1990; Lazarus 1991; Temoshok 1986; McFadden and Levin 1996; Francis 2006; Consedine and Moskowitz 2007; Stets and Turner 2014; Uskul and Horn 2015.

<sup>180</sup> See also: Johnson 1990; Wulsin et al. 1999; Kemeny et al. 2004; Stroebe et al. 2007

<sup>181</sup> “Fighting off and healing from disease requires a strong immune system and balanced emotions. It's never an either-or situation: The immune system works well when your system of peptides and receptors is in balance, and the peptide system is in balance when you are emotionally strong and healthy. Thus, when

hypertension, diabetes, respiratory tract infections and disease development (Uskul and Horn 2015).<sup>182</sup>

While the science connecting emotions and health is robust, most of these studies leave out two critical elements: evolutionary medicine and cultural-specificity. Although current research on emotions, evolution, and sociality have done a good job understanding the evolutionary and social motives behind interpersonal responses like belonging, understanding, controlling, enhancing, and trusting, “future research should entail more emphasis on behavior, more sensitivity to cultural specificities and universals” (Fiske 2000: 299). Viewing emotion-health interactions

in the context of the culture in which we live and the deep historical roots from which it grew...[ ] is not a viewpoint that most scientists are taught. We tend to do science as if it springs from the test tube, in a vacuum, untouched by its cultural surroundings. Historical time in science is often measured in weeks or months—certainly not decades [not to mention millions of years over the course of evolution]...Many scientists are thus oblivious to the societal and historical context that shapes our thinking and our choice of problems to be solved (Sternberg 2001:xii).

A third neglected factor in emotions and health is more holistic perspectives.

The complexity of how emotions fit within personal histories, sociocultural frameworks, circumstantial conditions, and physiological states makes them difficult to examine in context rather than isolated down to their simplest form and interactions. However, studies on emotions and health repeatedly show that “you’ve got to deal with the whole adaptive system of the organism and not just a

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you're dealing with difficult emotions, both your peptide and immune systems may be compromised. That's why it's important to stay emotionally healthy--not an easy task in this stressful world” (Kelly 2014).

<sup>182</sup> See also: Dube et al. 1996; Ostir et al. 2000; Salovey et al. 2000; Kubansky et al. 2001; Danner et al. 2001; Smart, Richman et al. 2005.

single element of the system” (Kelly 2014). In fact, professor of biophysics and physiology Dr. Candace Pert argues that the “molecules of emotion run every system in our bodies” (Pert 1997).

### **5.3 Evolutionary Explanations**

Although there is some “general consensus of the definition” of emotions, for example, emotions are seen as the affective states which can be differentiated into identifiable valenced qualities, are embedded in a social and cultural context, are experienced internally (subjective feeling), manifest themselves on a behavioral level (e.g. as emotional expression), and are associated with identifiable patterns of physiological activity (Uskul and Hone 2015:3).<sup>183</sup>

Sometimes it seems there are as many explanations of emotions as there are emotion researchers. Combine this with all of the different disciplinary theories and methods and it is no wonder that there is no major interdisciplinary consensus on why emotions evolved, what they are, and how they interact with social, cultural, ecological, psychological, and physiological elements. This section will briefly describe some of those major theories, but will focus mainly on helping readers to understand why and how human bodies have evolved to be hyper reactive to emotional cues.

#### **5.3.1 Emotions and Social Susceptibility**

As the fitness consequences for sociality increased over hominid development, so too did the importance of recognizing, assessing, and regulating the emotions of the self and others (Keltner and Haidt 2001; Keltner et al. 2006). Emotional intelligence, the ability to pick up on the tacit micro-expressions and hidden meanings that others conveyed, had survival and reproductive advantage. Think about it this way. Our ancestors who were able to recognize and feel indignant about deception or manipulation probably avoided

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<sup>183</sup> For more of an interdisciplinary theoretical literature review on emotion see Appendix Chapter 5.

many bad trades and one-sided relationships and likely cared better for their kin. Our ancestors who were highly perceptive of negative emotions like jealousy, rejection, shame, anxiety, and distrust had a better chance of identifying and avoiding social threats.

Emotions then, in a social susceptibility framework, provide the degree of physical awareness necessary for us to recognize, differentiate, and respond to the conditions of our environment and were honed in hominids through natural and social selection to respond to signals in the social domain. Much like health resource allocation, emotional recognition, expression, and regulation is a complex interaction between environmental conditions (including sociocultural), endogenous mechanisms, and adaptability to perceived conditions.

Emotions are special modes of operation shaped by natural selection. They adjust multiple response parameters in ways that have increased fitness in adaptively challenging situations that recurred over the course of evolution. They are valenced because selection shapes special processes for situations that have influenced fitness in the past....Selection has shaped flexible mechanisms that control the expression of emotions on the basis of an individual's appraisal of the meaning of events for his or her ability to reach personal goals" (Neese and Ellsworth 2009: 129).

Social emotions help us make rapid assessments via adaptive warnings, reward and punishment motivations, and hard-to-fake costly social signals. "Positive emotion motivate the organism to take advantage of environmental opportunities and to recognize when it has succeeded in doing so. Negative emotions motivate the organism to avoid misfortune by escaping, attacking, or preventing harm or by repairing damage when it has already occurred" (Neese and Ellsworth 2009: 132). Emotions also help us to differentiate significant interactions from less meaningful ones and store socially poignant memories at a higher rate than non-social ones. Furthermore, because emotional

responses are built upon ancient (and sometimes flawed) bodily systems, there are many trade-offs and modern mismatches as well as multiple competing interests; i.e., the need to manage someone else's emotions and protect one's self from manipulation.

The real life implications of the social susceptibility hypothesis have the potential to change the way we view and treat many illnesses. For example, while we currently think of negative emotions as potentially debilitating sensations, a biocultural evolutionary perspective recasts these emotions as pro-social adaptations, which warn us about social threats. Due to page limit constraints, I've moved a deeper discussion of the following topics to *Appendix: Chapter 5: 5.3 Evolutionary Explanations*.<sup>184</sup>

- Adaptive Warning Systems (5.3.1)
- Reward and Punishment Motivations (5.3.2)
- Appraisal Theory Via Rapid Responses to External Cues (5.3.3)
- Spindle Neurons (5.3.3.1)
- Costly Signals (5.3.4)
- Evolutionary Examples (5.3.4.1)
- Emotional Expression as Costly Signal (5.3.4.2)
- Emotion as Significance (5.3.5)
- Emotional Embodiment (5.3.6)
- Emotional Enculturation (5.3.7)
- Emotional Intensity (5.3.8)

#### **5.4 Asante Emotional Intelligence**

Why does any of this matter? What does this tell us about Eunice and Mercy's experience? As years have passed, I have come to view differently my position with respect to the intricate relationship between witch and witchdoctor. My reaction to the girls' beatings was predicated upon my emotional understanding of the world. Logically, I knew about Asante cosmology and understood the role of healer, witch, ritual, and

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<sup>184</sup> Pay particular attention to topics that haven't been covered in other Chapters, such as Appraisal Theory and Spindle Neurons.

restitution. Culturally, I understood Asante witchcraft, confession, spirit possession, ritual healing and the role of the fetish priest in curing the accused. Symbolically, I knew the meaning of the chants, garments, rhythms, movements, talismans and ritual procedures. Socially, I could interpret the non-verbal communication that occurred during the ceremony and between social actors. I was aware of many things, but I didn't necessarily understand them (Starkey 2008).<sup>185</sup>

What I lacked was the proper Asante emotional awareness and understanding. While my anthropological training had taught me how to analyze and interpret culture, it had not taught me how to engage emotionally with the culture from within. I had not learned how to understand or acquire another culture's normative patterns of emotional experience and expression. Our most treasured methodology, participant observation, got me close. It meant that I not only observed and recorded what I saw, but that I became a part of those relationships. I was an actor, not just a witness, in the ceremonies. I was invited to the births, the weddings, the funerals, and the family dinners. I knew these people, their kids, their wives, their girlfriends, their nicknames, their favorite foods, and their go-to jokes. This intimacy gave me extraordinary access into the social lives of my informants, but it also raised emotional and psychological questions for which I had no training.

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<sup>185</sup> "The distinction between awareness and understanding is important. A state of awareness consists of a taking in or registering of one's environment, and understanding is largely based on awareness; but understanding should not be equated with this awareness. We may apprehend a situation such as a ride on a roller coaster as threatening, though we know that it is not, and can feel that a trivial compliment is significant although we know that it is not. In these instances, our state of awareness and our understanding are divergent. Our understanding of a situation is based on a greater range of considerations and background beliefs than our state of awareness" (Starkey 2008:440)



What was implicitly clear but rarely discussed from an academic perspective was that these social relationships relied upon a deep and complex emotional intelligence—**the ability to recognize, evaluate and mediate the emotions of self and others**. Through trial and error, I learned some of the complicated motivations, intentions, desires, and goals communicated through a smirk or a raised eyebrow. What came so naturally to someone with the emic perspective took me over a decade to learn: how to display the proper sly smile in response to woman's scandalous story, when to click my tongue in agreement, how to nod my head in a sympathetic gesture, how to communicate outrage through a simple purse of the lips, when to use the hand movement that signaled uncertainty and when to use the other hand movement that meant "*MesrE wo*" or "I beg you" in Twi. "To break the habit of using a linear communicational model for understanding bodily praxis, it is necessary to adopt a methodological strategy of joining in without ulterior motive and literally putting oneself in the place of other persons: inhabiting their world [what was pejoratively labeled 'going native' in the early days of anthropology]" (Jackson 1989:135).

This is because "people's emotions are rarely put into words, far more often they are expressed through other cues. The key to intuiting another's feelings is in the ability to read nonverbal channels: tone of voice, gesture, facial expression, and the like" (Goleman 2006:96). The greatest tools I had during fieldwork were these gestures. They communicated whether or not I shared the same emotional reactions to information as my informants. When I responded correctly I was rewarded with further knowledge, when I

didn't, the conversation halted or continued on a shallow level. Thomas Scheff similarly argues that there is a:

need to include and study all of the parts of human communication: gestures and emotions are just as important as words, thoughts and actions. All of these components are equally necessary in understanding the character of the participants and the nature of their relationships. It is mainly for this reason that many studies of human beings seem thin and airless, since the various approaches typically omit one or more components. Many studies in the social sciences are based on interviews which focus solely on words. Studies in the behavioral sciences usually focus only on thoughts and actions or actions alone (as in the psychology of facial expressions). Social scientists usually study minds without bodies, psychologists bodies without minds. Because of these lapses, it is rarely possible to come to valid conclusions because some of the parts of the system are missing. Although recently emotions are beginning to receive notice, they have been ignored for so long that it will take some time to catch up (Scheff 1997:12).

As an anthropologist, I spent many years studying and practicing *Twɔ*. I analyzed verbs. I rehearsed tones. I practiced receiving and producing the language in academic classrooms and worked with Twi linguists to unpack all of the individual meanings of words that often got melded together in colloquial rapid speech patterns in the field. In Ghana, I learned Twi through trial and error. I learned how pronunciation mattered less than tone and how phrases take on a life and a meaning of their own. I couldn't have learned any of those things in a classroom.

Similarly, there were no classes on Asante non-verbal language or emotional intelligence. I never sat around with colleagues and professors studying and discussing Asante-specific emotional patterns and expressions. Yet, this was what I was doing in the field. I was acquiring **Asante social intelligence**: “the ability to understand the feelings, thoughts, and behaviors of self and others in interpersonal situations and to act

appropriately upon that understanding” (Marlowe 1986), and **Asante emotional intelligence**: “the ability to perceive, understand, and manage emotion in oneself and others” (Ashkanasy and Daus 2005). One of the biggest assets of extended fieldwork is slowly acquiring this type of tacit knowledge. Because “culture presents not only a set of suggested answers on how to behave...but also clues on how to feel about this action” (Geertz 1959). So over time, even when I could not consciously articulate the Asante rules or patterns of emotional expression, I began to *feel* uncomfortable when someone around me broke them. I had tacitly adopted patterns of behavior that I only recognized when they were disrupted (See Jamie’s fax pas in Chapter 4: *Pain* for an example of this).

There are some “problems with the way language handles the complexities of the world” (Goldschmidt 2006:33). While helpful at conveying technical or didactic information, unassisted by non-verbal or affective distinction, language is not always good at signaling intensity or degree of importance. For instance, I could understand the cultural logic of Eunice and Mercy’s beatings. I could even see the psychological desperation in the girls’ faces. What I couldn’t believe in was the reality of witchcraft, and thus, I disregarded all of the concomitant emotional intensity that comes with those beliefs. The costly signal of tears that Eunice and Mercy expressed when they were beaten resonated with me, but the costly signal of terror expressed when people talked about witchcraft did not. I privileged the fear of physical rather than metaphysical harm, because in my mind, one was real and the other was not.

This disbelief in witchcraft is a challenge faced by many anthropologists and their solutions to the quandary are as diverse as the people themselves. My solution was first,

to better understand the larger cosmological, historical, sociocultural, and polieconomic processes at play in Asante witchcraft, and second, to experience more witchcraft stories and rituals first hand.

#### **5.4.1 Asante Indigenous Religion**

There are many great Asante scholars on Asante religion and witchcraft whose work I have read thoroughly. A rich background in Asante cosmology and the ritual healing process is critical to fully understand the role of culture as instigator and alleviator in sickness and healing. Due to page limit constraints, I have provided a rich summary of the following topics in the *Appendix: Chapter 5*:

- Asante Indigenous Religion (5.1)
- Physical and Spiritual Duality (5.1.1)
- Order of God and Man (5.1.2)
- Asante Indigenous Ritual Healing Ceremonies (5.1.3)
- Witchcraft (5.1.4)
- The Lived Experience of Witchcraft (5.1.4.1)

#### **5.4.1 Social Dynamics**

The sociality of a medical encounter impacts the processes of sickness and healing. Imagine a private consultation between patient and physician where intense social dynamics influence the encounter and one's social susceptibility: power, discourse, trust, familiarity, expectation, judgement, bias, preference, etc. Now imagine a public medical encounter, like the case if Eunice and Mercy, where the social dynamics are exponentially amplified. Asante rituals are public events to which the entire village is invited. Often there are three times as many observers as there are participants actually seeking treatment or consultation. Patients are never alone at the shrine and are rarely, if ever, expected to go to the ritual alone. Families often attend the entire process of consultation, divination and treatment. In some cases, this is a positive type of social

support where family and friends are gathered to help contribute to the costs of treatment, to lend their opinions on the cause of the problem, to show the patient that they are invested in their health and wellbeing, and to physically help a patient who is unwell. In other cases, the sociality is contentious. People gather with malevolent intent, out of curiosity or rumor, to air a grievance, to publicly request payment that they believe they are owed, or to watch someone be punished for their wrongdoing. Either way, group dynamics amplify “*The Social Responses*” of a medical encounter, the corresponding physiological and psychological effects of that sociality, including emotion. Campos et al. (1994) argue group dynamics occur in three ways,

First, social signals can generate a contagious emotion and action readiness in the other. Second, social signals can render present person-environment transactions significant by giving affective meaning to perceptions associated with the signal. Third, social signals can generate emotions such as pride, shame, and guilt through the enduring effects that they can have as accompaniments to the approval and disapproval of others (Campos et al. 1994: 287).

The dynamics of social rejection and social support influence emotion. But they also trigger many known placebo and nocebo responses (especially those related to rewarding pro-social behavior and punishing anti-social behavior). To a large degree, the social nature of Asante indigenous ritual healing ceremonies, where patients are rarely left alone, the entire community attends, and everyone participates, enhances positive treatment outcomes. Asante rituals facilitate group cohesion and group entrainment. This triggers the release of oxytocin, which promotes social bonding and feelings of safety and security, as well as eliciting the parasympathetic or relaxation response. “One of the most powerful placeboogenic triggers is watching someone else experience the benefits of an

alleged drug. Researchers call these social aspects of medicine the therapeutic ritual” (Silberman 2009). Since Asante rituals are inherently group-oriented we would expect these placebogenic triggers to be enhanced in group settings.

Furthermore, in all my time in the field, I never witnessed a medical encounter for only one patient. At the shrines, clinics, and hospitals patients were constantly intermixing and participating in the ritual of medicine together. This is important because studies have shown that there is a very powerful placebo response in word of mouth, social observation and social modeling of another’s behavior. In fact, it is a routine practice in biomedicine when proscribing psychotropic medications (which are prone to extremely high placebo rates), to ask a patient which medications they have heard of and/or what medications any family or friends are on, because positive outcomes and adherence are much higher when a patient has a social connection to a medication (even more than if a medication is specifically designed for their gender, race, age, weight, etc) (Kozinets 1999; Silverman 2001; Popa-Velea et al. 2015). The social affect is not always positive. “Viewing another person show improvement...can increase the placebo component...and thus the overall potency of the treatment. Likewise, seeing another person...report side effects can substantially increase adverse effects” (Faasse and Petrie 2016).

#### ***5.4.2 Religious Dynamics***

Another significant feature of Asante ritual healing that has been found to be emotionally stimulating and physiologically beneficial is the integration of religious belief with healing rituals. “Religion provides context and direction for emotion and the

influence of religious systems on emotional experience and expression is considerable. For example, religions encourage certain emotions and discourage others. Religion also influences the expression of emotion—both its intensity and quality” (Emmons and McNamara 2006). Religion influences emotion in three ways: “First, religion encourages appropriate and inappropriate emotions and their level of intensity...Second, beliefs about the nature and attributes of God may give rise to specific emotions as well as influence overall emotional well-being...Third, religion offers the opportunity to experience a uniquely powerful emotional experience of closeness to the sacred” (Emmons and McNamara 2006:2).

Belief, positive expectation and the social legitimization of a healing system can induce powerful placebogenic responses. In fact, many aspects of alternative medicine may “provide a superior placebo” (Riley 1977) and “enhanced placebo effect” (Kaptchuk 2002). “Alternative medicine may be an especially successful placebo-generating health care system. Rather than specific biological consequences, which epidemiologists designate as “fastidious efficacy” ...alternative medicine may administer an especially large dose of what anthropologists call “performative efficacy”...Performative efficacy relies on the power of belief, imagination, symbols, meaning, expectation, persuasion, and self-relationship” (Kaptchuk 2002: 818). Unfortunately, nocebo responses— negative health outcomes triggered by negative sociocultural and emotional input—utilize the same neural pathways and pathologies. Just as positive expectations of recovery or an empathetic relationship with a caregiver can improve your health, negative expectations or relationships with caregivers can harm your health.

#### **5.4.2.1 Reputation and Word of Mouth**

Word of mouth and reputation in Asante ritual healing also play a critical role in successful therapeutic relationships. Most patients attend specific shrines based on word of mouth and referrals from others, and so attendance is based largely on word-of-mouth recommendations (a handful of *Ɔkomfo* were enterprising enough to advertise their services on radio, communicating that the healer was so successful and rich they could afford radio - a powerful reputation boost as well). Word of mouth facilitates placebo responses because in order to go to a specific *Ɔkomfo* you already have spoken to someone who has had a positive experience. As we discussed in Chapter 3: *Placebo*, suggestion from a trusted source is a very powerful placebogenic.

#### **5.4.2.2 Longevity and Continuity**

Developing and maintaining trusting therapeutic relationships is much easier in Asante ritual healing contexts because the role is for life, usually in the same village the *Ɔkomfo* was born and raised in, and often follows a trusted familial lineage. Thus, *Ɔkomfo*-patient relationships have continuity and longevity with patients which “encourages trust, provides an opportunity for patients and providers to know each other as persons and provides a foundation for making decisions with a particular individual. It allows physicians to be better advocates for their patients and allows patients some power by virtue of the personal relationship they have with this physician. Patients value continuity in and of itself, apart from its effect on health outcomes” (Goold and Lipkin 1999).

#### **5.4.2.3 Meaning and Communication**



The nature of the therapeutic relationship in Asante ritual healing lends itself to enhanced placebo effects by altering the meaning of an illness for the sufferer (Bourguignon 1976), modulating the “assumptive world” (Frank 1961), providing catharsis (Scheff 1979), manipulating expectations, encouraging polysemous meaning, facilitating talk therapy, releasing repressed childhood trauma (Spiro 1978), and transforming “a symptom...into a symbol” (Spiro 1978). “Alternative medicine may be an especially successful placebo-generating health care system. Rather than specific biological consequences, which epidemiologists designate as ‘fastidious efficacy’ (Feinstein 1985), **alternative medicine may administer an especially large dose of what anthropologists call “performative efficacy”** (Tambiah 1990). Arguably, the most effective placebo components of practitioner behavior are those which signal performative efficacy (Tambiah 1990), or authority, excellence, capability, confidence, and empathy. It has been argued that performative efficacy “**relies on the power of belief, imagination, symbols, meaning, expectation, persuasion, and self-relationship**” (Kaptchuk 2002:818).

*Ɔkomfor* provide meaningful interpretations of negative life events, conflict resolution, identity reincorporation, and forgiveness. Powerful nocebo effects are present in Asante daily life due to the ubiquity of witchcraft and cursing. Much Asante social and cultural behavior is conscripted to avoid social ostracism and achieve social belonging. *Ɔkomfor* play a critical role in social acceptance because they modulate emotions through action on social relationships (e.g., they mediate familial conflict, provide meaning for misfortune, and offer restitution and forgiveness via the ritual healing process). Asante

indigenous ritual healing ceremonies are culturally constituted defense mechanisms wherein these social dramas and illness narratives can be mediated by trusted healers. In fact, Asante healers spend the majority of their communication with patients discussing and mending social relationships. Patients who are suffering are literally surrounded by family. These beliefs and practices overtly and covertly encourage pro-social behavior. Witchcraft accusations and healings are done very publicly and with the explicit intent to punish, stigmatize, and discourage anti-social behaviors.

“Communication in a health care environment is particularly powerful and important: It literally kills or cures patients” (Eisenberg 1980:4). From the distracted yawn, the glance at the watch, or incomprehensible language, to the concerned look, attentive care, and compassionate touch, verbal and non-verbal communication affect how a patient perceives, internalizes, and then reacts to health-related care. “Everything in the health care setting communicates something to patients” (Ibid: 55). Moreover, there are specific placebo responses that are mediated by emotional communication. If someone is in pain or distress, an “emotional trigger of hope for relief [can] activate internal healing mechanisms (Humphrey 2002). Similarly, “people may invest in a treatment because it is consonant with their values and motivations and respond positively because of the emotional meaning of the treatment” (Kirmayer 2011:115). Because these types of emotional meanings are largely culturally-specific or subjectively based on a patient’s personal medical history, they are often omitted from serious medical research. Yet, we know that conditioned responses and sociocultural interpretation of a medical encounter significantly affect the treatment outcomes. Thus, it is important to utilize person-

centered ethnography in medical research that takes into account the values, motivations, and emotional meanings experienced by the patient, because these will influence treatment outcomes.

#### **5.4.2 Culturally Constituted Emotions and Defense Mechanisms**

Every culture has a

a specific cluster of symptoms, signs or behavioral changes recognized by members of those cultural groups and responded to in a standardized way. They usually have a range of symbolic meanings, moral, social or psychological, for both the victims and those around them. They often link an individual case of illness with wider concerns, including the sufferers' relationship with their community, with supernatural forces and with the natural environment. In many cases they play an important role in expressing and resolving both anti-social emotions and social conflicts in a culturally patterned way. The conditions in this group range from purely behavioral or emotional disorders to those with a large somatic component" (Helman 2007: 266).

Thus, emotions are experienced, interpreted, and expressed in culturally specific ways. Conversely (or additionally), sociocultural contexts can elicit specific emotions. In both cases, there are culturally approved methods of dealing with those emotions. We cannot fail to recognize that "in societies with different cultural patterns the same situation would be emotionally structured in a different way, the effects of individuals would be qualitatively, if not quantitatively, different, and other defenses would be invoked" (Hallowell 1955: 258).

For example, there is a mutually-reinforcing and self-perpetuating cycle between Asante culturally constituted fears of witchcraft and indigenous ritual healing ceremonies and *Okomfor* obligations. This cycle relies heavily on the body's susceptibility to adverse (nocebo) physical responses triggered by emotional fears and cultural expectations of being cursed (i.e., witchcraft or voodoo death). If the reality of witchcraft is part of your

paradigm, then any incident that is outside of the normal might be caused by witchcraft.

Like many explanatory models across cultures, witchcraft is a double-edged sword. It can explain many of life's misfortunes (e.g., death, sickness, tragedy, etc.) and yet at the same time it can trigger intense negative emotions (with their corresponding health consequences like stress, anxiety, and pain) around seemingly inconsequential, coincidental, or random occurrences (e.g., seeing an egg, a pineapple or really any ordinary item placed in a purposeful way might be evidence of a curse placed on you).

Such beliefs, however, are not just nonsense...but a thorough examination of the two phenomena of witchcraft and magic shows that they form a philosophy of life for the African. Witchcraft explains happenings that are beyond human explanation. It provides some sort of a solution to the problem of evil. It is thus an antidote to ignorance. For most people, at all times, and in all places, it is a necessity to know, even to know wrongly, rather than not to know at all. Beliefs about witches and the behavior associated with the beliefs form a closed system. **They not only provide an acceptable way of thinking about socially disruptive experiences of illness, death, barrenness, etc., but they also prescribe a socially approved way of doing something about them. They canalize and give institutional recognition to the hostile emotions which are unavoidable in small communities; and then provide a means of expressing and dealing with these emotions. Also, these beliefs are important social sanctions against anti-social behavior.** (Sarpong 1991: 49, emphasis added).

Furthermore, because the only qualified practitioners that can combat witches are *Okomfor*<sup>186</sup> and the only culturally-sanctioned methods of witchcraft alleviation, protection, and/or retribution are Asante indigenous ritual healing ceremonies, the system

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<sup>186</sup> Or other *Asante-based* religious healers like Muslim Malaams, Christian faith healers, or hybrid-healers that use the power of Christ to battle the incidents of witchcraft. I emphasize *Asante-based*, because the traditional practices of Islam and Christianity, for example, were not able to combat witchcraft. In fact, early missionaries told the Asante to give up their "backward traditions" and embrace the Judeo-Christian God and Jesus Christ, only to have a loss of parishioners attending church on Sunday and shrine on Wednesday because "If they don't believe in witches, how can they protect us from them?"

acts as a dialectic cycle where the medical therapy itself reinforces and codifies the etiology of the problem. Interestingly, over the years many religions including the Catholic Church developed specific practical methods for dealing with witchcraft and demonic infestations through the years via ritual prayers, anointings, sacraments, etc. (Amorth 2016). Knowing how cultural patterns and emotions impact sickness and healing is instrumental in uncovering the biocultural interactions of a culturally-specific medical encounter.

In fact, “research conducted over the past several decades has demonstrated a moderately strong association between chronic negative emotional states, such as hostility and anger, and negative health outcomes” (Williams 2002: 160). Emotions like hostility, anger, and fear negatively impact the central nervous system, endocrine system, immune system and cardiovascular system. At the same time, “the emphasis of many religious and spiritual traditions on mastering or controlling anger and other negative emotions may offer opportunities not only for studying the hostility phenomenon but also for understanding ways that the health-damaging effects of hostility may be thwarted” (Ibid.). Socioculturally sanctioned medical-systems may offer emotional healing components not available in biomedical or modern medicine. Due to deep-rooted emotional enculturation, adaptability, and health resource allocation, these indigenous health systems may provide psychological and social health benefits.<sup>187</sup> Looking at

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<sup>187</sup> Culturally constituted fears and defenses are based on the idea that anxiety and tension are both consistent and functional aspects of panhuman experience which can be “instigated and reduced ...through the operation of cultural factors (beliefs and institutionalized procedures) which define certain situations as dangerous, how the motivations of individuals are affected, and how the resulting behavior is related to the maintenance of the approved social code” (Hallowell 1955:267).

Eunice and Mercy's case study, it is impossible to truly understand their story outside of a thick cultural context. Could a biomedical doctor "heal" the root cause of their family anxiety? How might we be bifurcating other stories, and impeding the processes of healing, by privileging certain information (biological, mechanistic, and/or objective) over other information (cultural, historical, and contextual)?

Thus, it is important to shift the focus of religious behavior or ritual action from a system of beliefs, representational symbols or metaphorical propositions to a theory of practice (Bourdieu 1977; Sax et al. 2010), experience, and embodiment which takes seriously emotionally compelling aspects of ritual. A deeper discussion of this topic can be found in the *Appendix: Chapter 5: 5.2 Symbolic Versus Corporeal* as well as a literature review and analysis of what is real in the anthropological theory of witchcraft in *Appendix: Chapter 5: 5.2.1 What is Real?*

#### **5.4.5 Asante Emotions as Costly Signals**

We learned in previous sections of *The Social Life of Placebos* that emotions are the body's way of communicating significant information because emotions are hard-to-fake costly signals. For example, in the case of Eunice and Mercy, the emotionally heightened nature of these witchcraft healing ceremonies is a costly signal of its truth. Remember, my neighbor said, "*how can you fear a beating so much when your life is at stake?*" With Ghana's history and cultural expectations, Eunice and Mercy were literally facing life or death consequences, and their emotions conveyed as much. Their emotions communicated to themselves and to others in an honest, hard-to-fake way. In fact, we have evolved to trust costly signals more than other signals, which means that when

medical encounters are imbued with or trigger honest emotion, they become more effective for both participant and observer.

This is very important because as outsiders or medical practitioners, we often attempt to evaluate medical encounters from the most objective view point possible. We view emotional responses as subjective and separate from the task of diagnosing physical symptoms and prescribing treatments. We attempt to decrease the emotional component of medicine as much as possible, and avoid eliciting or manipulating emotional responses. Yet, explaining away witches or not taking them seriously as an influencing factor on the body has radically handicapped how we understand the effect of such beliefs on health. It is not as important that a practitioner believe in witchcraft as that he be aware of the patient's belief since, in Asanteland, that will explain many of the symptoms (e.g., anxiety, hypertension, stress, etc.) as well as largely determine the effectiveness of treatment (e.g., prescribing anti-anxiety medication will not solve the cultural etiology of the anxiety).

In this framework, an important factor that needs to be discussed in regard to emotional significance and costly signals is that medical treatments or therapies are subject to these same evaluations. Those that are able to trigger emotional responses or that include powerful hard-to-fake costly signals are more "trusted" than those that do not. Practitioners using techniques that are banal, common, unemotional or easily faked devalue the seriousness of the diagnosis and would not have the same effect on the patient and the community. In order to believe that a) a healer is capable of curing witches and b) the witches are cured, the degree of emotional significance needs to match

the seriousness of the problem to be an equally compelling costly signal, one that can convince the body and all the warning systems that there is no longer a social threat.

#### **5.4.4.1 Violence**

In the case of Eunice and Mercy, we saw that violence was the perfect costly signal to communicate to patient and community because it is one of the most hard-to-fake, emotionally significant, and difficult to watch costly signals. Due to our evolved empathetic brains (via Theory of Mind, Mirror Neurons, and parent-infant adaptations, etc.) and our hyper-sociality adaptations,<sup>188</sup> purposefully inflicting bodily harm on another person is one of the most poignant, threatening, and extreme anti-social actions anyone can do. Across cultures and history, for example, the quickest way for parents to censure antisocial behavior is to slap, hit, or threaten physical violence. The act of violence communicates not only that a behavior is socially unacceptable, but also that if repeated, it could sever social ties. For most people, the significance of the act of violence, and the negative emotions it triggers, is enough to motivate behavioral adjustment. Now, think about how socially significant culturally codified violence is. It has the same immediate and physical repercussions, but it is “enacted” or at least condoned by the entire community.

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<sup>188</sup> “Human learning and cultural capacities are most distinct because of ‘shared intentionality’: from the earliest age, we share attention, collaborate in joint action, understand at basic levels others’ plans, even share emotions, providing a platform for intensely social forms of awareness...Even when nonhuman animals understand others’ intentions, they do not fall in with those intentions, forming a ‘we’ intentionality, so they cannot learn as much from each other or cooperate as seamlessly...[This] encourages us to recognize the hyper-cooperativeness of our species: we collaborate in child-rearing, with non-kin, and in situations that seem to offer little individual benefit...Our social inclinations lead to extraordinary patterns of empathy, conformity, and imitation, bootstrapped by hypersociality” (Downey and Lende 2012:124).



Indeed, if we follow Foucault (1979:24) and rid ourselves of the instrumental ‘illusion that penalty is above all a means of reducing crime,’ we can begin to interpret modes of punishment (e.g., public beatings vs. private confinement) as expressive rituals, ways of saying things with action about our arbitrary views of responsibility, obligation, self-control, and personhood (Shweder and LeVine 1984: 47).

Thus, for an action as socially threatening as witchcraft, the emotional significance of the treatment needs to match the emotional significance of the problem.

This does not make the beating of Eunice or Mercy any less tragic, but based on the Social Pain/Physical Pain Overlap Theory (SPOT) (Eisenberger and Lieberman 2005) that was discussed in Chapter 4, people suffering from serious social rejection and group exclusion have a higher tolerance to physical pain. “Our results provide consistent and conclusive evidence that social exclusion produces decreased sensitivity and increased tolerance to physical pain, which in turn led to emotional numbness” (Dewall 2006). Feeling acute social ostracism is much the same as experiencing a broken leg. There is not a lot of extra mental attention to focus on anything but the pain itself. “The same is true for social injuries because all pain grabs our attention leaving less attention for other important things” (Lieberman 2013). What this means is that the social implications of physical violence often supersede the physical sensation of pain. The pain experienced from the severing of a social tie, a significant social mistake, or repudiation codified by the social structure, is often more painful than physical punishment itself.

#### **5.4.6 Asante Emotional Intensity<sup>189</sup>**

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<sup>189</sup> To be clear, when I discuss the concept of “intensity” it is in relation to felt experience and the emotional reaction of self and others in a particular context. I am not building on Alfred L Kroeber’s (1936) concepts of “intensity” and “climax.”

Communities share not only a system of symbols and interpretations, but also a tacit knowledge of a hierarchy of their significance. Thus, one of the goals for an anthropologist is to understand not only the meaning(s) behind symbolic representation, but also the order of significance that those symbolic systems have for the local population.

Emotional intelligence is critical to understanding how and why psychosocial factors influence physiological processes, and also to comprehending the degree or intensity of that interaction. Not all emotional responses are the same. Hierarchizing them based on degree of phenomenological intensity is a valuable way of understanding both the most important social adaptations for fitness and the most significant social and cultural values of a particular people.

Robert A. LeVine gives an excellent example of the interplay between personally felt emotional experiences and socially shared scripts of communication.

Mayer 1954 forecast my informants' descriptions down to the smallest details, not only as beliefs attributed to the community in general but also in narratives concerning personal experience. In other words, the Gusii I worked with for eighteen months told me stories of their own current encounters with witches for which Mayer's account provided the basic script, though his statements were based on interviews with other informants in a community some distance away. I discovered that Gusii accounts of personal experience with witches were in fact highly predictable in the social situations of their occurrence, the images of witches and victims, the narrative sequences of action, the emotional reactions attributed to self and others, and the outcomes of attempts to combat witchcraft. . . **These were the most intense emotional experiences reported** by my friends and neighbors about themselves and members of their immediate families, yet the form and contents of their reports were standardized, apparently following a conventional script with a single set of symbols and meanings (LeVine 1984:71, **emphasis added**).

In my fieldwork experiences with witchcraft, occult powers, cursing, accusations, and confession I have likewise rarely come across a case study that varied notably in form or content from the primary and secondary literature on African traditional religion or Asante indigenous religion and ritual. In this chapter I am making a conscious choice not to re-establish or re-describe the cultural script of Asante indigenous ritual healing and witchcraft as it already exists.<sup>190</sup> In contrast, I want to focus on the emotive intensity and relational connections that seemed to have larger implications in the lived experience of my informants than the script itself—especially in regard to the embodied experience of sickness and healing.<sup>191</sup> For example, why are some ceremonies more powerful and long-lasting than others even when they both follow the same ritual process? And how can symbolic representations actually influence behavior, social relations, and health?

As Joseph Adjaye, the Ghanaian scholar argued, “Less attention should be paid to the social construction of conventional collective values, and more attention should be given to the individual, emergent, and reflexive meanings that are evoked, affirmed, or

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<sup>190</sup> See: Achebe 1975; Adegbola 1983, 1998; Anderson and Johnson 1995; Antubam 1963; Appiah-Kubi 1981, 1993; Archampong 1989; Awolalu 1967; Awolalu and Dopamu 1979; Baeta 1962; Bannerman-Richter 1982; Boddy 1989; Behrend and Luig 1999; Booth 1977; Durodola 1986; Brautigam and Osei 1979; Chernoff 1979; Csordas 1983; Csordas and Lewton 1998; Danquah 1928, 1944; Dickson 1965, 1977; Dow 1986; Durodola 1986, 1983; Field 1960; Fortes 1969, 1983; Horton 1972, 1977; Idowu 1973; Kuada and Chachah 1999; Janzen 1978; Kwamee 2006; Gyekye 1985; Kyerematen 1969; Lambo 1974; Linde 2002; Lucas 1970; Masquelier 2001; Mendonsa, Eugene 1982; Middleton 1967; Mikulencak 1987; Moore and Sanders 2001; Parrinder 1961; Mullings 1984; Niangoran-Bouah 1991; Mthethwa 1989; Mullings 1984; Nketia 1955, 1963, 1970; Nukunya 2003; Onunwa 1990; Oosthuizen 2007; Opoku 1978; Osae 2003; Peek 1991; Prince 1964; Quarcoopome 1987; Rattray 1955, 1959, 1969; Reed 2003; Reynolds 1996; Sarpong 1971, 1974; Stoller 1989; Turner 1967, 1981; Twumasi 1972, 1975; Twumasi and Warren 1989; Wyllie 1983.

<sup>191</sup> “Suppose I have discovered that black magic is of compelling concern to Balinese: how best to convey it? Suppose too that they have a variety of forms and techniques: how best to render the information? It will depend, of course, on what I see as my task. Let's presume it is to “bear witness to the variety of ways of being human, ...to bear the burdens of one's observations” (Delaney 1988:293). In this context my task was to present an emotionally inclusive picture of one aspect of a ritual healing ceremony” (Wikan 1992: 475).

modified through the ritual drama” (Adjaye 2004:7). For this reason, the most significant aspect to me about LeVine’s assessment above is not that descriptions of witchcraft separated through time and space resembled each other, but that a) anthropologists, albeit only heretofore implicitly, often recognize different degrees of emotional intensity in the experiences that people express about themselves and others and b) even these “extra”ordinary experiences are communicated via shared, colloquial, and uniform ways. (Obeyesekere: objectifying and subjectifying personal trauma). Thus, the cultural script as a descriptive, cognitive, discourse-based analysis lacks crucial psychosocial components necessary to gaining a fuller understanding of the ritual healing encounter.<sup>192</sup> Affective analyses provide degrees of profundity, and attention to the social environment adds degrees of relationality and susceptibility, without which ethnography remains one-dimensional, a-historical, un-embodied, and incomparable as well as an inaccurate rendering of the lived experience. Furthermore, in a study of biocultural interactions and placebogenic phenomena, it is expressly those emotional components which most influence the processes of sickness and healing.

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<sup>192</sup> “If, on the other hand, an emotional state involves a perceptual awareness that is unique to the emotion, then emotions are cognitively significant, providing an understanding of the object of the emotion that is absent in a similar but unemotional episode of awareness. I argue the latter and substantiate the claim that emotions are essential to moral virtue because they can be essential to a full understanding of the situations that they involve. In such cases, emotions are not merely a symptom of the possession of an adequate understanding, but are rather necessary for having an adequate understanding... Full understanding consists in an appropriate understanding of an event, given our larger values, interests, concerns and goals (i.e. those things that relate to our thriving), and is a normative concept in that it implies a sufficiency or propriety of understanding. Conversely, deficient understanding involves not having the proper understanding of an object or event relative to these various values, interests, concerns and goals. To the extent that a proper understanding of a situation involves some depth of awareness regarding the situation, this added attention provided by emotional focus and import is beneficial” (Starkey 2008 2008:440).

Having attended hundreds of Asante indigenous ritual healing ceremonies, I found relatively few variations in the ritual structure between healers. Each *Ɔkɔmfo* had unique methods of proving authority, going into spirit possession, divining, and treatment options, but they all followed this fairly consistent basic structure. For example, there was nothing structurally or symbolically different from other Asante indigenous ritual healing ceremonies in the ritual undergone by Eunice and Mercy. On paper they followed all of the steps necessary for reintegration. However, there was a palpable increase in the degree of intensity of that particular ceremony. Likewise, there have been a few other ceremonies that stand out in my field notes not because of their deviations from the ritual structure, but because of their emotional intensity.

In analyzing these extraordinary cases a couple of things become apparent. First, the degree of emotional intensity was not necessarily based on the severity of the physical ailment, the likelihood of death, or the amount of money involved, but on something else entirely. I witnessed many calm ceremonies of patients whose lives and livelihoods were clearly in danger. I watched a relatively unemotional case where a man's entire leg was decaying with gangrene, and another one where the patient's immune system was so weak from AIDS that he was losing the final battle with Tuberculosis. I've interviewed jovial women discussing their children born with severe mental handicaps and countless seemingly banal cases of infertility and business failure. None of these cases had the emotional intensity of some much simpler cases.

One of the most passionate ceremonies I ever attended was a case about a stolen cell phone where a teenage boy was cocky and disrespectful to the *Ɔkɔmfo*. He refused to

admit to the cell phone theft and did not recognize the ceremony, the gods, or the ritual as a legitimate investigation and trial. At the end of the ceremony, he was given the sentence of certain death. The community was shocked and his parents wailed. They tried to change the *Okomfo*'s mind and a huge fight ensued. People were yelling all around the shrine. The teenage boy smirked, puffed out his chest and spit onto the shrine as he left. His parents were yelling at him and slapping him. The intensity of the proclamation was felt by all-around the shrine but the boy didn't appear to care or believe in it. People discussed the case long into the night, but no matter what arguments were presented, his fate remained the same. When I returned to that particular shrine, I inquired about the teenager and was assured that he had died of a sickness as promised. I could never locate that teenager or his family to corroborate the story, but I was told that his parents dragged him to two other *Okomfor* for second opinions with the exact same results: his parents were devastated, but the boy didn't take it seriously. That semester at boarding school he came down with a serious sickness and was dead within days. He never even had time to beg forgiveness.

When I was his student, Dr. Charles Lindholm used to tell us, "Look for contradiction. Look for places of paradox. That is where the real story is." The case of the stolen cell phone presented such a contradiction. How did such a simple, common, and seemingly inconsequential case produce one of the most emotionally intense ceremonies I had ever witnessed? How did this case elicit stronger emotions than ones where patients were dying of incurable diseases? Why were some cases so emotionally intense and others not?

This paradox stood out in my mind. The second thing that became clear when analyzing all of my ethnographic case studies in terms of their emotional intensity was that these cases, without exception, fell into three main categories: 1) lying or denying wrongdoing, 2) directly denying or challenging the *Okomfor* or the ceremony as a legitimate source of power and knowledge, and 3) intentional attempts to harm someone without regret or remorse. Not surprisingly, these categories encapsulate (in reverse) the essential Asante values of accountability, respect, and mutual aid. These categories also represent the fundamental anti-social behaviors of deception, cheating, status jumping, untrustworthiness, and lack of respect for high-ranking individuals and even life itself.

Understanding the increased danger, uncertainty, “anti-structure,” liminality, and emotional intensity of these cases in the lives of my Asante informants helped me to better order and prioritize Asante values. Death was sad and in many cases tragic, but it became extraordinary only in cases where it was purposefully caused by another person. Witchcraft and cursing were ubiquitous features in Asante daily life and thus not out of the ordinary, but the intent to harm another person by using them certainly was. The danger, punishment, and intensity came in response to the intent to harm to other people, which made denial all the more treacherous. While witchcraft accusation, confession, retribution, and reintegration are all built into the Asante cultural script, denying their power or one’s involvement in it is not. Denial and deception are significant. If there is no confession, remorse, or regret, it means that there can be no solution or punishment. In fact, most cases of witchcraft throughout Ghanaian history that ended in death seem to have been cases of denial as opposed to confession. If you admit to the crime, there is a

culturally conscripted defense mechanism in place for punishment, repentance, and forgiveness. However, if there is no confession, it becomes an extraordinary case. It undermines the entire system. Either an innocent person is put on the terrible path of restitution or a guilty person gets away with harming others unpunished. Neither is acceptable in the Asante worldview.<sup>193</sup>

Analyzing the emotional intensity of Asante indigenous ritual healing ceremonies helps us to see very clearly which aspects of these ceremonies are more significant to the Asante lived experience than others. They help us to see what sociocultural beliefs and behaviors are necessary to maintain the social structure. As we learn in the next chapter, I happened upon a ceremony that didn't require drumming. It was extremely uncommon, but it didn't cause any significant emotional intensity or threaten the system. However, witnessing a person unrepentantly lie, remorselessly harm another, or incredulously deny

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<sup>193</sup> Not surprisingly, this is not unique to Asante culture. Think about a very well-known case study in the American legal system. Caylee Anthony was a two-year-old girl who went missing and whose skeletal remains were eventually found near her family's home. From the very beginning, her mother, Casey Anthony, told numerous falsehoods and stories about Caylee's whereabouts and death, many of which contradicted and none of which fully explained what happened. Sadly, the death of a child by a parent is not uncommon in the United States and there are many public cases every year. However, this case in particular garnered the attention of millions and millions of people. It was discussed on all media outlets and in many polls. Casey Anthony was the most hated person in America. Now, this was not the most heinous crime in America at the time. Nor was Caylee the most loved celebrity. This was not the only case of a mother murdering her child that year or the only woman to be found innocent of the crime. So what was it about this case that captured the nation? Why was this particular case so "emotionally intense" in American culture? I argue it is similar to the cases of emotional intensity we are seeing in Asante culture. In both contexts, the cases that stand out are those that do *not* reinforce the system, but rather, *challenge* it. If too many of these cases go unresolved or unpunished, the entire structure (including belief, culturally reinforced behaviors, socially sanctioned solutions, legitimate power, methods of mediating cultural, social, and psychological tension, etc.) comes crumbling down. That is why some of the most emotionally intense case studies are those that subvert the system. See other cases that became extremely popular in the public mind where the accused did not confess, even in the face of mounting evidence and common sense, such as O.J. Simpson.



the power of god and *Okomfor* was unacceptable. Any of these behaviors was met with extreme emotions and punishments.

Eunice and Mercy *had* to confess of their witchcraft in order to be eligible for restitution. They *had* to get punished or else it challenged the idea that harming others was wrong. They also *had* to go through *Okomfor* (or other form of religious healer) as the only legitimate source of true repentance and forgiveness. Even when their niece Beatrice was recovering and got the “okay” from biomedical doctors, Eunice and Mercy were still held at the shrine until Kwame said they were “okay.” Biomedical doctors had no legitimate power over the aspects of witchcraft in this case.

#### **5.5.1.1 *Evolutionary Layers***

Similar to the adaptive warning signals of pain or stress, emotions communicate when a social tie is being strengthened or threatened. Particularly intense emotional signals communicate particularly egregious (and dangerous) social mistakes.<sup>194</sup> Also, adhering to acceptable sociocultural norms can elicit positive emotions and deviating from these norms can lead to negative emotions. Behaviors that raise your social status, reputation, and the quality or quantity of your social relationships can bring big emotional rewards. Think about the difference in degree of emotional intensity on a normal day doing what is “right” versus a time when you fall in love or get a promotion. The emotional rewards are more intense for those behaviors that have greater social significance. Similarly, behaviors that lower your social status, reputation, and the quality and quantity of your

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<sup>194</sup> Clearly individual variation plays a role here as well, especially in cases of social or personality disorders. For the sake of space and argument, we will not have time to get into individual variation.

social relationships can lead to intensely negative emotional punishments. Juxtapose getting a bad grade on a test with the intensity of negative emotion after being asked for a divorce or fired from a job. Emotions are more intense for behaviors that threaten your sociality. It is no different for social systems. Communities and social structures reward positive social behaviors and punish negative ones. Particularly dangerous behaviors, to the group and the system, elicit emotionally intense reactions and sanctions.

Clearly, the specific patterns and particulars of those signals are culturally dependent. People may feel zero guilt or shame for breaking the rules of another culture, but intense and debilitating guilt and shame for breaking the rules of their own. In this framework, culture and ritual are mechanisms that increase pro-social behaviors and decrease anti-social ones, and emotional intensity helps us to recognize those behaviors that are the most dangerous to the group.

### **5.5 Methodological Considerations**

Jamie's *faux pas* in the last chapter and my anthropological dilemma in this chapter caused me to examine anthropological methods of acquiring emotional intelligence in another culture. There is a deep discussion on these topics in *Appendix: Chapter 5: 5.4 Methodological Considerations*.

### **5.6 The Case of Eunice and Mercy**

This chapter was an attempt to analyze the story of Eunice and Mercy's witchcraft accusation, confession, and healing from a perspective that includes emotional intelligence, empathetic understanding, and emotion as "significance," in order to show how anthropological methodology is particularly suited to acquire these skills and make their attainment and significance explicit. Emotional intelligence is developed alongside

our ability to speak and yet most attempts to locate emotions within cultural analyses neglect to go beyond verbal definitions or symbolic systems, a failure which truncates “feeling” into what we can think or speak (regardless of the fact that much of our shared understanding of the world exists outside of both of these forms). Incorporating emotions into ethnography elucidates how:

- Social relationships rely upon an intuitive and complex ability to recognize, evaluate and mediate the emotions of self and others.
- The degrees of intensity (or banality) parallel lived experience.
- The degrees of intensity (or banality) make some things significant and others insignificant.
- Symbols become powerful, pervasive, and long-lasting.
- Meaning is embodied in individuals.
- Meaning is shared and resonated via intersubjective experience
- Experiences have degrees of emotional viscosity which make less emotional contradictions less powerful, persuasive, or long-lasting.
- Emotional intelligence, resonance, and empathetic understanding are critical in more accurately depicting life as its lived by others.
- Emotional intelligence, resonance and empathetic understanding are the most undervalued assets of anthropological methodology.
- Tacit knowledge can be made explicit.
- Personal experience can become an asset rather than a liability.
- Resonance can de-exoticize the “other” and prevent the consequences of differential sensibility.

For Eunice and Mercy, the belief and expectation of witchcraft—and the concomitant social and emotional sensations and elicitations—had real consequences on their social and physical self. “If men define situations as real, they are real in their consequence” (Thomas and Thomas 1928). What I learned from this experience was that the Teenage Witches Ethnographic Case Study becomes much more understandable when we elucidate culturally specific emotional significance in the ritual healing process and the relationship between health and emotions. Eunice and Mercy experienced jealousy and malevolence when they cursed Beatrice, followed quickly by ostracism,

extreme fear, and social threat. Almost single-mindedly, they followed the cultural script for forgiveness of their witchcraft and reconciliation with their family. Asante culture not only provided the “cultural constituents of the fears of individuals” but also “the institutionalized means available for their alleviation” (Hallowell 1955).

Kwame was able to use Asante indigenous ritual healing processes to cure and reinstate these teenage witches back into their families. Despite his subject methods, he provided “emotional-focused coping strategies to reduce a stressful reaction to a transgression. Direct empirical research suggests that forgiveness is related to health outcomes and to mediating physiological processes in such a way as to support the conceptualization that forgiveness is an emotion-focused coping strategy. Indirect mechanisms might also affect the forgiveness-health relationship. Namely, forgiveness might affect health by working through social support, relationship quality, and religion” (Worthington and Scherer 2004).

Teenage and child witches provide a window into the sociocultural world that they inhabit and the medical therapies that they use to understand the world around them.

Children’s enactment of spirit possession idioms and witchcraft in Africa including the meanings such idioms provide and the local healing resources they mobilize...can be interpreted as manifestations of social crisis and mass traumatic stress. On the other hand, such idioms also allow children to articulate, reflect upon, and communicate the complex feelings resulting from their precarious positions within families and communities under duress...witchcraft idioms may act as a healing resource at the group level, but at the expense of the accused child...The idioms of evil spirits and witchcraft speak of these children’s navigation of the moral universe of their postconflict communities. Given that children’s appraisal of their experiences through these notions may also exacerbate their anxiety, interdisciplinary research examining the microprocesses that lead

to children being haunted or accused, including emotional and physiological level effects, is urgently needed (Reis 2010).

At a very young age, Eunice and Mercy were thrust into the role of social outcasts and dangerous entities. They experienced extremely harsh living conditions and traumatic ritual processes. Through the socioculturally-conscripted methods for confession, punishment, and reincorporation, they overcame social stigma and physical banishment. Ultimately, the cultural script gave them “one of the most powerful emotions that has to be expressed...forgiveness” (Kelly 2014). And with that codified forgiveness, Eunice and Mercy were reincorporated back into their families and societies with their full personhood. They could, theoretically,<sup>195</sup> go back to being typical Asante girls.

Ultimately, all of these sociocultural beliefs, expectations and practices played a role in Eunice and Mercy’s health and wellbeing. The vestiges of our human phylogenetic social susceptibility created the conditions in which their physical bodies were experiencing extreme warnings (in the form of anxiety, stress, and pain) and punishments (in the form of negative emotions and unpleasant hormones) in order to sway them into more socially acceptable behavior. *Okomfo* Kwame’s actions and the context of the ritual healing ceremonies were able to intercept those negative warning systems and punishments by providing a projection of a positive future via positive expectation, hope, and a means for forgiveness. Through ritual actions, he was able to mediate Eunice and Mercy’s social relationships and perceptions about the conditions of their environment, ultimately dampening adverse and amplifying beneficial endogenous processes.

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<sup>195</sup> I say “theoretically” because despite my best efforts at continued communication with Eunice and Mercy over the years at the address they gave me, I was unable to ever track them down again and follow up on their story.

Humphrey [2002] posed the key question about the social dimension of the placebo effect from an evolutionary perspective. He suggested the need of the emotional trigger of hope for relief in order to activate internal healing mechanisms to counteract the otherwise biologically useful defence mechanisms such as pain and anxiety reactions. It is plausible to think that basic emotions generate the tendency to engage in the projection of positive (or negative) future events and mediate the effective integration and regulation of learning processes and social interactions (Colloca and Miller 2011: 1866).

### **5.6.1 Synopsis**

*The Social Life of Placebos*, Chapter 5: *Emotion*, provides a thick description of one particularly emotionally intense case study of Asante witchcraft accusation and curing. It pays attention to the affective elements of the various participants and the emotional moderating features of Asante indigenous ritual healing ceremonies.

For example, there is a mutually-reinforcing and self-perpetuating cycle between Asante culturally constituted fears of witchcraft, indigenous ritual healing ceremonies, and *Okomfor* obligations. This cycle relies heavily on the body's susceptibility to adverse (nocebo) physical responses triggered by emotional fears and expectations of being cursed (i.e., voodoo death). This chapter also discusses the beneficial (placebo) physical responses activated by specific features of Asante indigenous healing rituals (relaxation responses, entrainment, meaningful explanations, etc.) that alleviate fears (along with their concomitant biological effects) and induce certain expectations of protection, safety, and social support.<sup>196</sup>

Those fears and expectations represent methodological quandaries for anthropological research because they are represented in culturally particular ways that do not resonate

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<sup>196</sup> "Given body/mind/emotional resonance, we suggest that the placebo response is an evolutionarily adaptive trait and part of healing mechanisms operating across many levels—from genetic and cellular to social and cultural" (Thompson et.al. 2009:112).

with or influence outsiders' emotions in the same way as an insider's. Thus, it is difficult for anthropologists to adequately describe and understand the emotional significance of cultural practices for their informants. But it is not impossible. This section discusses the evolution of empathy and argues that emotional intelligence—the ability to recognize, evaluate and mediate the emotions of self and others—can be learned through the anthropological methods of extended fieldwork, participant observation and social and cultural immersion. Much like learning a language, which takes a long time and requires knowledge of both grammatical and pragmatic rules (how social context alters language use), acquiring emotional intelligence entails large investments of time in social interactions and involves both cultural and affective proficiency. It also requires intersubjectivity, resonance, shared cultural meanings and social rituals.

In and of itself...verbal language is not always so good for conveying or transferring sentiments or feelings from one person to another. For this, day-to-day verbal language needs embellishing, such as through lowering your voice or clasping the hand of the person you are speaking to. Better than these techniques, there is the language of ritual—of action sets performed for their culturally relevant symbolic value....Ritual communication includes more kinesthetic or bodily communicative mediums of song, dance, and prayer as well as systematized gestures or actions (Sobo 2013:82-83).

Emotional intelligence is critical not only to understanding how and why psychosocial factors influence physiological processes but also to comprehending the degree or intensity of that interaction. Not all social susceptibility responses are the same. Hierarchizing them by degree of physical or psychological intensity is a valuable way of understanding both the most important social adaptations for fitness and the most significant social and cultural values of a particular people. For example, *The Social Life of Placebos* attempts to order and prioritize Asante values by creating a hierarchy of

emotional intensity in Asante ethnographic case studies because emotions are signifiers of intensity and importance. There are some “problems with the way language handles the complexities of the world” (Goldschmidt 2006:33). While helpful at conveying technical or didactic information, unassisted by non-verbal or affective distinction, language does not always succeed at gauging the intensity or degree of importance of any particular signal. The complexity of Eunice and Mercy’s case highlights these emotional hierarchies well.

What stood out from the hierarchizing exercise was that the most emotionally “intense” cases were not necessarily those with the worst ailments or problems as I had originally hypothesized. Rather, the most intense cases fell into specific categories: lying or denying your wrongdoing, directly challenging *Okomfor*, and trying to harm someone. As well as encapsulating the essential Asante values of accountability, respect and mutual aid these categories also represent fundamental anti-social behaviors (deception/cheating, status competition and untrustworthiness) that would have carried significant costs throughout our evolutionary history and towards which we would have, therefore, adapted intense detection, disgust and avoidance responses. The hierarchizing exercise sheds light on the co-evolutionary relationship between social adaptations and susceptibilities and sociocultural expectations and institutions, or, stated another way, between universal panhuman predispositions and culturally particular expressions, interpretations and modes of maintenance.

Eunice and Mercy will forever represent for me the complicated intersections of belief and reality, emic and etic, and biological and cultural. Their case is a microcosm of



what many patients experience emotionally during healthcare encounters. There are spiritual, social, psychological and cultural factors that have an influence over the processes of sickness and healing. One of the reasons that anthropologists should be a more vital part of the dialogue on social susceptibility, health resource allocation, placebo studies, and mind-body medicine is that we can shed some light on some of these psychosocial factors. Trying to understand Eunice and Mercy's case without extended and embedded fieldwork would have painted a less accurate picture of the types and intensities of the many entangled "webs of significance" (Geertz 1973) interacting during that particular medical encounter. Understanding the neurobiological impact of meaning responses, social responses and placebo and nocebo responses should give us a vivid picture of how important emotions are in the processes and outcomes of sickness and healing.

## **CHAPTER 6: STRESS**

- 6.0 Chapter Overview
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- 6.2 Culture of Obligation and Fear
  - 6.2.1 *Hospitality/Hostility Cycles*
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- 6.5 Conclusion

### **6.0 Chapter Overview**

According to Adjima, a local Asante *Okomfo*, a patient must be made calm or malleable before ritual can affect his or her physical body. It is this idea - the role of stress and relaxation in amplifying or dampening our physical susceptibility to external stimuli - that is the focus of this chapter. Here we learn about Abena's infertility struggle, and dig deeper into the social nature of illness among the Asante and the impact of specific familial relationships and religious obligations on Abena's health.

In order to understand why and how those interpersonal relationships and cultural beliefs could have any influence on Abena's pregnancy, we discuss the evolutionary and proximate mechanisms of the autonomic nervous system. Why did the stress response evolve? How does it work? How does it impact sickness and health? How is it exacerbated in highly intelligent social species? What are its endogenous regulatory

processes, and how are those co-opted in modern environments? Understanding the mismatch between how the stress response evolved in our stone-age bodies and how it is currently being activated by our large brains, modern environments and extended social groups, is critical for understanding why our bodies are so socially susceptible. This background lays the foundation for understanding some of the proximate mechanisms of how that susceptibility operates during stress, including but not limited to psychoneuroimmunology, behavioral endocrinology and placebo and nocebo responses.

While evolutionary medicine has done an excellent job showing how various diseases have developed and changed over time and across different environments, the field has largely ignored that same focus on the medical therapies themselves. This section attempts to rectify that with an analysis of the different ways that humans use social and ritual means to mediate stress.

This section explains key features of Asante indigenous ritual healing ceremonies (cultural beliefs, music, altered states of consciousness, psychotherapy, phenomenological changes, symbolic healing and entrainment) and how they mediate stress. It goes over ethnographic, primary and secondary research in order to elucidate biocultural interactions in ritual healing and then it provides original ethnographic and physiological data to provide evidence that Asante indigenous ritual healing ceremonies impact stress, relaxation, and entrainment responses.

Stress is a hot topic. It seems like you can't open a magazine or peruse online media without an article about the effects of stress or ways to mitigate it. So what does viewing this topic in a culturally contextualized biocultural evolutionary perspective tell us that

we don't already know? For starters, recognizing our social susceptibility, modern stress load and coping mechanisms goes a long way toward taking seriously some of those behaviors often dismissed as ineffectual, illogical or merely symbolic, like ritual and religion. It emphasizes that social relationships are as necessary to your health and development as nutrition, exercise and avoiding harmful substances. Finally, it turns current thinking on its head and explains how our stone-age bodies are more successful, in many instances, at the social and ritual management of stress than biomedical and pharmacological treatments.

### **6.1 Abena's Case of Stress and Infertility**

"I don't really like this stuff. It's not good," said Anthony our taxi driver-turned-informant.

"Why?" I asked.

"Well you see," he said, "they trap you. You get caught in a trap and you can't get out. Plus, I am Seventh-Day Adventist now and so I don't like this fetish priest thing."

"Anthony, you don't have to come with us. You can just drive us there, drop us off and pick us up later" I said.

"No, no, no, no, no. That is not what I mean. I do not have a problem taking you and translating small small. I just don't like to go to them myself. Do you hear me?" he explained, gesturing back and forth with his hands.

"Of course." I answered. "You are free to stay behind if you ever feel uncomfortable or do not want to come farther. Okay?"

"No problem," replied Anthony.

Anthony was a local teacher and taxi driver. He lived close to us in our small village and loved to come to our house in the afternoons to talk. He was curious why we always hired taxis to go to the small villages. When I explained that I attend ritual healing ceremonies thrice weekly and every 42 days for *Akwasidae*<sup>197</sup> he told me his reservations about fetish priests and then offered his services as a driver. Over time, Anthony's participation increased. At first, he would stay in the car until we returned from the ceremony. Then, he began coming to the shrine with us and would sit back and talk to the other drivers. Eventually, he would sit with us and translate when the Twi was too rapid or when I had small questions and didn't want to interrupt the shrine workers. Toward the end, he just assumed his position next to me and offered a running commentary. He had his favorite fetish priests and even introduced me to new ones I had not met on my own. He felt comfortable having these alliances because he didn't feel "trapped" - if anyone from church asked him why he was attending shrine he would tell them he was driving and helping me, not going for himself. Over time, he explained that his aversion wasn't because *Okomfor* were bad or fraudulent people. Quite the opposite. He thought they were very powerful, but they created obligations and entanglements that were difficult to extract yourself from, and you did not want to be on the opposite side of an *Okomfor*'s anger. Plus, "fetish" priests and traditional religion were looked down upon by the Seventh-Day Adventist community. They all knew that many of their congregants visit *Okomfor* here or there, but only in times of great trouble (when basic prayers and church services weren't working) and never openly.

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<sup>197</sup>Every 42 days there is a ritual holiday celebrating and honoring the ancestors and Royalty.

One day Anthony asked if his wife Abena could accompany us. “Of course” I replied. Abena and I were close friends from the village though she had never before shown any interest in our afternoon excursions to the shrines. Abena was also a good Seventh-Day Adventist and had met Anthony at church services. They bonded over their modern approach to life and had an enviably loving romantic relationship in a culture where marriages were often economic alliances. On the way to Kofior Abena explained that she just wanted to sit back and watch what we were doing.

The Kofior shrine was about fifteen minutes from Boapong village where Anthony and I lived and worked as teachers at the local secondary school. The trail to the shrine was a tiny footpath off the red dirt road that was easy to miss unless you knew exactly where you were going. From there it was a two-mile hike into the rainforest. You were surrounded by nothing but foliage for close to twenty minutes yet you could hear the low rhythms of the drums from the beginning of the trail. The hiking and the constant beat created a hypnotic combination and by the time you reached the small clearing where Madam Derwah, Kofior’s *Okomfo*, performed it felt as if the ceremony had already begun.

We arrived as we always did by greeting all of the patients, shrine workers and Madam Derwah from right to left and then offering a new bottle of Schnapps to the gods at Kofior. Because the shrine was extremely remote I always had time before the ceremony really started to explain the purpose of my visit and get permission to take people’s physiological measurements before, during and after the ceremony. On this particular occasion everything had gone routinely at the beginning. The musical

ensemble, a group of Madam Derwah's sisters and nieces, had begun drumming, chanting and shaking musical gourds in the outdoor shrine while the shrine workers prepared Madam Derwah for possession. She was dressed in a white tunic to signify the unpossessed state and sat on a small stool opposite the drumming while waiting to become possessed. After a few minutes of listening, twitching and eye-rolling Madam Derwah's body seized and she jumped in the air. Her feet overturned the stool and she immediately began to dance in elaborate whirls and twists. Her shrine workers led her into the consultation room and she was changed into a striped fugu adorned with blood talismans, each one symbolizing the potency and life force of all of the many animal sacrifices predating this one. Madam Derwah danced elaborately for another half an hour and then returned to the consultation room where she conducted divination of patients' problems, etiology and treatment one by one. The music ensemble continued to play during this process and I was allowed to take patient measurements while they awaited their turn with Madam Derwah. It was while I was distracted that the entire story of Abena and Anthony got a whole lot more complicated.

I was in the middle of taking someone's blood pressure when I heard a loud, high pitched scream and then a scuffle. I looked up to find that Abena was screaming and Anthony was trying to hold her still. His arms were around her stomach and her body was twisting and flailing. She managed to fall onto the ground and break free of his arms. Her body was seizing but before anyone could reach her she had stood up and begun running around the shrine. Her shirt was torn, her light pants were covered in the red dirt of the shrine floor and her eyes were wild, unfocused and searching. She was screaming,

knocking over anything in her path, pushing away anyone who tried to contain her. It was when she ran into the forest and stood on a log that Anthony finally catch hold of her. At this point she was surrounded by other patients, shrine workers, musicians, and my entourage. Once trapped, her body slackened and she became compliant if not unconscious of voluntary movement. Her eyes remained rolled back in her head and her body shook uncontrollably. Madam Derwah emerged from the consultation room and commanded the shrine workers and Anthony to carry her into the consultation room.

Abena remained in this semi-conscious state while Madam Derwah, shrine workers and Anthony went through the divination process. Madam Derwah would ask a question, throw the kola nuts and then assess how they landed. A few times Anthony responded to a question and Madam Derwah got very upset, hitting a knife across a chair loudly and pointing at Abena. A few times Abena responded with grunts of approval or dissent. This process continued for a while and slowly Abena came back to her regular self. By the end of the divination process she was tired but fully conscious and talking.

Once all of Madam Derwah's questions were answered to her satisfaction (e.g., Is infertility your biggest concern? How long have you been trying to get pregnant? Is there any reason why you can't get pregnant due to earlier transgressions or harm? Is there anyone who had reason to curse you?), the *Okomfo* explained that since Abena was an identical twin she was particularly susceptible to spirit possession, and that she had become possessed by the gods of Kofior while she was listening to the music. The gods told her that Abena was being cursed by her two sisters-in-law because they were envious of her marriage to Anthony and that she would not be able to get pregnant unless she



continued attending the shrine and removed the curse via the ritual healing process. The gods got mad at Anthony because he refused to participate in any further ceremonies. Surprisingly, neither Anthony nor Abena questioned this explanation at all. By all accounts they had an unusually happy and loving marriage and it was the object of much ire and teasing from many people in their village.

After this pronouncement, Abena's visage changed. It was clear that she suspected her sisters-in-law were the cause of her troubles. She and the *Okomfo* discussed how she could pay a tribute to the shrine and do various ritual actions to protect her home so that the *Abosom* would prevent this curse from afflicting her further. It was prophesied that Abena would become pregnant within the month. Madam Derwah explained the steps Abena and Anthony would need to strictly follow to get pregnant and it was clear from her communication style and behavior that she thought of Abena as a typical patient. However, it was also clear, looking at Anthony's clearly frustrated face, that he was anything but.

Later Anthony confided in me that he felt betrayed by Abena. Clearly, she wanted to get pregnant. Everything they were doing in their SDA congregation wasn't working and he felt that she used his side-job with me as an excuse to visit the *Okomfo*. He never doubted Madam Derwah's power to help with their pregnancy or Abena's predisposition to spirit possession. The only thing he ever questioned was getting involved in a lengthy obligation cycle with this shrine. He was adamant against it.

At this point in the ceremony, Abena and Anthony's consultation was over and Madam Derwah signaled to her shrine workers to bring in the next patient and explained

what they needed to do next for Abena. Anthony resisted, saying he didn't want to pay or participate. There were some harsh words spoken between *Okomfo* Mensah and Anthony, and we were all excused from the consultation room. Abena took Anthony by the arm and they had a very heated private discussion at the edges of the shrine. Eventually, Anthony acquiesced and they followed the shrine worker's directions about what they were supposed to do next. Abena followed all of *Okomfo* Madam Derwah's requirements, which were paying small fees to the shrine, bathing with certain herbs,<sup>198</sup> and placing specific symbolically significant objects outside her home and on the paths of her afflictors. The explanation from Abena was that these objects would protect her from any negative forces preventing her from getting pregnant and would communicate to those doing the cursing that she was on to them, she had a powerful *Okomfo* on her side, and they better stop what they were doing.

On the ride home from the shrine that day I got to hear Abena and Anthony's perspective. Anthony was upset. He did not want to continue visiting the shrine because even if they got pregnant they would have a recurrent obligation to the gods always hanging over their heads. Abena admitted that they had been trying hard to get pregnant

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<sup>198</sup> Although ethnobotanical substances were prescribed, I was told that the herbs she was asked to bathe with were not particularly potent or known for increasing fertility. Rather, the focus of her treatment was on the ritual actions of protecting her from witchcraft, attending the shrine, and laying objects on the paths of her accusers. This was important to me as I was interested in how the ritual aspects of the healing process elicited a healing response and not in measuring ethnobotanical efficacy. While I enjoyed and appreciated the apprenticeship I experienced in Asante ethnobotanical healing plants, I had no way to measure or make claims about their physiological effect. Thus, I slowly grew more and more interested in the cases focused on the ritual process and action as therapeutic remedy, rather than ethnopharmacological or botanical substances. Studies on Asante ethnobotany and herbal healing, include, but are not limited to: Appiah-Kubi 1981; Mensah I 1992; Abel and Busia 2005; Asase et.al. 2005; Addo-Fordjour et.al. 2008; Agyare et.al. 2009; etc.

since they married and she knew that something was wrong for it to have taken this long. She did not know that her sisters-in-law were cursing her, but now that it was discovered she said she was not surprised. They always acted strange around her and she should have been pregnant by now.

Abena was an Asante woman in her mid-twenties. She had been married for three years<sup>199</sup> and biomedical doctors said that nothing was wrong with her reproductive system. I had been in Asanteland long enough to recognize the importance of that patient history. For the Asante, infertility or difficulty getting pregnant is not a normal part of life or a regular variation on the spectrum of women's reproductive health. Because of their extraordinary nature, infertility and impotence signal to others that you have committed a sin, broken a taboo, been cursed, afflicted by witchcraft, or worse, that you have had a self-induced abortion<sup>200</sup> that has affected your reproductive system and for which you are

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<sup>199</sup>It is a common thought that women should get pregnant no later than the first year of marriage. It is acceptable to get married in one's mid- to late twenties, but it is not acceptable to wait to have children. The inability to get pregnant right away signals female infertility (immediately) and male impotence (after some time) and both communicate very serious and egregious sins, broken taboos, and/or witchcraft interactions. In fact, one of my single roommates contemplating marriage highlighted the magnitude and intensity of this fear by saying, "Men can legally divorce you if you are not pregnant or at least getting fat in the first year. They will leave you and find someone else who can have a baby immediately. You show the world that they are impotent. Asante men are not impotent." Another person illustrating the social pressure to have children was a professor I became very good friends with named Adjima. He and his wife met in their village in Ghana and married young. They were in love and traveled the world together as he got his various degrees. We spent time together in both Ghana and the United States. One night in the USA he spoke about his problems, "Our families are pressuring us to get divorced. Jill cannot have children. They say she makes me look bad. We have been married for fifteen years. Why would I leave her for this?" Jill and Professor Adjima eventually adopted a teenage boy, but they always carried a stigma with them in their village, jobs, and social standing because of their lack of children.

<sup>200</sup>Although abortion is illegal in Ghana and if ever discovered carries enormous negative social consequences, it is very common. "Abortion is the most condemned method of birth control, but it is also the most widely used" (Bleek 1978:120). At the local secondary school, a boarding school of 500 students, where I worked it was reported (and these were only the cases that were discovered) that eleven girls had gone to a neighboring town to get strong ulcer medication that was known to cause abortions, six girls were tested HIV positive, one skeleton of an unborn fetus was found on the soccer field, and one girl was rushed to the hospital in a pool of blood and berated by school faculty, hospital staff, and local police because she

now being spiritually punished. Since the last possibility has the most problematic physical<sup>201</sup>, social, and marital repercussions, and the other etiologies cast doubt on one's character, infertility as a result of being cursed or afflicted by witchcraft is, surprisingly, the most favorable diagnosis. If infertility is linked to someone else's jealousy, malevolence, or actions, it removes some of the social consequences and self-punishing features of the ailment while also alleviating their psychological and physiological side effects<sup>202</sup>.

At the time I was surprised that this diagnosis seemed to alleviate much of Abena's anxiety about her difficulty getting pregnant. Since fear of witchcraft was ubiquitous, I figured this would be a terrible discovery. Instead, Abena was very happy. Despite what

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had attempted a self-administered abortion. Countless patients and healers (male and female) at indigenous healing ceremonies attributed their ailments to the secret abortions they had had, knew about, or paid for. Since contraceptive is a sign of impotence and not regularly used, abortion is usually a primary means of family planning. "In Ghana public opinion also suggests that induced abortion is the most widespread method of fertility control" (Bleek 1978:103). "Ghana's abortion law does nothing to prevent many induced abortions from occurring. However, few Ghanaian women who seek abortions obtain them from physicians, and most appear to induce abortions themselves, often in collaboration with pharmacists" (Ahiadeke 2001: 96). For example, many women secretly confided in me how to do a self-administered abortion by grinding glass coke bottles with a fu-fu pounder and then inserting it into the vagina, or taking a palm frond and stabbing the uterus, or which medication to purchase at the pharmacy that will have the best effect. Also, there are many herbal contraceptives, abortifacients, and fertility enhancers (Anarfi 2003). All of these variables make it common for women to have unknown reproductive problems after marriage (especially because they do not reveal any previous abortion efforts for fear of social and marital consequences and potential legal ramifications).

<sup>201</sup>There is severe stress, self-punishment, regret, blame, social rejection, ostracism, and stigma associated with abortion in Ghana (see also, Ahiadeke 2001; Bleek 1981, 1978, and 1990). Although there hasn't been any research on the psychological and health effects of abortion on Asante women nor has any cross-cultural researcher included Ghanaian women, we can compare these ethnographic findings of enormous social, psychological, and emotional trauma to research conducted in the United States on women's well-being after abortion that show little post-abortion trauma (Russo and Zierk 1992) to conclude that cultural context makes a big difference in the experience, interpretation, and coping responses surrounding abortion; something that would influence and be critically important even in biomedical healthcare settings.

<sup>202</sup>Social rejection, stigma, ostracism, and stress cause many negative physiological responses (Wilkinson 1999; Dickerson et.al. 2004; Link and Phelan 2006; Ryan et.al. 2009; 2011). Similarly, self-punishment, regret, blame, and accompanying stress influence the body in harmful ways (Groves 1978; Fuhrman and Kuhl 1998; Cacioppo and Hawkley 2003; Laye-Gindhu and Schonert-Reichl 2005, Wrosch et.al. 2007; Worthington and Scherer 2004)

had seemed to me to be an emotionally intense and quite elaborate ritual, she left the ceremony with a huge smile on her face. She said she was blessed to know who was cursing her. It also took away some of the personal stigma surrounding her predicament even though her husband was not supportive of the indigenous healing process.

Abena and Anthony's story continued to evolve as the weeks passed. I was feeling somewhat guilty about introducing the pair to Kofior shrine until I met one of Madam Derwah's sisters at Boapong's market one day and she gossiped to me that Abena had attended Kofior shrine behind her husband's back before the day she became possessed in search of answers about her infertility. I did not let Abena or Anthony know that I had been privy to this information and I watched as they struggled to decide what to do. Eventually, Abena won out and they went back to Kofior Shrine where they were asked to provide a monetary tribute to the shrine and continue specific ritual actions to ensure that the *Abosom* (gods) would prevent this curse from afflicting her further. It was prophesied that Abena would become pregnant within the month.

Abena followed all of the requirements and Anthony reluctantly acquiesced. They attended the shrine a few more times with me and on their own and she soon got pregnant. Abena was thrilled to be pregnant and told everyone she knew. Anthony was also happy but he soon wanted to stop their obligations at the shrine. They fought about this for a few months but eventually Anthony won out and they stopped attending and supporting Kofior shrine. By this time Abena was showing and her pregnancy seemed well on its way. Shortly thereafter I was invited over to their house and when I asked how she was feeling Abena explained that she had lost the baby. This put a deep tension in

their marriage. Anthony continued to feel that indigenous healing came with too many strings attached. If you didn't follow everything you were punished worse than the original problem you sought to solve and if they had a baby, they would owe the shrine forever. Abena felt distrust of her in-laws and now her husband. For her, Madame Derwah was able to illuminate things that were normally hidden and protect her from the afflictions preventing her pregnancy. The fact that she lost the baby only after they stopped obeying Madam Derwah's instructions only reconfirmed the legitimacy of the ritual healing process for Abena.

Many questions arose for me during Abena and Anthony's struggle with infertility and these questions make up the rest of this chapter: For better or worse, can social relationships impact the processes of sickness and healing? Is it possible for non-physical ritual actions to influence endocrine processes? Can a culturally-specific fear, like witchcraft, inhibit pregnancy? Is there something about *Okomfor* behavior and Asante indigenous ritual healing ceremonies that decrease stress? This chapter will explore some of these questions as we break apart the ultimate, proximate and social aspects of biocultural interactions during stress and ritual healing among the Asante.

## **6.2 Culture of Obligation and Fear**

The cases, theoretical arguments and background information scattered throughout *The Social Life of Placebos* were all selected to contribute to a thick description of the biocultural interactions at play in Asante medical encounters.<sup>203</sup> This case by case

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<sup>203</sup>All topics and case studies were chosen for their relevance to the chapter topic and the manuscript's research objectives. They do not provide a thorough background of Asante historical, economic, sociocultural, political or medical processes, they do not create a comprehensive intellectual history of

approach illuminates the many different factors, obligations, competing values - even surprises - inherent in Asante medical encounters; however, I fear that it may neglect many of the broad overarching patterns and beliefs that shape the Asante paradigm; a paradigm which has enormous meaning and social influence over medical encounters. In summary, there is a mutually-influencing contention in Asante culture between status, fear, obligation and power which undergirds much of Asante daily life. Due to space constraints, I have moved the detailed discussion of some of the following sociocultural beliefs, practices, and relationships that contribute to an Asante culture of fear into

*Appendix: Chapter 6: 6.1 Culture of Fear:*

- Culture of Fear (6.1)
- Hospitality/Hostility Cycles (6.1.1)
- Status (6.1.2)
- The Role of the *Okomfor* (6.1.3).

### **6.3 Stress and the Sympathetic Response**

Stress is not inherently a negative thing. It is an organism's generalized response to environmental pressures in preparation for action. Stress or the activation of the sympathetic nervous system is an adaptive response that can prepare for and protect the body against significant damage by making an organism highly adaptable to any combination of stressors.<sup>204</sup> "Furthermore, as a highly generalized species, adaptability and flexibility are our most valuable survival strategies. We are the only species on the planet (save some insects) who can occupy the varied ecologies and survive the earth's vicissitudes mostly due to the degree to which we are "non-specific" and adaptable.

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anthropological work among the Asante and they were not chosen because they are necessarily the most important aspects of Asante daily life.

<sup>204</sup>Stressors are anything in the environment that activates stress and these can change depending on circumstance.

However, when moderate stress becomes higher in intensity and/or consistent, it is called distress and can lead to immense physiological damage and, unabated, eventual death.

If the body is in a “fight or flight” or stressed state<sup>205</sup> the sympathetic system (the body’s acute stress response) floods the body with powerful hormones that slow and overtake everything from the circulatory system to the immune, reproductive, digestive, and gastrointestinal<sup>206</sup> systems, which are co-opted and focused on getting through the immediate stressor.<sup>207</sup> Heart rate, breathing, blood pressure, and dilation increase; growth and development are stopped in the short term and stunted long term; sweating and goosebumps follow. Adrenaline (or epinephrine), noradrenaline (norepinephrine),<sup>208</sup> and glucocorticoids are secreted throughout the body, increasing the heart rate and energy level, and priming the body for action.

When we find ourselves in situations that seem threatening, the hypothalamus—a structure that lies deep in the brain—sends out an alarm. This triggers two cascades of activity: a rapid response that releases one set of hormones and a more delayed one that releases a different set of hormones. Together these two lines of defense not only enable us to cope with acutely stressful situations but also prepare us for similar future situations by strengthening our memory of what we have just been through (Schmidt and Schwabe 2011:26).

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<sup>205</sup>I say “state” instead of “response” because chronic stress manifests as prolonged periods rather than acute episodes.

<sup>206</sup>The phrase “scared shitless” is an accurate description of the stress response and the body’s natural propensity to lighten the load, a behavior seen on a daily basis during fieldwork in Ghana when surrounded by goats in every direction frightened, running away, and pooping. Interestingly, similar phrases are found in most languages (LaCombe 2012).

<sup>207</sup>It has to be noted that while stress is often considered immunosuppressive, during acute stress the sympathetic response actually sends warnings to these various systems depending on the stressor so that the immediate functioning of that particular system is actually enhanced in the short term, i.e., the immune system is warned of a wound or infection and able to function quicker than if it had to identify the impending problem itself. However, these short term benefits are lost and negatively affected by the physiological damage of prolonged stress. “Thus, the timing and duration of stress may significantly affect the nature (enhancing versus suppressive) of the effects of stress” (Dhabhar 2006: 876).

<sup>208</sup>The same hormone artificially elicited by methamphetamines. British researchers typically use the word “epinephrine” and US scientists “adrenaline”, but they are interchangeable.



Ultimately, this response evolved because people who were better able to “fight or flee” predators or other life threatening events survived and reproduced at higher rates than those who fell prey to these circumstances, and the many traits that make up a strong sympathetic system were passed on in higher frequencies in subsequent generations. Due to the severe fitness consequences of inactive or slow sympathetic responses (it is more advantageous to always over-respond to any stressor than to ever under-respond, i.e. there is more damage done by not reacting to one instance of a rustle in the bushes if it turns out to be a lion), humans have very sensitive, predictive, and over-active sympathetic systems.

The phrase “the Fight or Flight response” was coined by Walter Cannon in his 1915 book *Bodily Changes in Pain, Hunger, Fear, and Rage* and has become a popular idiom although it is an inaccurate or truncated portrayal of how the body responds to stress. For example, most people leave out the freeze response which is useful when encountering bees, snakes (a common primate danger), and bears (playing dead counts as a form of freezing) and the reason behind such phrases as “scared stiff,” “frozen with fear,” and “like a deer frozen in the headlights.” Interestingly, in humans experiencing trauma where fleeing and fight are not options (such as some cases of rape or assault) the natural reaction is often to freeze. Sadly, many victims are filled with shame or see this “freezing response” as a sign of weakness rather than what it actually is: the “survival instinct” or an adapted response to inescapable danger based on millions of years of evolutionary pressures. One way that the freezing response relates to this research is that in situations of heightened stress, in this case during the ritual healing ceremony with intense poly-

rhythmic drumming, when fleeing and fighting are not options, our body still floods with epinephrine and norepinephrine, priming the body for some kind of action; and a common side effect of these chemicals (as in methamphetamine use) is repeated rhythmic rituals and trance-like states. Both of these responses are regular parts of Asante indigenous ritual healing ceremonies. The freeze response also has significant implications for PTSD in so far that it has been argued that the freeze response locks many of the stress hormones from fueling a fleeing or fighting action and that these trickle out over time in bursts of remembering (Rothschild 2000; Scaer 2001; Lacombe 2012). Further research should be done on the effect of rhythmic/trance environments (like those seen in Asante ritual healing techniques) for PTSD subjects to be able to “release” some of these “locked” hormones and psychosocial triggers in a cathartic environment with ritual actions and a safe (surrounded by friends and family) stimulated stressor (polyrhythmic drumming activates the sympathetic system). Likewise, it could be argued that having the opportunity to act during a stressor will give subjects back some of the control they lost when they froze.

Robust sympathetic or stress responses were enormously beneficial in our evolutionary past. They prepared our bodies to respond to immediate threats in our environment. In fact, they were so advantageous that over time our stress response became anticipatory—predicting and activating physiological changes even before conscious awareness of the specific threat. The autonomic nervous system evolved to produce a general non-specific arousal via acute endocrine changes (like bursts of adrenaline, endorphins, cortisol, etc.) until we can read the situation better and send more

specific resources (e.g., adrenaline and cortisol to flee or fight, endorphins and endogenous opioids in cases of pain or injury, etc.). The stress response prepares the body almost instantaneously for these physiological changes. It releases energy reserves, doubles blood flow to the muscles and oxygen to the brain, and preemptively increases platelets and painkilling hormones in case either are needed.

But like most aspects of evolution, there is a trade-off. Our bodies are incapable of functioning in a stressed state or with a high allostatic load<sup>209</sup> for very long without significant damage to the body. Fortunately for our phylogenetic ancestors, predator encounters and life threatening events were relatively rare and short-lived occurrences. Either you died or it was over soon. In our evolutionary past, stress was more acute and in short spurts, very adaptive for immediate responses to potential threatening situations. Similarly, our relaxation responses were capable of alleviating the symptoms of the stress and maintaining homeostasis in the body (Adler 2000; Mayer 2001; Benson 1975). Yet, throughout evolution, the relaxation response became unequal to the stress response, and created an allostatic load: “the wear and tear that the body experiences due to repeated cycles of allostatic stress responses, as well as to the inefficient turning-on or shutting-off of these activated responses. It is the price we pay for adaptation” (Fricchione and Stefano 2005: 59; Adler 2000; Mayer 2001). “Unfortunately, much of modern medical

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<sup>209</sup>“The physiological consequences of chronic exposure to fluctuating or heightened neural or neuroendocrine response that results from repeated or chronic stress” (McEwen and Stellar 1993). Allostatic load is used to measure the cumulative damage that frequent activation of the sympathetic system does to specific organs in the body.

practice demonstrates a misunderstanding of the evolution of physical responses to stresses that were faced by our ancestors” (Trevathan et.al 1999: 3).

Increases in intelligence<sup>210</sup> and social group size create what we call psychosocial stress--or the activation of the sympathetic response via a psychosocial trigger (i.e. dominance hierarchies, ostracism, reciprocity exchanges, deception, etc.). Thus, while stress has acute protective and adaptive benefits; unmediated, and with all of the psychosocial triggers of modern life, it has serious long-term health consequences, such as hypertension, heart disease,<sup>211</sup> decreased immune functioning, increased susceptibility to illness, prolonged recovery time, accelerated disease pathology, interrupted diurnal rhythms, changes in neural plasticity, cortisol induced stomach fat storage, enlargement of adrenal gland, atrophy of thymus, spleen and other lymphoid tissues, gastric ulcers, decreased number of lymphocytes, suppression of leukocyte mobilization, stunted

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<sup>210</sup>By intelligence I mean frontal lobe capacity, long term memory, abstract thinking, immediate recall, theory of mind, agency detection, self-consciousness, etc.

<sup>211</sup>“Healthy-appearing primates who have large cardiovascular responses to social stress may be at increased risk of coronary arteriosclerosis...The same appears to be true for humans” (Lovallo 2011: 44).

growth<sup>212</sup>, fluctuating asymmetry<sup>213</sup>, dull hair, skin problems<sup>214</sup>, halted epigenetic gene expression,<sup>215</sup> etc.

As the fitness costs of pro-sociality increased throughout human evolution, the autonomic nervous system was co-opted in order to anticipate, predict and respond to stressors in our social environments— it became susceptible to activation via psychosocial triggers. Furthermore, as our neocortex grew (including long-term memory, predictive reasoning, emotional intelligence and social intelligence), this system became

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<sup>212</sup>The term for permanently stunted growth due to early childhood stress is called stress dwarfism. A more common occurrence in the relationship between stress and height is the interaction of height and malnutrition. Political and economic factors are indicators of both levels of psychosocial stress and access to resources and are statistically significant in growth outcomes. There is a positive correlation between adult height and low early childhood and adolescent stress, where subjects with low GDP, malnutrition, inequality, and poverty tend to display stunted growth and development over time (Komlos 1994).

<sup>213</sup>Another consequence of the stopping or stunting of growth and development during prolonged stress is fluctuating asymmetry, which is a deviation from the normal developmental pathway because of early childhood stress and malnutrition, and as in dendrochronology, these periods of stress are permanently stored in the development of one's body. In fluctuating asymmetry, stress stunts or halts the normal developmental pathways and the body does not have enough energy or nutrition to ensure bilateral symmetry in face and body proportions, as it naturally does during early childhood development under favorable conditions, so that these people have measurably (albeit slightly) different eye and ear levels, finger lengths, and wrist and ankle circumferences. Fluctuating asymmetry is a way that the body resiliently attempts to maintain normal development under duress. It is also a permanent and costly signal of ill health (costly signals are discussed at length in another section of this dissertation) and a detriment in sexual selection, as symmetry is highly correlated with physical attractiveness cross-culturally, which makes evolutionary sense as it indicates a history of low stress and high access to resources. Interestingly, some studies argue that there is evidence that body symmetry also influences assessments of dancing ability which supports Darwin's hypothesis that dance is a signal of health in sexual selection (Brown et.al. 2005).

<sup>214</sup>Less severe consequences of current stress and a high allostatic load are skin problems, dull hair, and thin fingernails. The epidermis and dead cells of the hair and fingernails are some of the final non-essential systems to be allocated energy and resources. Thus, periods of prolonged stress are very apparent. This is both as a natural consequence of the damaging effects of stress and as indicators or costly signals in sexual selection about one's fitness and genetic quality. For example, many birds attract mates by the vibrant colors of their feathers or supple plumage. The evolutionary reasons why these seemingly non-essential traits are so important is that they communicate the state of the non-visible essential organs. If the body is malnourished, genetically inferior, or under prolonged stress, the color and quality of the feathers suffer first and indicate (unconsciously) these problems to potential mates. Likewise, clear skin, shiny hair, and strong fingernails are health indicators about one's present state of stress.

<sup>215</sup>Epigenetics is the study of the epigenome or the factors involved in gene inhibition and expression. Stress is one of the biggest factors in DNA methylation and histone modification, which effect whether certain genes will be expressed without altering the underlying genome.

not just susceptible to acute or social threats, but also to activation by imagined, perceived, remembered and anticipated social threats.

The risk of illness increases when individuals are subject to stressful experiences in the social environment and are unable to cope with or resist those experiences. Culture shapes the stress process. Anthropologists have adapted social-psychological models of the stress process to settings outside North America and Europe, showing how the definitions of stressful circumstances and coping resources change in different cultural settings, and how the interactions among these elements are modified by culture... Research on the stress process in medical anthropology has been fruitful both for increasing our understanding of the causes of poor health and for the insight into the dynamics of culture it has afforded (Dressler 2011: x).

Thus, while stress has physically protective and socially adaptive acute benefits; unmediated, it has serious long-term health consequences leading to disease and even death. The bad news is that the trade-off for immediate and anticipatory social preparation is that we often suffer from the negative health effects of social stress. The good news is that our autonomic nervous system has two complementary, homeostasis reinforcing systems: the sympathetic system (stress) and the parasympathetic system (relaxation) which means that both stress responses and relaxation responses are susceptible to psychosocial triggers. “Recent anthropological research has contributed to our understanding of such stress-health dynamics, demonstrating that psychosocial stress is largely a function of meaning. That is, the interpretations and attributions—or meanings—that people make about their social situations influence their experience of stress” (Seligman 2014). In fact, the relaxation response was an early name for placebo responses because stopping stress and promoting parasympathetic “rest and digest,” “feed and breed” and “maintain and repair” processes is one of the most common ways that psychosocial interventions lead to beneficial health outcomes.

As nature would have it, increased intelligence and social interaction have positive trade-offs as well. We are able to create cultural systems that decrease and alleviate the negative health consequences of stress.

The conscious minds of humans, armed with such complex selves and supported by even greater capabilities of memory, reasoning, and language, engender the instruments of culture and open the way into a new means of homeostasis at the level of societies and culture. In an extraordinary leap, homeostasis acquires an extension into the sociocultural space. Justice systems, economic and political organizations, the arts, medicine, and technology are examples of the new devices of regulation...the investigation of sociocultural homeostasis can be informed by psychology and neuroscience, but the native space of its phenomena is cultural...Both basic homeostasis (which is nonconsciously guided) and sociocultural homeostasis (which is created and guided by reflective conscious minds) operate as curators of biological value. Basic and sociocultural varieties of homeostasis are separated by billions of years of evolution, and they promote the same goal—the survival of living organisms—albeit in different ecological niches. The goal is broadened, in the case of sociocultural homeostasis, to encompass the *deliberate* seeking of well-being (Damasio 2010:28-29; *original emphasis*).

In the animal kingdom, there are examples of extreme physiological responses to hostile environmental conditions such as hibernation, torpor, and even freezing, (Moalem 2007), but these are unusual circumstances. Most species have some form of health resources allocation system that is able to “trade off different demands (e.g., immune defense, metabolism, reproduction, somatic growth) for the available resource levels and optimal allocation for both short-term welfare and long-term survival” (McNamara and Buchanan 2005:1008). Thus, we owe our stress responses, homeostasis seeking, and optimized resource allocation systems to a phylogenetic history that we share with many other animals. What makes us unique, however, is that increased social complexity, group sizes, and brain size led to greater fitness consequences for social selection and paved the

way for powerful sociocultural stressors and alleviators.<sup>216</sup> So the equation is the same: our bodies shut down important maintenance functions when faced with an external stressor and weigh out the damage to the body by length of time in a stressed state versus mortality or harm from the stressor. But the conditions that impact those physiological adjustments have become more complex in modern life.

Part of that complexity is the non-specific nature of stress and stressors. An early stress researcher, Hans Selye (1936, 1974) studied human responses to physical stressors such as cold, heat, pain, etc. Yet, despite devoting his life to the study of stress and stressors, he could never find specific, repeatable, universal correlation and concluded that “the determinants of the stress response are non-specific. Thus, many unspecific conditions can put strain on the organism and lead to a disease outcome” (Center for Studies on Human Stress 2007:3). Furthermore, different people will interpret the same stressor in a variety of ways. “The effects of meaning on the body have recently become the subjects of increasing attention in both the social and clinical sciences, as it becomes more and more clear that peoples’ interpretations and attributions about their experiences can have powerful effects on their health and well-being” (Seligman 2014).

Bear in mind that there is only an approximate relationship between stress—our internal, adverse reaction to stimuli we perceive as threatening—and stressors—the threatening stimuli that actually surrounds us. A traffic jam might make us feel stressed one day but not the next. This is good news because it suggests that with the right training and preparation, we might be able to face any stressor with equanimity (Epstein 2011:31).

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<sup>216</sup>Biocultural medical anthropologists have readily acknowledged the precedence that social environments have over physical environments in modern life where daily psychosocial stressors have a serious impact on health conditions. Blakey 1994; Dressler and Bindon 2000; Goodman et al. 1988; and McDade 2002.



Understanding the importance of perception and the interpretation of stressors in the amplification or dampening of a stress response is key to recognizing, first, the importance of cultural contextualization in any medical encounter, and second, the non-specific nature of many placebo and nocebo responses. Since the human body has evolved to respond to the perceived conditions of its environment, the stress response can either increase or decrease (and the relaxation or parasympathetic response will either become activated or inhibited) depending on one's interpretation of the world around them.<sup>217</sup> In fact, just as gene expression is inhibited by stress-related enzymes, many of the neurobiological components of placebo and nocebo responses are highly susceptible to stress. In short, the health effects of stress plug into very complicated interactions of co-evolutionary and biocultural factors: "risky health behaviors, biological characteristics, and neurobiological underpinnings that could account for the increased disease risk associated with psychosocial risk factors" (Williams 2002:169).

Thus, stress relates to sickness and healing in a couple of important ways. First, the stress response is another way to describe evolutionary expectancy mechanisms that trigger predictive biochemical responses before actual environmental pressures are fully understood. Because our stress responses are so robust, they actually function to elicit generalized, non-specific biochemical responses to what we expect or predict will happen

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<sup>217</sup>“Autonomic and endocrine outputs act by signaling receptors on smooth muscles and endocrine cells of peripheral tissues. For any given output signal, responses may be enhanced or diminished by altered effector function. As a result, the possibility exists that altered peripheral physiology may contribute to development or progression of disease” (Lovallo 2011: 39)

rather than what is actually happening<sup>218</sup>. These are the same pathophysiological mechanisms behind powerful placeboogenic responses generated by expectation, conditioned responses, and social cues. The second way that stress impacts sickness and healing is that in large or continued doses it can be detrimental to health and even deadly. It can also be triggered and alleviated via psychosociocultural variables. Nocebo responses function in similar ways and when nocebo responses are too strong or prolonged and the psychosociocultural methods of alleviation have been exhausted, exacerbated by the process, or are unable to provide a meaningful alternative, death can and does occur (Adler 2011; Benson 1997; Hahn and Kleinman 1983; Engel 1971; Cannon 1942).<sup>219</sup> Third, our body has evolved ways to combat stress which can be useful in healing. Our parasympathetic response co-evolved to maintain homeostasis and is also a robust system which has enormous therapeutic potential. In fact, one of the earliest researchers in placebo studies, Dr. Herbert Benson, famously coined the phenomena “The

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<sup>218</sup>Many placebo responses are activated by the anticipatory or forward thinking area of the neocortex. During any experience we encounter our brains try to predict the outcome and prepare the body. Placebo responses are our body’s way of preparing for what we anticipate will happen. Therefore, to our body, the reality of what is happening is less important than what we think is happening. Along the same lines (but to a much smaller degree), we physically respond to movies— increased or decreased heartrate and respiration, elevated or depressed mood, adrenaline rushes, oxytocin releases, amplified cortisol, etc— even though we know that they are fake (Scheff 1979; 1997).

<sup>219</sup>Cannon (1942), in one of the most widely accepted explanations of voodoo death, argued that extreme fear of occult forces can activate the stress response in powerful, emotionally persuasive, and continuous ways that without alleviation can lead to death. A more recent theory argues that voodoo death is actually brought on by the dorsal vagal response (Porges 1995) which is the body’s natural “braking” mechanism to slow heart rate, blood pressure, and breathing when the sympathetic nervous system reaches life threatening levels. Many animals die of this sudden dorsal vagal braking rather than the stress response and Porges argues that voodoo death in humans might function the same way (which is supported by Adler’s [2011] research on Sudden Unexpected Nocturnal Death (SUNDS) and cardiac arrhythmia). “Because the human species has a developed cortex, we can use our intelligence to make sense of what just happened (i.e. with a traumatic event). ..In the case of Voodoo Death, the individual’s belief system does not provide the necessary meaning that might calm the individual down. In fact, it is working the other way around. The individual’s belief system is creating a fear state that increases a sudden rise in activation. The more dramatic the increase in activation, the more the dorsal break is likely to come on” (LaCombe 2012).

Relaxation Response” (1976). As Damasio state above, the fourth way that stress impacts health is in co-evolutionary social, ritual, and meaningful ways which mediate the harmful effects of stress and activate relaxation responses. Some of the most common means of sociocultural homeostasis are grooming, ritual, meditation, empathetic touch, music, dance, etc. Finally, stress is a generalized response that is used to adapt and cope with particular contexts and is a model for the role in which context shapes physical experience. Our bodies have evolved to be flexible, adaptable, and non-specific. They are designed for psychosocial plasticity and to be influenced by our sociocultural environments.<sup>220</sup> “Whether you believe you are drinking alcohol<sup>221</sup> or living perilously under a witch doctor’s malediction,<sup>222</sup> it is culture as well as neurobiology that together constitute the matrix from which the corresponding bodily changes proceed” (Morris 1999).

This background on stress allows us to analyze Asante indigenous ritual healing in a new way. Which aspects of Asante culture induce stress? Which methods and techniques regularly practiced in Asante medical encounters induce a relaxation response? Do we have any biometric proof? The following section will answer these questions by uncovering some of the biocultural interactions taking place, in regard to stress and relaxation, during Asante indigenous ritual healing ceremonies.

#### **6.4 Biocultural Interactions in Asante Indigenous Ritual Ceremonies**

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<sup>220</sup>“Because chemicals produced by immune cells signal the brain, and the brain in turn sends chemical signals to regulate the immune system, the two systems are able to signal each other continuously and rapidly in response to external or internal threats to homeostasis” (Koenig and Cohen 2002:174).

<sup>221</sup>50% of participants “get drunk” on placebo alcohol (Hammersley, Finnigan and Millar 1992).

<sup>222</sup>Healthy people can die after a curse (Hahn and Kleinman 1983) or unmediated culturogenic or psychogenic expectation of death (Adler 2011).

This section includes the most quantitative data in *The Social Life of Placebos* and provides statistically significant evidence of relaxation and entrainment responses occurring by way of Asante indigenous ritual healing ceremonies. It details how these rituals reduce social stress through actions on a patients' interpersonal relationships in "shift and persist" tactics proven in research settings to reduce stress and anxiety and increase resilience. Because our stress and relaxation responses are so sensitive to socially and culturally specific triggers, it is vital that we understand the context in which patients interpret, experience and embody these triggers. This section follows a trajectory similar to that of renowned psychological anthropologist Rebecca Seligman's new book (2014) on the biocultural interactions of Candomble in Brazil.<sup>223</sup> It concludes by raising important questions about the relationship between stress and health and how powerfully cultural meaning and social ritual can exacerbate or alleviate stress-based suffering.

The following sections will highlight ethnographic evidence as well as findings from secondary sources to discuss which features in each stage of the ritual process have therapeutic efficacy. Interwoven in these descriptions will be the results of primary

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<sup>223</sup>"Embodied learning is a biocultural process and as such involves bodily mechanisms, including psychophysiological ones. Embodiment is reflected in and produced, at least in part, by biological processes designed to be responsive to social and cultural input. A particularly critical and unique contribution of this study, therefore, is the use of data from psychophysiological measurement to explore the biological dimensions of embodied learning....Transformation of the whole self has the potential to heal because it affects both embodied processes, including psychophysiological ones that may contribute to symptoms of bodily affliction as well as discursive and meaning-related processes that, through their effects on interpretations and perceptions, may transform bodily experiences from symptoms of illness, to markers of spiritual capacity....and finally, cultural systems like spirit possession, which synchronize embodied and discursive forms of learning, are particularly effective at facilitating transformations that heal" (Seligman 2014).

biometric data collected in the field with *Okomfor*, shrine workers, and patients before, during and after Asante indigenous ritual healing ceremonies.

#### **6.4.1 Biometric Data**

Located in the *Appendix: Chapter 1: 1.3 Quantitative Physiological Measurements* is a description and discussion of all of the various quantitative and physiological methods assessed and attempted over the course of this research. Ultimately, field conditions and the sacred nature of the healing ceremonies limited what types of biological measurements I could collect. In the end, I captured heart rate, pulse, blood pressure<sup>224</sup> and blood oxygenation levels, along with subjective evaluations, of over 95 individuals before, during, and after Asante indigenous ritual healing ceremonies. While they don't get deep into the neurobiology of Asante rituals, these measurements can tell us a lot about stress and relaxation responses as well as some surprising results about the social nature of these rituals.

As we learned from the thick descriptions of *Okomfo* Kofi's and *Okomfo* Derwah's ritual healing ceremonies, each *Okomfo* has a unique tone and style. While there are variations between the different techniques of *Okomfo* and the size of their shrine and patronage, there are specific patterns and processes that are shared by *Okomfo* in the Asante region in terms of requirements, procedures, explanatory models, and ritual process and these elements are consistently observed by other Asante researchers,

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<sup>224</sup>Systolic blood pressure measures the pressure in the arteries when the heart contracts. Diastolic blood pressure measures the pressure in the arteries when the heart muscle is resting, between beats. Heart rate is the rate at which the heart contracts and pumps blood throughout the body every minute. Pulse is a parallel measurement, but instead of measuring heart contractions, it measures the rate of increased blood pressure in an artery each time the heart beats.

including Twumasi (1975) and Nketia (1963, 1970). Overwhelmingly, Asante indigenous ceremonies (from those in the King's palace to that of a newly appointed apprentice) all follow a similar ritual healing process--preparation, disassociation, and resolution--and they all shared key features such as music, spirit possession, divination, libation, and consultation.

#### 6.4.2 Preparation Stage

According to Bernard, a local Asante *Okomfo*, the first step to any ritual healing is *dwudwo*.<sup>225</sup> In Twi, this literally means: (*dwu*) to work or make (*dwo*) calm, quiet, humble, soft, tame, comfortable, and/or appeased.<sup>226</sup> While other healthcare practitioners I worked with did not state this fact so clearly, this pattern persisted across all of the different healthcare systems I observed. Patients were required to be calm before any actual work began. In fact, in cases where a patient was overly emotional or visibly upset, I heard many caregivers repeating the words “*Dwodwoodwo*”<sup>227</sup> over and over to calm them down. *Dwudwo* is so important, that many times I saw patients ignored, turned away, or refused care until they approached the healing encounter calm, quiet, humble, soft, and tame. Asante conceptions of relaxation can teach us a lot about how ritual

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<sup>225</sup> *Dwudwo* (*jwùjwóu*) (v) = to calm, allay, tame, appease, soften, tame, refresh. To soften, to tame, to become soft or tame.

<sup>226</sup> *Dwo* (*jwòu*) (v) = to be meek, humble, to abate, cool, *Dwo* = (v) to be harmless, kind, cease, wither, to cool, to be calmed, appeased, allayed; to abate, subside; to become or be soft; to relax from a state of excitement; to be calm, quiet, gentle, mild, meek, tame, peaceable, humble; to come to rest, to feel comfortable: *Me ho adwo me kakra*: “I feel a little better.”

<sup>227</sup> *Dwodwoodwo* (*jwóujwóújwóu*) (adv) = safely. This word has a soothing sound where the word phonetically sounds like what it describes. This type of onomatopoeia is common in Niger-Congo non-bantu West African languages. Some other great example of in *Twi* is the word for noise, *gyegyeegeye*, or noisemaking, *gyegyeegeye*, which are themselves noisy to say, the word for restless, *kramakrama*, the word for uneven or lumpy, *apɔwapɔw*, the word for little, *kakrakakra*, the word for acidic or sour, *nyinyanyinya*, (try to say that without “experiencing” sour), the word for unsteady, unstable or unsettled, *gyigya-gyigya*, and the words for knocking, *kɔkɔkɔ* and *memeeme*. In *Yoruba*, some examples are the words circuitous, *kólokòlo*, crooked, *wíwó*, or rough, *sákisàki*.

processes can influence the physical body. For example, *dwudwo* teaches us that one must be calm before a ritual can have any effect. Because stress shuts down many body systems, halts genetic replication enzymes, and decreases trust, openness and psychological flexibility (Koen 2013), calmness and relaxation as a prerequisite for medical treatment is an effective framework. It also raises the question, are Asante ritual healing ceremonies structured in a way that promotes *dwudwo*?

The setting of ritual healing ceremonies is important as it acts as both a framing reference and a biological preparation for disassociation. It frames the ritual as an alternate reality with specific drumming, dancing, chanting, location, dress, and procedure taboos. These are common paraphernalia in trance ceremonies which are used by the *Okomfo* as an invitation for the spirits to overtake him. These are also visual evidence that the *Okomfo* is no longer a human, but rather an *abosom* inhabiting an earthly frame. The setting provides the ambience needed to go into a trance as well as the proof needed to maintain the veracity of spiritual interaction. “The monotonous chants, the endlessly repeated refrains, the fatigue, the fasting, the dancing, the narcotics and so forth, create a sensory condition that is wide open to the ‘supernatural’” (Frecka: 1989:70) and, importantly, these behaviors also create the conditions for decreased stress responses and amplified relaxation responses.

In Asante healing ceremonies most rituals begin with drumming, chanting, and dancing. This drumming communicates to the village that a healing ceremony is going to take place as well as to the gods that they are being petitioned. Each village has different rhythms, which invoke the specific village *abosom*. Every healer goes into the trance

state a little differently. Some *Okomfor* use hallucinogens, fasting, and/or meditation and some make themselves tired with dancing, jumping, and whirling. Most have a set of “proofs” of authority that highlight their power. I’ve witnessed *Okomfor* who prove their great strength by stabbing themselves, pouring sand into their eyes, whipping themselves, rubbing poison ivy all over their body, and lighting explosions on their hands. In one case, the *Okomfo* was a very elderly woman who gave evidence of her power by doing a series of cartwheels. Other *Okomfor* display their omniscience through psychic “tricks,” games, magic, and other “ways of knowing” (Peek 1991). Some *Okomfor* highlight their wealth with expensive changes of clothing and others show off their physical acuity with special dance moves and jumps (See *Appendix: Chapter 6: 6.2 Okomfor Proofs of Power and Authority* for a full list and detailed description of some physical and psychological proofs of power). “All of these activities contribute to the appearance that some influence beyond the natural powers of the diviner is operating, whether it is attributed to a spiritual being or to the diviner’s supernatural powers. Music, rhythmic drumming, or singing, and special settings are commonly used, all heightening the impact of the diviner’s performance” (Steadman and Palmer 2008: 138).

The sheer vastness of the preparation paraphernalia and individual displays make it difficult to pinpoint the exact biological processes of eliciting trance states in Asante ritual, but much research has been done on altered states of consciousness (Sabourin et al. 1990; Winkelman 2000) and we will talk about this a little later in this section. For now, an important feature to highlight from a biocultural interactionist perspective is



something all of these ritual actions have in common (despite their differences in form and content): poly-rhythmic drumming and chanting.

#### **6.4.2.1 Music**

Drumming and chanting is a common denominator that each of these *Okomfo* share during the preparation stages of their ceremonies. Music is such an important part of life in West Africa that I rarely attended any event that didn't have some form of music. In fact, "no one who has visited a scene of public worship in Africa can be in doubt that one of the attributes of the gods is that they are music-loving gods" (Agordoh 2005: 39). Music is a significant part of healing rituals throughout Africa (Boddy 1989; Colson 1969). West Africa has received much scholarly attention for the role of music in determining roles and rituals, from griots, shrine musicians, and sacral music, to poly-rhythmic drumming, call and response, and the politics of high-life (Chernoff 1979; Van der Geest and Asante-Darko 1982; Van der Geest and Whyte 1988; Reed 2003). For the Asante, music is not limited to religious or ritual healing contexts. It pervades many aspects of routine, economic, social, and political life. However, ritual healing ceremonies are fundamentally experienced and embodied within musical environments and patients' "experience sickness and healing through rituals of consciousness-transformation whose experiential core is music" (Friedson 1996, xi).

However, the drumming and chanting at Asante indigenous ritual healing ceremonies is unique. It is reserved for specific times and places, there are only certain instruments and rhythms allowed, and despite the global success of many Ghanaian musicians and musical styles, "entertainment music" is almost never part of ritual healing ceremonies.

During the ritual process, the basic function of Asante drumming is communicative (Wilson 2006). There are many different types of ritual drumming, but the most common modes are the signal mode, speech mode, and dance mode (Nketia 1963), all of which act as a means of communication during the ceremony. The relationship between communication and drumming is best elucidated by the *atumpan*—the Asante “talking drum”—which is famous for its ability to imitate Twi speech patterns of high and low tones. Unlike the common rhythmic percussion patterns of most drums, the *atumpan* is played with “a steady flow of beats, often lacking in regularity or phrasing” (Nketia 1963: 28).

Drums are loud and can be heard for miles; they communicate to everyone in the village and nearby farms that something is happening at the shrine. They also communicate to the *Abosom* that their presence is needed and that it is time to possess the *Okomfor* (Twumasi 1975; Bannerman-Richter 1982). The rhythms, lyrics, chants, dances, and level of intensity will vary depending on the particular ritual or festival and “each god has its own type of music, which interests him more or which is of his own taste,” (Agordoh 1994: 39). But there is more to the role of drumming in Asante ritual healing ceremonies than this functionalist explanation. Upon extended observation it becomes clear that drumming is a preference, not a necessity. Because these rituals are very time consuming (the average ceremony lasts three-four hours and drumming is usually consistent throughout) and musicians are paid something small for their time, there are

ceremonies at smaller shrines, on non-festival days, and in the middle of the week that do not have drumming.<sup>228</sup>

Aside from the communicative function, drumming also has an efficacious element. The better the drumming, bigger the spectacle, the more power patients and attendees perceive and the better the shrine's reputation will become. Thus, via anecdotal evidence, there is a link between the efficacy of the healing ritual and the quality of the drumming.

The efficacy of drumming extends to the specific rhythms as well. The master drummer at Moateng described how as an apprentice he was taught specific rhythms proven to be the most effective over time, and those were the rhythms he used the most often. However, he also claimed that he could create new rhythms and/or adopt rhythms from other shrines that he liked, which, if they were found to be effective, could be added to the repertoire of his shrine (Wilson 2006). Asante drummers can move those present at a shrine the way a band moves concertgoers. A good drummer alternates rhythmic displays and surges of intensity, depth, speed, convergence, and dissonance in order to sway the crowd. Drummers vary the speed and intensity of their drumming to correlate to the stages of the ritual process. The chanting and drumming become particularly intense when *Okomfor* are attempting to go into spirit possession. "The drummer is in tune with the spirit so that his rhythm changes when he senses the spirit's advent; both the spirit and humans arrive at the climax at once" (Turner, E. et al. 1992: 193). Famous drummers

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<sup>228</sup>It must be mentioned, however, that there is still some rhythmic accompaniment during these ceremonies. A small bell is used to signal to the *Abosom* to come for possession and throughout the divination and supplication portions of the ceremony a small rock is tapped against a larger rock on the first two beats of a 4 beat measure consistently for approximately 30 minutes to an hour. There are also often local village women who are already present at these rituals and chant at the beginning of the ceremony.

(and drumming ensembles)<sup>229</sup> are able to communicate via the beating of the drum in the most rudimentary language that penetrates and oscillates deep within our bodies.

“In addition to the use of songs as a vehicle for worship, it is a means of stimulating the... gods to action and keeping them in a condition of ecstasy until the mission of the gods has been fulfilled” (Agordoh 1994, 39). When asked directly if drumming had a physical effect on people attending the ritual, local drummers stated that drumming gives energy to the *Okomfo*, which helps them become possessed and maintain enough energy to complete the ritual with vigor. In fact, “according to the local drummers, the *abuko* and *adaban* rhythms, both of which are traditional dance rhythms, are played during the ceremony to excite and energize the *okomfo* (Who are acting as the ‘media of the gods.’” (Wilson 2006). To test this assertion, I measured the heart rate, blood pressure, pulse, and blood oxygenation levels of *Okomfo* before and after ritual ceremonies, with and without drumming.

#### **6.4.2.2 *Okomfo* Biometric Data**

One of the problems with being in the field is that I cannot isolate specific independent variables. I cannot ethically ask the healers to pretend to be spiritually possessed this time or to forgo drumming so that I can control variables that I am hoping to measure. However, in a fortuitous turn of events, a healer I regularly worked with and whose patients I had measured before held a series of ritual healing ceremonies without drummers. This is a rare occurrence and usually only happens when there are so many

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<sup>229</sup>The concept of “drummers” includes more than just one drummer. Usually there is a leader, but on average there are 3-6 drummers with various types of drums as well as other percussion instruments like the bell and maraca.

patients that the healer needs to perform in the middle of the week, when it is difficult to get the entire shrine drumming and chanting ensemble together. Luckily, I was able to attend a number of these rituals and collect enough measurements that we could compare the physiological effects of Asante indigenous healing rituals with and without drumming (to my knowledge the first study of its kind). Drumming is particularly isolated in this framework, even though chanting, singing and dancing<sup>230</sup> play an important role in ritual ceremonies, because there were no ceremonies where chanting, singing, and dancing *did not* take place. These were features, in one form or another, in every ceremony I ever attended, and thus, cannot be isolated and measured for biological significance.

Another limitation is collecting *Okomfor*'s biometrics while they are in the ritual process. Beforehand they are usually preparing long before any patients or shrine workers show up and afterwards there are always tasks to be done until late into the night. So anytime I measured *Okomfor* I was interrupting their work. Patients were much easier to measure as there is a lot of sitting and waiting time before and after ceremonies. I measured patients at most of the shrines I attended, but I measured *Okomfor* only at shrines where I was a very close friend. As a result, I have only 8-10<sup>231</sup> *Okomfor* subjects (depending on the metric) in the sample. However, in a turn of good luck, I was able to get equal numbers of *Okomfor* at ceremonies with and without drumming.

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<sup>230</sup>“The aesthetic appreciation of singing derives from the quality of the singer’s voice and the composition, style of delivery, significance of the words, and suitability and appropriateness. The aesthetic value of a song derives also from the level of audience involvement, which is a reflection of the amount of enjoyment generated by the performance. To be aesthetically appreciated and valued, a musical performance must arouse the involvement of the audience, because in the traditional African society music-making is a participatory communal activity; everybody takes part in it” (Gyekye 1996: 128).

<sup>231</sup>Due to the variable nature of the ceremonies, there were times when I wasn’t able to collect all the before and after measurements of some patients, shrine workers and *Okomfo*.

Anecdotal and ethnographic research claims that drumming at Asante indigenous ritual healing ceremonies increases the energy and vigor of *Okomfo*. I translate that as an increase in cortisol, adrenaline, and blood flow. Due to field constraints, the only valid and conclusive measure I had that would indicate “energy” levels is increased or decreased heart rates on measurements taken before and after the healing ceremony. What the findings show us is that on average, **healers at ceremonies *with drumming* had an increased heart rate of 26.75 beats faster *after* the ceremony.**<sup>232</sup> One *Okomfo*’s heart rate actually increased 42 beats per minute from her before-to-after measurements and ended with a heart rate of 115 after the ceremony, well above the average resting heart rate. Interestingly, this was over three times more than the results of *Okomfo* in ceremonies without drumming. What we discovered was that **healers at ceremonies *without drumming* still had an increased heart rate, but it was only 8.5 beats faster on average *after* the ceremony.**

In one case, I was lucky that an *Okomfo* actually invited me to take his measurements in the middle of a ceremony. This was during a ceremony without drumming and the before-during-after findings are interesting. Before the ceremony this *Okomfo*’s heart rate was 55, during the ceremony his heart rate was 56, and after the ceremony his heart rate was 51. He was the only *Okomfo* with decreased heart rate in before-after measurements, but interestingly the “during” result show us that his “energy” did go up in the middle of

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<sup>232</sup>**With Drumming:** *Okomfo*#1: 83/Before to 115/After = +32; *Okomfo*#2: 56/Before to 77/After = +21; *Okomfo*#3: 68/Before to 110/After = +42; *Okomfo*#4: 52/Before to 64/After = +12. **Without Drumming:** *Okomfo*#5: 55/Before, 56/During to 51/After = -4. *Okomfo*#6: 53/Before to 65/After = +12; *Okomfo*#7: 61/Before to 71/After = +10; *Okomfo*#8: 57/Before to 73/After = +16.

the ceremony. If field conditions allowed, future research could examine how heartrate changes for *Okomfor* in the middle of their ceremonies when they are spiritually possessed. I predict we would see spikes of increase.

What these results tell us, if we accept heartrate increase as a measure of elevated “energy” or “vigor,” is that informants were correct. The research findings provide evidence that: **1. Most *Okomfor* experience increased energy (heartrate) as a result of Asante indigenous ritual healing ceremonies. 2. The degree of that increase does correlate with whether or not drumming was present at the ceremony. 3. Ceremonies with drumming had over three times greater heartrate increase than ceremonies without drumming.**

#### **6.4.2.3 Music (Continued)**

But there is another side to the biophysiology of drumming. Long-term engagement with poly-rhythmic drumming is usually associated with trance-like states, not “energy” or “vigor.” Does the drumming, chanting, singing, and dancing in Asante ceremonies have a different effect on patients attending the ritual than it did on *Okomfor* performing in the ritual?

What we know is that drumming, chanting, toning, rhythmic beats, and meditation are found in most cultures (Levitan 2008), from the drumming of Asante ceremonies, toning of monks in Tibet, and chanting of Hindu healers to the playing of Native American drums, spinning of Sufi dervishes, and mindful practices of Indian Yogis. We also know that across many or most of these cultures, drums beat at a steady rate of 4.5 beats per second, which induces a trance-like state in listeners (Maxfield 1990). One of the

arguments for why drumming creates a trance-like state is that “the rhythms of chanting and singing, dancing, handclapping, and percussion instruments engage right-hemisphere capabilities, concomitantly evoking the ‘timeless’ quality or the attendant experience” (Lex 1979:126).

These descriptions are the closest that I have found that describe the embodied experience of Asante polyrhythmic drumming. After only 20-30 minutes of listening to the music at Asante ritual ceremonies, it feels as if time stands still and yet at the same time you can feel the penetration of each oscillation acutely. Drumming in Asante ritual healing ceremonies usually lasts anywhere from two to four hours. In my personal experience as a regular participant at these ceremonies, the prolonged exposure definitely put me into a trance-like state where, when it finally stopped, I felt an immediate absence and every time I heard the drummers beginning a session, it felt as if my body was leaping to return to that state.

Anecdotal evidence aside, researchers have discovered that music, particularly meaningful music, activates the “somatosensing regions of the insula and anterior cingulate” (Blood and Zatorre 2001), elicits endogenous opioids (Simao 2015), facilitating entrainment (Leviton 2008), and promoting relaxation by occupying neural arousal pathways otherwise used by stress hormones (Crowe 2004). In fact, “music therapy is used for pain and stress reduction, motivation, anger management, as an adjunct to physical therapy in the case of motor difficulties, and for a variety of other purposes” (Leviton 2008:97-98). “There have only been a dozen or so careful, rigorous studies and so I don’t want to overstate the case, but they seem to point to what the



ancient shamans already knew: Music—and particularly joyful music—affects our health in fundamental ways. Listening to, and even more so singing or playing, music can alter brain chemistry associated with well-being, stress reduction, and immune system fortitude” (Levitan 2008:98). Psychoneuroimmunology most often uses the immune markers cortisol and immunoglobulin A (IgA), hormones that are associated with the body’s reaction to stress. Studies have shown that these hormones can be positively affected through music (Fancourt et al. 2014).

Across several disciplines in the health and social sciences, psychological flexibility is gaining in influence and explanatory power as a conceptual frame to better understand diverse cultural and clinical contexts of health and healing. Although music as a potential primer of psychological flexibility is seldom considered in extant research, key contributions have framed aspects of music's potential efficacy to promote health and healing within the construct of psychological flexibility... psychological flexibility is accomplished by engaging specific cultural exemplars found in the natural and built environments, the local belief system, poetry, prayer, and music, creating a multilayered network of flexibility (Koen 2013).

More importantly, as discussed in *The Social Life of Placebos*, music increases social bonds. Listening to music especially with other people can elicit oxytocin (Grape et al. 2003). Oxytocin is a “reward” hormone that increases pro-social behavior and produces feelings of trust and connection between people (Kosfeld et al. 2005). In fact, studies have shown that “social support and oxytocin interact to suppress cortisol and subjective responses to psychosocial stress” (Heinrichs et al. 2003). Comparatively, absence of social support is as detrimental to health as smoking, obesity and high blood pressure (Eisenberger et al. 2007). Moreover, producing music with other people and participating in that experience as a group (whether singing, changing, drumming, or dancing) releases oxytocin and increases social bonding (Freeman 1995).

Another way to describe that process of feel-good hormones and social bonding during a shared music experience is called entrainment. Entrainment is the process by which one's heartbeat is determined or modified by an outward rhythm. Another way to describe entrainment is psychoacoustic vibrational sound therapy. This technique is used often in music therapy to change, via music and rhythm, the patients' heart rate and mood. When our bodies come in contact with external rhythms that vibrate our tissues, our auditory system, heartrate, and brain waves are all affected and we experience the process of entrainment (Hink et al. 1980). This process uses sound vibrations— auditory perceptions of binaural beats, kinesthetic perception, and sympathetic resonance— to effectively promote relaxation responses.

Entrainment works much the same way a tuning fork does. One oscillating body will affect another oscillating body, causing it to synchronize its vibrations and match its resonance. In drumming, the oscillating vibrations of the bodies of individuals' present match the beat, rhythms, and oscillations of the drum and song. Kinesthetic responses to vibrations are also seen in neurological systems as well as cellular soft tissue, as in our organs, tissues, and cells. For example, after about a minute of a constant repeated beat, all people listening to that beat will have similar heart rates (Strogatz 2004). Less known is the physics of entrainment as applied to biosystems and electromagnetic brainwaves. Because brainwaves are produced by electrochemical activity in the brain, affecting that electrochemical activity in turn affects the brainwaves. This can happen through the introduction of chemicals via drugs, alcohol, food, fasting, strenuous activity, and tension as well as through entrainment.

The ability to hear and respond to binaural beats is argued to be based on evolutionary adaptation of the brain structure, as only evolved species can detect binaural beats and which beats they detect is dependent on cranium diameter (Oster 1973). “This perceptual phenomenon of binaural beating and the objective measurement of the frequency-following response suggest conditions which facilitate entrainment of brain waves and altered states of consciousness” (Hink 1980).

From meditative, creative, and relaxed states, to increased concentration, control and alertness, binaural beats and entrainment in rhythm and music have been argued to affect consciousness. “Music, relaxation exercises, guided imagery, and verbal suggestion have all been used to enhance the state-changing effects of the binaural beat” (Owens and Atwater 1995). Similarly, other ritual practices seen in Asante healing ceremonies such as humming, toning, and breathing exercises help prepare the body to “hear” these beats (Tart 1975).<sup>233</sup>

#### **6.4.2.4 *Entrainment Biometric Data***

Secondary source data suggest that many aspects of Asante indigenous ritual healing ceremonies, especially group drumming, chanting, singing, and dancing, produce entrainment effects, which promote social bonding, increase relaxation, and decrease stress. The difficulty is proving it. How can you show entrainment biologically? My hypothesis was that if ritual participants showed similar heartrates during the ceremony, it

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<sup>233</sup> The *raison d’être* for rituals is the readjustment of dysphasic biological and social rhythms by manipulation of neurophysiological structures under controlled conditions. Rituals properly executed promote a feeling of well-being and relief, not only because prolonged or intense stresses are alleviated, but also because the driving techniques employed in rituals are designed to sensitize or ‘tune’ the nervous system and thereby lessen inhibition of the right hemisphere and permit temporary right-hemisphere dominance, as well as mixed trophotropic-ergotropic excitation, to achieve synchronization of cortical rhythms in both hemispheres and evoke trophotropic rebound (Lex 1979:144-145).

would provide evidence for an entrainment effect. Fortunately, I was able to uncover even more evidence.

I collected over 85 patient, musician (including drummers and chanters), and shrine worker biometric data before, during and after Asante indigenous ritual healing ceremonies with and without drumming. It is important to note that I compared before measurements as a baseline to make sure individual shrines didn't have significant differences from each other and to establish that patients attending ceremonies with drumming and those attending ceremonies without drumming did not have marked biometric differences to begin with. The results showed that there were no significant baseline differences between shrines or between groups attending ceremonies with and without drumming (see Chapter 6: Appendix for Full Data Sets and T-tests).<sup>234</sup>

The results turned out better than expected. Across all measurements (systolic and diastolic blood pressure, heartrate, and pulse) and with both groups (with drumming and without drumming), we see entrainment effects. These are determined by two main factors. If patients truly began to entrain with one another, we should see, first, greater variety of group biometric data before and after ceremonies but less variety (i.e., more similarity) during the ceremony. Second, we should see general group trends across the entire before-during-after sequence. The research results show evidence of both. I

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<sup>234</sup>Once I collected all of the data, I was able to analyze the results and find some important general trends. I did not have the training needed to run a statistical analysis in order to find out if any of the results were statistically significant. I outsourced this data set and t-tests to a third party, Dr. Kathryn Kozey of Western New England University in 2014. We worked together to extrapolate meaning from the results, but all of the numerical and statistical analysis in the Appendix is her work.

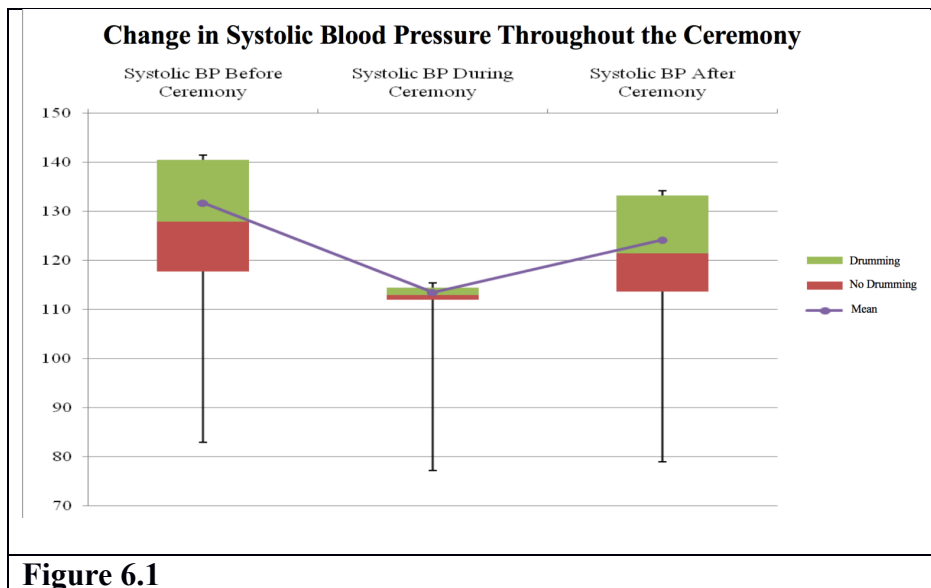
expected to see both of these factors in heartrate and pulse, but I was surprised to see how significant the entrainment results were in blood pressure as well.

For example, **the biometric research findings show that for both groups** (with and without drumming) **systolic blood pressure has a greater range of variability among the entire group before the ceremony, that range of variability drops significantly for *everyone* during the ceremony, and then the range of variability spreads out again after the ceremony** (though not to the same degree of variability as the before measurements).<sup>235</sup> As you can see in the numbers and in the data visualization (See Figure 6.1), this significant drop in group systolic blood pressure variability *during* the ceremony, and not before or after, provides evidence that Asante ritual healing ceremonies elicit group entrainment effects.

In terms of general group trends, we also find these in the data. **Results show that for both groups** (with and without drumming) **the mean systolic blood pressure is higher before the ceremony than after the ceremony, with a significant drop during the ceremony.**

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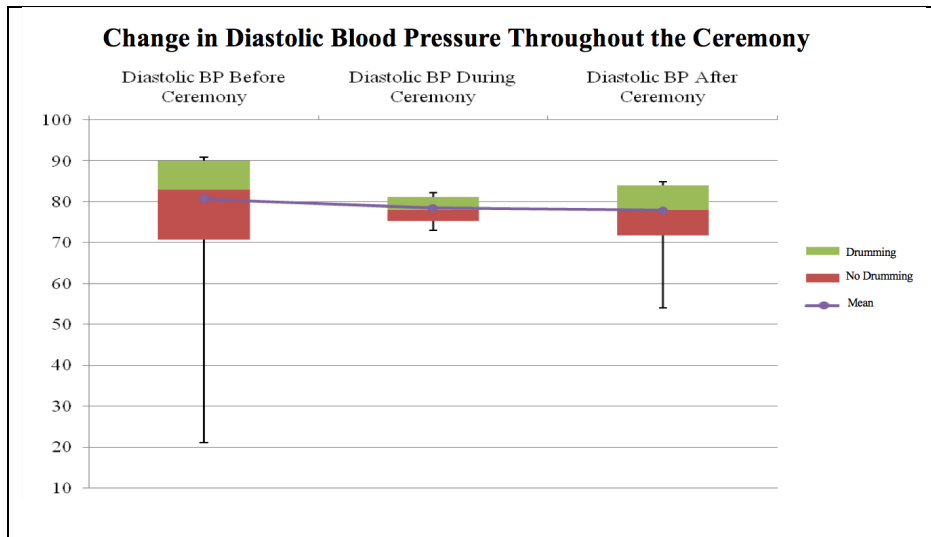
<sup>235</sup> What this looks like numerically is that *before* the ceremony the entire group's systolic blood pressure measurements range from ~117-140, which is a difference of ~23 mm Hg (millimeters of mercury). *During* the ceremony, the entire group's systolic blood pressure measurements range from ~112-115, which is a difference of ~3 mm Hg and *after* the ceremony, the entire group's systolic blood pressure measurements range from ~115-133, which is a difference of ~18 mm Hg.



**Figure 6.1**

We do *not* see as marked a general trend in the mean diastolic blood pressure of the group decreasing before, during, and after the ceremony as we did with systolic. But we do see significant entrainment effects in regard to group alignment during the ceremony. **Results show that for both groups** (with and without drumming) **diastolic blood pressure has a greater range of variability among the entire group before the ceremony, that range of variability drops significantly for *everyone* during the ceremony, and then the range of variability spreads out again after the ceremony** (though not to the same degree of variability as the before measurements).<sup>236</sup> Entrainment effects can be seen in the numbers and in the data visualization (See Figure 6.2) during Asante indigenous ritual healing ceremonies.

<sup>236</sup> What this looks like numerically is that *before* the ceremony the entire group's diastolic blood pressure measurements range from ~70-90, which is a difference of ~20 mm Hg. *During* the ceremony, the entire group's diastolic blood pressure measurements range from ~76-81, which is a difference of ~5 mm Hg and *after* the ceremony, the entire group's systolic blood pressure measurements range from ~72-85, which is a difference of ~13 mm Hg.



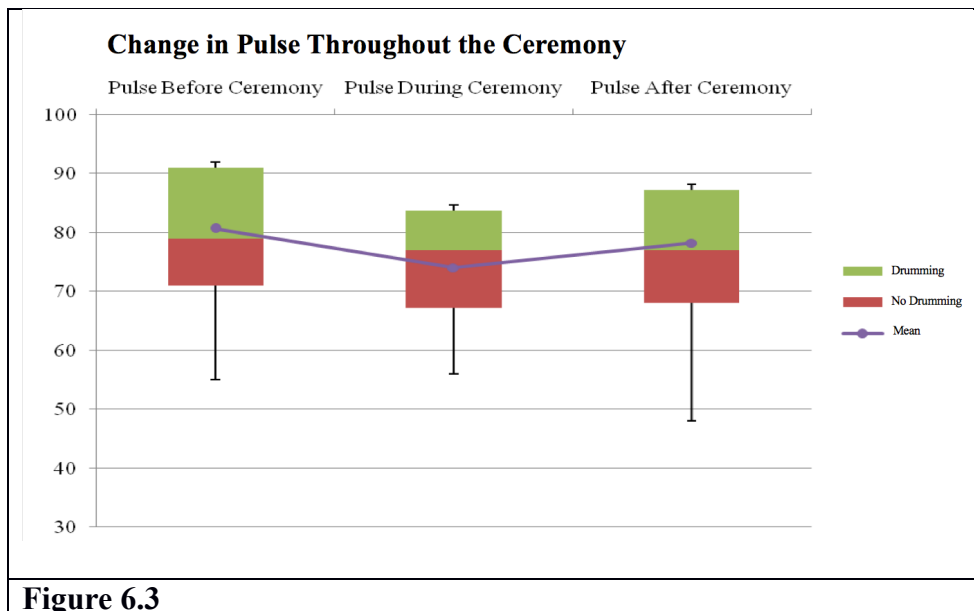
**Figure 6.2**

These results were surprising. Originally, I did *not* hypothesize we would see entrainment effects in measurements of blood pressure, yet these were the most statistically significant results in the entire data set. Interestingly, they were more significant than the results of both pulse and heartrate and these measurements were more affected by the presence of drumming in the ceremony. For example, **for groups attending ceremonies *with drumming*, pulse has a greater range of variability among the entire group before the ceremony, that range of variability decreases for everyone during the ceremony, and then the range of variability spreads out again after the ceremony.**<sup>237</sup> We do *not* see any changes in group variability ranges of pulse throughout the ceremony in the group that attended the rituals *without drumming*.

In terms of general group trends, **results show that for the group who attended ceremonies *with drumming*, the mean pulse is higher before the ceremony than after**

<sup>237</sup> What this looks like numerically is that *before* the ceremony the entire *with drumming* group's pulse measurements range from ~79-91, which is a difference of ~12 mm Hg. *During* the ceremony, the entire group's pulse measurements range from ~76-84, which is a difference of ~8 mm Hg and *after* the ceremony, the entire group's pulse measurements range from ~76-88, which is a difference of ~12 mm Hg.

the ceremony, with a significant drop *during* the ceremony. We do *not* see this same effect in the no drumming group. There is only a slight decrease in the mean pulse for the group who attended ceremonies *without drumming* from before to after measurements, with a slight drop during the ceremony. As you can see in the results and in the data visualization (See Figure 6.3), there is some evidence in pulse metrics that Asante ritual healing ceremonies may promote group entrainment effects.



**Figure 6.3**

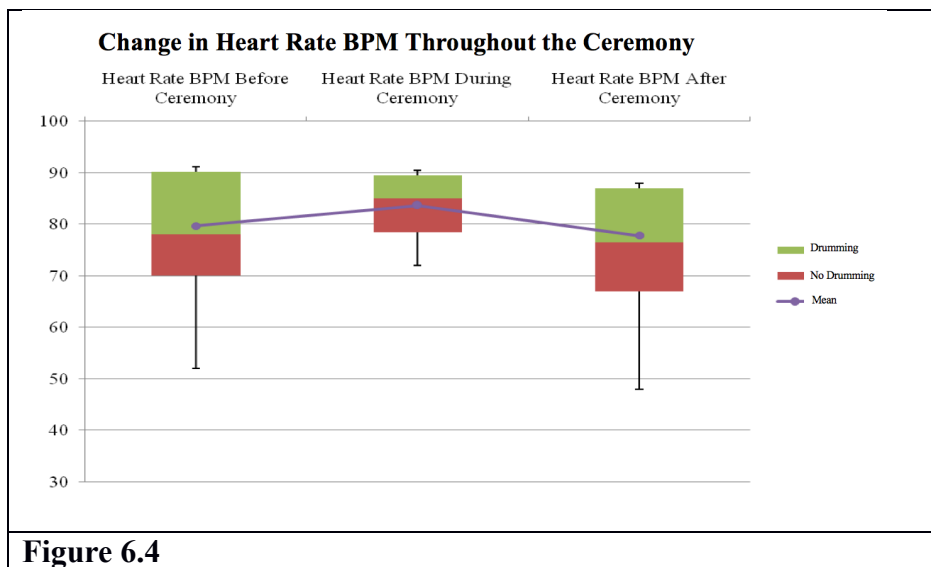
As expected, we see similar results in heartrate measurements as we did in pulse measurements. For groups attending ceremonies *with drumming*, heartrate has a greater range of variability among the entire group before the ceremony, that range of variability decreases for *everyone* during the ceremony, and then the range of variability spreads out again after the ceremony.<sup>238</sup> We see slight changes in group

<sup>238</sup> What this looks like numerically is that *before* the ceremony the entire *with drumming* group's heartrate measurements range from ~78-90, which is a difference of ~12 mm Hg. *During* the ceremony, the entire group's pulse measurements range from ~67-84, which is a difference of ~17 mm Hg and *after* the ceremony, the entire group's pulse measurements range from ~68-87, which is a difference of ~18 mm Hg.



variability ranges of heartrate throughout the ceremony in the group that attended the rituals *without drumming*.<sup>239</sup>

In terms of general group trends, **results show that for both groups** (with and without drumming) **the mean heartrate is higher before the ceremony than after the ceremony, with a slight *increase* during the ceremony**. Interestingly, heartrate is the only measurement that goes up during the ceremony. Could this have something to do with the excitement of spirit possession? More research is needed to figure out why heartrate generally increases *during* ceremonies. As you can see in the results and in the data visualization (See Figure 6.4), there is some evidence in heartrate metrics that Asante ritual healing ceremonies may promote group entrainment effects.



<sup>239</sup> What this looks like numerically is that *before* the ceremony the entire *without drumming* group's heartrate measurements range from ~70-78, which is a difference of ~8 mm Hg. *During* the ceremony, the entire group's heartrate measurements range from ~79-85, which is a difference of ~6 mm Hg and *after* the ceremony, the entire group's heartrate measurements range from ~68-77, which is a difference of ~9 mm Hg.

What these results tell us, if we accept that ranges of group variability and general group trends are measures of entrainment effects, is that: **1. On average, Asante indigenous ritual healing ceremonies decrease participants' blood pressure** (systolic and diastolic), **heartrate and pulse of participants attending ceremonies with and without drumming. 2. There is an even more significant decrease in participants' blood pressure** (systolic and diastolic) **and pulse that occurs *during* ritual ceremonies. 3. The mean heartrate increases for participants attending ceremonies with and without drumming.** More significantly, **4. All biometric measurements comparing the range of participants' before, during, and after results show less variability *during* ceremonies, with blood pressure showing a significant decrease in group variability rates *during* ceremonies and the ranges staying smaller even *after* the ceremonies.**

#### **6.4.3 Disassociation Stage**

Eliade (1974) argued that the two most universal features of shamanism were the ability to produce Altered States of Consciousness (ASCs) and to interact with the spirit world. Both features are present in Asante ritual healing ceremonies. Researchers have tried to find one framework that encapsulates all of the different types of modified cognizance such as meditation, trance, hypnosis, mindfulness, possession, and twilight-learning (Budzynski 1986; Winkelman 2000) and the best we have currently is the concept of Altered States of Consciousness. While the term can be vague and without clear boundaries, it refers to all of the different states of consciousness that can occur when one's mind and body are in a physiologically reduced state of arousal. ASCs are consciousness-altering responses in the reticular-thalamic activating system which in turn

alter arousal states, attentional focus, and levels of awareness— quintessential to consciousness itself. Hypnosis studies show that this maintenance of consciousness with low cortical arousal is possible in selected individuals as a natural ability or as a skill that can be acquired over time (Sabourin 1990). Much like the spindle neurons we discussed in Chapter 5, ASCs create connections between the emotive and the executive centers of the brain.<sup>240</sup> However, due to the nature and variety of this phenomenon, there is no singular or specific cause-and-effect. From drugs, physical manipulations and binaural rhythms, to adaptive behaviors learned as a result of demanding circumstances (Green 1986), ASCs are a fascinating tangle of multi-influencing biocultural interactions.

Some of the health benefits of ASC's are increased relaxation, reduced stress, enhanced creativity, enriched learning, and improved sleep (Atwater 1997). ASCs are also known to elicit pain alleviating endogenous opioids (Carter 1993) and to trigger out-of-body experiences (McMoneagle 1993).

One way that Asante *Okomfor* modify meaning and perceptions (and the concomitant biological consequences of those changes) is through action on their own and patients' consciousness levels. Among *Okomfor*, preparation for ASCs (referred to as spirit possession among the Asante or dissociation by ritual scholars) is very important. Healers

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<sup>240</sup> ASCs are “a natural response to many different conditions that result in the production of slow-wave brain discharges in the serotonergic connections between the limbic system and brain stem regions. These synchronous brain waves are manifested in high-voltage slow-wave EEG activity, especially theta waves, of three to six cycles per second. These linkages between the attention mechanisms in the lower brain regions (reticular formation) and the limbic brain produce ascending discharge patterns that synchronize the different levels of the brain and the frontal lobes. Altered states of consciousness integrate information from the lower levels of the brain into the processing capacity of the frontal cortex, particularly integrating nonverbal emotional and behavioral information into the frontal brain. This integration of information from preverbal brain structures into the language-mediated activities of the frontal cortex provides intuition, understanding, enlightenment, a sense of unity and personal integration” (Winkleman 2004:11).

will begin preparing days and weeks in advance and then even more carefully in the hours leading up to a ritual healing ceremony. Trance states are

induced through a great variety of procedures, including chanting and singing; periods of extensive exercise through dancing, drumming, and dramatic enactments; prolonged fasting, water deprivation, and the use of emetics; exposure to temperature extremes (e.g. a sweat lodge or staying in cold streams); the use of psychoactive plant medicines, particularly hallucinogens; various austerities, including cutting the body; and periods of prolonged social isolation and sensory deprivation (Winkleman 1992).

The extreme use of or abstinence from hallucinogens, alcohol, kola nuts, sleeping, eating, sex, meditation, drumming, dancing and/or physical exertion makes the body more amenable to binary beats, which elicit disassociation. “Austere conditions such as fasting and thirsting, forced strenuous exercise, seclusion, hyperstress with feelings of terror, inducing of pain, temperature and kinetic stimulations, all known to produce ASCs....These stressors are the best agents to elicit endogenous opioid release” (Jilek 1982). Pain mediation is an important ASC promoter, as disassociation involves “harsh physical acts, deprivation, ingestion of substances, and other activities designed to produce altered states of consciousness in diviners and clients” (Winkleman 2004). Not only do these harsh physical acts trigger trance states, but they also act as performatives for the public to acknowledge *Okomfor*’ power and authority. The ability to silently, calmly, and nonchalantly withstand physical pains which would cause a normal person distress, sets *Okomfor* apart. Biofeedback is also an important element of ASCs in Asante ritual healing. Biofeedback is when conscious mental activity can control physiological responses, even those once considered involuntary, such as “heart rate, blood pressure, core body temperature, galvanic skin response, salivation, urine formation, gastric mobility, alpha rhythms, and electromyographic activity” (Stoyva 1972). All of these

proofs of *Okomfor* power and authority<sup>241</sup> reinforce the knowledge patients have of the authority and power of the practitioner as well as the knowledge of the authority and power of the ritual as a mechanism to heal.

There are very clear behaviors to mark the time period before and after an *Okomfor* goes into spirit possession. This alternate reality is framed by changes in location, dress, behavior, drumming, dancing, chanting, pouring libation, prayer, unnatural movements, and painful experiences. Once drumming has begun, *Okomfor* wait patiently, dance erratically, smoke incessantly, or meditate in order to become possessed. The moment of possession is marked by a visible change in *Okomfors*' bodily comportment such as visibly convulsing, seizing, and shaking. After this moment, *Okomfors*' eyes glaze over, look beyond the immediate surroundings and show no signs of recognition of the people who surround them. As soon as this happens, shrine workers guide the possessed *Okomfor* throughout the rest of the ceremony and immediately cover their hands, feet, and anything they touch in white talcum powder. There are specific clothing and behavioral characteristics for each *abosom* that may appear. After about 2-4 hours of elaborate possession performances, shrine maintenance and patient consultation, divination, and restitution, *Okomfor* come out of possession. Sometimes the exit is as dramatic as the invocation and healers will fall down or lose consciousness. Other times coming out of possession is signaled with a change of facial expression, focusing of the eyes, speaking, and a change of clothing. Each time, however, *Okomfor* reveal that they

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<sup>241</sup> See Appendix: Chapter 6: 6.2 *Okomfor Proofs of Power and Authority* for more.

have no consciousness of their time during possession. Regardless of the specifics of each *Okomfor's* experience, possession always leaves them in a tired, weak state.

One biological reason why trance states have such a draining effect on *Okomfor* has to do with sodium and potassium levels. Binaural beats produce different waves at different frequencies, i.e. alpha, beta, theta and delta. "After an extended period in the Beta state the ratio between potassium and sodium is out of balance. This is the main cause of what is known as 'mental fatigue'" (Buchanan 2011). ASCs in Asante rituals promote opiate effects such as analgesia, anxiety reduction, euphoria and amnesia (Frecka 1989). They influence meaning and modify patient perceptions about the conditions of their environment and access to health promoting resources such as money or invested caregivers.

In the case of stress buffering, social support can operate by preventing responses to stressful events that are inimical to health...Support may play a role in two different points in the causal chain that links stressors to illness...First, the belief that others will provide necessary resources may redefine the potential for harm posed by a situation and bolster one's perceived ability to cope with imposed demands, thereby preventing a particular situation from being appraised as highly stressful...Second, support beliefs may reduce or eliminate the affective reactions to a stressful event, dampen physiological response to the event, or prevent or alter maladaptive behavior responses. The availability of persons to talk to about problems has also been found to reduce the intrusive thoughts that act to maintain chronic maladaptive responses to stressful events...The actual receipt of support in the face of stressful events could also play a role. Support may alleviate the impact of stress appraisal by providing a solution to the problem, by reducing the perceived importance of the problem, or by providing a distraction from the problem. It might also facilitate healthful behaviors such as exercise, personal hygiene, proper nutrition, rest or adherence to medical regimens (Koenig and Cohen 2002).<sup>242</sup>

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<sup>242</sup>See also: House 1981; Cohen and McKay 1984; Cohen and Wills 1985; Thoits 1986; Cohen 1988; Lepore et al. 1996; Cohen, Underwood and Gottlieb 2000.

ASCs impact symbolic healing, performative efficacy (Austin 1962) and psychodynamic self and group integration. “The efficacy of information and other forms of meaning, on the other hand, rests not only upon the ability of senders to encode and transmit information, but upon the ability of others to receive those messages, that is to recognize, comprehend and take account of them” (Rappaport 1999: 110). Disassociation is a point in the ceremony where powerful emotions are provoked, only to be alleviated during the resolution phase, and when sensitive information is made public. ASCs provide a stage of liminality where meaning and perceptions can be modified, tested, and altered.

At a minimum, healing rituals provide an opportunity to reshape and recalibrate selective attention. In a more expanded model, rituals trigger specific neurobiological pathways that specifically modulate bodily sensations, symptoms and emotions. It seems that if the mind can be persuaded, the body can sometimes act accordingly. Placebo studies may be one avenue to connect biology of healing with a social science of ritual. Both placebo and ritual effects are examples of how environmental cues and learning processes activate psychobiological mechanisms of healing (Kaptchuk 2011:1865).

#### **6.4.4 Resolution Stage**

The final stage of Asante indigenous ritual healing ceremonies is resolution, which encompasses the interactive healer-patient dialogue during consultation and divination as well as all of the treatment steps prescribed. After becoming spiritually possessed, *Okomfor* meet with patients to discover the problem and provide a solution. Each *Okomfor* approaches divination differently, using different tools, techniques, and “ways of knowing” (Peek 1991). Here, the healer asks not only specific questions about the physical symptoms, but also questions about any social and cultural happenings. The yes or no answers to these questions (controlled by *abosom*) can range from the alignment of cowrie shells, sticks, talismans, broken egg shells, and kola nuts, etc. to the flailing of sacrificial chickens and goats. The consultation can range from confessing wrongdoings,

sin, broken taboos, participation in witchcraft, and not following ancestor obligations, to accusing someone else of witchcraft, ancestor cursings, familial arguments, etc. Through a series of questions and answers, *Okomfor* “strategically predict” (Winkleman 2004) the cause of the illness as well as how to resolve the problem.

Psychotherapy is the most commonly used measure of legitimizing and understanding the therapeutic efficacy of this resolution stage as it deals with repression, unconscious behavioral processes, detachment, hysteria, delirium, sexual tension, and fabulation. For example, detachment elicits psychological disturbance and physical disorganization which leads to ill health. This is solved ritually via communal reconnection and social bonding, leading to improved health and well-being. Although the Asante mediums for consultation and divination are all different, resolution is usually considered a type of psycho-social therapy and restitution used to alleviate anxiety. Daniel Moerman talks of a discovery in *Anthropology of Symbolic Healing*, where in over 100 studies, “the form of therapeutic technique used did not seem to change the fact that a high proportion of patients were helped by the psychotherapy” (1979: 59). This same article argues that the necessary components for psychotherapy are a helping relationship with the therapist/healer, suggestion, and abreaction. All three are features in Asante divination. Claude Levi-Strauss (1972) made this idea clearer when he argued that the patient-healer relationship lays the stage for transference and abreaction which then allows for trauma to be controlled and relieved by uncovering and then resolving its causes.

“Communication in a health care environment is particularly powerful and important: It literally kills or cures patients” (Eisenberg 1980:4). While cultural beliefs and social



rejection can produce enough stress to kill you, sometimes instantly (Adler 2012), positive communication in therapeutic relationships can also provide meaning, alleviate stress, and elicit placebo effects. Asante ritual healing ceremonies have numerous methods to influence, reverse, and inhibit the pathology of stress and anxiety as well as explicit methods and desires to promote relaxation responses. While patients do not spend extended amounts of time with *Okomfor*, they are given inclusive, holistic explanations of etiology and treatment assurances that incorporate many of the social, cultural and spiritual aspects of patient wellbeing neglected in biomedical settings. “Consultation in unconventional medicine is more likely than its mainstream counterpart to produce a precise diagnosis that matches patients’ perceptions” (Kaptchuk 2002:819). Each diagnosis is very specific to that patient and their social, physical, financial, and professional circumstances. “When it is considered that 40% to 60% of patients may never receive a firm diagnosis in conventional medicine... an alternative diagnosis may be a potent form of nonspecific healing that changes the circumstances under which the patient exists... including reducing the ‘dysphoria of uncertainty...’” (Kaptchuk 2002:819). Nonspecific healing allows for flexibility in alternative diagnosis and prognosis, and treatment aims serve ‘to regulate symptom intensity and distress’ and ‘create enough certainty to diminish the threat of the inchoate while preserving enough ambiguity to allow for fresh improvisation’ (Kaptchuk 2002:820; Csordas 1988; Kirmayer 1994). Just a diagnosis or explanation of the etiology of a problem can reduce stress in patients. This dampening of the sympathetic response becomes even more robust when *Okomfor* modify patient’s perceptions about their social and physical conditions

and provide meaningful solutions to their concerns. Clear communication and a therapeutic relationship legitimize patient suffering and re-categorize it as something that can be alleviated. Discovering meaning in misfortune and having a sense of control over something that was once uncertain decreases anxiety and stress.

Psychotherapy can elicit powerful opioids and enhance serotonergic function in patients. Resolution in Asante indigenous ritual healing almost always “emphasizes traditional social roles, morals, and values, placing the causes of suffering in the context of ruptured social relations and the need to adopt appropriate social roles and traditional normative expectations for healing” (Winkleman 2004:7). Relationships and the social body, not just the physical, are the main sources of investigation and discussion throughout healer-patient discussions.

In *The Spectrum of Ritual; A Biogenetic Structural Analysis*, Eugene D’Aquili (1979) et al. argued that healing systems have evolved over time through the structure of our brains, as dictated by the genetic code (D’Aquili 1979:5). Fabrega (1997) later claimed that “at the root of medicine one finds [ ] complex but integrated adaptation[s] for both sickness and healing” (Fabrega 1997). In fact, “much evidence suggests that rituals and mind-body processes shaped the development of shamanism” (McClenon 2006) and the universality of shamanic practices “illustrate that shamanic psychodynamics are a basic aspect of human experience and an evolved psychology” (Winkleman 2002). There is even a ritual healing theory that argues “moderate levels of dissociative capacity have optimum survival advantage... [because] sick people who are not cognitively open and responsive to suggestion are less likely to be healed in this system” (McClenon 2006: 2-

11). Since sickness is a problem that cultures have had to cope with throughout time, it is important to view ritual healing practices in evolutionary terms, instead of simply juxtaposed with modern biomedicine. When we understand the basics of evolutionary principles such as adaptive responses, social susceptibility, and health resource allocations, the processes and techniques (and even claims of efficacy) in indigenous medical systems become much more understandable.

The efficacy of some rituals rests upon the ability of human organic processes to translate information conventionally encoded in such utterances and acts as cursing, bone pointing and shamanic projectile removal into chemical and neural signals. These, in turn, may have further physical consequences, either beneficial or harmful, for the organism receiving the message. It is significant that the ritual acts initiating attempts to achieve organic effects are often simple and easy to observe, but the subsequent neural and hormonal processes directly producing the effects are not. They are extremely complex and they are hidden from direct view. The precise nature of the causal principles relating the act to its ultimate effect is, thus, obscure and even mysterious. The location, within human organic processes, of the boundary between the domains of the physical and the meaningful is not well known but cannot be a sharp one. It is plausible to believe that the very obscurity of this region is one basis of notions concerning the occult efficacy of ritual words and acts (Rappaport 1999:113).

Many of our negative health conditions are the result of adaptive warning systems, reward and punishment motivators, cultural expectations and social relationships. In psychosomatic illnesses, anxiety produces dysfunction in the automatic and endocrine systems. This anxiety is a psychological consequence of sociological events and can produce powerful placebo responses. In *Anthropology of Symbolic Healing*, Daniel Moerman (1979) explained that cultures who believe in the literal influencing power of witchcraft and cursing are more prone to psychosomatic illnesses. For example, voodoo death—or death occurring with no known physical or pharmacological cause but with a culturally bound etiology—is not necessarily the sudden activation of the sympathetic system as Cannon originally thought. New research suggests it is the dorsal vagal

response or the strong parasympathetic “break” to counteract acute stress. When the stress response is activated due to extreme fear in sudden, exacerbated or prolonged ways and heartbeat, breathing and blood pressure reach intolerable levels, our secondary activation system kicks in to halt this process (the dorsal vagal response). Most animals cannot survive the rapid break (LaCombe 2012). However, due to our intelligence and ability to make meaning out of misfortune most humans will never experience a rapid dorsal vagal response, mainly because we rely on cultural and ritual processes to make sense of our fear. In the extreme case of Voodoo death, the paradigm is unable to provide the necessary meaning to “talk the self out” of extreme fear. Furthermore, culturally constituted defense mechanisms are not only unable to always explain or “calm” fear, but they can increase it (as in the case of some witchcraft cursings and *Okomfor* prophecies which exacerbate fears but do not leave patients any ways to protect themselves outside of the ritual environment).

Because the human species has a developed cortex, we can use our intelligence to make sense of what just happened (i.e. with a traumatic event). That is, of course, if our belief system does not sway us. In the case of Voodoo Death, the individual's belief system does not provide the necessary meaning that might calm the individual down. In fact, it is working the other way around. The individual's belief system is creating a fear state that increases a sudden rise in activation. The more dramatic the increase in activation, the more the dorsal break is likely to come on (LaCombe 2011).

Barbara Lex (1974) described this process in *Voodoo Death: New Thoughts on an Old*

*Explanation*, by saying that “an informed observer can discover trophotropic activation in weeping, dizziness, profuse salivation, frequent elimination of wastes, and papillary constriction; similarly, ergotrophic activation is exhibited in profuse sweating, constipation, muscular rigidity, and papillary dilation; mixed discharges are evinced by

simultaneous presence of symptoms characteristic of both systems” (1974: 821-22).

These are all symptoms very present in Asante healing ceremonies and *Okomfor* are able to influence, reverse, or inhibit the pathology of that stress and anxiety.

While psychosomatic or psychosocially produced stress and anxiety may originate in the external world, they have very profound physiological consequences. Prolonged stress responses can increase inflammation, reduce immunological functions and exacerbate autoimmune diseases like Grave’s disease, Crohn’s and multiple sclerosis. The healer’s role in mediating immune interactions is in modifying the meaning and perceived conditions inhibiting correct immunological responses. (Moerman 1979).

Stress responses that promote anxiety and compromise immunity are exaggerated in collective cultures where hospitality/hostility cycles exist. Familial obligations and occult forces are a constant source of fear making patients feel that they have very little control over their circumstances. Asante ritual healing ceremonies can increase patient well-being by reducing anxiety and promoting immunological effectiveness, as well as resolving the social and cultural aspects contributing to these problems. In fact, some argue that the trance-like states (such as those found in Asante music and entrainment) create “parasympathetic dominance” (Mavromatis 1991) over the autonomic system and activate relaxation responses and endogenous healing and repair processes, including placebo responses.

Much evidence implies that the effectiveness of shamanic ritual is due, in part, to hypnotic and placebo effects...Repetitive rituals induce hypnotic, suggestive states. Rituals may include sensory restriction or overload, fasting, ingesting drugs, repetitive movements, dancing, drumming, chanting, prayer, or prolonged postures; features inducing altered states of consciousness. Dissociation, coupled with suggestion, tends to result in hypnosis. Symptoms, procedures, and

outcomes associated with spiritual healing are parallel to those associated with hypnosis. Cognitive states associated with shamanism are linked to hypnosis: alterations in thinking, changes in sense of time and body image, loss of control, changes in emotional expression, perceptual distortions, changes in meaning and significance, sense of ineffability, feelings of rejuvenation and hypersuggestivity (McClemon 2006).

#### **6.4.4.1 Relaxation Biometric Data**

My original goal when beginning this research over a decade ago was to show how Asante cultural practices and indigenous healing rituals influence physiological processes. Hopefully this chapter has illustrated some of the negative health effects of stress and the positive health effects of relaxation. While ethnographic research and secondary source data suggest Asante indigenous ritual healing ceremonies reduce stress and increase relaxation, I sought to find biometric evidence. Over the course of 26 months, I collected biological measurements of healers, shrine workers, and patients before, during, and after ritual healing ceremonies. Analyzing the collective group, the data shows consistent evidence across many different Asante shrines, that participation in ritual healing ceremonies reduces blood pressure, heartrate and pulse. For example, **systolic blood pressure rates decreased ~13 mm Hg between before and after measurements, with a significant ~25 mm Hg drop *during* the ceremony (See Figure 6.1). Diastolic blood pressure rates decreased ~5 mm Hg between before and after measurements, with a drop of ~9 mm Hg *during* the ceremony (See Figure 6.2).** Pulse and heartrate decreases were less significant dropping ~3 beats per minute between before and after measurements, with a slight ~4 reduction of pulse *during* ceremonies (See Figures 6.3 and 6.4).

Due to expectancy and conditioned responses, I wondered if participants who attended Asante indigenous ritual healing ceremonies at least once a week (as in the case

of healers and shrine workers), were more habituated to the effects. In comparing shrine workers to everyone else, what we see is that **there is a reduction in systolic blood pressure between before and after measurements, however, the shrine workers experienced much less of a change than patients.** Interestingly, **shrine workers' average before systolic blood pressure measurements are higher than *Okomfor* and patient average before metric.** More research is needed to understand why this is the case, but it might be that their responsibilities during the ritual (i.e. they are working the entire time and get in trouble if they make any mistakes) cause them to have elevated blood pressure before the ceremony.

**Both healers and shrine workers started out with statistically significant lower pulse and heartrates before ceremonies than patients.** It is possible, much like patients experiencing placebo responses just by signing up for clinical trial, that healers and shrine workers are experiencing placebogenic effects based on expectancy or conditioning before the ritual even begins. **Healers and shrine workers also ended with statistically significant lower heartrates after the ceremonies than patients,** which could support the claim that placebo or relaxation responses in Asante ritual healing ceremonies are not diminished due to longitudinal participation. More research is needed to prove this claim.

What all of this data tells us, if we accept that reductions in blood pressure, heartrate and pulse, are measures of relaxation responses, is that: **1. Asante indigenous ritual healing ceremonies produce relaxation responses across all biometric measurements, with all different types of participants, and in ceremonies with and without drumming. 2. Regular participation in Asante healing rituals** (e.g., healers and shrine

workers) leads to lower anticipatory pulse and heart rates as well as more significantly reduced heartrates after ceremonies.

#### **6.4.4.2 Biocultural Interactions in Abena's Case**

Abena's knowledge about her deviant sisters-in-law gave her a clear diagnosis, prognosis, and treatment plan--something that none of the previous healthcare visits (across the wide spectrum of Ghanaian medical pluralism) had given her. This confidence gave her a sense of control over her infertility that she did not have previously. Although there were still problems, i.e., her husband and Seventh-Day Adventist community did not want Abena visiting *Okomfo*, Abena felt like she was a part of the solution (she could either adhere to the treatment requirements or not) instead of having things just happen to her. That sense of control and regulation was important to her. Another important factor was the knowledge of who her enemy was. Previous to the *Okomfo's* revelation, Abena was paranoid about all of the people who could possibly be cursing her as well as suffering feelings of personal shame trying to figure out what she did wrong that caused her infertility. These thoughts carried an enormous amount of fear, stress, and anxiety. Thus, a clear statement from Madam Derwah about who was responsible for her infertility eased much of that distress. Now that Abena knew who the culprits were, she could set about fixing the relationship and protecting herself from future cursing. She worked closely with the *Okomfo* to pay certain tributes and follow specific rituals so that her womb and her home would be protected. These rituals helped Abena feel safe. Furthermore, the *Okomfo* had prescribed very specific rules regarding her fertility: from eating and bathing habits to social and ancestral relationships that she needed to make



right. These actions modified Abena's perceptions about the conditions of her infertility (i.e., she was told she wasn't barren as some other doctors has told her) as well as her external state of support (i.e., she was told she needed to reach out to specific uncles and family members who could be useful in providing financial assistance).

To my knowledge, Abena and Anthony have still not conceived. While there are likely physiological impediments to a successful pregnancy for Abena, we cannot skip over the enormous psychosocial stressors impacting fertility (e.g., stigma, discrimination, cursing, etc.). In fact, studies have shown that stress can actually shut down reproduction and increase the chance of miscarriage and infertility (Sapolsky 2005).

Stress also causes a rise in cortisol which temporarily shuts down the reproductive system. This makes evolutionary sense because stress signals an unsafe or unfavorable environment and reproductive inhibition in response to heightened and prolonged stress would be an adaptive way of ensuring the energetically costly and dangerous conception and gestation takes place only in cases of low stress conditions. Furthermore, high cortisol levels result "in an increased chance of miscarriage and (in some cases) temporary infertility.

Fertility returns after cortisol levels return to normal (Berman 2015).

"What we do know now is that when stress-reduction techniques are employed, something happens in some women that allows them to get pregnant when they couldn't get pregnant before" (Bouchez 2015). These studies on the negative effect of stress on conception make it plausible that *Okomfo* Madam Derwah was able to modify the effects of stress in Abena's life and pave the way for pregnancy. "It is becoming more and more important, in terms of what studies we do, to focus our efforts on the physiological effects of stress and how they may play a role in conception (Pisarska in Bouchez 2015).<sup>243</sup> It is

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<sup>243</sup>There is a "systematic interaction between genes and environment, including maternal stress levels, [that] affects serotonergic and other endocrine-related neurotransmission, partially explaining vulnerability to trauma, antisocial behavior, and depression" (Lende and Downey 2012:48).

possible that psychoprophylactic techniques of the *Okomfor* in Asante indigenous ritual healing ceremonies modified Abena's perceptions about the conditions of her environment, altered her endogenous health resources allocations, and triggered placebo (and or endocrine) responses amenable to fertility.

Abena's story (and the countless others like hers) caused me to reevaluate my assumptions of sickness and health. For example, my original biomedical worldview takes for granted that while social interactions impact my life, they have little bearing on my health. Health and disease are independent of social relationships or verbal statements. Germs, bacteria, viruses, parasites, fungi, and trauma can enter my body and cause harm and, likewise, medication can penetrate my body and cause healing. However, the etiology and locus of disease and illness is within the body, not the social world.

In the *Twi* language, *abufuo kasa de amane-nya ba*, translates into *the slip of the tongue is more dangerous than the slip of the foot*. This Asante idiom means that the consequences of verbal and social mistakes are more painful, complicated, and longer lasting than physical mishaps. Asante culture has a very sociocentric ethnomedical perspective on the body, where physical manifestations of illness are less important than the larger social causes and solutions. Cultural appropriateness and social interactions impact life and have a huge bearing on health. There is no separation of health and disease from interpersonal relationships.

The single most important thing I learned in fieldwork was that social relationships and interactions impact the body and that "words can cause physical harm." In Asante

ethnomedicine, social relationships, cultural meaning, and ritual process influence physical health for good and for bad. And not just in a symbolic way. Immaterial things can influence physiological mechanisms. Curses, spirits, and witches can enter the body and cause harm. Words, music, gods, and healers can penetrate through biology and heal and protect against malevolent forces. The social body, not just the physical body, is the etiology and locus of illness and disease.

It took me a while to realize this. My enculturation with the germ theory of disease overshadowed all of my expectations surrounding medicine. Pathogens were the primary instigator of disease in my mind and regardless of how open I was to Asante explanations of spiritual etiologies for physical ailments, I could not let go of the biomedical paradigm that only physical agents can influence physiology. It took sitting through hundreds of different ritual healing ceremonies and listening to many patient histories until I realized that I was completely missing the Asante explanatory model.

Asante have a different theory of disease: a social theory of disease. Words and interactions can penetrate the body. They can inflict pain, activate biochemical processes, and inhibit natural pathologies. These interactions do not only occur in symbolic ways (as I had been trained to expect), but in physical realities. People weren't talking about the ways in which spirits, curses, ritual speech, invocations, encounters, interactions, envy, etc. impacted them metaphorically; they were testifying one after another about the physiological reality of words, spirits, and social interactions as activating and inhibiting the body.

After my experience in the field with Abena and the realization that the Asante indigenous medical paradigm is structured differently than my own, I opened my worldview. I began to do research on the meta-physical behaviors that can impact biological processes. I learned that we have a name for this type of phenomena: placebo and nocebo responses, and that mind-body interactions are very powerful; powerful enough to influence fertility.

The concept of placebo and nocebo responses paved the way for me to see that the Asante were right. Verbal exchanges and social interactions are not inert. Words can harm. Social support can mend. Ostracism can hurt. And all of these experiences activate physiological mechanisms. Asante ritual healing can heal social wounds, protect individuals, provide social support, and alleviate anxiety.

## **6.5 Conclusion**

Modern health care is by no means devoid of ritual. Physicians, badly miscast in the shaman's role, are the ritual makers for most of life's major passages—birth, death, pregnancy, menopause, puberty, and old age. A stay in the hospital or a visit to a clinic is heavily steeped in ritual, with prescribed behaviors, dress, and demeanor, and with prominently displayed symbols of healing (diplomas, the caduceus). These rites and symbols have great power—a nod of the head or a word can be either life-giving or the kiss of death. The missing element, therefore, is not ritual per se but rather an awareness of participation in its transpersonal functions (Achterberg 2009: 12)

It is clear from the above research findings that patients have physiological reactions to the ritual healing process. Even in cases where no pharmacological agents were taken and no drumming took place, we see a relaxation effect. In a world where family, friends, witches, and ancestors are constantly impacting your life for good and for bad, it is essential to have a medical system which respects these psychosocial variables as powerful factors influencing the processes of sickness and healing and highlights “the

importance of participation in social networks for maintaining health and preventing and recovering from disease. These effects occur either through direct psychological and biological influences of our social contacts or through the buffering effects of these contacts when we face stressful life events” (Cohen 2002:116).

A deeper understanding of the proximate and ultimate mechanisms of the autonomic nervous system highlights the negative health impact of psychosocial and cultural stressors on the body. This background also illustrates how non-physical elements such as cultural beliefs, social relationships, and ritual processes are able to penetrate the body. Unlocking the biocultural pathologies and interactions between placebo and nocebo responses and stress and relaxation cycles are essential to parsing the role that ritual and health practitioners play in modulating those processes. Biocultural evolutionary frameworks and ethnographically grounded research<sup>244</sup> should become standard practices in the future on studies assessing the therapeutic efficacy of ritual healing.

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<sup>244</sup>“The risk of illness increases when individuals are subject to stressful experiences in the social environment and are unable to cope with or resist those experiences. Culture shapes the stress process. Anthropologists have adapted social-psychological models of the stress process to settings outside North America and Europe, showing how the definitions of stressful circumstances and coping resources change in different cultural settings, and how the interactions among these elements are modified by culture...Research on the stress process in medical anthropology has been fruitful both for increasing our understanding of the causes of poor health and for the insight into the dynamics of culture it has afforded” (Dressler 2011: x).

### **Conclusion:**

Some “of the most powerful forces in our lives [are] the biological consequences of social, human, and meaningful interaction” (Moerman 2002:136). In this manuscript, I have attempted to depict some of those social, human, and meaningful interactions in Asante medical encounters and their corresponding evolutionary and proximate biological consequences in order to help us better understand why evolutionary processes have left our bodies susceptible to psychosocial manipulation and some of the health consequences of that susceptibility. I have also tried to show how culturally specific beliefs, expectations, and behaviors can both exacerbate and alleviate physiological processes that are susceptible to social and meaning-based manipulation in beneficial and adverse ways.

Combining interdisciplinary theory, neurobiological studies, and ethnographic discoveries can be a problematic task. In the end, I hope that I have accomplished three main things. First, I hope that readers better understand the concepts of mind-body medicine, placebo studies, and our human physiological susceptibility to environmental conditions. Second, I hope that readers got some insight into the largely unknown practices of Asante caregivers (across the healthcare spectrum) in a land where social and cultural means of coping with sickness are heavily relied on as well as some exposure to the vivid and compelling healers and processes of indigenous ritual healing ceremonies.

Finally, I hope that you will begin to recognize *The Social Life of Placebos* in your own lives (in all its varied manifestations).

**APPENDIX**  
**CHAPTER 1: RESEARCH & DISSERTATION OVERVIEW**  
**1.1 QUALIFICATIONS**

My introduction to Ghana was a bit quixotic. I was a sophomore at Brigham Young University (BYU) studying anthropology and African studies. I was eager to get field experience and discouraged by the lack of study abroad programs that were economically accessible and targeted toward field research. I became friends with a biochemistry professor visiting from the University of Ghana, Dr. Adjimani, who was grateful for some warm conversation in the frigid Utah winter. He encouraged me to go to Ghana and I applied to the University of Ghana's International Student Programme in November 2001. By January I was on a plane headed to West Africa at twenty-years old, alone, and leaving the country (and my traditional Mormon culture) for the first time! The next six months were a whirlwind of culture shock, field mistakes, language learning and traveling throughout West Africa. Living at the University of Ghana with local roommates provided an ideal introduction into Ghanaian culture and people. Late night conversations about family interactions, social relationships and religious beliefs provided a foundation of cultural awareness that guided my future ethnographic endeavors. I was able to learn *Twɛ* (an Akan language spoken throughout Ghana, but predominantly in the Asante region) directly from the people and in the contexts where it was spoken. I made dear friends whom I have kept in contact with since 2001 and with whom I am still close to today.

After this field experience, I spent the next decade learning about and conducting research in Ghana, West Africa—mostly in the Asante region of central Ghana. Over the

course of the last twelve years I went back to this region five times, for a total of 26 months in the field. I attended the University of Ghana from January-May 2002 and then traveled throughout Ghana, Cote d'Ivoire, Mali, Burkina Faso, Togo, and Benin in June 2002. Shortly after I returned to the states, I was hired to help create and run the Ghana Medical Anthropology Field Study Program at Brigham Young University and was trained in the Field School Approach to ethnographic methodology (see 3.5 Methodologies) as a facilitator for International Study Programs at the Kennedy Center for International Studies. I spent the next five years recruiting undergraduate students, teaching a Ghanaian culture and language preparation course, and training facilitators and professors to conduct research abroad. I led over 30 students on Field Study Programs to Ghana during three different excursions: June-August 2003, May-August 2004, and May-June 2007. During this time I worked on my own research and completed a Bachelor's degree from BYU in sociocultural anthropology and African studies. These experiences prepared me for the MA/PhD cultural anthropology program at Boston University (specializing in medical anthropology) where I received Foreign Language and Area Studies Fellowships from August 2005-May 2008 and studied three years of African culture courses, two years of Yoruba language, and one year of *Twi* language at Boston University and Harvard University.

I returned to my field site in Ghana during the summers and spent my days in different medical contexts, observing and recording what I saw, interviewing practitioners and patients, conducting rounds with biomedical doctors, attending indigenous ritual healing ceremonies and trying to unravel the myriad ways that Asante



negotiate sickness and wellbeing. Eventually, I ran into some contradictions; where the anthropological literature did not fully explain what was happening in the field. At first, I was more concerned with what all of the cultural symbols in Asante ritual healing *meant*, rather than *how it worked*. About halfway through my research I realized that my informants and I were talking past each other. They would tell me about the intense somatic pain they experienced as a result of witchcraft cursings or familial discord and walk me through the process of how they were cured via ritual healing processes. I would, in turn, build an ethnomedical explanatory model that explained the Asante social construction of disease and the cultural production of healing. Healers were talking about how ritual healing ceremonies had effective techniques for altering physiological pathways (of course, they used a different Asante specific vocabulary) and I was hearing a description of the Asante sociocultural contexts and rituals of caregiving. It took many years and the insistence of countless healers and patients to realize that I was “seeing” symbolic healing and they were “doing” physical healing. In my experiences with hundreds of Asante healers and patients, there was a clear shared understanding about the mutually-affecting feedback loop between sociocultural beliefs and behaviors and sickness and healing. No matter how I tried to write about this process from a sociocultural perspective, I felt like I was minimizing or ignoring these Asante biophysiological claims. Until I could understand and explain why and how sociocultural processes influence physiological ones, I would fail to adequately describe Asante explanatory models of sickness and healing.

It was quite an adjustment to realize that I had no idea *if* Asante ritual healing ceremonies actually altered physiological processes nor any tools to discover *how* and *why* they might. In order to investigate these questions, at the intersection of biology and culture, further, I went back to Boston and began delving into interdisciplinary research on biocultural interactions. I discovered that there was research—albeit disparate, inchoate, cross-disciplinary and often bio-centric—on the phenomena I was seeing in the field. Asante *Ɔkomfor* taught me that because the body is made up of both spiritual and physical matter, anything affected in one state can manifest in the other. Since non-physical or extra-somatic can influence bodily states, the healer’s job is to manipulate those psychosocial processes in order to elicit specific reactions from the body. This is not a foreign concept in mind-body medicine. What we are talking about are the context-specific physiological effects of the ritual of medicine and the provisions of care. Another word for this phenomenon is the “placebo effect.”

After this discovery, I participated in (and presented this research at) Harvard Medical School Osher Research Center’s “Healing and Placebo Seminars” for two years as a graduate student. When I returned from my last fieldwork in Ghana (2008-2009) this program transitioned into the Harvard-wide Program in Placebo Studies and the Therapeutic Encounter (PiPS) at Beth Israel Deaconess Medical Center and Harvard Medical School run by my dissertation committee member, renowned placebo researcher and the Director of PiPS, Dr. Ted J. Kaptchuk. PiPS is the first research center to pursue placebo studies through interdisciplinary research initiatives that bridge regular clinical and social sciences, as well as the humanities. Research in placebo studies is expanding

every year and I have tried to stay abreast on all of the latest intellectual history developments, arguments, controversies, and recent discoveries in placebo and nocebo studies. Many of these are outlined in Chapter 3 of this dissertation.

Placebo and nocebo studies provided an excellent lens through which to view the proximate neurobiological mechanisms of mind-body and biocultural interactions. However, they raised as many questions as they answered. I could now understand, in theory, *that* ritual processes can alter physical states and even *how* this biocultural feedback operates, but I still had no clear sense of *why* human bodies are susceptible to psychosocial manipulation and, furthermore, the role that specific cultural contexts play in all of this. Fortunately, Boston University had extensive resources, in terms of programs as well as professors, which facilitated my training in these other areas. I discovered in my required biological anthropology PhD seminars that evolutionary theory, biology, medicine and psychology provided many of the answers to *why* psychosocial stimuli influence physiological processes and also the sophisticated evolutionary and developmental complexities of how these biocultural feedback loops developed and reinforce each other; and the consequences of those underlying structures and predispositions on our bodies in modern environments. This inspired me to stay longer at Boston University in order to complete all of the PhD requirements and training for the degree in biological anthropology as well.

Along the way, I was fortunate to experience rigorous training in sociocultural anthropology, medical anthropology, ritual studies and evolutionary psychology of religion as well as many opportunities to conduct research. I received guidance and

mentoring from learned Africanists in the field, Drs. Parker Shipton, James Pritchett and Jim McCann, who taught me the rich legacy of African history, theory and ethnography on witchcraft, ritual, healing and religion. I have had the opportunity to work directly with legendary psychological anthropologists, Drs. Charles Lindholm and Robert A. LeVine, who encouraged me to recognize the deep psychological roots and motivations of human behavior as seen via person-centered psychologically-informed ethnography in sociocultural contexts. They have found ways to acknowledge universally shared panhuman neurological and biological structures and constraints without displacing social interactions or cultural institutions to secondary positions; recognizing the mutually constitutive relationship of psychosocial and physiological development and interaction; and have, likewise, inspired me to do the same. I collaborated with the Institute for The Biocultural Study of Religion, The Social Science and Religion Network and Seminars and The African Studies Center at Boston University and the Study of World Religions at Harvard University. Over the last ten years I worked as a grader, TA, Research Assistant and Instructor in: African studies, medical anthropology, psychological anthropology, biological/physical anthropology and cultural anthropology. This research (in its different incarnations) has been featured in university and national publications, conferences, invited speeches, guest lectures and on the TED stage as a 2010 TED fellow.

In May 2008 I completed all of the *Twí* language, comprehensive exam and PhD coursework requirements (for degrees in both biological and cultural anthropology) as well as the Master's degree and an African studies graduate certificate from Boston

University. I conducted dissertation research fieldwork from August 2008-July 2009 and have been teaching and writing ever since.

### **1.1.1 Field Setting and Day-to-Day**

For this research, I decided to narrow the scale (who is being studied: Asante in medical contexts) and scope (what is being studied: biocultural interactions) in order to keep the breadth (holistic context: what myriad factors contribute to Asante medical encounters). I focus only on healers, patients and medical encounters in the Sekyere/Mampong districts of the Asante region in central Ghana, West Africa. I did this for a number of reasons including time, language, and previous relationships with healers, medical settings, and local elders, chiefs and queen mothers.

I have worked most regularly with twenty Asante healers over the course of the last decade-- a handful of whom I followed through their recruitment, apprenticeships and eventual establishment as indigenous healers. I also witnessed the ritual healing ceremonies of over one hundred different Asante *Ɔkomfor*. I observed, recorded and interviewed most of these healers, some of them in great depth. In 2009, I was one of only a handful of *obruni* (foreigners) ever to have been invited to the *Asantehene* (King's), palace at the annual festival for *Ɔkomfor* to supplicate *Onyame* (God), the *Abosom* (lesser gods) and the ancestors for prosperity and peace for all Asante. I was allowed to observe, participate in and record many of these ceremonies, including private consultations as well as spirit possession, drumming, chanting, libation, divination, animal sacrifice and ethnobotanical farming, product development and distribution. I

received permission from both healers and patients to collect physiological measurements before, during and after ritual healing ceremonies.

During shrine visits three times a week, I greeted participants, explained the purpose of my visit (if I was attending for the first time), asked permission to conduct research, paid homage to the gods (usually in the form of a bottle of Schnapps) and then observed and recorded the ceremony (usually lasting 3-4 hours). If permission was granted I collected physiological data and conducted small interviews with patients, shrine workers and healers. I regularly stayed long after the ceremony to watch patients begin their treatment plans and to conduct extended interviews with healers. Some healers insisted I participate in the ritual healing ceremonies in the form of dancing, drumming, shaking a gourd with the chanters, divination and even public conversations with them during spirit possession where *abosom* demands could be unpredictable. I was able to trace some patient ailments from when they first arrived at the shrine until they were either cured or stopped coming. Often this was a long process of two to six months. In some particularly difficult cases resolution was indeterminate and patients were still consulting healers many years later. Most often, however, I followed patients through all of the stages of an Asante indigenous ritual healing ceremony (see Chapters 5 and 6 for more details) capturing physiological and subjective appraisals of patients' pain, emotion, anxiety, meaning, satisfaction, etc.

While I spoke *Twi* and often used proper *Twi* greetings and other nonverbal signs of respect as icebreakers to gain access to informants, I usually brought along a translator or sat by a shrine worker so that I could ask questions throughout the ceremony and in case I

couldn't fully communicate with non-English speaking informants and in order to translate many of the religious vocabulary that I did not learn during formal Twi lessons. Often these shrine workers and translators provided valuable information as informants themselves.

While my main unit of analysis is specifically biocultural interactions in Asante indigenous ritual healing ceremonies (see below), my integration into Asante social life gave me a wealth of experience in broader Asante sociocultural and ethnomedical expectations and behaviors. During all of my five research experiences I lived closely among Asante friends and “family.” My life outside of research was purposefully embedded in the social and cultural fabric of Asante daily life. I participated in community events, volunteered at the local high school, attended regular church services, gossiped about current affairs, maintained friendships with people far outside my scope of research, and inquired about every aspect of Asante life to whoever would listen. I participated in daily farming, shopping, cleaning and cooking habits. I tried to capture a holistic awareness of what it means to be Asante (in terms of actions, motivations, obligations and constraints) as well as what it might feel like. All of these experiences added to the contextualization of Asante medical encounters and were necessary for untangling the myriad and often competing determinants of sickness and healing in Asanteland.

Ultimately, I believe that my interdisciplinary academic training, contacts, extended fieldwork and cultural and linguistic knowledge demonstrate a long-term engagement

with Asante ethnography, and allow me to achieve the research objectives laid out in this dissertation.

## **1.2 QUALITATIVE METHODS**

### **1.2.1 Unit of Analysis:**

*The Social Life of Placebos* uses a biocultural approach to address what Nichter (2009) outlined as three types of ethnomedical inquiry: 1) comparative studies of cultural ailments and healing techniques guided by a search for universalism, 2) cross-cultural comparative studies of human physiological processes with culture constituting a mediating or confounding variable (see the following sections on evolutionary causation and problems in biocultural evolution) and 3) studies of the efficacy of healing techniques and procedures which are contextualized and attend to their content as well as performance, expectations and criteria of assessment (2009:xi). Ethnomedicine also entails a study of the afflicted body as a space where competing ideologies are contested and emergent ideologies are developed through medico-religious practices and institutions which guide the production of knowledge (Nichter 1992: x). Asante indigenous ritual healing ceremonies and ethnomedicine started out as my primary unit of analysis but as you will read in Chapter 4 there are some problems with studying therapeutic efficacy from an ethnomedical perspective. In an attempt to more accurately represent Osei's biocultural perspective and the integrated experience of medical encounters, the unit of analysis for this research has shifted slightly to the biocultural interactions in Asante indigenous ritual healing ceremonies and Asante medical encounters. Any assessment of this manuscript should keep that unit of analysis in mind as this research will not be a holistic description of Asante indigenous ritual healing



ceremonies or Asante medical systems and it will not outline all of the sociocultural or biological determinants of sickness and health in Ghana; it will merely attempt to uncover the proximate and evolutionary explanations of biocultural interactions in Asante indigenous ritual healing ceremonies and should be judged as to whether or not it accomplishes that goal.

There are as many ways of conducting this type of research as there are researchers. I am certain different units of analysis and methodological and theoretical frameworks on Asante medical contexts would be enormously valuable. However, in order meet the Research Objectives 1.2 of this dissertation, I have selected the specific focus and particular explanatory models and tools necessary to answer the Research Questions 1.2.1 and achieve the Research Goals 1.2.2. The main units of analysis in this research are biocultural interactions in Asante medical contexts. I examine these in a variety of ways. First, I use ethnographic qualitative methods to create a thick description of culturally contextualized biocultural interactions in Asante medical encounters. Second, I use quantitative methods of physiological measurements before, during and after Asante indigenous ritual healing ceremonies to investigate whether culturally specific expectations and behaviors alter physiological processes. Third, I compare these results to proximate neurobiological mechanisms of placebo and nocebo responses to explain the myriad ways that psychosocial variables or events or processes can elicit physical reactions. Finally, I situate all of these findings within a biocultural evolutionary framework in order to elucidate why our bodies evolved to be susceptible to psychosocial manipulation and the health consequences of that susceptibility in modern environments.

### **1.2.2 Sampling Process:**

I had a method of semi-voluntary self-selection for sampling individuals to teach me about Asante cultural and social domains. Basically, I asked whoever was willing (which in Ghana due to strong hospitality culture is nearly everyone) about their lives, thoughts, experiences and interpretations, i.e., on buses, in restaurants, waiting for taxis, at the market, etc. This sample provided me with a holistic awareness of basic Asante beliefs and behaviors. For targeted information on sickness and healing, I had a more selective sample of key informants. Often this was either context specific informants, i.e., patients, participants or bystanders, at medical encounters or expert informants, i.e., healers, workers or health practitioners, who were more knowledgeable about specific features in Asante medical and ritual healing practices than the average person in the society. I made sure to include key informants across the entire spectrum of Ghanaian medical pluralism in order to understand a wide range of perspectives and their distribution in Asante health care options (see the discussion on medical pluralism in Chapter 6 for more). I also used chain or snowball sampling to get expert informants to help identify and introduce me to other expert informants. More selective and context-based sampling produced more relevant and detailed information about Asante medical contexts. This selectivity also allowed me to go deeper, in terms of person-centered ethnography, with key informants than a broader sample would allow.

In this research, I used a mix of qualitative ethnographic methods which I varied dependent on the context, sample and purpose of the particular exchange. Below is a list

of those methods as well as specific examples of why, how and when they were used in this research.

### **1.2.3 Extended Integrated Fieldwork:**

This method (usually) consists of living with and among informants and participating in all aspects of daily life, including becoming socially embedded and integrated into the society, for an extended period of time (often around 12 months but varying widely in duration). This method is useful in fostering close, long term, mutually beneficial relationships with informants as well as in recognizing patterns of behavior over time. Over the course of my 26 months in the field, this method was critical in establishing trust and rapport with informants, gaining access to less public rituals and medical practices, uncovering secondary and tertiary levels of data (see reliability checks below), observing specific Asante patterns of behavior in medical contexts (see content analysis below) and acquiring emotional intelligence (see emotional intelligence below).

### **1.2.4 Participant Observation:**

Incorporating of many of the other methodologies listed in this section, participant observation aims to move the researcher's role from outside observer to experiential participant with the hope that so doing will engender rapport, familiarity and increased recognition and awareness of specific features and behaviors in the sociocultural context. This method was a consistent and daily feature of my field research and was conducted by taking **recordings** (see below) and **field notes**: i.e., recording observations, descriptions, specific communications and interactions at the time of the ethnographic event to be analyzed at a later date. Participant observation is an inherent part of extended integrated fieldwork with the additional mandate to observe and record ethnographic

details, especially social action and behaviors. Instead of a **problem-oriented approach**, where a pre-constructed hypothesis is tested in an ethnographic setting and data is used to either confirm, reject or restructure the hypothesis, **participant observation** and **extended integrated fieldwork** attempt to collect a broad and holistic description of the ethnographic context, without regard to theory or relevance, in order to acquire unbiased data (or as close to it as possible) that can be analyzed in myriad ways and via different perspectives later on. Anthropologists construct hypotheses out of the ethnographic data rather than using ethnographic data to confirm already held hypotheses. There are pros and cons to both methods (see problem-oriented approach below). For this research I conducted 4 different **extended integrated fieldwork** experiences where I tried to collect holistic unbiased ethnography. Over time, I narrowed the scope of the research, i.e., focusing only on biocultural interactions in Asante medical contexts, in order to obtain greater depth and untangle some of the complexities. By my fifth fieldwork visit I had more specific questions, contradictions and problems that I sought to understand through targeted ethnography on specific topics and interactions.

#### **1.2.5 Interviews: Formal, Semi-Formal, Informal, Structured and Unstructured:**

Interviews are one of the most common qualitative ethnographic methodologies and

are useful in uncovering informant thoughts and feelings on specific topics (as distinguished from their actual behavior as observed in participant observation, above). I adjusted my level of formality and interview structure depending on the type of information I sought and the closeness of relationship I shared with the informant. I used interviews every single day during fieldwork in order to elicit and understand Asante

sociocultural processes as well as to uncover and record specific informant ideas and verbatim statements. I also, whenever possible, interviewed all of the different actors in the social drama, i.e., healers, patients, shrine workers, drummers, chanters, participants, etc., in order to examine the distributed and differential knowledge and perspectives of the various **stakeholders** and, ultimately, make a thicker description of the medical event. A key method I used in Asante indigenous ritual healing ceremonies—in conjunction with physiological methods (below)—was **rapid assessment interviews** before, during and after a shared medical event of a large group of people on a particular topic (the patient's **phenomenological experience** of the ritual process (Csordas 1988) in order to evaluate and compare changes in the patient's "state"). I used **longitudinal interviews**, conducted over the course of many years and throughout many different contexts of individual key informants, to capture a person's "traits" over time (this tool was also helpful at reliability, consistency checks as well as degree of genuineness, see below). Concurrent with longitudinal methods, I also conducted **life history** and **health history** interviews. **Life history interviews** recorded the different developmental events and remembrances applicable to (as stated by) key informants that have shaped, confirmed or otherwise influenced an informant's expectations and behaviors. A good example of the utility of this method is deepmlife history interviews with Osei and Abena where they described the thoughts, feelings actions and events in their life before, during and after being (involuntarily) recruited to become *Ɔkomfor* (see a detailed description of this in Chapter 6: Culture of Fear and Obligation).

Becoming aware of these life histories, the similarities therein, instances of cultural resistance, informants' own recollection and interpretation of life events, and the cause and effect relationship between obedience and misfortune was critical to painting a picture of the types of pressures, constraints, expectations and behavioral modification that *Okomfor* experience. **Health history interviews** provided similar more comprehensive information about individual patients' experiences, over a lifetime, with sickness and healing. This was useful for understanding a patient's physical and **genealogical** as well as mental predispositions. While not without limitations (i.e., subjective bias, memory errors, etc.), health histories were a good way to ascertain informant conditioned responses and expectations which could then be speculatively or informally applied to clinical research (see method below).

#### **1.2.6 Syndemics:**

Health histories also make apparent syndemic factors affecting sickness and healing.

**Syndemics** "entails not just one health problem but a cluster of problems that work together, reinforcing and often exacerbating each other synergistically" (Sobo 2013:193; Singer 2009). It is important to understand syndemic contributors, interactions and all of the constraining and motivating factors in every health encounter.

#### **1.2.7 Person-centered ethnography:**

Drawing from psychological anthropology, person-centered ethnography seeks to capture an informant's own perspective, i.e., his or her opinions, experiences, feelings, confusions, expectations, hopes, and perceptions and how these change over time and dependent on situation. This technique requires rapport and a long-term investment in the relationship but produces much deeper knowledge about the lived experience of Asante

daily life than more traditional interviews that ask informants to explain social systems and cultural values. The majority of my interviews were person-centered and I learned especially valuable information from informants with whom I maintained contact over the course of a number of years. For example, because I was friends with Abena, a local school teacher in the village I lived in for a year, she allowed me to conduct life history and health history interviews, she let me follow her into the consultation rooms and shrines of the many doctors and healers she went to, and she told me all about her fears and frustrations with infertility, her religious confusions, and the particularly sticky social relationships she experienced with in-laws and her twin sister. In fact, Abena even told me about some of the ways she lied and deceived others. All of this information was critical to providing a comprehensive view of the myriad factors that influence Asante medical contexts.

#### **1.2.8 Explanatory Models:**

Collecting patient and practitioner explanatory models of illness was a good way to uncover attitudes, expectations and meanings about sickness and healing specifically, the cause, timing, mode of onset, pathophysiological process, natural history, severity and appropriate treatments of a condition. These questions include, but are not limited to: What has happened? Why has it happened? What has it happened to you? Why now? What would happen to you if nothing was done about it? What would happen to others in your social group? What should you do about it? Whom should you turn to for help? (Kleinman 1980; Helman 2007:129). An example from this research is from the **1.1**

**Ethnographic Breakthrough** above where Osei provides a rich explanatory model of Abena's infertility.

#### **1.2.9 Ethnography of an Indigenous Healer:**

This methodology entails creating a thick description of a healer or group of healers. This is a participant-observation study, which usually involves 'sitting in' with one or more healers and observing the ritual setting of their work, the techniques that they employ and the types of responses that their patients have to them. It often also involves trying to assess the efficacy of these techniques vis-a-vis those of conventional Western medicine (Helman 2007:462).

Much of my research was based on this methodology which included long-term ethnographies of one healer, i.e., my ten-year relationship and longitudinal observation of Osei's going through all of the stages of becoming a *Ɔkomfo* as well as his personal feelings on the matter, as well as shorter-term ethnographies of many healers, i.e., comparing numerous Asante indigenous healers and ritual healing techniques.

#### **1.2.10 Ethnography of Medical Institution or Medical Context:**

Using participant observation, extended fieldwork and access (via close, long term mutually beneficial relationships with informants), I observed and recorded shared patterns of behavior over time of "institutional culture, norms, rituals, social organization, use of language and divisions of labour within a medical...environment" (Helman 2007:462). Paying attention to the cultural context of health problems and medical solutions is vital to any study on therapeutic efficacy; as they are both mutually reinforcing. Research, especially in evolutionary medicine (see Chapter 3), is



predominated by disease-centered or individually-centered approaches, which can ignore the impact of medical institutions and cultural contexts on sickness and healing.

The cultural context of health problems is all too often ignored by individually centered approaches. Second, people spend a significant portion of their lives within small interactive groups, where their behavior may be impacted as much or more strongly by the group than by any individual characteristic that they bring to the group....[Which is essential to establish] the importance of cultural contexts and the organization and structure of human systems...and the impact of cultural structures on human behavior (Trotter 2011:57).

This method was essential to discovering and then analyzing Asante pain behaviors and social responses to pain as seen in acute trauma in medical encounters. Without this method, I might not have recognized significant shared patterns of behavior, across individual case studies and health care practitioners that I was then able to analyze collectively. Ultimately, these findings might be the most noteworthy, or at least applicable, of the entire dissertation (See Chapter 5: Pain for more details; also next two methodologies).

#### **1.2.11 Informal Content Analysis of Practitioner-Patient Interactions:**

I used content analysis techniques to collect, record and then analyze practitioner-patient interactions, behaviors and communication patterns in specific Asante medical contexts. This was useful in confirming the existence and frequency of said patterns and outlining the specific, contextual and consistent features of those patterns which allowed me to then analyze them juxtapose clinically significant research (see next methodology)

as well as apply them to novel contexts with commensurate patterns. I used content analysis of Asante pain behaviors and social responses to pain (see above and Chapter 5) in order to find specific patterns of shared interactions, behaviors and communication between Asante practitioners and patients during cases of acute trauma. Because these patterns of behavioral pain modulation were consistent across trauma type and medical context, I am able to suggest a consistent Asante pattern of pain behavior and social responses to pain that is shared throughout the region. Content analysis of a wide variety of patient-practitioner interactions in the region also allows me to discuss specific behavioral and communicative techniques for the management of pain in novel settings where medication is not available.

#### **1.2.12 Informally Applied Clinical Research:**

After content analysis (above) and because the features were confirmed and consistent across numerous Asante medical encounters, I was able to find patterns in Asante practitioner-patient interactions during acute trauma encounters that were commensurate to conditions studied in clinical settings. I speculatively applied this research to Asante medical contexts in order to better understand some of the proximate mechanisms of practitioner-patient interactions as seen in placebo and nocebo studies. This is important because current methodologies in field settings can't replicate many of these empirical and clinical research designs and the incommensurability is hampering both clinical and field research. While there are many limitations to this methodology, it, nonetheless, facilitates a level of cross-cultural, cross-context comparison that is rare, needed and that raises important questions and prompts better field methodologies for health research.

#### **1.2.13 Focus groups:**

Collecting interviews with a small group of people is helpful to observe how people negotiate, agree, disagree and form collective answers. It is also a good way to measure cultural consonance and individual preference. I used focus groups on a few occasions to uncover shared expectations and for populations that were tentative or hesitant to be interviewed alone. For some, focus groups took the individual attention and pressure off of them, they felt less threatened by me, my presence was less noticeable and informants became more comfortable and opened up more when surrounded by peers. This methodology was important in recognizing how my presence affects the field encounter or conducting **reflexive anthropology**. This was especially noticeable and useful with sensitive topics like abortion and sex and with certain populations like teenagers.

#### **1.2.14 Ethno-Taxonomies:**

It was helpful for me to collect ethno-taxonomies or Asante-specific classifications and coherent systems of thought as seen in ethnobiological, ethnobotanical and ethnomedical, etc. models. In fact, Osei's explanation of how ritual processes affected human physiology in **1.1 Ethnographic Breakthrough** is a great description of the procedure and significance of this method. While most of the ethnobotanical and ethnopharmacological taxonomies or knowledge collected from herbalists, chemists and pharmacists, were collected in the field do not appear in this manuscript, they were vital for uncovering the paradigmatic boundaries, rules and relationships between physical and psychosocial variables with and without "active" (as defined by ethno-taxonomies) substances. This was an imperative task in studying "placebo responses" in field settings.

#### **1.2.15 Go-Along:**

Go-Along methods entails participating in actions coterminously with informants in order to better understand the kinesthetic, interactive and corporeal aspects of cultural meaning, social relationships and ritual actions (Kusenbach 2012). I used, or was compelled to use, this method regularly during ritual healing ceremonies where my participation (in the form of dancing, drumming, consulting, etc.), commensurate with and alongside informants, created rapport, a sense of shared space, mutual intentionality, activated mirror neurons and empathetic understanding, and (in the case of ritual healing) facilitated physiological entrainment. This methodology was helpful at “attuning” my physical, psychological and social experiences to those of my informants and facilitating anthropologist as apparatus and resonance or emotionally intelligent methodologies (see below).

#### **1.2.16 Resonance Methods: Emotional intelligence**

Readers will benefit from paying particular attention to the story about my student Julie in this section because it illustrates how seemingly simple qualitative methods can lead to quite significant discoveries and shift research in new directions. Jamie’s story is also an important element in Chapter 4 illustrating the importance of anthropological methods in the acquisition of emotional intelligence.

In Chapters 5 I argue that an imperative, undervalued and neglected aspect of ethnographic research, as evidenced by lack of explicit methodology, is **Resonance** with informants, **Emotional intelligence** or emotional literacy in host culture and/or **Empathetic understanding**. Based on my personal experiences of coming to understand and relate to my informants in affective - not just cognitive - ways over the course of

**extended integrated longitudinal fieldwork** (see Chapter 5: Emotion), I outline a new method that takes seriously the researchers' ability to acquire emotional intelligence and understand informants in empathic ways. The method is based on quantitative data and evidence of **entrainment** in ritual healing ceremonies, evolutionary adaptations and panhuman empathic capacities and in conjunction to **informally or speculatively applied research** on mirror neurons, theory of mind, empathy, **acquiring tacit knowledge** and social and emotional intelligence acquisition. This method is important, I argue, because it: **1)** more closely depicts life as it's lived by informants, **2)** recognizes and **hierarchizes the degrees of intensity or significance** of social action as communicated by tacit emotional expression (see Chapter 5: Emotion for more on this), **3)** takes into account evolved panhuman communicative abilities (i.e., the universal capacity to interpret facial expressions or recognize deception) that exist beyond cultural differentiation because "psychic unity is ... that which makes us imaginable to one another" (Shweder 1991:18), **4)** takes seriously the **anthropologist as apparatus** or the researcher's own capacity to acquire and interpret tacit or emotional information and to use those embodied (or even "embrained") experiences to resonate with informants, **5)** makes explicit, much like language learning, the process of emotional and social intelligence acquisition in primary and secondary cultures, and **6)** elucidates distinctive, taken for granted, valuable, underestimated and essential assets and unique contributions of anthropological method. "Research techniques should focus on capturing both our conscious awareness of why we do what we do and the inherent processes that shape the flow and outcome of that doing" (Lende and Downey 2012:43). This method was critical

in recognizing and making explicit the latter mandate, enormously useful in collecting informant's **phenomenological experiences**, and in evaluating how those experiences influenced or activated psychosocial and physiological processes in Asante medical contexts. It was also helpful for me to be able to recognize that not all ethnographic details have the same degree of intensity, valence and significance for informants and that **categorizing and hierarchizing** these experiences is a valuable way to isolate what, among the standardized and myriad interactions, is most important to informants. I was also able to compare numerous individual **hierarchies of emotional intensity** and find consistent patterns of what makes certain interactions more emotionally intense than others across Asante medical contexts, which allowed me to illuminate deeply held shared Asante values (see Chapter 5: Emotion for more). Because emotional intelligence can be learned with consistent, participatory and extended observation, imitation and practice, this method makes explicit why **extended integrated fieldwork, participant observation** and **go-along methods** are so essential to collecting accurate, coherent and comprehensive qualitative ethnographic data. It also provided a less arbitrary way to (i.e., evolved capacities to recognize tacit or emotional signals like deception) to explain why I trusted some key informants more than others and to recognize that there are varying **degrees of genuineness** and honesty in all human social interactions.

#### **1.2.17 Signs and Signifiers:**

A good way to discover, understand and hierarchize cultural meaning (beyond just **observing** and **recording behavior** and **acquiring emotional intelligence**) is to look for and then explicate cultural symbols, i.e., words, behaviors, clothes, colors, actions,

movements, accoutrements, patterns, and affective, nonverbal, and bodily expressions, etc. Each cultural symbol is a “‘storehouse of traditional knowledge’...a ‘storage unit’ into which is packed the maximum amount of information” (Turner 1974; Helman 2007:225). I discovered a lot of valuable information about Asante paradigmatic understandings of the world by asking simple questions about what a particular cultural symbol meant. I did this via **interviews** and **focus groups** with key informants where I asked them to explain the meaning of specific symbols or actions, by eliciting **explanatory models** and **ethno-taxonomies** and through **content analysis** of consistent patterns of speech and behavior. Much of the job of an anthropologist is to make explicit the signs, and what they signify, that are taken for granted by members of a culture. This “doxa” or knowledge that is assumed by members of a society, that “goes without saying because it comes without saying” (Bourdieu 1977:167), and creates a feeling that “the natural and social world appears as self-evident” (164), is relatively easy to uncover via ethnographic methods. For example, talcum powder is used by all *Okomfo* in all Asante indigenous ritual healing ceremonies. It is so common a practice that I was called “*abofra*” or “child” when I asked about it (the sign) and what it meant (signifies). In fact, not knowing this was a sign that signified my own outsider status. I was told that talcum powder was in and of itself nothing special; “just something you buy cheap at the market.” When used in ritual healing ceremonies, however, it took on new meaning. It was a sign that meant that the *Okomfo* was spiritually possessed and it preceded everything s/he touched and everywhere s/he walked, signifying that the actions were coming from an *abosom*, not the *Okomfo*. It was swiped across the eyes to signify that

“the man is gone, but gods see.” Prepared with this information I was able to recognize this **sign and signifier** used by numerous healers, in different ways and in many contexts. I no longer needed an informant to explain that an *Okomfo* was out of spirit possession when I saw him washing the talcum powder from his face. In fact, I didn’t even need clarification when I encountered this **sign and signifier** in a novel way completely out of context. My first assumption when I saw a young woman start to move erratically in a crowded festival gathering was that she was having a seizure but she quickly rubbed a white substance across her eyes (I am not sure it was even talcum powder) and I immediately understood that she was spiritually possessed, which was confirmed by the group shortly thereafter.

#### **1.2.18 Consistency Checks:**

Confirmation of symbols, meaning, explanations and feelings are a regular feature of qualitative ethnography. It is important to make sure the information collected is consistent both cross-culturally and through all of the various levels of culture (see below). I did this by making sure to ask multiple people the same question or **sign/signifier** until I arrived at (via discovery and description, not creation and explanation) an answer shared among a diverse population that was routine and consistent (**informal inter-consensus**). Only then would this concept become an Asante sociocultural “fact.” The gestalt collection of these socially confirmed and consistent “facts” became the **informal cultural consensus** model or paradigmatic cultural logic of the Asante worldview(s) (a necessary caveat to note here is that not all individuals in a culture will understand or approximate this cultural consensus model the same way or to



the same degree, see **informal cultural consonance** below). I also asked an individual the same question many different ways. This helped to mitigate the biases caused by the question itself as well as **check for consistency and reliability** in the answer i.e., is this the *real* answer—what the informant actually says, does, thinks and feels, or is the answer what the informant thinks *I* want to hear, what she *says* she does, or what she thinks she *ought* to say, do, think and feel, etc. (**informal intra-consensus**). These checks are common features of well-written questionnaires and surveys but they are also helpful in qualitative ethnographic interviews. It was also useful to check for consistency across a diversity of medical contexts because it helped me distinguish which Asante expectations and behaviors regarding sickness and healing were general to all medical encounters and which were specific to particular health care settings. I also checked for consistency by comparing my data to **secondary sources** on the Asante; similarities meant that I was probably on the right track and differences led to further investigation.

#### **1.2.19 Informal Person-Centered Cultural Consonance:**

Despite **consistency checks**, there is always going to be differentiated and distributed knowledge within a culture and variation in “the degree to which individuals, in their own beliefs and behaviors, approximate widely shared cultural models” (Dressler et al. 2007:195). I conducted informal person-centered cultural consonance checks by asking key informants the degree to which they matched or differentiated from the prevailing cultural expectations and behaviors in particular settings. Since low cultural consonance correlates with low social support, low access to resources and increased psychosocial stress, this was an important measure for me to collect and it shows up throughout this

dissertation. For example, Kojo describes, in a Chapter 4 footnote, how he had low cultural consonance when he first became an *Okomfo* and the impact that had on his social acceptance and personal levels of wellbeing (including stress and sickness), in Chapter 4: Emotion I discuss the impact of my own increased emotional stress due to low cultural consonance in Asante witchcraft and I outline the effect of cultural consonance on status and status related health problems.

#### **1.2.20 Reliability Checks:**

This method checks the reliability between perceived and actual statements and behaviors. There are often contradictions or confusion between four different levels of data. Where possible, it is useful make sure all four levels are examined: 1) What people *say* they believe, think or do, 2) What people actually *do*, 3) What people *really* think and believe, and 4) The *context* of the above three points (Helman 2007:456-457). It is relatively easy via questionnaires or interviews to collect information about what people *say* they believe, think and do. However, that is not always consistent with what they *actually do*. Thus, **participant observation** is needed to find out if there are discrepancies between these two levels. If discrepancies are discovered, then more in-depth, **person-centered interviews** are needed to uncover deeply-held, less conscious or even less acceptable beliefs. Close, long-term, trusting relationships (i.e., the importance of **extended integrated fieldwork**) are often critical to accessing information on this level. Finally, all of these levels can be influenced by the context in which data was collected (i.e., time, location, circumstances, etc.) and attributes of the researcher; another reason why close relationships with informants and extended long-term research across

many different contexts is essential. A good example of the importance of this methodology in my research was that informants would often *say* that they do not attend indigenous ritual healing ceremonies but then I would see them there. I became close with these informants over time and asked them in different ways (see **consistency** checks above) and in different contexts about this discrepancy. This led to valuable information about fears, obligations, social status and class.

#### **1.2.22 Photographic, Video and Voice Recordings:**

Collection of specific instances and events is useful in order to capture and retain information so that you can go back and analyze it in more detail than the situational circumstances allow. This is often the case in the fast-paced , multivariate, layered context and interactions of Asante indigenous ritual healing ceremonies. Recordings are also helpful in case you missed important information the first time around. There are some limitations that can arise when people know they are being recorded and so it is useful to go between **field notes** and **recordings** according to the specific situation, informant and research objective. One example of how **recordings** were valuable to this research was that I was able to go back through my photographs and video recordings to uncover the variety of healer “proofs of authority” (discussed at length in Chapter 6 and in *Appendix: Chapter 6: 6.2*), which I had not thought were relevant at the time of data collection, but that became important during analysis and the writing process. Because I was creating a **thick holistic description of the ethnographic context** rather than conducting **problem-oriented research** I did not pay particular attention to these “proofs

of authority” and I would have missed significant details had I not captured these case studies on video for future analysis.

### **1.2.23 Field School Approach:**

I was trained in the field school approach to ethnographic research, which actively involves undergraduates in primary field research, ethnographic writing, conference presentations and academic publications by creator, Dr. John P. Hawkins (Hawkins and Adams 2005), at Brigham Young University as an undergraduate (see Appendix, Chapter1, 1.1 Qualifications). I used this approach throughout my entire research trajectory. I took undergraduates into the field and incorporated them into my own research as a Ghana Field Study Facilitator and then independently contracted with students during my last two field excursions. This method was helpful because it forced me to: apply my cultural, linguistic and geographic knowledge, recognize and explain overarching patterns of Asante sociocultural expectations and behaviors via cultural preparation and teaching, answer questions that I had not thought of (i.e., **ethnographer becoming the informant**), maintain and continually express clear research design and methodologies, pay attention to my and others’ impact on the research setting and become aware of and evaluate the degree(s) of my own cultural assimilation. This last point was an unexpected byproduct of this method and became very important in my research. For example, taking “new” students into the field (who had didactic cultural preparation and ethnographic training from myself, but had no actual field experience or immersion into Asante contexts) was vital to my quantitative data (i.e., I could measure how much of our physical response to Asante indigenous ritual healing ceremonies and

poly-rhythmic drumming was due to conditioned responses, expectations and attunement by comparing “new” students’ physiological measurements—who were physically, psychologically, affectively and contextually unfamiliar with these ceremonies—with key informants’ (and even my own) physiological measurements—who had varying degrees of familiarity and attunement with the ceremonies (this was taken into account and measured). Observing “new” students in the field also helped me to become aware of and measure my own degree of Asante acculturation and emotional intelligence, especially in regard to information that is tacitly acquired. The best example of this is the story of Jamie, one of my students, comforting a patient at the local biomedical district hospital (see more in Chapter 5: Pain). It wasn’t until I tried to explain to Jamie why her behavior was culturally inappropriate that a) I recognized my own acculturation to and acquisition of tacit emotional and social intelligence in Asante responses to pain and b) those deeply-held, difficult to explain and largely unconscious Asante social responses and their underlying meaning became more apparent.

#### **1.2.24 Qualitative Mixed Methods Combined:**

In fact, this experience with Jamie led to my using another qualitative ethnographic methodological approach, **problem oriented research**. Rather than the more holistic methods of **extended integrated fieldwork** and **participant observation** (see above), where a thick description of the myriad features of an ethnographic setting are described and then a hypothesis is constructed from the data at a later date, I used a **problem-oriented approach**, where I outlined a definite question, contradiction or problem and then sought out the specific ethnographic data needed to explain it. After 12+ months in

the field, this type of methodology became more and more common. Many of the limitations of this method (i.e., confirmation bias, reductionism, etc.) were mediated because of my extensive previous holistic ethnography and because the questions were grounded in and arose out of ethnographic settings (rather than academic or positivistic hypotheses). For example, in order to understand my strong negative reaction to Jamie's comforting behavior I sought out and recorded Asante case studies of comforting behavior. Once I collected numerous cases in a wide range of medical contexts, I compared and analyzed them. What I discovered from this **problem-oriented approach** was that there were clear behavioral signals and meanings associated with specific comforting behaviors. Jamie's actions of soothingly comforting and hugging a patient—which signal empathy and compassion and signify social support in an American biomedical context—communicated something quite different in an Asante medical context. In fact, the only times I ever saw this type of soothing comfort and soft touch in Asante medical encounters was when a patient was terminal, beyond care and without hope of cure. In most other cases, the normal pattern of Asante social responses to pain was harsh speaking, rough touching, criticism and normalizing or minimizing the trauma. These patterns illuminate the **signals and significance** of Asante social responses to pain, i.e., soothing comfort and soft touch were signals that meant that someone had little or no hope of recovery whereas harsh speaking, rough touch, criticism and normalizing or minimizing the trauma were signs that the patient would be alright. Thus, Jamie's actions communicated the exact opposite of what she intended within an Asante context (see more in Chapter 5: Pain).

The layered and interacting nature of anthropological methodologies becomes very vivid in this case study. None of this research comforting behaviors would have been undertaken without me “feeling” uncomfortable with Jamie’s actions. This largely unconscious, unpleasant sensory response required a level of **emotional intelligence** in the Asante paradigm that can only be gained via **long-term integrated fieldwork, holistic ethnography, participant observation, going-along** with informants throughout their daily lives and in their own space and finding **resonance** with them. This background facilitated my acculturation, regardless of whether or not I was aware of it, to Asante-appropriate comforting behaviors. While these methods are necessary, they are not always sufficient because much of the knowledge that anthropologists (and members of a society) acquire is tacit; which means that it is understood, interpreted, experienced and expressed implicitly without conscious awareness, evident comprehension or explicit communication. Therefore, methods are needed that discover **(etic perspectives, field school approach, ethnographies of medical institutions and healers)** and describe **(interviews, signs and signifiers)**; that challenge **(consistency checks, secondary sources, ethnographer as informant)** and delve deeper into **(reliability checks)**; that elicit personal introspection about **(phenomenology, person-centered, life histories)** and explanatory models of **(ethno-taxonomies)**; that find patterns **(content analysis, health histories)**, degrees **(cultural consonance)** and hierarchies in **(emotional significance, genuineness)**; and that confirm **(field notes, recordings, cultural consensus, problem-oriented)**, complicate **(syndemics,**

**anthropologist as apparatus**), and compare (**informally or speculatively applied research**) these deeply-held tacit understandings of the world.

#### **1.2.25 Qualitative Research Limitations and Significance:**

I also attempted various other qualitative methods which were not as successful as the above. I tried collecting **case-control samples** of a population suffering from the same illness in order to uncover shared Asante somatic responses or behavioral patterns across the spectrum of health care options. I discovered that this approach did not work well in my area. Each health care option (generally) had a specific set of disease-types, i.e., patients' did not go to indigenous healers, biomedical doctors and Christian faith healers to cure malaria. It was also difficult because most of the "illnesses" at Asante indigenous ritual healing ceremonies did not map well to established disease categories. While this method was not useful at what I had intended it for, it did help my construct an Asante hierarchy of resort or patterns of when, where and why patients go to the various health care options.

Qualitative ethnographic methods are "a complex mix of interviewing, observations, participation, explanation, validation and cultural learning that allows the anthropologist to match what people say and do, when they say and do it, and where these activities occur with the theory that will explain it" (Trotter 2011:54). They allow the level of flexibility and informality needed to conduct research on the lived everyday experience of being human in a social environment. I found that when I attempted more formalized, standardized or controlled qualitative methodologies, I created a degree of separation between myself and informants and between the research collection and lived experience,



which set myself apart from my informants, that I was unwilling to compromise.

Similarly, the results of my attempts at these more regimented models of qualitative data collection did not contribute significantly to my knowledge of the biocultural processes in Asante medical contexts and they often neglected or weeded out some of the more unique cases or features. As such, many of my methods begin with the same modifier: informal content analysis, informal cultural consensus, informal cultural consonance, informal inter- and intra-consensus and informally applied clinical research. The limitation of these informal methods means that this research will be unlikely to be applied to clinical settings or valued broadly across disciplines. On the one hand, this is problematic for biocultural interdisciplinary research. On the other hand, I think that the level of ethnographic detail, specificity and holism is worth it. It provides unique anthropological contributions and specific expectations, behaviors, interactions and techniques that illuminate how psychosocial processes influence human physiology in culturally contextualized rituals of caregiving.

### **1.3 QUANTITATIVE METHODS**

One of the body systems most susceptible to psychosocial activation is the autonomic nervous system, which has two complementary, homeostasis balancing systems: the sympathetic system (stress) and the parasympathetic system (relaxation). “Since the early 1980s, biocultural anthropologists have focused on psychosocial stress as a pathway to link lived experiences to biology (Goodman et al. 1988)...The stress perspective links culture, psychology, and political economy to a broad range of health conditions through specific physiological pathways and biological processes” (Leatherman and Goodman

2011:38). The interpenetrating relationship between biology and culture becomes very vivid in studies on stress and relaxation responses (see Chapter 5: Stress for more). As such, this research examines Asante sociocultural stressors and methods of stress alleviation via the qualitative methodologies outlined above as well as psychological and physiological measurements of stress (state and trait) via the quantitative methods below.

### 1.3.1 Perceptual Measures of Stress:

Because perception determines the timing, onset, course and intensity of a stress response, it is critical to understand the patient's personal perceptions, i.e., their experiences, expectations and changes over time, or "the phenomenology of the transformative process as lived by participants," (Csordas 1988). There are many psychological instruments available for measuring the perception of stress. The most widely used measurement is the **Perceived Stress Scale (PSS)** (Cohen et al. 1983) a 10 question, 5-point Likert scale questionnaire, which measures self-reported appraisals of how unpredictable, uncontrollable, overwhelming and stressful respondents find their lives.

#### **Perceived Stress Scale**

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name \_\_\_\_\_ Date \_\_\_\_\_ Age \_\_\_\_\_ Gender (*Circle*): **M** **F** Other

**0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often**

1. In the last month, how often have you been upset because of something that happened unexpectedly?.....**0 1 2 3 4**

2. In the last month, how often have you felt that you were unable to control the important things in your life? .....**0 1 2 3 4**

3. In the last month, how often have you felt nervous and "stressed"? .....**0 1 2 3 4**

4. In the last month, how often have you felt confident about your ability

to handle your personal problems? .....	0 1 2 3 4
5. In the last month, how often have you felt that things were going your way?.....	0 1 2 3 4
6. In the last month, how often have you found that you could not cope with all the things that you had to do? .....	0 1 2 3 4
7. In the last month, how often have you been able to control irritations in your life?.....	0 1 2 3 4
8. In the last month, how often have you felt that you were on top of things?..	0 1 2 3 4
9. In the last month, how often have you been angered because of things that were outside of your control?.....	0 1 2 3 4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? .....	0 1 2 3 4
<b>Appendix Figure 1.3.1: Perceived Stress Scale (Cohen et al. 1983).</b>	

Another common measurement is the **State-Trait Anxiety Inventory (STAI)** (Spielberger et al. 1983) a 40 question, 4-point Likert scale inventory measuring state and trait anxiety, defined as unpleasant feelings of unease, worry, tension and stress. State anxiety (S-anxiety) refers to those unpleasant feelings and the arousal of the autonomic nervous system activated by perceptions of an immediate threat. Trait anxiety (T-anxiety) refers to those unpleasant feelings that are experienced on a daily basis. A shorter version of the STAI, the **STAI-6** was created by Marteau and Bekker in 1992 that retained reliability and validity of the inventory but “offers a briefer and just as acceptable scale for subjects while maintaining results that are comparable to those obtained using the full-form of the STAI” (Mareau and Bekker 1992: 301).

### Appendix A: Self-evaluation questionnaire (Y-6 item)

Name ..... Date .....

*A number of statements which people have used to describe themselves are given below. Read each statement and then circle the most appropriate number to the right of the statement to indicate how you feel right now, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.*

	Not at all	Somewhat	Moderately	Very much
1. I feel calm	1	2	3	4
2. I am tense	1	2	3	4
3. I feel upset	1	2	3	4
4. I am relaxed	1	2	3	4
5. I feel content	1	2	3	4
6. I am worried	1	2	3	4

Please make sure that you have answered *all* the questions.

### Appendix Fii ure 1.3.2: Short Form State-Trait Anxiety Inventory STAI-6 (Marteau cpf 'Bekker 1992).

An updated version of the STAI was designed in 2008 called the **State-Trait Inventory for Cognitive and Somatic Activity (STICSA)** (Ree et al. 2008), which includes self-reported assessments of S-anxiety “degree of cognitive and somatic anxiety experienced at a particular time” and T-anxiety “predict[s] the situations in which different individuals will display elevations in cognitive and somatic state anxiety” (Ree et al. 2008: 313). I attempted (in varying degrees) each one of these inventories and did not have much success.

All of these psychological instruments are intended for English speaking, literate (in reading and writing) educated populations familiar with written questionnaires. Whereas my informants were a mix of bilingual (most people under ~50 years old speak both *Twi* and English) and *Twi*-only speakers, who had varying degrees of literacy and education (most males under ~50 years old had had some kind of formal education, but this varied in quality and duration). Only a small minority of my informants had completed secondary school—high school equivalent—and could read and write and most were

unfamiliar with written questionnaires. Because of this, attempts at administering written questionnaires failed miserably (computer questionnaires were out of the question as there was no access to computers in most of the villages, unreliable or non-existent electricity, and computer illiteracy). As a result, I attempted oral administration of these questionnaires. Again, I ran into some major problems. Many of the phrases used were colloquial English. For example, phrases like “handle your personal problems,” “things were going your way,” “cope with all the things,” “on top of things,” “piling up so high,” in the **Perceived Stress Scale** were unfamiliar to my Asante informants and when operationalized tended to blend together in indistinct ways. Similarly, the **State-Trait Anxiety Inventory (STAI)** and **State-Trait Inventory for Cognitive and Somatic Activity (STICSA)** had many phrases and words that needed to be explained, which meant that the questions embedded in the inventory (designed for reliability and internal consistency checks) ran together in repetitive ways and became way too long to conduct orally. To counteract this problem I translated the shorter questionnaires, **PPS** and **STAI-6**, into the *Twi* language. Not surprisingly, there were problems with this method as well.

### **1.3.2 *Twi* Translations:**

I attempted to find *Twi* equivalents to important words in the **PPS** and **STAI-6** questionnaires. I have broken down the *Twi* words, their definitions, meanings and root etymologies in great detail in the accompanying Appendix Notes.<sup>1.4</sup> I will highlight just the most relevant translation findings in the next two pages. First, the *Twi* concept of “feeling” is largely somatic and not psychological. To feel means to perceive by the physical senses, i.e., touch, taste, smell, hearing, etc. This was an important distinction

because when I asked patients how they felt I would often get a physical description of their ailments. It was difficult to phrase language in such a way that patients would tell me how they were feeling in regard to their psychosocial “feelings.” Uncovering this language barrier by attempting to translate the **PPS** and **STAI-6** was a significant discovery that helped me to be aware of different types of “feeling” and to remember to ask about both. The second important discovery in regard to “feeling” (especially in light of my social susceptibility hypothesis which I outline in the next chapters) was the word *nkate* which means to perceive through the senses. However, when this word is broken down into its root words, it actually means to become malleable, soft or open to perceiving through the senses. It means that “feeling” is not just something that happens to you (an outside stimulus that acts upon you) but that individuals play a major role in the amplification or dampening of “feeling” by how susceptible (to outside stimuli) they become. Likewise, the word that means to calm, *dwudwo*, literally means to make soft, tame or malleable. These were important findings in shifting the research toward an Asante sensorium. As we learned from Kathryn Geurts’s (2003) seminal work in Ghana on the Ewe of the Eastern Region’s sensorium, different “senses” are culturally constructed and socially produced. How one “feels” and which feelings are important is due to enculturation and context depended.

Intimately connected to perceiving through the senses or “feeling” in the Twi language is the concept of fear; the word to describe perceiving or experience something is literally the same word as fear, i.e. *hu* means to discern, perceive, see, recognize and fear. One of the reasons this is so important to this research is because “fear” was the main non-

somatic concept that patients used to talk about the psychosocial elements of sickness and healing. When patients talked about fear they discussed their psychological, social and spiritual worries. It was very difficult and rare to discuss aspects of psychological, social and spiritual significance with patients outside of a context of fear, worry and anxiety. In Twi this concept is described beautifully with the words *suro* which means fear is your unknown growing cries, *anidwo* which means calmness through the abatement of fear and *dwodwoodwo* which means safely and is made up of the word for harmless (*dwo*) repeated three times. What is fascinating about the linguistic analysis of fear is that the concepts of fear, dread and terror (*ahi*) are synonymous with mockery, derision and insult (*ahi*). This gets us at the heart of this research on social susceptibility— or how social interactions and ritual processes can influence physiological states—by illustrating the vivid panhuman fear of ostracism or rejection. A fact that becomes increasingly important to this manuscript as we discover in Chapter 4: Pain that the “sting” of rejection or social pain involves the same neural pathways as physical pain does!

Another important theme that was uncovered during the process of translating these quantitative questionnaires was that of access to resources, money and food. Economic stability (in the form of access to money, shelter and food) was a major factor in the linguistic breakdown of the words for: fearful, fear, experience, distress, troubled, perplexed, etc. For example, *nnyinnyam* means that agony and the pains of death are to slowly wither and not ever acquire or become. Panic or *tu bo* means to uproot or move wealth. Also, *ahohia* or distress literally means one whose self wants or needs and the phrase *ade hia me* means I am distressed for want of money or food. The theme of fear

and resource acquisition becomes very vivid in the definitions of *kɔsaankɔmee*: to be fearful means to go to battle without being full; to go hungry or to not know when or where you will eat next and *bo tɔ yam*: to be content is to have a full stomach.

The *Twi* language does a beautiful job of providing experiential descriptions of anxiety: *ayamuhyehye*: that which burns inside the stomach or heart, *bo nnyinnyan*: to be confounded, confused or alarmed without growing or obtaining clarity or *abodwo-kyere*: long suffering which captures, squeezes and puts your mind under lasting pressure. One confusing discovery was the fact that the words for anxiety and distress were often synonymous with the words for sympathy, empathy and compassion. For example, anxiety is *ayamuhyehye*, or that which burns **inside** the stomach, compared to compassion: *ayamhyehye*, or that which burns the stomach. In fact the definition for *ayam'hyehyé* is: compassion, commiseration and anxiety. Thus, in *Twi* anxiety and compassion produce a similar feeling. Upon further investigation what I discovered through linguistic analysis that the reason anxiety and compassion were the same word was because being near someone in distress produced the same feelings as experiencing the distress oneself. This discovery gets at the heart of this research and the aim to illustrate how one's "feelings or perception through the physical senses" can be altered by someone else. Another example of the beautiful descriptions in the *Twi* language in regard to the concepts of anxiety, compassion and social susceptibility are the words *ahumbɔɔɔr* or sympathy, which when broken down to its constituent parts means: those who recognize the sadness crashing or storming inside and *tu abasam* or despair and disappointment, which literally means that which happens that breaks, uproots, **RELAX**: There is no *Twi* word for "relax."

**RELAX synonym: REST: 1) *Ahodwo*: (v) rest (from trouble, quiet, peaceful, happy state and circumstances. 2) *Hodwo*: (v) to be slack, lax, relaxed, loose, weak, feeble, strengthless; to weaken, enfeeble, debilitate, relax "he has been entirely disabled, sprained, or exhausted. 3) *Abodwe (bo dwo)*: inward rest, contentedness, content, contentment, satisfaction, peace of mind, equanimity, evenness of temper, imperturbation, tranquility, sedateness. 4) *ɔhome (ɔ'hômé)*: (n) rest, home [1) *Ahodwo*: a= one who, that which, ho= self, auto, *Dwo*= (v) to be harmless, kind, cease, wither, to cool, to be calmed, appeased, allayed; to abate, subside; to become or be soft; to relax from a state of excitement; to be calm, quiet, gentle, mild, meek, tame, peacable, humble; to come to rest, to feel comfortable: *Me ho adwo me kakra*: "I feel a little better." **Rest means that which calms. 2) *Hodwo*: ho= self, auto, dwo= calm (see above): Rest means to be calm. 3) *Abodwe*: a=one whom, that which, bo= amount, price, cost, value, dwe (v)= deflate, cool, calm; to be harmless, meek, kind; to cease, to wither; (adverb) completely, entirely, totally, utterly: Rest means one who has a measure of calm. 4) *ɔhome* (n)= rest, home, (hômé) (v)= to rest, *homebea (hômébea)* (n)= rest home, rest stop or resting place, *ɔ home bere (ɔ' home bere)* (n)= rest period. ɔ (ɔ') (pronoun)= he/she, *home (hômé)* (v)= to breath, rest, pause; to inhale; to unwind, he/she breaths or unwinds, (*béá*) (v) =place, position, positioned, a place to breath or unwind,****



*bere* (n)= time, a time to breath or unwind. Interesting, the Sabbath in *Twi* is *homeda* or a day of rest, breath and unwinding. **Rest means he/she who breaths or a place of pause and unwinding.**]

**RELAX** antonym: **Vex:** 1) *No abodwo*: Displeases, vexes. 2) *Abodwo-kyere*: longsuffering. 3) *Dwennwen*: (v) To care, be anxious, distracted, take anxious thought. 4) *Kramakrama* (*kràmàkràmà*) (adjective) =restless, wild [1] *no abodwo*: *no*= her/him, that, the, *n*= negation + *o*= he/she, *bo*= amount, value, cost, price, *dwo*= calm, cool, abate, *abodwe* (*bo dwo*)= inward rest, contentedness, content, contentment, satisfaction, peace of mind, equanimity, evenness of temper, imperturbation, tranquility, sedateness: *enye no abodwo*: “It displeases, vexes him,” *Eho nye won abodwo*: they do not feel comfortable there: **Vex means that which perturbs him internally.** 2) *Abodwo-kyere*: *a*= one who, that which, *bo*=amount, price, cost, *dwo*= calm, cool, abaate, *abodwo*: (see above) contentedness, *kye*: to last, *kyere*: catch, capture, squeeze; to be under pressure; apprehend, detail, bind, to be in great distress or straits: **Longsuffering means that which captures, squeezes and puts your mind under lasting pressure.** 3) *Dwennwen*: *dwen* (*dwene*)= to think, meditate, consider, *n*= negation, *dwe*=calmness, coolness, *wen*= skin: **To take anxious thought means to ruminate internally on stressful thoughts.** 4) *Kramakrama*: *kra*= soul, to take leave of, goodbye, *kraman*=dog, *kramakrama*= hot, fiery, fierce, wild, vehement, ardent, very active, impetuous, passionate: **To be wild is to have a hot impetuous soul, like a dog.** Common phrases: *ne ho kyere no*; *ne ho hia no wo mma nhina*; *ne tirim akyere no* (*asem bu aye ehu ne a wereho nhina*) “he has become distracted, out of his senses or wits—to press or be pressed together,” *kyere so*= throng or crowd; *nnipa no akyere so* “the people are crowded together; to prepare for war, show or manifest ill will, hostility, animosity, aversion, to bear malice to make one fee a grudge, *nkyeree*= manner of binding; state of bondage, bonds; a grudge, ill will, animosity, malice aversion: *mede ne na ho nkyeree* (*ne ho tan, ne ho abi*) *ne mede merekyere no* “I make him feel the grudge I owe to his mother,” *mfa magya ho nkeyree nkyereme* “do not make me suffer for the aversion you have conceived to my father.”]

**CONTENT:** 1) *Bo tɔ yam* (*bó tɔ`yéym`*) (v) = **to be content**, 2) *Te apɔw* (*tè àpɔ`w`*) (idiom) = **to be well, to be healthy.** [1] *bo tɔ yam*: *bo*= amount, cost, price, worth, *tɔ* (*tɔ`*) (v)= to buy, set, purchase, *yam* (*yéym`*) (n)= stomach, abdomen. **To be content is to have a full stomach.** 2) *Te apɔw*: *Te*= to hear, understand, *a*= one whom, that which, *pɔw* (*pɔ`w`*) (v)= to be sophisticated, cultured, polite, **To understand that which is sophisticated.**

**COPE:** 1) *Tumi gyina ano* (*tù mí jì ná á nō*) (v)= **to cope.** [1] *Tumi gyina ano*: *tumi* (*tù mí*) (n) = power, authority, (v)= to be able to, can, *gyina* (*jì ná*) (v)= to stop, to remain, *ano* (*à nō*) (n)= margin, mouth, entrance, edge, total, oral, lip, (preposition)= on, at, along. **To cope is the power to be able to remain along the edge.**]

**MODERATELY:** There is no *Twi* word for this but a synonym could be: *bi* (*bí*) and *binom* (*binóm`*) (article) =some.



patient's phenomenological assessments of how their feelings, sensations and perceptions changed throughout the ritual process. I did this by asking simple, open ended questions before the ritual process began, while patients were waiting outside the shrine. I asked them how they are "feeling" (or perceiving their world through sensations) and what brought them here today. I then conducted the first of three physiological measurements (see below), which I took before, during and after ritual healing ceremonies. I did not ask these questions during the ritual (it could be distracting to the patient and neighbors) but I repeated them afterwards. I then measured the difference in patient-perception from before to after the ritual healing ceremony. While there were a handful of very memorable before-after perceptual rapid assessment interviews (I will discuss these in more length in Chapter 6: Stress), most patients said some rendition of, "I'm feeling a lot better." Even though this is beneficial to research on the subjective perceptions of change due to the ritual healing process, I was worried that patient's consistent positive responses could be due to the Hawthorne effect (altered behavior because of observation), social acceptability bias (answers that are "right" or socially acceptable and reflect well on the patient regardless of if they are currently accurate) or evaluator bias (answers that patients think I want rather than what they actually "feel"). In other types of qualitative interviewing (see above) I made great efforts to avoid these biases by conducting many interviews over a long period of time in different environments with informants to whom I was very close. Unfortunately, that was impossible in a medical setting where I was trying to interview large numbers of patients in a short time who inconsistently attended shrines. Another consideration is that because I was very close to many of the *Okomfor*,

patients might have seen us in collusion and didn't want to say anything that might offend the healers. All of these concerns meant that quantitative interview portion of this research makes up a very small part of the analysis.

#### **1.3.4 Physiological Measurements of Stress:**

Data that was more reliable and that appears throughout the following chapters is physiological measurements I collected before, during and after the ritual healing ceremonies. Yet, these weren't without their own difficulties as well. I wanted to capture physiological measurements of stress and to show how stress biomarkers change as a result of Asante indigenous ritual healing ceremonies. There are two main ways to measure stress: 1) via the **stress hormones**, "the glucocorticoids (called corticosterone in animals, and cortisol in humans), and the catecholamines (epinephrine and norepinephrine)" (Center for Studies on Human Stress 2007:4) and/or 2) via the **stress response**, which "consists of an involuntary set of physiological alterations that included increases in heart rate, blood pressure, respiration rate, and metabolic shifts that liberate energy....the relaxation response (RR)...which can be voluntarily elicited, is associated with decrease in oxygen consumption, respiratory rate, and blood pressure, along with an increased sense of well-being" (Dusek and Benson 2009).

#### **1.3.5 Stress Hormones:**

Over the last two decades, **salivary cortisol measurement** has become the most popular biomarker used to measure glucocorticoids in the stress response (Kirschbaum and Hellhammer 1989). However, cortisol measurements require that the samples be collected at the same time of day because cortisol levels change based on circadian rhythms. They decrease drastically from morning to afternoon and then more slowly from

afternoon to evening. This rhythm is further altered by sleep patterns and individual exposure to daily stressors. These timing constraints were a major limiting factor on cortisol collection. Asante function on polychronic time where no one wears a watch and events happen when most people have arrived rather than based on systematic monochronic schedules. This is due mainly to the remoteness of shrines and availability and uncertainty of transportation. As such, it was impossible for me to collect samples at shrines of the same people, at the same time, in the same context (i.e. before the ceremony had started). Another problem is that food and sleep patterns affect cortisol secretion and when I tried collecting informants' sleep patterns I discovered that my Asante informants have very irregular sleep patterns. For example, one informant explained that he woke up at 4 am, took a 2 hr nap around noon at his office, fell asleep again around 4 pm for 30 minutes on the bus ride home, relaxed (but did not really fall asleep) after eating a big meal around 6pm and went to sleep for the night around 11 pm. He explained that this was his "normal" sleep pattern, except sometimes he got up even earlier to work in the farm before it got too hot and then took a long nap during the hottest part of the day or on days when he traveled or on holidays or weekends, etc. So consistency of sleep patterns was also something I had difficulty finding. Furthermore, "a broad range of events including concurrent stress, illnesses, and minor daily life activities occurring prior to saliva collection can interfere with the concentrations of salivary cortisol" (Center for Studies on Human Stress 2007:15). Because my sample population was patients attending medical services, they were already predisposed to stress, illness and unusual daily activities. Plus, there are enough inter- and intra-individual differences

in these patterns that it is difficult (especially in cross-cultural research) to control for the cortisol secretions related solely to stressors rather than other variations as cortisol levels are not always valid indicators of stress. Thus, all of these constraints made collecting diurnal (discover the “normal” cortisol slope) or awakening cortisol responses (35-35 minutes after waking) nearly impossible and diminished the validity and advantageousness of cortisol measures for this study. Furthermore, I was particularly interested in stress measurement changes over a short period of time or stress states (i.e., after a medical encounter) rather than over a long period of time or stress traits.

The other stress hormones, **catecholamines**, are not easily measured in saliva but can be found in blood samples. On top of all of the field constraints previously mentioned, collection of catecholamines has its own difficulties. First of all the accuracy of the test is affected by certain foods which increase catecholamine levels: coffee, tea, bananas, chocolate, cocoa, citrus fruits and vanilla. Besides the last food item, anyone familiar with Ghana will recognize that these items make up some of the main staples in the local diet and it was impossible to make sure informants had avoided these food items for the past several days. [These local and situational conditions are very interesting, I’d say; they really do help give the lie to some of the “objective” test methods in the context.] Similarly, stress and exercise also affect the accuracy of these results and since most patients walk ~2-12 miles to get to the shrine and are suffering from stress and ailment on arrival catecholamine levels would already be increased. The final problem with collecting this hormone was that there are cultural beliefs regarding giving blood and someone collecting blood that would have completely derailed the project as there is a

major preoccupation and fear (that relates to witchcraft and contagion or the idea that something that once was a part of you can be used by someone else to harm you) with someone having any aspect of your physical body (genes, blood, hair, skin, fingernail clippings, placentas and even clothes that were once on your person). These ideas are not unique to Ghana or anthropology and fit well within the literature on “contagious magic” i.e., magic deemed to work through bodily contact, that is as old as Frazer’s Golden Bough. Thus, unless this methodology was reliable, accurate and helpful (which it was not under my field constraints), I was unwilling to risk the social and cultural meanings and misconceptions concomitant with it. Plus, plus IRB ethics and AIDS prevalence were significant limiting factors.

The collection of saliva samples was less problematic ethically and practically, though while discussing these different methods in pre-dissertation research, saliva samples also always carried the question “what are you *really* going to do with the samples?” even when the research design was explained in many ways. Other **biospecimens**, like collecting urine, hair, and cheek cell samples, had similar connotations and produced adverse informant reactions. Regardless, in all cases the samples need to be preserved, usually refrigerated until a research team could analyze them (to prevent bacterial growth and other problems that invalidate the samples’ integrity) which was an impossible constraint in my field conditions (no refrigeration, no regular electricity, no coolers or postal services to mail back samples, etc.).

I also examined a few other possible physiological measurements of stress in my field setting. **Feedback regulation of the HPA axis** by oral administration of dexamthasone

and collection of blood samples (5x) that can be used to measure HPA hormones. Aside from the problems related to blood collection (see above) administering any type of medication was a major problem. Despite making it clear with every single informant each time I collected their physiological measurements that I was not a doctor nor could I diagnose or treat any illnesses, I was asked on a consistent basis to provide medications. As such, any method that put me in the role of healthcare practitioner rather than researcher was ethically precarious and potentially derailed or obfuscated my role and position in the local community.

Another promising (yet problematic) method is the **measurement of Vagal tone**. Often referred to as the polyvagal theory proposed by Stephen Porges which distinguishes between primitive stress responses (immobilization as in a freeze response or feigning death) and more evolved stress responses (social communication, meaningful abstraction, and self-soothing coping mechanisms). The main idea here for modern humans is that the primitive mechanisms are only activated when the more evolved ones fail. This has significant implications for occurrences like voodoo death and adult Sudden Unexpected Death Syndrome or SUNDS (see Shelly Adler's "Sleep Paralysis" (2011) for a brilliant examination of the nocebo effect and SUNDS).

You will see the word Vagal throughout this research as it refers to the parasympathetic or relaxation impulse, "break" or system activated in response to a sympathetic or stress response, which decreases heart rate and attempts to get the body back to a state of homeostasis after a stress event. However, this method requires sophisticated electronic devices and the installation of leads, both impossible in a field



setting for the above sociocultural reasons as well as time constraints and no access to electricity at the shrines. While the polyvagal theory is widely accepted, its methods of measurement are less stable and useful in field settings.

Since sweat is controlled via the sympathetic nervous system it can be measured as a signal of a stress response via a method called the **Galvanic Skin Response (GSR) or skin conductance methods**, which measure the electrical conductance of the skin by sending a tiny amount of current through the body and measuring the electrical conductance between two points. Electrical conductance fluctuates based on the degree of sweat secretion which is elicited by arousal of the sympathetic system. Thus, skin conductance can be a biomarker for a stress response. The main problem is that environmental factors such as temperature and humidity influence sweat secretion (for thermoregulation, to keep the body cool) and make GSR measurements inconsistent and inaccurate (because sweating is no longer a signal of stress but an environmental response, one that is dependent on and variable to one's individual acclimatization). Because the Asante live in an equatorial climate and regularly experience 100% humidity, GSR methods are invalidated by the field environment. Another potentially advantageous measurement, especially once I discovered a group entrainment effect in Asante ritual healing ceremonies (see below for more), was the collection of oxytocin. However, despite its promise it cannot yet be collected in a field setting with great accuracy. "We can state with a high degree of certainty that measurement of OT in saliva does not yield meaningful indices of individual differences or intra-individual changes" (Horvat-Gordon et al. 2005).

### **1.3.6 Physiological Stress Response Measurements:**

Many of the limitations and constraints of measuring stress hormones in the field were not present in measuring physiological stress responses. For starters, most of the measurements are non-invasive and do not require the collection or storage of biospecimens. The measuring devices are (for the most part) inexpensive, small, and transportable and do not require electricity. Better yet, the biomarkers—heart rate, pulse, blood pressure, respiration rate and blood oxygenation levels—are more accurate for stress-state measurements over a short time or throughout an event because they involuntarily respond, via consistent inter and intra-individual physiological changes, to environmental stimuli. These biomarkers are not as susceptible to daily circadian rhythms, individual sleep cycles, recent food intake, heat and humidity. The data collection model is also familiar to most Asante because vital statistics are measured each time they go to a hospital or a clinic. There is no “contagion” or biospecimens being taken from participants; nor are there any exchanges of biological materials.

Physiological measures of a sympathetic stress response include an **increase in heart rate, pulse, blood pressure and respiration rates and a decrease in blood oxygen saturation levels**. These are immediate involuntary physiological adjustments in the body that signal the elicitation of arousal or stress. The physiological measures of a parasympathetic relaxation response include a decrease in heart rate, pulse, blood pressure and respiration rates and an increase in blood oxygen saturation levels. These are instantaneous involuntary (and voluntary, in the sense that you can consciously breath slowly or inhibit negative rumination in order to alter these states) physiological

adjustments in the body that signal the elicitation of the Vagal break, sympathetic suppression or relaxation. “Blood pressure reduction is among the changes most consistently observed during studies of the [Relaxation Response] RR” (Dusek and Benson 2009; Dusek et al. 2008; Sudsuang et al. 1991). All of these physical changes are highly sensitive to acute environmental stimuli and provide a quantitative map of stress and relaxation responses across a wide demography of people attending the same event as well as tracking changes that occur in individuals over the course of a single isolated event. These simple measures “offer avenues to study the dynamic of stress in the field (DeCaro 2008; Flinn 2008; McDade et al. 2007; Lende and Downey 2012).

Blood oxygenation measure or pulse oximetry is as simple as the use of a non-invasive, small sensor placed on the participant’s fingertip which measures oxygen saturation in patient’s blood. Someone stressed will usually take shorter, faster breaths, which result in a decrease in the amount of oxygen in the blood; when more relaxed, one takes longer, deeper breaths, which brings the blood oxygen levels back to normal homeostasis. The pulse oximeter also measures heart rate, or the rate at which the heart contracts and pumps blood throughout the body every minute. Pulse is a parallel measurement, but instead of measuring heart contractions, it measures the rate of increased blood pressure in an artery each time the heart beats. Stressors activate faster heart rates and pulse rates so that blood can be pumped throughout the body (especially to the appendages) to facilitate “fighting” or “fleeing” (this process is discussed in great detail in Chapter 6: Stress). Similarly, blood pressure is highly vulnerable to autonomic nervous system arousal (sympathetic and parasympathetic). Blood pressure rises in a

stress state and lowers in a relaxation state. “Blood pressure reduction is among the changes most consistently observed during studies of the [Relaxation Response] RR” (Dusek and Benson 2009; Dusek et al. 2008; Sudsuang et al. 1991). Systolic blood pressure measures the pressure in the arteries when the heart contracts. Diastolic blood pressure measures the pressure in the arteries when the heart muscle is resting, between beats. Pulse and blood pressure are both measured using a blood pressure monitor.

#### **1.3.7 Data Collection Process:**

Speed of data collection is critical to field research because any interaction that takes the participant out of the ceremony or into unfamiliar territory long is going to influence what is being measured: the ritual process or the research one? As such, I tried to create minimal interruptions to the normal ritual processes, social interactions and meaningful exchanges naturally taking place. Consequently, I tried to streamline the data collection process to take up as little time or space as possible. Before the ceremony even began I asked patients if they would like to be a part of research I was conducting on the physical effects of Asante indigenous ritual healing ceremonies. I explained the requirements of participation: getting measurements taken before, during and after the ceremony. For the patients who desired to participate I read them an oral informed consent form (available in English and in Twi). I usually had a local assistant or translator on hand for any questions or clarifications. I also often had a research assistant on hand to help hasten the process. After receiving verbal consent I handed participants a piece of cardboard to indicate their identity throughout the various measurements while keeping their anonymity. I also collected basic demographic data: date, time, age, gender, place and

position (i.e., was the patient new, returning, a shrine worker, drummer, member of the chorus, villager, foreigner or *Ɔkomfor?*). Before collecting the first before-data, I asked participants simple, open-ended rapid assessment perceptual questions (see above), which I repeated when I collected the after-data measurement.

I collected measurements of blood pressure, heart rate, pulse and blood oxygenation using two battery operated devices: a blood pressure monitor (the cuff went around the participant's left bicep) and a pulse oximeter (that clipped lightly onto the participant's right index finger). I placed both devices on at the same time and their combined time of measurement lasted from 1-3 minutes depending on whether there were any errors. I recorded all measurements in a notebook without any identifying features that would trace back to particular individuals. I tried to create a comprehensive view of the physiological stress response in Asante indigenous ritual healing ceremonies by demonstrating the patterns of these measurements across space (i.e., at a variety of different shrines, on different days of the week and at different times of day) as well as the patterns over time (i.e., changes in individual patients over the course of a ritual ceremony and by collecting measurements consistently at one shrine over the course of a year).

### **1.3.8 Quantitative Limitations & Significance:**

There were some limitations in these methods. Even though the physiological measurements did not take very long, they still needed to be conducted individually. This meant that there could be anywhere from 15-30 minutes of differentiation between one participant's "before" measurement and another's (depending on how many participants I

had at an individual ceremony). This also meant that some participants “after” measurements were closer to the close of the ceremony than others and that some participants left before I had a chance to collect their “after” measurements. Another limitation was that because I tried not to interrupt the ritual process, there were many times that I was unable to get a fast, non-intrusive “during” measurement. Some patients had very elaborate rituals that they needed to participate in (i.e., pouring libation, animal sacrifices, consultations, divinations, etc.) and they were not free until after the ceremony ended. Thus, before-during-after measurements are not available for all participants.

Another problem of conducting research in a natural field setting is that I cannot isolate out or control for particular variables. For example, I could not ethically ask *Okomfo* to “pretend” to be spiritually possessed during one ceremony so that I could measure and compare the outcomes of sham versus active Asante healing rituals; nor can I isolate out and measure the individual effects of all of the various features of the ritual process. There are many culturally specific elements in Asante culture, which instigate and prolong sympathetic stress responses (such as witchcraft, familial and religious obligation and hospitality/hostility cycles). There are also many features of Asante indigenous ritual healing ceremonies and practitioner care-giving behaviors, which inhibit and curtail stress responses and elicit parasympathetic relaxation responses (such as polyrhythmic drumming, dancing, chanting, disassociation, altered states of consciousness, social support, entrainment, conflict resolution, divination, meaningful explanatory models, forgiveness, humor, play, catharsis, etc.). Unfortunately, this method

precludes measuring the degree to which each of the many features of the ritual process affects stress and relaxation responses.

One of the advantages, however, of not being able to control all of the variables in a natural field setting is that your research design is flexible to surprises. One of those surprises was the *Ɔkomfo* at Asafo, Madame Sarpong, who asked me to take her measurements in the middle of spirit possession. Up to this point, I would measure *Ɔkomfor* before and after measurements, but I did not feel it was appropriate to interrupt the ceremony while the healer was in spirit possession to take “during” measurements. Madame Sarpong or rather the *abosom* possessing her noticed I was taking during-measurements of other patients and walked up to where I was sitting on a bench made out of a tree trunk at the side of the shrine and asked, “When is it my turn?” I was totally caught off guard and to make sure I understood her I clarified, “You want me to take measurements while you are in spirit possession?” “Yes,” she said, “Follow me.” She walked into the consultation room and sat down on a stool in front of the shrine’s many talismans and stuck out her left arm. I took her measurements and she made some jokes about *obruni* (white person or foreigner) and their “machines.” What is fascinating is that even though this is an isolated incident (no other *Ɔkomfor* let me take their measurements during consultation while they were in spirit possession) and thus, not statistically significant, it still provides some fascinating results. For example, the average measurement of all of the participants at Asafo shrine that day was—before pulse: 82.9 and after pulse 85.7 with an average ~6 point drop in the “during” measurement (of the participants that I was able to collect in the middle of the ceremony) for a maximum of a

2.8-6 point degree of change throughout the ceremony. This was radically different than Madame Sarpong's measurements. She started out similar to everyone else with a before pulse of 83, however, her "during" measurements skyrocketed. While in spirit possession Madame Sarpong's during-pulse rose to 115 for a 32 point degree of change! It is clear just by observing *Okomfor* perform that it is a strenuous activity: there is dancing, chanting, twirling, running, jumping, cartwheels, somersaults, yelling, (and psychological proofs of power (see Chapter 6)), etc. But we never quite knew the degree to which it altered the body. This research provides a closer glimpse into that world and raises questions for future research.

The advantage of research flexibility provided one other significant finding. As I mentioned earlier, one of the problems in conducting research in ethnographic settings is that it is unclear what specific aspects of the ritual process activate specific physiological responses. Thus, the therapeutic efficacy (discussed in great detail in Chapter 4) of indigenous medicine and ritual healing is often either relegated into the no-man's-land of non-specific healing or attributed almost entirely to the few clinically-significant features, like psychotherapy. I was guilty of doing the former until about halfway through my fieldwork. One of the key features of Asante culture and indigenous ritual healing ceremonies is prolonged and elaborate polyrhythmic drumming which can lead to **group entrainment**, the synchronizing of heart beat, pulse and breathing of the group which also is known to increase levels of oxytocin, the social bonding hormone, and other feel good hormones like dopamine and serotonin. There has been a lot of research on Asante drumming in specific and the physiological effects of polyrhythmic drumming in general,



which show that they create neurovegetative-like trance states, relaxation responses and entrainment effects. Because drumming is such a fundamental part of Asante indigenous ritual ceremonies, because it lasts so long (3-4 hours straight) and because of my own subjective physical sensation of relaxation while attending these ceremonies, I hypothesized that much of the relaxation and entrainment responses of Asante ritual healing was probably attributable to polyrhythmic drumming. Due to a fortuitous accident—the drummers were stuck at the farm—I was able to test this hypothesis in a natural experiment in the field by taking physiological measurements of an Asante indigenous ritual healing ceremony without drumming and comparing them to the results of the rituals with drumming. The findings were surprising. Both rituals with and without drumming had statistically significant relaxation responses. We can extrapolate from this finding that drumming is not the only contributing variable to relaxation responses in Asante healing rituals (although it was impossible to control for expectancy in attuned participants). Importantly, comparing combined before to after measurements did not describe the entire picture. Rituals with and without drumming show a reduction of all physiological measurements from before to after the ceremony, however, the data collected in the middle of the ritual healing ceremony tells a deeper story. Across participants and comparing both ceremonies with drumming and without, systolic blood pressure dramatically drops (from an average of: 129 to 113) during the ceremony and then raises back up (to an average of: 124) after the ceremony. Heart rate and pulse increased during ceremonies with drumming and they decreased during ceremonies without. This matches well with the biological research on polyrhythmic drumming that

claims the specific **binaural beats** produce different waves at different frequencies which impact the alpha, beta, theta, and delta states and alter ratios of potassium and sodium causing mental fatigue or what many informants called trance states (Buchanan 2011).

Due to the constraints of ethnographic research methodologies most of the placebo and nocebo studies used in *The Social Life of Placebos* to demonstrate the proximate mechanisms of psychosocially activated physiological processes are from Randomized Clinical Trials (RCT's) and speculatively applied to Asante ethnographic case studies. However, this research includes original never-before-seen physiological data collected before, during and after Asante indigenous ritual healing ceremonies to show the effect of these healing rituals and the provisions of care on stress and relaxation responses. This data reveals some important findings. Asante indigenous ritual healing ceremonies generate statistically significant relaxation responses. They also produce quite noteworthy (and statistically significant) entrainment effects. The data also shows that the individuals who attend ritual healing ceremonies regularly (*Okomfor*, shrine workers and musicians) have statistically significant anticipatory relaxation responses before the ceremony even begins and they also have statistically significant relaxation responses post-ceremony, which tells us that those most physically attuned to these ceremonies can trigger the same placebo responses that are activated in others via the ritual process through expectation and they can also prolong these effects long after the ceremony is over.

## **CHAPTER 2: EVOLUTIONARY EXPLANATIONS & SOCIAL SUSCEPTIBILITY**

### **2.1 EVOLUTIONARY THEORY BACKGROUND**

At the heart of both anthropology and most scientific inquiry there is a deep curiosity to understand similarity and difference. This aim was the primary motivation behind Charles Darwin's evolutionary theory in *On the Origin of Species*. Similarity was explained by a history of common descent and difference by adaptation through the process of natural selection which he explained as

even slight modification, which in the course of ages chanced to arise, and which in anyway favoured the individuals of any of the species, by better adapting them to their altered conditions, would tend to be preserved ; and natural selection would thus have free scope for the work of improvement...this relationship between the physiology, behavior, and environment determined those who would survive, mature, reproduce, and thus pass their adaptive traits on to the next generation (Darwin 2003:7).

Most people have a basic understanding of the concept of natural selection—due to variation in all organisms, heritable traits which are favorable become more common in successive generations than heritable traits which are unfavorable—but often people are ignorant of the process through which natural selection functions. Both are necessary for a comprehensive knowledge of natural selection and are critical for its application to other disciplines.

Darwin's evolutionary theory seeks to explain adaptive design in three ways, phenotypic variation, heritability, and fitness consequences. Since all organisms vary in observable traits, parents and offspring share these traits, and survival and reproductive rates are motivated by these traits, there is “a tendency for fitness enhancing phenotypic traits to increase in frequency over multiple generations” (Wilson 2002:7). Natural selection is the consistent process through which variation among phenotypic attributes

correlates with differential fitness (survival and reproduction success rates) and leads to different frequencies of those attributes in subsequent generations in a consistent, non-random, and purposeless way.<sup>245</sup> “This process cannot have a goal, any more than erosion has the goal of forming canyons, for the *future cannot cause material events in the present*” (Original emphasis, Futuyma 1990:342). Natural selection requires variation and maintains polymorphism and, therefore, does not necessarily promote, “survival of the fittest” because there is no gravitation toward or fixation on only one particular genotype, in fact there are always competing constraints and trade-offs between the different levels of selection.

Although this process is very complex, it can be summarized by explaining that there are different types of selection (natural, sexual, social<sup>246</sup>) and different levels or units of selection (genes, individuals, groups) and that each type and each level has different selective pressures and fitness consequences. Natural selection weeds out deleterious traits, except those costly attributes which give certain individuals reproduction advantage over others. This is the process of sexual selection and explains why traits exist despite their cost to survival.<sup>247</sup> Since both ecological and social environments

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<sup>245</sup> Specific parts in definition: “if a population exhibits (a) variation in a trait, (b) a consistent relationship between the trait and fitness, and (c) inheritance of the trait, then the frequency distribution of the variations (1) will differ among age classes and (2) may differ between generations” (Futuyma 1998: 349).

<sup>246</sup> “Sexual selection refers to the subset of social competition in which the resource at stake is mates. And social selection is differential reproductive success (ultimately, differential gene replication) due to differential success in social competition, whatever the resource at stake” (West-Eberhard 1979:158).

<sup>247</sup> There are two types of sexual selection: male competition and female choice:

**Male competition:** Sexual selection by male competition can take on overt and covert forms. An example of overt competition is direct fighting for sex. An example of covert competition is large testes and multiple copulations where the competition is based on the fitness of an individual’s sperm.

**Female choice:** Natural selection would have weeded out large peacock feathers or a loud frog “chuck” because they are energetically costly and increase the chances of predation. However, sexual selection by

determine the selective pressures constraining natural and sexual selection, fitness can also be influenced by one's social behavior and the behavior of others in a process called social selection, where costly attributes remain which give certain individuals social, and therefore survival and reproductive, advantage over others in highly social species.<sup>248</sup> Natural selection also functions at different levels or on different units of selection: gene, individual, and group (often competing and/or simultaneous).<sup>249</sup> One of the most debated subjects on evolutionary theory in recent years is how influential each level of selection is in comparison with the others. "When natural selection acts, it alters the frequencies of entities at many levels in the hierarchy of biological levels of organization. It also produces adaptations that benefit entities at many levels" (Ridley 2003:306). What is

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female choice accounts for their frequency because males who exhibit the largest feathers or loudest "chuck" attract the largest amount of females and have the highest reproductive success.

<sup>248</sup> "Social selection is an important subtype of natural selection that can explain some human traits that are otherwise difficult to understand. Its focus on the role of partner choice calls attention to the fitness effects of decisions made by other individuals and thus to the fitness benefits of trying to understand what others want and how to get them to prefer one as a partner. The benefits of such displays and choices create escalating positive feedback cycles that result in extreme traits with high costs. These traits, such as strong motives to please others, give a net long term

benefit on the average, but like the peacock's tail, they can also have substantial negative effects. Sexual selection increases the magnitude of a display until its fitness advantages from increased matings are balanced by other costs such as energy expenditures and increased vulnerability to predation. Social selection increases the magnitude of prosocial traits until the benefits of getting more and better partners are balanced by personal costs incurred by creating displays, following norms, fulfilling commitments, and helping others. The positive feedback in this process offers an explanation for how selection could have shaped such extraordinarily costly social traits" (Neese 2009:147).

<sup>249</sup> Although this is heavily debated, the majority of scholars think that natural selection most often takes place at the level of the individual organism and some have even argued that selection can take place at the level of the allele, species, and kin, the most common levels of selection are genes, individuals, and groups:

**a)** Some heritable traits that enhance the survival and reproduction of a **gene** at higher rates than other genes are actually destructive to the individual and a group. Although, some argue that "gene" is not a useful term and the argument of gene-selection should be based on long term changes in the frequency of specific allele's in a population (Dover 2000).

**b)** Some heritable traits that enhance the survival and reproduction of an **individual** at higher rates than other individuals are actually destructive to particular genes and the group.

**c)** Some heritable traits that enhance the survival and reproduction of a **group** at higher rates than other groups are actually destructive to particular genes and individuals.

important to note is that inherent in the evolutionary process 1) there is a series of competing selective pressures and adaptations at the different levels and types of selection and 2) each carries costly trade-offs.

“An adaptation is a phenotypic variant that results in the highest fitness among a specified set of variants in a given environment” (Futuyma 1998:354). Adaptations are often overly presumed for any “favorable” trait, however, specific criteria needs to be met and ample evidence proven for something to actually be an adaptation as a result of natural selection. It has been argued that two main questions need to be answered about the characteristics of adaptations, “one is *whether* it is adaptive. The other is (if the character is adaptive) *how* it is an adaptation” (original emphasis, Ridley 2003:270).<sup>250</sup> For example, adaptations need to show complexity and functionality in design and be testable in an experimental model and through the comparative method. One must show how an adaptations evolved by a selective agent and/or for a specific function as well as prove that a trait is an adapted form of the ancestral state and not just a survival from its phylogenetic history.<sup>251</sup> To make it more complicated, something can be advantageous or increase the frequency of a trait without being an adaptation. Some examples of these are: pre-adaptation, exaptation, spandrel, and genetic hitchhiking.<sup>252</sup> Similarly, just like

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<sup>250</sup> For example, “faced with any form of organism, we can ask *whether* it exists because it is the only form that organism possibly could have (constraint), or *whether* selection has operated in the past among many genetic variants and the form we now observe was the one that was favored. If the form of an organism is the only one possible, an analysis that treated it as an adaptation would be misdirected...If the constraint is the law of gravity, adaptation is a fanciful hypothesis” (original emphasis Ridley 2003:278-279).

<sup>251</sup> “Darwin saw clearly that a feature might be beneficial, yet not have evolved for the function it serves today, or for any function at all” (Futuyma 1998:354).

<sup>252</sup> **Preadaptation:** traits which are remnants of phylogenetic history or a preexisting anatomical structure inherited from an ancestor being used for a potentially unrelated purpose.

adaptation, any theory of evolution must also account for the origin, selective agent and function, or prevalence of maladaptations. Maladaptations are the natural byproducts of the imperfect process of natural selection via descent with modification.

Evolutionary theory is one of the simplest concepts to explain extraordinary amounts of phenomena. However, there are many caveats in a discussion of evolutionary theory. First, it is important to remember is that there are other ways for a change to occur in the frequency of traits in successive generations other than by natural selection. For example, there can be novel change in the genetic material (mutation), change in allele frequency in the population (genetic drift), and introduction from outside/different genotypes (immigration/migration). To result from natural selection frequency of a trait must be due to differential fitness and not left to chance. Second, while natural selection argues that adaptation makes organisms better suited for their environments, it does not assume that environmental or social changes always elicit adaptations. In fact, adaptation can occur in stable environments. Third, harmony, balance, and reciprocal relationships, if they exist, are auxiliary and not ends unto themselves. Fourth, evolution is not goal directed. Organisms will never develop into the “perfect” form or take the “best possible” route for change. “Selection may fix only those genetic variants with a higher fitness than other genetic variants in that population at that time. It cannot fix the best of all conceivable variants if they do not arise, or have not yet arisen” (Futuyma 1998: 361). Fifth, evolution

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**Exaptation:** traits with current utility which evolved for other usages (i.e. adaptations for other functions) or no usage at all (i.e. nonadaptations, unacted upon by natural selection) later co-opted for its current role.  
**Spandrel:** traits which evolved, but not through natural selection, as a side-effect of a true adaptation.  
**Genetic hitchhiking:** traits which do not enhance survival and reproduction, but are associated with or passed on concomitantly with traits that do.

is not progressive. All evaluative measurements of fitness, efficiency, and suitability are environmentally relative. Finally, evolutionary theory attempts to explain only what has happened, not what should or can happen. All ethical and moral applications and criticisms of this theory reveal a primary misunderstanding of the goal-less, purposeless, virtue-less nature of a theory designed to explain only the unity and variation of all living organisms.

## **2.2 TINBERGEN'S MODEL**

Tinbergen's model (1963) is helpful in parsing out the many variables which contribute to any given behavior and highlights gaps in knowledge where more research is needed. It starts with the basic question: why does animal *x* do behavior *x*? Then it separates that question into two different kinds of explanations, the ultimate or evolutionary reasons *why* something came to be the way that it is and the proximate or immediate reasons of *how* it developed and currently functions. Proximate answers are those that explain (1) the specific mechanism, structure and pathology of what particular stimuli elicits a specific response and (2) the ontogeny or developmental history of an individual within its own ecology. Ultimate answers, on the other hand, explain (3) the specific adaptations, which were naturally selected due to their fitness consequences and (4) the phylogeny or evolutionary history of a species within its ecology.

Tinbergen's model of evolutionary and proximate explanations helps us parse apart the often competing processes (phylogeny, adaptation, ontogeny and mechanisms) at work in any given medical interaction. This biocultural dialectic process is impossible to



ignore when studying human behavior—especially behaviors directly in the center of biocultural interactions like indigenous medicine.

But uncovering the smallest common transdisciplinary denominators or constructing biocultural interactionist theories of how these different levels generally interact with each other is not enough.<sup>253</sup> We also have to ask how specific social imperatives, psychological expectations and cultural systems explicitly influence specific physiological processes. Clinical research fills in the neurobiological specificity often overlooked in these anthropological frameworks and can measure the biological consequences of particular human behaviors.

That said, “What seems clearer today is that interdisciplinarity is not readily achieved just by giving ‘airtime’ to different points of view (valuable as that is). There are methodological, epistemological, even metaphysical tensions involved in the attempt to arrive at an understanding greater than the sum of its parts; and these tensions are not readily resolved, even by invoking concepts of ‘levels and systems’” (Harrington 1999:7). With this caveat in mind, *The Social Life of Placebos* uses Tinbergen’s model of ultimate and proximate explanations in order to shed light on the long history and many different interactions taking place during medical encounters.

Below is a diagram of Tinbergen’s model.

T w o D	Two different Objects of Explanation	
	<u>Developmental/Historical</u> <i>Explanation of current form in terms of a sequence</i>	<u>Single Form</u> <i>Explanation of one form of a species</i>

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<sup>253</sup> See *Appendix: Chapter 2: Biocultural Interaction Theories* for a description of some of these theories.

i f f e r e n t K i n d s o f Q u e s t i o n s	<b><u>PROXIMATE</u></b> Explains how organisms work by describing their structures and mechanisms and their ontogeny	<b><u>ONTOGENY</u></b> Description of an organism's development, from DNA code to the forms of different life stages.  <b>DEVELOPMENTAL EXPLANATIONS</b> for sequential changes in individuals across the lifespan	<b><u>MECHANISM</u></b> Description of an organism's structure and how its mechanisms work  <b>MECHANISTIC EXPLANATIONS</b> for <i>what</i> an organism's structures are like and <i>how</i> they work
	<b><u>EVOLUTIONARY</u></b> Explains why organisms are the way they are by describing how selection shaped current forms and their phylogeny	<b><u>PHYLOGENY</u></b> Description of the history of a species as reconstructed from its fossil precursors and DNA evidence  <b>PHYLOGENETIC EXPLANATIONS</b> for sequential changes in a species across time	<b><u>ADAPTATION</u></b> Explanations for the characteristics of a species based on how they give a selective advantage  <b>EVOLUTIONARY EXPLANATIONS</b> for <i>why</i> an organism is the way it is
<b>Appendix Figure 2.1 Tinbergen's Model</b> (Neese 2009).			

## 2.3 MODELS OF TRANSDISCIPLINARITY

On the one hand, this approach seeks to obfuscate disciplinary boundaries by creating a general theory of human sciences where the four questions model and the reference levels make up the “smallest common transdisciplinary denominator” (Medicus 2005) and experts in various fields collaborate to answer the questions and find the gaps in knowledge. On the other hand, the false disciplinary boundaries that transdisciplinarity seeks to avoid finds its way into the assumed coherence of the levels of individuals, groups, and society which do not correspond as bounded entities the same ways that molecules, cells and organs do.

## 2.4 BIOCULTURAL INTERACTION THEORIES

One good model of biological-cultural interactions in evolutionary theory is dual-inheritance or gene-culture coevolutionary theories, which highlight the ways that culture and biology influence each other (Boyd and Richerson 1985; Danchin et al. 2011; Laland et al. 2010; Richerson et al. 2010). A similar model is proposed by Sobo (2013) called the connectionist approach, which “introduces the general principles of anthropology and specific biocultural topics by focusing on the synergistic interaction of biology and culture, or nature and nurture. In other words...[it] demonstrates that we are, simultaneously and self-reinforcingly, biocultural creations” (Sobo 2013: 7).

Critical medical anthropology provides theories specifically targeted at the many complex biocultural interactions that take place during the processes of sickness and healing as well as parsing apart some of the social determinants of health and wellness.

Critical biocultural approaches [] broaden medical anthropology by seeking to consider evolutionary and ecological dynamics, prehistoric and historic as well as contemporary contexts, direct measures of human biology (often using biomarkers), and efforts to explicitly link the social and political to the biological; the specific mechanisms and processes through which inequalities get ‘under the skin’ (Leatherman and Goodman 2011:34).

There are also tertiary interactionist models, i.e. the “triple helix” of gene, organism and environment (Lewontin 1983, 2000), and “four dimensional” interactionist models i.e., genetic, epigenetic, behavioral and symbolic all contribute to adaptations and selective pressures in our evolutionary trajectory (Jablonka 2001; Jablonka and Lamb 2004). As well as constructivist evolutionary approaches (Fuentes 2009; Shultz 2009; MacKinnon and Fuentes 2012):

Humans can extend their net of caring, investing and bonding more widely than genetic kin, even beyond species. If we remove the exclusivity of

neo-Darwinian views of evolution, add the ideas of [developmental systems theory], niche construction, and social and symbolic inheritance and place them in the context of ethnographic knowledge, archaeological histories, contingency in human behavior and individual agency, we can derive better anthropological answers”....This *constructivist evolutionary approach* seeks to incorporate modern evolutionary theory with anthropological methods, includes not only adapted (and phylogenetic) aspects of behavior and ecologies, but also those which may or may not have evolutionary impacts” (MacKinnon and Fuentes 2012:87-88, *original emphasis*).

## 2.5 TWI TRANSLATIONS

**FEEL synonym; SYMPATHIZE or EMPATHIZE: 1) *Hu ma* (hú mà) (v)= to sympathize, to empathize. 2) *Ahummo bɔ* (èyhùm `mɔ `bɔ) (n)= sympathy. 3) *Ahumbɔbɔr or Ehumbɔbɔr* = sympathy, mercy, compassion. 4) *Tema* (tè mà) (n)= sympathy, compassion, charity. 5) *Yamyefo* (yèym `yèyfo) (n)= an empathic person. [1) *Hu ma*: *Hu*= perceive, fear, *ma* (mà) (preposition); (v)= for; to give, let, administer, bestow, provide, render, supply; to feel for, sympathize with: **To sympathize or empathize means to recognize and then give or provide.** 2) *Ahummo bɔ*: *a* (áà) (relative pronoun)= who, whom, which, that, *hu*= perceive, fear, *ma* (mà) (preposition); (v)= for; to give, let, administer, bestow, provide, render, supply, *ahum* (èyhùm) (n)= thunderstorm, storm, tempest, wind blast, *mbɔbɔ*= pity, sadness, pitiful, sad; to look at with compassion, pity, commiserate, mercy: **Sympathy means one whom recognizes or perceives a tempest of sadness.** 3) *Ahumbɔbɔr or Ehumbɔbɔr*: (see above) *e* (èy) (subject pronoun) it, it, *a*= one whom, that which, *ehu* (n)= fear, panic, terror, sees, recognizes, fears, perception or fear, *ehu aka no*: “fear has befallen him, he is frightened,” *ma*= to give, provide, *ahum*= storm, *mu*= inside, within, *mbɔbɔ*=sadness, pity, *bɔ* (bɔ `) (v)= to crash, break, strike, hit, crete, make smash, ring, *r*= plural: **Sympathy or compassion means those who recognize the sadness crashing or storming inside.** 4) *Tema*: *te*= to hear, understand, *ma*= to give, provide: **Sympathy or compassion mean to understand and provide.** 5) *Yamyefo*: *yam* (yèym or *yamu* (yéymù) (n)= stomach, abdomen, heart, *ye* (yèy)= we, to be good, *fo* (fo)=counsel, advice: **empathic person means one who gives advice that is good for the stomach/heart.]****

## 2.6 The Evolutionary Processes of Social Susceptibility

The following sections get deeper into some of the specific evolutionary transitions and adaptations that leave human bodies susceptible to social cues, threats, and conditions.

### 2.6.1 Benefits and Costs of Group Living

There are many benefits and costs of group living. One benefit of living in a large group is that there is safety in numbers.<sup>254</sup> Living in groups also means greater predation detection because there are more eyes to spot a predator and to warn others. The larger the group the less one has to individually invest in scanning for predators and being alert because the larger the group the less we have to be constantly looking out for predators and the more reliant we become on following the group or trusted individuals for our own survival. Especially in times of stress when it is impossible for each individual to acquire enough information to make informed decisions, following the group or trusted individuals is a mitigated risk compared to the dangers of going it alone. Group living also allows us to divert that energy, which would otherwise be spent on constant surveillance and vigilance, to other endeavors. It is easier to find and collectively defend food resources, especially those highly sought after, in a group and the cost per individual to defend the food site diminishes as the group size rises. It is also advantageous to spread out to cover more ground and to follow or learn from older members of the group in order to increase your chances of finding high quality food patches.

But living in groups also increases the risk of disease, inbreeding and intra-group competition over food sources. Larger groups mean increased travel costs. The larger the group the farther you have to travel to find food or the stronger you have to be to defend your food from others. While you are more protected from inter-group aggression, larger

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<sup>254</sup> Group living statistically improves an individual's mortality rate by increasing an individual's chances of survival in a predation event because animals like lions, leopards and crocodiles can only kill one individual per predation event. Your chance of dying is  $1/N$  where  $N$  is the number of members of your group. Thus, there is safety in numbers. The bigger the group, the greater your chances of survival from predation. Not to mention the care-giving behaviors humans developed and we have evidence for ~250kya.

groups mean more intra-group competition for mates and resources. This in-fighting is often what caps group size because the costs of physical altercation, contest competitions and shifting alliances begin to outweigh the benefits of increased group size. “The downside of larger groups is that there is increased competition for food and mating partners within the group. If you are on your own and you manage to find food, it’s yours. The larger your group, the more likely it is that one of the others in your group will try to poach it. Primates with strong social skills can limit this downside by forming alliances and friendships with others in their group” (Lieberman 2013a:33; emphasis added).

The Jarman-Bell principle (Geist 1974) argues that there is a useful model to keep the ties between many of these competing adaptations and their subsequent physical and social consequences straight: body size is directly correlated to food quality, which is correlated to food availability, which is correlated to group size and systems of food defense and distribution, which are correlated to mating structures. Let’s walk through each of these in further detail and show how they influenced human social adaptations. Low quality food like leaves and grass require a large digestive system and stomach size (i.e., think about cows or gorillas), high quality foods like fruit, insects and meat require much smaller digestive systems and smaller body size. Because brains are so energetically costly, we see a direct correlation between quality of food and brain size. As our *Hominin* ancestors began to eat higher-quality foods more resources could be devoted to brain growth and we see a reduction in gut size and magnification of brain size concomitant with an increase in high quality food, defended by large cooperative social

groups. This is called the brain-gut expensive tissue hypothesis (Aiello and Wheeler 1995) and argues that “One thing is certain: brain tissue is metabolically expensive...Bigger brains generate heat, have to pass signals over great distances, and demand significant amounts of high-quality food, especially given that the human gut is disproportionately underdeveloped, perhaps as a direct result of metabolic trade-offs with an energy-greedy brain (Falk 1990; Ringo 1991; Aiello and Wheeler 1995)” (Downey and Lendy 2012:106).<sup>255</sup>

Low quality food sources like leaves or grass are abundant and easy to access. This produces scramble competition where it is more profitable for individuals to invest in trying to eat as much as possible, than to invest in trying to defend or exclude other from the food source. However, high quality food is less abundant, hard to access and usually occurs in food patches that are small and defensible. This produces contest competition where it is more advantageous for individuals to directly compete over and systematically exclude others from the food source.

As group sizes increase, the downsides of group living can be mitigated by social solutions that limit intra-group competition while maintaining the benefits of large group size. It would be enormously costly (and life threatening) for each food event to result in fighting over who is stronger. Constant intra-group competition and vigilance is an impossible physiological and psychological burden. One solution is dominance

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<sup>255</sup> In humans “changes in the diet that supported brain size may in turn also have supported intestinal shortening and tooth size reduction. These changes would have been largely due to the advent of cooking, which...predigests food in effect, making many nutrients and certain energy sources more available to the body” (Sobo 2013:74).

hierarchies, which produce predictable relationships between individuals and limit actual fighting events. In fact, aggressive displays often signal dominance enough to establish stable hierarchies, thereby limiting the consequences of actual fights. Though dominant individuals have greater access to resources than low status individuals, low status individuals are protected from physical altercations in which they would most likely lose (either by getting kicked out of the group or from physical trauma).

Another solution is to invest in cooperative relationships of reciprocity where instead of self-reliance on finding food, you can rely on predictable relationships of sharing food. But this requires sophisticated social intelligence to determine who is trustworthy. Those with good social acuity will be able to recognize deception or free-riding in others, avoid those relationships and have greater access to resources via quality social alliances with others. Those less aware will get taken advantage of. “The social intelligence hypothesis focuses on the demands and opportunities that being a long-lived, highly social species brings and the role of competition with our own kind” (Downey and Lende 2012:106). This theory explains why many other more ecological problem-solving-based hypotheses failed to show that tool creation, food collection and hunting coalitions produced similar brain growth patterns across all species that share these traits and environmental pressures. It mediates the predominant “selfish” individual theories and places human behavior within a socio-centric framework. The social intelligence hypothesis explains many traits like “theory of mind,” empathy, fairness, deception, cooperation, altruism,



non-verbal or tacit communication and cooperative care-giving, etc. that are not adequately explained by ecology-based theories.<sup>256</sup>

The current theories in evolutionary biology extend far beyond an outdated application of strict adaptationism with natural selection as the only mechanism. Sociality, at its core, is not just composed of altruistic acts based on shared kinship. Rather, **sociality functions to meet the biological and developmental needs of offspring, shifts the way species-specific traits are inherited, and changes the selective equation by modifying the environment(s) in which groups of species live** (MacKinnon and Fuentes 2012:87, emphasis added).

### 2.6.2 Social Versus Ecological Determinants

Human brains are enormously expensive. They take up a disproportionate amount of energetic resources and require numerous costly adaptations (see increased brain and neocortex size below). But the benefits of large brains had to outweigh the demands or they would not have survived natural selection. Early theories assumed that brains increased in order to process factual information and ecological problem-solving (Clutton-Brock and Harvey 1980; Wynn 1988). Yet, a couple factors challenged this hypothesis. First, many small-brained animals are able to process similar information and problem-solving without the extra expense of having a large brain. For instance, we know that primates have an expanded and more complex visual system than their phylogenetic ancestors (Barton 1998; Ross and Martin 2007; van Essen et al. 1992). The selective agents for these adaptations were previously argued to be ecological: finding food and avoiding predators. However, much like the conundrum with brain size, species with similar ecological pressures do not show the same types of visual expansion. However, species with complex social systems do. “Many studies converge on the fact that primate

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<sup>256</sup> See *Appendix: Chapter 2: Social Versus Ecological Determinants* for more on this topic.

vision is also specifically tied to sociality, in that complex social symbols (facial and gestural, in particular) are processed in an emotional context” (Adolphs 2001; Brothers 1990; van Essen et al. 2001; Young 1994; MacKinnon and Fuentes 2011:69-70).

### **2.6.3 Social Brain Hypothesis**

Around 200,000 years ago we see the emergence of big-brained *Homo sapiens* (anatomically modern humans) as well as the controlled use of fire, increased social group size, social care-giving of the young, infirm, old and even dead (via burial rituals), remarkable social, emotional, intellectual, aesthetic and cultural complexities and many anatomical features (i.e., thinner, domed skulls, vertical foreheads, prognathic noses and chins, raised palates, parabolic dental arcade, smaller teeth and lighter skeleton, etc.) correlated with prefrontal cortex and language adaptations.

As our social group size increased, individuals who had more metabolic energy that could be devoted to solving social problems, managing relationships, and increasing status, probably survived and reproduced at higher rates; and larger brains (particularly brains with greater frontal lobe capacity), despite all of their costs, increased in frequency in succeeding generations.

There is a correlation between brain size, group size, and social complexity. The larger the group, the more complex the social system, the bigger the brain (particularly the frontal lobe). This is true across species. “These various data suggest that the extent to which animals can develop and exploit large numbers of complex social relationships depends closely on the size of the ‘computer’ they have available to do the necessary calculations” (Barrett et al. 2002: 129). This social brain hypothesis (Whiten and Byrn 1997; Barton and Dunbar 1997; Dunbar 1996) is based on the idea that the fitness

consequences of social intelligence (e.g., deception, manipulation, and exploitation)<sup>257</sup> outweighed the costs of large brain size (e.g., difficult birth, prolonged infant dependency, and extended juvenility, etc.).

Scientists have debated this question for a long time, but the research of anthropologist Robin Dunbar is fairly conclusive on this point. Dunbar has found that the strongest predictor of a species' brain size—specifically, the size of its neocortex, the outermost layer—is the size of its social group. We have big brains in order to socialize. Scientists think the first hominids with brains as large as ours appeared about 600,000-700,000 years ago in Africa. Known as *Homo heidelbergensis*, they are believed to be the ancestors of *Homo sapiens* and the Neanderthals. Revealingly, they appear to be the first hominids to have had division of labor (they worked together to hunt), central campsites, and they may have been the first to bury their dead (Smith 2013).

Because neocortex size and social size and complexity coevolved it is difficult to isolate out specific causation patterns. Instead we talk in terms of correlation. Thus, many cognitive developments (i.e., increased memory, imagination, impulse control, theory of mind, etc.) are correlated with increased social complexity and, in turn, many aspects of social complexity (social play, deception, coalition formations, empathy, social dominance schemes, reproductive strategies, emotional mediation)<sup>258</sup> are correlated with increased cognitive intelligence. This correlation is important for a few main reasons. First, because of the functions it plays: cerebral cortex capacity is responsible for many functions including long term memory and planning, impulse control, social and emotional intelligence, mental flexibility and adaptability, physical and emotional

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<sup>257</sup> “The initial impetus to service and build valuable social relationships and use them to one’s own advantage is thought to have had a ratchet effect on brain size, as the increasingly cunning manipulative strategies used by some individuals selected for equally cunning counter-strategies in others so as to avoid being deceived or manipulated, which in turn selected for individuals with an even greater ability to outwit their opponents” (Barrett et al. 2002:139).

<sup>258</sup> For more, see: Burkart et al. 2009; Byrne and Corp 2004; Lewis 2000; Kudo and Dunbar 2001; MacKinnon and Fuentes 2012).

interactions with others, and sexual behavior. Each of these functions is crucial for navigating social relationships. Second, increased neocortex size is particularly significant because of the role it plays in the structure<sup>259</sup> and development of the brain. Social complexity is “correlated to larger neocortices in certain primate taxa” (Shultz and Dunbar 2007) which take longer to develop<sup>260</sup> and are highly plastic.<sup>261</sup>

the brain of a newborn baby is still very much a work-in-progress. It is small, little more than one-quarter of its adult size and strikingly uneven in its maturity. By birth, only the lower portions of the nervous system (the spinal cord and brain stem) are very well developed, whereas the higher regions (the limbic system and cerebral cortex) are still rather primitive....The human brain takes time to develop, so nature has insured that the neural circuits responsible for the most vital bodily functions—breathing, heartbeat, circulation, sleeping, sucking, and swallowing—are up and running by the time a baby emerges from the protective womb. The rest of brain development can follow at a more leisurely pace, maximizing the opportunity for a baby’s experience and environment to shape his emerging mind (National Centre for Infants, Toddlers and Families 2015).

Extended post-natal brain development enables more time for environmental stimuli to imprint on and shape neural development, which is particularly advantageous for

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<sup>259</sup> “The neocortex is necessary for many cognitive functions but sufficient for none. It is therefore misleading to view the neocortex as the ‘cognitive’ part of the brain” (Barton 2006:231). “Complex cognitive processes are mediated by networks that link the neocortex with other structures—the functional systems of the brain cut across all major subdivisions (thalamus, cerebellum, medulla, neocortex; Barton 2006)” (MacKinnon and Fuentes 2012:79).

<sup>260</sup> In fact, it is argued (Walker et al. 2006) that “natural selection has decreased human growth rates so that there is more time for increase cognitive development (with lower ‘body-maintenance costs’)....Primates are unique among mammals for the extended postnatal period in which myelination of pathways and neural circuitry formation take place and are then subsequently modified, particularly in the cerebral cortex. Complex ‘association systems’ responsible for organizing intercortical circuits integrate information across functional domains from before birth—as in all mammals—yet continue to grow and reorganize into puberty (Levitt 2003). After an initial organization of brain areas during the prenatal growth period, there is structural (and molecular) remodeling that occurs just prior to birth, which then continues into the neonatal, childhood, and pre- and post-puberty stages (Levitt 2003; Woo et al. 1997; Gross 2000)” (MacKinnon and Fuentes 2012:80).

<sup>261</sup> Accordingly, primates experience significant post-natal brain growth. For instance, Cebus monkeys experience 50% of their brain growth post-natally, Chimpanzees ~ 65%-75%, and Humans ~ 75% + (Vinicius 2005). Controlling for body-size, human adult brain-size is 3.5 times larger than the chimpanzee (i.e., the average human cranial capacity is 1300 cubic centimeters and the average cranial capacity of the other great apes is between 300 and 400 cubic centimeters (Rilling 2006; Schoenemann 2006; Deacon 1997)) and human infants have remarkably large brains (American Genetic Association 1921), compared to other primates, to begin with (Ulijaszek et al. 1998:104).

learning and acquiring social and emotional intelligence.<sup>262</sup> It is also crucial for the environment to have an “imprint” on the brain in terms of physiological responsivity and adaptability to one’s environmental conditions.

For primates in general and humans specifically, the extended development of neurological networks appears to be a facet of the complex interaction of the individual with its social environment. This feedback system (social networks, extended development, social and ecological experience) simultaneously shapes the acquisition of behavioral patterns and the functional development of the brain. This, in turn, plays out in the lives of primates as they encounter, interact with, and potentially reconstruct their surroundings (social and structural)” (MacKinnon and Fuentes 2012:81).

In fact, increased plasticity is one of the reasons why human brains are so energetically costly. Controlled for encephalization variables, human brains still show higher metabolic energy and activity levels (even when in “default mode”) than expected.<sup>263</sup> What this means is that one of the costliest features of an already expensive adaptation— encephalization— is adaptability,<sup>264</sup> or the capacity to predict, recognize

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<sup>262</sup> Sakai et al. 2011 used MRI technology to map the development of chimpanzees from 6 months to 6 years. “Their results demonstrate that both infant humans and infant chimpanzees start out with an underdeveloped prefrontal cortex, an area known to play an important role in cognitive functions like self-awareness and decision-making. This delay may provide both species an extended period to develop the knowledge and skills shaped by life experiences that are crucial for complex social interactions. Yet, despite this similarity as infants, the white matter in the prefrontal cortex of chimpanzees does not grow as rapidly as it does in humans, and this may contribute to our differing communication skills (language) and higher levels of intense social interaction” (MacKinnon and Fuentes 2012:81).

<sup>263</sup> “Pruess (2011) argues that the gap between human and other brains is, in part, the result of genetic modifications to synapse formation and energy metabolism that make the human brain use more energy than expected for a brain of its size.” (Downey and Lende 2012:117).

<sup>264</sup> “We require a consistent usage of terminology, such as adaptation and adaptability, two fundamental constructs in human biology. Many textbooks, for example, envisage adaptation—defined as a beneficial response to environmental adversity—solely in biological terms, while others relate it to both biology and behavior. Understanding of adaptation is often dangerously tautological: evidence of adaptation is linked to ‘success’ in overcoming a difficult environment, while success is all too easily attributed to ‘adaptation.’ Assessment is made all the more difficult given the human capacity for niche construction (modifying and creating environments...), which alters the patterns and types of ecological pressures on populations. The concept of adaptability—flexibility in the face of environmental adversity—has even greater significance for human life, since most life trajectories negotiate a great deal of change; but it is also more challenging to document in the case of humans. Adaptability involved complex, interacting responses, with costs and benefits manifested not just as immediate trade-offs, but of the lifetime of an individual and across several generations... Making judgements about trade-offs is difficult; a response is deemed adaptive only if

and adjust (physiologically, socially, and behaviorally) to external cues. Humans are not the only species who have this capacity, but our extended neural development gives external stimuli more time to influence ontogenetic processes and our increased infant dependency magnifies the fitness consequences of those interactions—especially in the social domain.

#### **2.6.4 Challenges from Encephalization and Increased Life History Demands**

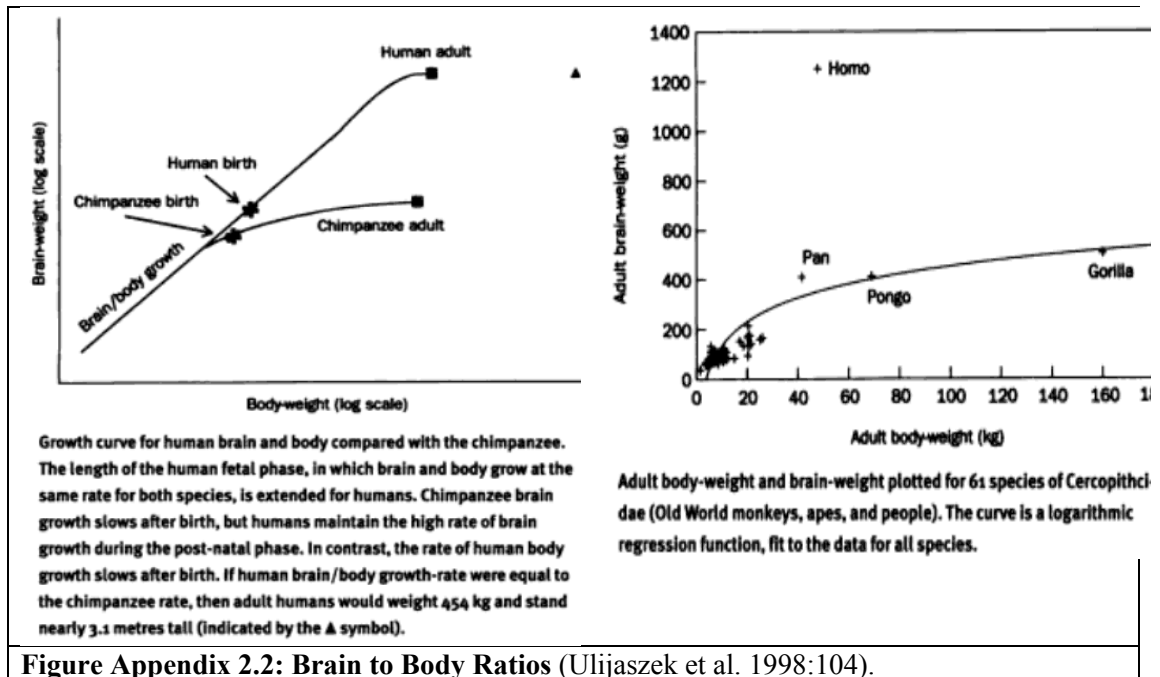
Humans have a much larger brain to body ratio than any other animal. “Human encephalization quotients appear to be five to seven times higher than predicted for a mammal of our size (Schoenemann 2006: 381) (See Figure 3.2). Compared to another mammal of equal weight, human brains are freakishly large” (Downey and Lende 2012:108).<sup>265</sup> In fact, humans are off the charts in brain to body ratios (See Figure 3.2).<sup>266</sup>

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benefits outweigh potential costs. This was evident in debates rejecting the ‘small but healthy’ hypothesis (children have reduced body size under conditions of food scarcity, enhancing short term survival but entailing longer-term risks to maternal-child health and work capacity)” (Panter-Brick and Fuentes 2009:7).<sup>265</sup> (Goldman 2010).

The encephalization quotient (EQ) “of 1 suggests that relative brain size is exactly as expected. An EQ above 1 suggests that relative brain size is large, and an EQ less than 1 suggests a smaller brain than expected. Humans have an EQ of 7, great apes and some monkey species have EQs between 1.5 and 3, and several species of toothed cetaceans (the odontocetes) have EQs between 4 and 5.” (Goldman 2010)

<sup>266</sup> “Humans have brains that are six times larger than would be expected for their body size compared to the average primate, while primates as a group have brains that are significantly larger than would be expected for mammals of equivalent size” (Barrett et.al 2002:139).



**Figure Appendix 2.2: Brain to Body Ratios** (Ulijaszek et al. 1998:104).

But it is not just increased cranial capacity that matters. The development, structure and location of that brain growth is significant.<sup>267</sup> Over the course of hominid history we see important morphological brain changes: reduction to the occipital lobe, expansion of the frontal lobe, heightened forehead and reduction in robust features like brow ridges and occipital ridges.

In humans, structural brain changes in evolution help us to discern the neural underpinnings of our cognitive capacity; our neocortex is disproportionately larger than other parts of the brain, while our olfactory bulbs are undersized. Moreover, we exhibit hemispheric asymmetry, exaggerated more than other great apes. Two explanations exist

<sup>267</sup> “Human cognitive distinctiveness is not merely, or even primarily, the result of overall brain enlargement, but rather shifts in the organization of the brain and the relative size of different neural structures (Jerison 1973; Holloway 1966). . . . Shifting regional proportions, in humans for example, might allow more complex problem solving and interaction or greater inhibition of instinctive behavior, or tip the balance among sensory modalities (Downey and Lende 2012:110-111).

for these sorts of structural difference: the first is developmental dynamics, which posits that it is easier to size up brain areas that appear later during embryonic development, so the brain cortex can grow larger than brain stem; and the second is ‘mosaic’ expansion, in which patterns of selection increase or decrease parts of the brain because they are involved in specific functional systems. Finally, connections matter, because brain regions do not function in isolation; neurons must communicate and function together. The human brain relies on connections both generally within regions and also in specific fashion; for example, neocortical connections to the viceromotor system handle the tongue, mouth, and larynx (important for the production of speech) and neocortical connections from prefrontal areas down into limbic areas increase the ability to regulate and control behavior, particularly in social settings (Downey and Lende 2012:105).

Humans have remarkably large brains at birth (compared to other primates and relative to body-size) *and* also remarkably high post-natal brain growth.<sup>268</sup> One of the reasons for this is due to cephalo-pelvic constraints; the ratio of infant brain size at birth to mother’s pelvic capacity. Bipedality restricted pelvic inlet size, which, combined with increased natal brain size makes human pelvic-to-head ratio the closest, and human childbirth the most difficult of any in the animal kingdom (as measured by brain-pelvic ratio).<sup>269</sup> To accommodate the narrowed pelvic opening infants twist inside the birthing canal until they are facing backwards during crowning, which makes us one of the only species that usually requires childbirth assistance (Trevathan 1999). Thus, in humans

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<sup>268</sup> See *Appendix: Chapter 2: Primate versus Other Mammals* for a diagram and more on the unique life history features of primates that are different from other mammals.

<sup>269</sup> Save the spotted hyena who gives birth through a faux phallus. A story for another time!

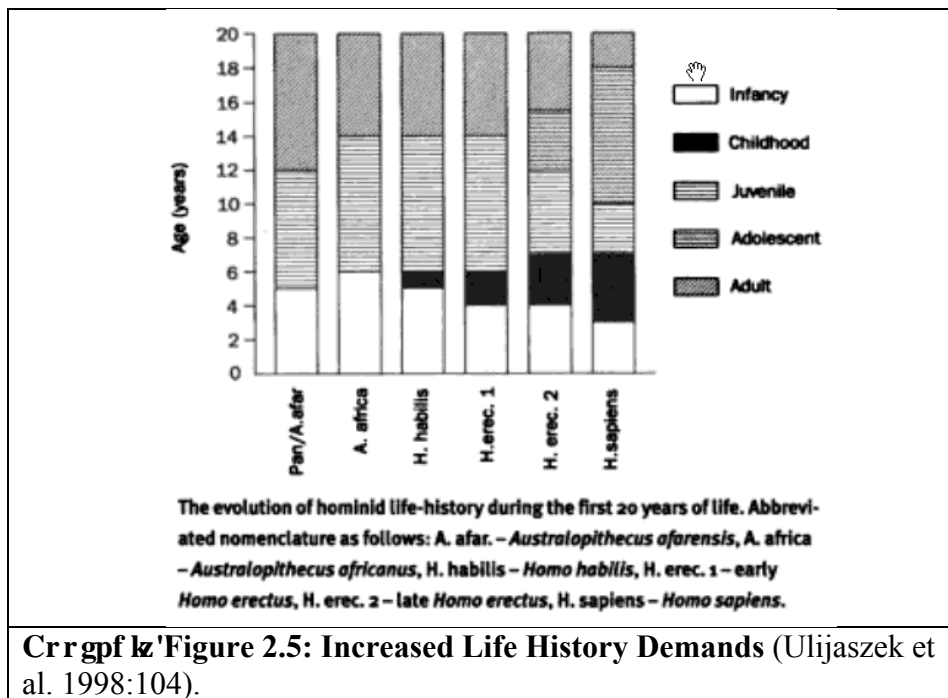


even one of the most basic biological functions—birth—is inherently social. This birth constraint means that there is a limiting factor on pre-natal brain development and that to achieve the human adult cranial capacity a period of “rapid post-natal brain growth and slow body growth—the human pattern—is needed to reach adult brain size” (Ulijaszek et al. 1998:104). Thus, human life history trajectories are longer than those of other non-human primates, requiring slow *in utero* body development, rapid post-natal brain growth, extended infant dependency, delayed sexual maturation, continual neural development throughout adolescence, reproduction later in life, a huge investment in the single-offspring-per-birth event, longer inter-birth intervals and increased life expectancy.<sup>270</sup>

Primates differ from other mammals in a couple of important ways. Most mammals reproduce early in their lives, have multiple offspring per birth, short interbirth intervals between litters and live relatively short lives. In contrast, primates reproduce later in their adolescence, typically have a single offspring per birth event, have longer interbirth intervals and live relatively long lives (See Figure Appendix: 2.5).

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<sup>270</sup> For more on how primates differ from other mammals, see *Appendix: Chapter 3: Life History in Primates Versus Other Mammals* and *Increased Life History Demands* for a comparative diagram.



**Figure 2.5: Increased Life History Demands** (Ulijaszek et al. 1998:104).

A look into our phylogenetic history explains this further. We share a rich and complicated evolutionary trajectory with our ancestors where the fitness consequences of social belonging and ostracism are a matter of life or death. Our ancestors were altricial, which means that they are born underdeveloped and grow over time, which means that from the moment of birth they rely completely on the care and protection of others for their survival. Compare this to other social non-altricial or precocial animals like horses, able to walk and eat independently within hours of being born. Altriciality is a costly trait. While it allows for greater plasticity and adaptability to one's environment and elongated periods of learning and brain development, it also produces high attachment, interpersonal dependence and vulnerability to social signals of inclusion or exclusion.

Primate brain growth is differentiated even further when you take into account metabolic adaptations (i.e., combination of resource allocation, social niche construction, evolutionary constraints and interactions with other adaptations, etc.). Most of the brain

development of Old World monkeys occurs in utero, which means most of the investment comes from mothers before birth. In New World monkeys and apes, most brain development and maternal investment occurs post-natally, which also allows for investment or care-giving from non-mother sources (Leigh 2004). Extended life history allows more time for environmental conditions to influence developmental processes. Prolonged infant dependency increases the selective pressure of social relationships. “With the longest periods of dependency and socially mediated learning among mammals, the attachments that young primates form with their mothers and members of the group are of primary importance for successful ontogeny” (MacKinnon and Fuentes 2012:82).

#### **2.6.5 Hyper-Attachment Adaptations**

For most of the first five years of life (and even beyond) children are completely dependent on others for their survival. Humans have developed a range of adaptations to increase attachment and avoid isolation, including facial neoteny, crying, oxytocin-inducing pheromones, and paternal resemblance, which helps assure paternity and reduce infanticide. We have also seen shifts in adaptations of increased parental investment with reduced sexual dimorphism, increased pair bonding, decreased testosterone levels in new fathers, and increased oxytocin levels in new mothers. “Parallels between the sensory, endocrine, and neural mechanisms of both mother and infant responses that underlie the early mother-infant relationship demonstrate an active, dynamic interplay built on feedback systems” (MacKinnon and Fuentes 2012:82).

This feedback loop is an adaptive warning system felt by both infant and caregiver. For infants, changes in the social domain, such as the absence of mother, elicit a strong distress response of crying, tears and emotional displays of fear, pain and suffering. These hard-to-fake costly signals trigger unpleasant physical sensations in caregivers as well. But not all adaptive responses are cognitive or even conscious. Infants experience extreme distress when their needs are not met or when they are separated from their primary caregiver, and contentment and satisfaction and reunion.

Non-sedating levels of opiates have been shown to reduce separation distress cries in a variety of mammalian species. Moreover, reconnection between mother and infant increases opiate levels, naturally [or I would say, endogenously], in both parties. This suggests that the same neurochemical that is instrumental in alleviating the distress of physical pain may also be central in alleviating the distress of social separation in infants (Lieberman 2013: 50).

The delivery of pleasant or unpleasant sensations is vital for infant survival. But even more telling is that these sensations are not relegated only to the infant-caregiver relationship. They do not go away as we age. They are used throughout our development to continually reward pro-social behaviors that will increase our status and connections and to punish anti-social behaviors that will alienate or stigmatize.

#### **2.6.6 Social Selection**

There are many different kinds of selection: Natural, Sexual, Individual, Group, etc.<sup>271</sup> As the consequences for environmental fitness (e.g. those with traits best suited to a given environment reproduce and survive at higher rates) decreased (e.g., ecological conditions began to exert less of a selective pressure), competition shifted to more social traits. Increased group size, larger frontal lobes, reduced predation, and cultural

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<sup>271</sup> See *Appendix: Chapter 2: 2.1* above for the definitions and descriptions of each of these kinds of selection as well as a brief literature review and how they relate to each other.

innovation (e.g., tool use, shelter, food storage, etc.) made it so that conditions of the environment exerted a relatively uniform selective pressure on all individuals (and, concomitantly, their heritable traits) in a population. Thus, selection for mates, resources, and survival was more determined by social conditions than by ecological ones.

Social selection is an important subtype of natural selection that can explain some human traits that are otherwise difficult to understand. Its focus on the role of partner choice calls attention to the fitness effects of decisions made by other individuals and thus to the fitness benefits of trying to understand what others want and how to get them to prefer one as a partner. The benefits of such displays and choices create escalating positive feedback cycles that result in extreme traits with high costs. These traits, such as strong motives to please others, give a net long term benefit on the average, but like the peacock's tail, they can also have substantial negative effects. Sexual selection increases the magnitude of a display until its fitness advantages from increased matings are balanced by other costs such as energy expenditures and increased vulnerability to predation. Social selection increases the magnitude of pro-social traits until the benefits of getting more and better partners are balanced by personal costs incurred by creating displays, following norms, fulfilling commitments, and helping others. The positive feedback in this process offers an explanation for how selection could have shaped such extraordinarily costly social traits (Neese 2009:147).

Culture adaptations (like tool development and hunting strategies) also played a role in that social ratcheting effect, as well as social transitions (like divisions of labor and pair bonding). For example, due to the dietary transition toward eating animal protein our ancestors needed to form complex hunting coalitions, manufacture sophisticated tools, plan out hunting scenarios, communicate cooperatively, and anticipate each other's and their prey's reactions during the hunting event. This also put them into increased contact, competition and danger from large predators. "As we know from the fossil record, there was an increased mortality among young adults by predation during this time period in our evolution, and this likely necessitated myriad social responses via feedback loops, such as alloparenting and increased cooperation among and between social groups"

(McKinnon and Fuentes 2012:82). These changes mitigated the costs of being a biped carrying a dependent infant (unlike other primates, human infants cannot independently grasp their mothers) in a predation or hunting ecology (Wall-Scheffler et al. 2007). Larger groups, cooperative interactions, and cultural adaptations made humans less accessible and too energetically costly for regular predation. As the pressures of ecological and predator selection decreased, energy saved from constant and individual vigilance could be diverted toward other endeavors like cultural adaptation, which expanded the range of habitats that humans could successfully occupy. But selective pressures did not disappear. There was still differential fitness of all individuals within a population, however, that fitness shifted from those best suited to their ecological environments, to those most adept in their social ones.<sup>272</sup> “Neurological complexity emerges both under direct selection and as a byproduct of the physiological and behavioral adaptations required to effectively negotiate social networks in which coalitions, multiparty social negotiations, and reciprocity are the primary avenues for social and reproductive success” (MacKinnon and Fuentes 2012: 85-86).

Individuals with stronger reciprocal attachments, higher status, and social intelligence probably tended to survive and reproduce in greater frequencies than less socially successful individuals. This not only increased the frequency of social traits in

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<sup>272</sup> “As local environments are modified, pressures may alter, changing the selective landscapes for those primate populations. Increased cognitive complexity in the hominoids facilitates a more rapid—or more intensive—utilization of social bonds and relationships as tools to meet ecological challenges. In some hominoid lineages, heightened levels of cooperation and reciprocity became core components of behavioral repertoires, constantly engaging the social and biotic ecologies, resulting in niche construction and concomitant shifting and modification of selective landscapes” (MacKinnon and Fuentes 2012: 85-86).

subsequent generations, but it also magnified the fitness consequences of sociality. Social selection proponents argue that

Situating social selection at the core of human evolutionary development, changes the focus from how our ancestors dealt with ecological problems to how our ancestors dealt with social problems. Human brains developed complex neural mechanisms in order to respond to and succeed in our social environments. This “social-heavy” neurological bias has an enormous impact on our daily lives, decisions and development to this day. “To the extent that we can characterize evolution as designing our modern brains, this is what our brains were wired for: reaching out to and interacting with others. These are design features, not flaws. These adaptations are central to making us the most successful species on earth” (Lieberman 2013:9-10).

In fact, research in social neuroscience suggests that our brains are fundamentally social organs. They switch “on” to solve problems, talk, and engage in the world, but when they are not engaged in anything that merits full attention, they switch “off” or rather use the extra energy to imagine, predict and analyze problems or interactions in the social domain. Lieberman (2013) demonstrated in a series of important fMRI studies that “when we’re not cognitively engaged in anything specific, the wandering mind activates what he calls the social cognition network. The fact that this is our default setting — the network is active even at rest —[means] that it has a greater adaptive value than any other neural network” (Henig 2013). What this suggests, according to Lieberman, is “that evolution, figuratively speaking, made a big bet on the importance of developing and using our social intelligence for the overall success of our species by focusing the brain’s

free time on it” (Lieberman 2013: 20).<sup>273</sup> This socially-centric default network is active in babies from birth. This makes sense because the fitness consequences of large brains, infant dependency and hyper-attachment (see above) would make social intelligence—the ability to understand, respond to and even compel other people’s thoughts and behaviors—enormously advantageous to survival. But what is fascinating is that we retain this default pre-occupation with social information for the rest of our lives. It is argued that “increased intelligence might be more useful for social problem-solving than environmental adaptation” (Downey and Lende 2012: 120).

Moreover, neural and behavioral plasticity is particularly attuned to pick up on micro-expressions of social information. That sensitivity, our increased intelligence, and our long post-natal neural development create the perfect conditions for learning and enculturation as well as for our environment (both ecological or social) to imprint on and influence our development.

The hypothesized responses to the energetic costs of an increasing brain size and an extended period of child rearing in the genus *Homo* ~1.5 million years ago included more cooperative interactions between group members, an associated increase in communicative complexity, increased effectiveness at avoiding predation (possibly with tools and multi-individual coordination of anti-predator behavior, and an expansion of the

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<sup>273</sup> “When you have down time, even if it’s just for a second, the brain system comes on automatically. What’s remarkable about the default network...is that it looks almost identical to another brain configuration—the one used for social thinking or making sense of other people and ourselves...The default network directs us to think about other people’s minds—their thoughts, feelings, and goals. Whenever it has a free moment, the human brain has an automatic reflex to go social. Why would the brain, which forms only 2 percent of our body weight but consumes 20 percent of its energy, use its limited resources on social thinking, rather than conserving its energy by relaxing? [Because] evolution has made a bet...that the best thing for our brain to do in any spare moment is to get ready for what comes next in social terms. Evolution only makes bets if there are payoffs—and when it comes to being social, there are many benefits. Having strong social bonds is as good for you as quitting smoking. Connecting with other people, even in the most basic ways, also makes you happier—especially when you know they need your help” (Smith 2013 referencing Lieberman 2013).



types and patterns of habitat exploited. As *Homo* became more costly for predators due to the above responses, predators shifted emphasis to more accessible prey, reducing the overall selective pressure of predation on the genus *Homo*. Given this, *Homo* experienced an increased opportunity for social interactions, range exploration, and testing of a variety of novel foraging opportunities, all of which demanded—and fed back into—an emerging higher cognitive functioning....At the populational level, we see that with an increase in cooperative interactions between members of *Homo* groups (and potentially between groups in local areas), foraging efficiency, predator avoidance, and care for offspring expand in effectiveness (as a form of positive feedback) facilitating the observed range and habitat expansion—as well as cultural expansion—in the period 1.8-1.0 million years ago. Therefore, human niche construction began to make use of the components of tool use, increased infant survivorship and better group health, and expanded information transference via more-complex communication patterns—all of which were tied to an evolving hominin cognition, which enabled success in myriad environments. **Such behavioral plasticity can be a prominent result of successful adaptation** (MacKinnon and Fuentes 2012:74, emphasis added).

No single individual has to have extreme intelligence for innovation to occur, if all individuals have the capacity to learn from, imitate and trust (i.e., accept an idea without needing to start from scratch or even understand it completely) others. This capacity allows us to reshape our environments, and therefore, the selective conditions in which our bodies adapt. “The ‘cultural intelligence’ hypothesis argues that humans have a species-specific set of social-cognitive skills (that emerge early in ontogeny) for participating in and exchanging knowledge through particularly complex cultural groups (Hermann et al. 2007). Thus, the extent to which our biological and cultural traits are intertwined and embedded in our species’ evolutionary history is unique among primate taxa” (MacKinnon and Fuentes 2012:86).

Looking back through our evolutionary history, it appears that the basal sociality of complex gregarious mammals was expanded upon in primates, with primates then using their social networks, contexts, and enhanced cognition as tools to meet and modify the demands of the environment

(the selective landscape). As local environments are modified, pressures may alter, changing the selective landscapes for those primate populations. Increased cognitive complexity in the hominoids facilitates a more rapid—or more intensive—utilization of social bonds and relationships as tools to meet ecological challenges. In some hominoid lineages, heightened levels of cooperation and reciprocity became core components of behavioral repertoires, constantly engaging the social and biotic ecologies, resulting in niche construction and concomitant shifting and modification of selective landscapes. Neurological complexity emerges both under direct selection and as a byproduct of the physiological and behavioral adaptations required to effectively negotiate social networks in which coalitions, multi-party social negotiations, and reciprocity are the primary avenues for social and reproductive success. Thus, social complexity *itself* acts as a niche-constructing mechanism to facilitate the intersection between individuals within a group, individuals with their environment, and conspecific groups within that local population. This feedback and feed-forward process became a central trend in hominin (human) evolution (MacKinnon and Fuentes 2012: 85-86).

Ecological pressures, the social landscape, and other elements in an individual's life history elicit responses governed by the parameters set by physiology, environment, and experience. The nature of such parameters allows for a wide range of potential expression, leading to variable or flexible behavior in individuals. As data sets increase, this flexibility becomes more visible at the level of the group, and it becomes increasingly evident that social organization is an emergent property (Allen and Starr 1982; Fuentes 2011) that has characteristics not readily reducible to the context-specific interactions between individual animals that produce it (MacKinnon and Fuentes 2012:73).

Vastly different primate genera illustrate how social complexity as a niche-constructing mechanism is characterized by dynamic, fluid behavioral exchanges that are fundamental to primate sociality and group living. A highly evolved social cognition is required to monitor and remember complicated social networks, roles, rank, and histories...As primates, we share an extended period of infant development and brain maturation, which allows for the acquisition of species-appropriate skill

sets and knowledge. However, humans are unique in terms of the sheer amount of information that is spread via social mechanisms through space *and* time (e.g., spoken or written language characterized by abstraction and symbolism). In the relatively brief period of time in which the genus *Homo* has evolved, we have fundamentally altered and manipulated many environments, which has influenced our survival in terms of predator avoidance, dietary exploitation, cultural complexity, and increased infant survivorship and overall group health. The social-biological ecologies of human populations are modified by social behavior, which is in turn affected by the pressures of those same social-biological environments ... Integrated and holistic theories such as niche construction force us to think of sociality in a new light—not as an independent category, but as an interrelated aspect of a generated niche. It highlights how social living encompasses the cognitive developmental environment; social resources and competition for those resources; alteration of the selective landscape (while being continuous with the natural environment); material culture in humans and some of the apes; and an extension of cognitive capacities into distributed systems of multiple individuals (MacKinnon and Fuentes 2012:76-77, emphasis added).

#### **2.6.7. Developmental Plasticity**

Compared to other species, humans are not superlative. We are not particularly strong, fast, big or tall. We cannot fly or live under water. We do not have useful teeth, claws or other defense mechanisms and our sight, smell and hearing is markedly less powerful than other species. The superpower that we do have, however, is adaptability; the ability to adapt to the conditions and problems of novel and changeable environments. “If adaptation means survival, then the human body needs to develop coping mechanisms whether these are cultural or biological, including genetic (through natural selection over a long time) and physiological (over the person’s lifetime) mechanisms” (Roberts 2009:16).

Developmental plasticity is the “dynamics of life span development as occurring simultaneously within different time scales (i.e., moment-to-moment microgenesis, life span ontogeny, and human phylogeny) and encompassing multiple levels (i.e.,

neurobiological, cognitive, behavioral, and sociocultural)” (Li 2003:171). It is essential to understanding the lifelong interpenetration between genes, organisms and environments (Leatherman and Goodman 2011: 35). Human neurological and genetic development is designed to perceive and adapt to changing environmental conditions. This is a very valuable ability. It has made us one of the most successful species on earth. Nervous systems sensitive to cues of predation or threat can stop labor during childbirth if unsafe circumstances are detected. But these social adaptations also increase the consequences of adaptability which leave our neural, genetic and physical development susceptible to social conditions, such as cases where early childhood stress disrupt and permanently alter otherwise healthy development.

There are some maladaptive trade-offs due to our developmental plasticity. “Some trade-offs are made during early life to meet immediate challenges and allow survival but...have irreversible consequences which...compromise later fitness” (Gluckman et al. 2009:263). For example, deficient intrauterine growth and premature birth are two strategies that allow fetuses to survive against placental insufficiency; however, these carry many health consequences such as increased infant mortality, cognitive impairment and predisposition to metabolic disorders. Epigenetic plasticity, or the ability to promote and inhibit gene expression based on social and environmental signals, inherited markers, and stress, acts in a similar way by allowing bodies to adapt to immediate circumstances at the cost of later health consequences. Accelerated age of puberty, stunted growth,

stress dwarfism, mental illness, and fluctuating asymmetry<sup>274</sup> are all examples of this. In extreme cases of survival or early childhood stress, allocations of immediate resources at the cost of later consequences are advantageous. For example, metabolic resources and normal developmental growth processes (i.e., symmetry, height, synaptic connections, etc.) might be diverted toward immediate survival in a child born into adverse conditions (i.e., unstable attachment, high-stress environment, malnutrition, etc.). While this is lifesaving in the moment, it can lead to long-term health consequences like genes that aren't (epigenetically) expressed, and/or mental illness.

Sometimes health problems are due to a mismatch between the phylogenetic life history and developmental strategy (i.e. early maturation based on adaptive response to environment but with delayed emotional maturity based on natural course of development). Negative health consequences based on developmental plasticity can also be due to predictive strategies. When a fetus is exposed to a nutrient-poor environment in early pregnancy, this triggers adaptive responses like low metabolic and thermoregulation rates. However, if that child is then exposed to obesogenic environments these adaptations predispose them to early puberty, diabetes, obesity, heart disease, depression, chronic disease, etc. “The recent ‘evo-devo’ synthesis of evolutionary theory and developmental biology—of phylogenetic and ontogenetic approaches to organismal biology—has been especially persuasive in arguing that evolution does not simply work

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<sup>274</sup> Fluctuating asymmetry is when there are asymmetrical measurements of normally symmetrical phenotypic traits like different ear heights or wrist widths. These are the result of childhood disease or severe malnutrition during critical periods of growth and development when the body diverts health resources and metabolic energy normally reserved for symmetry toward primary body systems and survival.

on finished genes or traits, but on the developmental programs that produce adults of a species as well” (Downey and Lende 2012:109).

We have short-term examples of phenotypic plasticity, such as our ability to tan when exposed to direct sunlight, sweat when hot, and shiver when cold. We also have long-term examples like UV exposure-correlated skin color and thermo-regulated body shapes. Humans have the added ability to adapt to their environments using social and cultural innovation. As more and more of our “environment” becomes culturally constructed, so too do our selective pressures, to the degree that sociocultural contexts can shape and guide developmental processes.

This moves us away from reductionist models of genetic inheritance that envisage only linear impacts of natural selection, a static or tautological definition of adaptation, and a simple binary definition of health and disease...[This] demonstrate[s] the complexities of fetal development across multiple physiological and social contexts, to show that genetic make-ups and environmental contexts interact over the course of a lifetime...The adaptive or maladaptive nature of fetal responses is difficult to demonstrate while the mismatch between early and later environments remains defined. Clinical health research here draws closely on modern evolutionary theory to understand the processes by which humans and their environments (writ large) relate to one another to produce critical health outcomes for mothers, babies and later adults (Panter-Brick and Fuentes 2009:7-8).

It is vital to a discussion of mind-body medicine to understand that psychosocial and physiological processes are mutually-constraining and activating. There is no primary or secondary influencer. Both impact and constrain to various degrees based on context. Furthermore, while there is the panhuman capacity for adaptability, every human body is a unique tangle of neural, genetic, ecological, developmental and sociocultural histories, stressors, and responses. “Instead of always being explained by a mixture of the two ‘pure’ transcendences, the activity of nature/society making becomes the *source* from

which societies and nature originate” (Latour 1992:282, *original emphasis*). In a Lamarkian-twist, we are, quite literally, what we have experienced.

#### **2.6.8 Genome, Epigenome, Epigenetics**

Epigenetics is the study of the epigenome or the factors involved in gene inhibition and expression. The genome is the full sequence of someone’s DNA; but it is just that, a blueprint or a map. What genes are actually expressed or inhibited is highly dependent on the epigenome, the “contractor” if you will, of those blueprints who is on the ground responding to the actual conditions, problems, and interruptions occurring during construction. The epigenome is designed to recognize and respond to signals in the environment in order to make epigenetic trade-offs to maximize fitness (see more below).

Two of the most important ways that epigenetic plasticity “acts as a servant of experience” are via trade-offs and stress. In the first case, humans inherit epigenetic shortcuts or pre-established solutions to adverse environmental conditions. The body has sensitive discovery systems for things like danger, violence or famine and if these conditions are detected in-utero a series of epigenetic trade-offs will be switched on in order to facilitate the best possible fit with the perceived or predicted environment. Depending on when these trade-offs are turned on in the developmental life course they could have life-long lasting, irreversible effects.

To a first level of approximation, it's simple and straightforward, that there are a set number of modifications that could be made to the DNA itself or to the proteins that bind to DNA and control its structure, and activity and that those small number of modifications either turn a gene on or off. In actual fact, one of the lessons over the last 10 years is just how complicated these epigenetic processes are. We now know that there are probably about a thousand proteins that are involved in epigenetic regulations. So if you think that a human only has only 20 or 25,000

genes, each gene gives rise to one or more proteins. The fact that a thousand proteins are involved in epigenetic regulation is pretty astounding, because that's just a genes wrapped up in controlling genes. And then in conjunction with that realization has been the observation that in response to an environmental stimulus, whether it's learning something or being exposed to high fat, that turning on a gene might involve hundreds of individual proteins binding to a given gene that's being controlled. So it's really quite complicated, and we're just beginning to scratch the surface and understand those mechanisms” (Nestler 2011 in Mirsky 2011).

The second way that epigenetic interactions are influenced by environmental conditions is stress. Stress produces chemicals and activates body systems that counteract the enzyme in DNA methylation that unwinds DNA from histones. Without this unwinding of the DNA, transcription, replication, translation and, therefore, protein synthesis and amino-acid building are impossible, basically thwarting the expression of that sequence. If it is a short stress response, or during a non-critical developmental time period, there should be no lasting consequences; and regular genetic expression should start back up during the parasympathetic or relaxation response which gets the body back to homeostasis and promotes “repair and maintenance” functions. However, if the stress is prolonged, activated regularly or without proper repair and maintenance time, it can permanently alter the epigenome.

In epigenetics we know that early childhood stress plays a major role in the expression or inhibition of critical genes necessary for healthy physical and mental development. Stressful environments during childhood impact critical periods of genetic, neural and social pre-disposition, growth and development which have many health consequences later in life (depression, schizophrenia, etc.) (UNICEF 2007, Worthman,



Pickett and Wilkinson 2007, Wilkinson and Pickett 2009). Early childhood stress can lower life expectancy, increase the allostatic load,<sup>275</sup> and accelerate cellular aging and weathering (Geronimus et al. 2001; Geronimus et al. 2006; Geronimus et al. 2010) “The prevailing aetiological model for adult disease which emphasizes adult risk factors, particularly aspects of adult life style, has been challenged in recent years by research that has shown that poor growth and development and adverse early environmental conditions are associated with an increased risk of adult chronic disease” (Kuh & Ben-Shilmo 1997).

We have known that nurture can influence nature for many years, but epigenetics helps us to understand how that works in more concrete ways. The fitness benefits of adaptability demonstrate why epigenetic potentiality would have been selected for and new science in epigenetics is beginning to show us how those environment-behavior-epigenetic interactions operate.<sup>276</sup>

The capacity of an organism to adapt to an environment is mediated through epigenetic changes in gene expression. Liver genes will only be expressed in liver. The liver will never express brain genes. But [ ] as an individual eats a high-fat diet or is exposed to other types of environmental exposures, the ability of the liver to adapt involves turning on and turning off certain liver genes to control the liver's activity, and that's mediated through these epigenetic mechanisms that modify the activity of established liver genes...by analogy, a person's behavioral experience could be seen for the brain just the way a high-fat diet is seen for the liver; that as an individual learns things, it is subjected to stress, it is subjected to other challenges in his or her environment. The brain attempts to adapt and respond to those challenges and that occurs in large part through changes in expression of brain genes through epigenetic mechanisms. And we now know that it is the same epigenetic mechanisms that occur in brain

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<sup>275</sup> Allostatic load references the accumulated wear and tear on the body over time as a result of consistent or chronic stress (McEwen and Seeman 1999).

<sup>276</sup> See *Appendix: Chapter 2: Connectome, Connectomics* for a comparative discussion on the neural connections that we inherit (connectome) and those that develop over time (connectomics).

as occur in liver...only the specifics differ—brain genes in brain, liver genes in liver (Mirsky 2011).

“Environmental imprinting” on the brain and body does not just take place at the level of genetics. There are also very important neural susceptibilities that we must highlight.

#### **2.6.8.1 Connectome, Connectomics**

Just like our physical bodies adapt to changes in the environment, so too do our brains. Repeated actions, habits and learning shape the strength, amount, and structure of various synaptic connections. Their presence, development and speed is determined by experiential learning. Similarly, stress during early childhood or critical periods of neural development can inhibit, alter and/or redirect synaptic connections. This pruning and strengthening of neural connections is the basis of an emerging field of study called, connectomics. Designed to resemble the relationship between the genome and epigenetics, connectomics argues that we have a “connectome” of neural synaptic connections that can be mapped (much like the genome) and can explain a basic blueprint of neural anatomy and connectivity. However, connections that are used frequently increase over time and those that are not decrease over time. Thus, based on developmental processes, each individual’s brain will display a unique architecture of connections. Those personally-tailored developmentally specific connections can be analyzed via connectomics to understand how specific environmental, cultural, social and ontogenetic factors influence neural processes and patterns. “The more we learn about how brains evolve, the more it seems that evolution can tinker with any neuronal attribute, from embryonic origin to structural complexity and physiological function. A major challenge for the coming years is to reveal the details of that tinkering” (Striedter 2006:4).

While connectomics is just emerging, the role that ontogeny has on neural development and the causative nature of physical and social experiences in shaping brain structures and processing is not new. Much like the shift we are seeing in Economics from Macro-economics to behavioral economics, cognitive science, including cognitive anthropology, has shifted to theories much more aligned with the nature of human adaptability.

The computer metaphor, especially the idea that instincts or universally shared traits are necessarily ‘hard-wired’ in the brain, is a pervasive misnomer. Brains, especially complex, slow-maturing brains like ours, are better understood as grown, or ‘wet-wired,’ with connections emerging through a competitive and selective process...many neurologists now believe that brain formation requires significant amounts of non-genetic information, including shaping by interactions within the brain itself, with the body, and with the environment” (Downey and Lende 2012: 115).

Furthermore, the developmental plasticity of neural connections sensitive to external stimuli means that human brains have a seemingly infinite ability to adapt to a wide range of conditions, including those with no evolutionary precedent (Downey and Lende 2012:116-117). “Genetic information underdetermines the structure of the brain [(Edelman 1987, 1993)]; instead, early exuberant production of neural connections is followed by ‘neuronal group selection,’ a culling process in which active synaptic connections persevere while underused links gradually weaken and disappear (or become dormant)” (Downey and Lende 2012:115-116).

“Roughly speaking, the brain grows and develops in four steps. Neurons are created, or ‘born,’ through the division of progenitor cells, migrate to their proper places in the brain, extend branches, and make connections. Disruption of any of these steps can lead to an abnormal brain” (Seung 2012:104). Furthermore, disruption by way of genetic

mutation or environmental trigger at any stage of neural development (i.e., protein synthesis, spiking, secretion, electrical currents, neurotransmitters, binding, receptors, gene defects, migration defects, axon deformity, miswiring, etc.) can alter our connectome and in some cases even our mental function. The connection between prolonged infancy and neural plasticity in humans becomes very vivid when you realize how rapid synaptic connections are created in newborns. “New synapses are created at a staggering rate in the infant brain. In Brodmann area 17 alone, over half a million per second are produced between two and four months of age” (Seung 2012:107).

## **2.7 Evolutionary Medicine**

The trend toward a more historical and comprehensive view of sickness and health has come, not surprisingly, from outside of the medical establishment.<sup>277</sup> “Cultural ideologies, values, and the socialization experiences of medical researchers often prevent disease and human disorders from being conceptualized in evolutionary terms, even in the face of much relevant data that make it necessary and logical” (Trevathan et.al 1999:5-6). This misunderstanding affects not only the questions we ask about sickness and disease, but also the way these questions are framed and the approach we take to treatment. Thus, it is crucial for medical anthropologists to not only analyze health

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<sup>277</sup> “The application of Darwinian principles to the practice of medicine has slipped through the intellectual net of medical education, and it has been left to the evolutionary biologists to point out the need to take natural selection into account in an increasing number of fields of medical practice....The doctors of the future will find it necessary to take account of the biological imperatives that Darwin revealed if they are to have any real understanding of their trade as it will be practiced in the new millenium” (Trevathan et.al 1999:viii-ix).

problems through an evolutionary lens, but to show how these findings can be applied in clinical settings to improve health through action on the social determinants of health.

For example, during times of famine and rapid climate change during the Younger Dryas (~13,000 years ago) people with an ability to store fat, reduced metabolic rates, decreased thermoregulation, accumulated brown fat and increased glucose levels in the blood were able to survive and reproduce at higher rates and the frequency of those alleles increased in subsequent generations (Neel 1962, 1982; Ritenbaugh 1989; McGarvey 1994; Ritenbaugh and Goodby 1998; Benyshek et al. 2001; Joe 2004; Baker et al 2007, Moalem 2007).

Although these traits were advantageous during specific points of our evolutionary heritage they are maladaptive in current environments where when we have access to food year-round, the caloric value of our food sources is exponentially higher than in the EEA, we often eat for reasons other than satiety, there is unequal access to nutritional education and healthy food sources, global temperatures are warmer and we have the cultural technology (clothing, shelter, fire, heaters, and transportation) to manipulate our climate.

### **2.7.1 Problems In Therapeutic Efficacy**

What is clear is that it is not enough to claim *that* a healthcare system is beneficial, we must explain *how* and *why* particular features of a healthcare system affect the pathophysiology of a disease and/or increase patient and societal well-being. Yet, this raises some questions: Who decides what is and is not beneficial<sup>278</sup>? What

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<sup>278</sup> “The very question of benefits is itself a confusing ethnocentric compote of emic and etic thinking (Kleinman 1975:115).

pathophysiological changes are valid? And how do we measure “wellbeing”? To start, one of the biggest problems with studying efficacy in any medical model is that it is nearly impossible separate out the socially, culturally, and psychologically *healing* elements of a medical encounter from the physiologically *curing* ones and to isolate which aspects of a particular interaction were actually beneficial or which effects were due to spontaneous symptom fluctuation, regression to the mean, sampling bias, Hawthorn effects, or natural history, etc. These are very serious limitations (and will be discussed in more detail below). I also do not want to downplay the significant and necessary contributions that specificity in double-blind randomized controlled trials (RTC)—the gold standard of measuring and isolating biochemical efficacy—provide and even fascinating attempts to utilize these methods to study the efficacy of indigenous healing (Anderson 1992) and the biochemical properties of ethnobotany, ethnopharmacology, and ethnomedical practice (Ortiz de Montellano et al. 1975, 1983, 1985, 1988; Krieger 1979; Etkin and Ross 1983; Skoler 1984; Rodriquez-Bigas et al. 1988; Moerman 1989). At the same time the pharmacological distinction between selective and non-specific effects of drugs “has assumed a central role in contemporary medicine, where rational treatment is often equated with the therapeutic action of chemical substances on diseases that are defined in exclusively biological terms” (Shepherd and Sartorius 1989: 1). Specific pharmacological solutions for specific symptoms has become the end goal for clinical research, however, even in predictable techniques like receptor-binding assays many non-specific variables influence the binding process. What is clear is that even in closely controlled experiments “the specific

effect of most chemical agents can be radically modified by... ‘biologically non-specific’ influences” (Shepherd and Sartorius 1989: 1). Furthermore, some diseases are more susceptible to environmental or psychosocial triggers.

Drug development is a risky and uncertain practice even in the case of illnesses that lend themselves to measures of efficacy in readily quantifiable and biological terms. In the case of disorders such as depression or anxiety, clinical trials bear an added layer of complexity. In these instances, the identification of appropriate patients and endpoints depends crucially on techniques—and on ‘standardized’ scales—whose reliability and validity are questionable even to those who use them most, namely, drug developers (Lakoff 2002:72).

If the research and practice of biomedicine were limited to its own efficacy measures there would be no need for the promotion of evidence-based and science-based medicine in the medical establishment. The fact that these concepts are modern catch phrases predicates that not all biomedical expectations, behaviors or techniques are grounded in measures of efficacy. Thus, “the dilemma is clear: to employ a controlled clinical trial necessitates the removal of traditional medicine from its proper cultural context, but to assess it in situ using the criteria of the controlled clinical trial applies a standard that biomedicine does not normally apply to itself” (Waldram 2000:616).

Furthermore, the specific isolated effects of biochemical efficacy are not accurate measures of whether or not a treatment, procedure, or interaction is beneficial to a patient. RCT’s do not usually measure the alleviation of suffering, patient satisfaction, social wellbeing, or those aspects of healthcare most important to the patient. In fact, in most cases, subjective measures of “beneficiality” fall routinely on the side of alternative medical systems: In Taiwan patients were more satisfied with shamanic healing (85%) than biomedical doctors (30-35%), in California more patients claimed they felt better

after seeing a chiropractor (81.8%) than a physician (50%), and to make matters more confusing many studies show that even when the treatment efficacy results of biomedical and alternative medicine are roughly the same, patients “were significantly more satisfied with treatment” from alternative sources (Anderson 1992:3; Kane et al. 1974; Coulehan 1985; Deyo and Diehl 1986). "To be healed is not necessarily the same as to be cured. It is common to have received a healing and still have symptoms or recurrences of illness" (McGuire 1991:42-43). Part of the problem is that satisfaction and efficacy are two completely different things.

It is highly questionable whether one can or should evaluate the effectiveness of one system by the criteria of another, but we do this all the time when we evaluate ritual healing in terms of biomedical criteria. Ritual healing may well be ineffective according to such criteria, but the opposite is also true: in a great many cases, modern medicine is ineffective in meeting those needs that are addressed by ritual healing...Surveys of ‘patient satisfaction’ show that most of the time, sick people are more satisfied with treatment by ritual healers than by biomedical doctors (Sax et al. 2010:10).

I think the crux of this problem is that we are fundamentally studying medical efficacy in an ahistorical, decontextualized, and disparate manner. Medical research has almost replaced theory with small-scale, isolated, mechanistic approaches to specific one-to-one interactions. There is

discordant space between the prevailing biomedical paradigm, which focuses on a technical understanding of diagnosis and treatment, and a broader understanding of illness and healing as relational and embodied. Although biomedical achievements are impressive, the knowledge resulting from this paradigm is limited by its ontological and epistemological assumptions. When the body and world are objectified, illness meanings, therapeutic relationships, and healing practices are dismissed or distorted (Pohlman et al. 2013).



“Medical anthropologists take a more intersubjective view, analyzing the operations of the placebo effect in terms of the importance of context in the process of healing” (Lakoff 2002:73). Though, as theorists and academics we can often privilege cognitive models over corporeal ones. Anthropological theory is inundated with representational, symbolic, communicative, and structural interpretations of the purposes and benefits of indigenous healing and relatively few analyses of the physiological effects of ritual action, social interaction, and psychological meaning.<sup>279</sup> “Some forms of cultural behavior have been argued to be ‘healthy’ in only the most circuitous ways” (Nichter 2009:xiii). In anthropology, there is

the tendency to interpret ritual in terms of what it ‘symbolizes’ rather than what it actually does. The final result of these various processes is the peculiar, modern theory of ritual—what we can call the ‘representational theory’—which seeks to understand or interpret ritual in terms of the underlying ideas, emotions, structures, or relations that it ‘represents,’ ‘symbolizes,’ or ‘expresses,’ rather than the ends toward which it conduces. The real, external world effects of ritual can be recognized only by the ‘objective’ historian or social scientist and do not correspond its ends as conceived by the ‘natives’ (Sax et.al. 2010:6).

In fact, social scientists often transform their subjects into the “other” by using terms like “alternative medicine” and “ethnomedicine”<sup>280</sup> which can connote abnormality,

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<sup>279</sup> The five basic themes and theories in anthropology: “(1) evolutionary theories that focus on creating an understanding of individual, social and cultural ‘change through time’; (2) cognitive or cultural domain theories that explore the relationships between what and how people think, and what and how they behave—these theories explore the shared mental processes that exist primarily within human minds (e.g., thought processes, beliefs, emotions, knowledge, etc.) and how those processes link to the observable behaviors that those same individuals exhibit (behaviors, actions, etc.); (3) theories about the structures that humans create and the organization of human behavior beyond the individual level (within kinship, social networks, associations); (4) theories of human manipulation of symbols (the domains of linguistic anthropology, symbolic anthropology, communication theories, etc.); and (5) the theories that explore integrated cultural-ecological relationships (biology and behavioral interactions and multiple levels), including relationships of humans to the biological and physical environments within and surrounding them” (Trotter 2011: 51).

<sup>280</sup> “The study of everyday life, perceptions of the normal and natural, the desirable and feared, and that form of embodied knowledge known as common sense as it emerges in efforts to

exoticism, and deviations from some “standard.” These terms sidestep the embodied and sociosomatic nature of sickness and healing. They limit comparability with other healing systems and they neglect the relationship between ritual action and physiological processes by focusing on the sociocultural contexts of ritual and ethnomedical<sup>281</sup> explanatory models instead of biocultural interactions. As such, I have taken great efforts to limit my use of the words “ethnomedicine” and “alternative medicine” as well as to describe Asante medical encounters in terms of how they influence people symbolically, socially, *and* physiologically.

Another semantic problem is that prefixed medical terms (alternative, complementary, integrative, ethnomedical, traditional, etc.) have been used by those in the medical establishment in ethnocentric ways that continue the divide between culture and biology, norm and other. “Biomedical inquiry, erroneously accepting the universality of its model of disease and curing, simply assumes that the model is, or should be, appropriate to all other medical systems” (Waldram 2000:605-606). Thus, other systems become derivations of the biomedical model: ethnomedicine, alternative medicine, complementary medicine, etc. “Comparison presumes a normative standard of measure by which the other is known and often judged. In describing one thing in terms of another, comparison assumes knowledge of the one to which the other is compared. The

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establish or reestablish health as one aspect of well-being...how well-being and suffering are experienced bodily as well as socially, the multivocality of somatic communication, and processes of healing as they are contextualized and directed toward the person, the household, community and state, land and cosmos (Nichter 2009: x)

<sup>281</sup> Throughout the rest of this manuscript you will notice that I consciously avoid using term ethnomedical or ethnomedicine. I think it sets up biomedicine as the norm and turns other medical systems into the “other.”

known then operates as measure of the unknown, standing in an unequal relation to it” (Friedman 2011: 753). Although many scholars have clarified that biomedicine is itself also an “ethnomedicine” with its own paradigmatic barriers, cultural assumptions and power relations, it is still “wrongly presumed that traditional systems of ethnomedicine are circular in their reasoning, are consensual and complacent, rely little on experimentation, and entail no critical thinking (Janzen 1981; Trawick 1986). Indigenous healing and ritual efficacy is assumed by many in the medical establishment to be “illogical and ineffective.”<sup>282</sup> Biomedicine in contrast, is presented as logical and self-correcting through the deployment of standardized, replicable procedures which test for the falsification of hypotheses (Nichter 2009:xii). Thus, it is critical that cross-cultural studies on sickness and healing take seriously the means-ends claims of informants.

Therefore, what is needed is a theory of indigenous medicine which analyzes the efficacy claims of its patients and practitioners. “As we attempt to give an anthropological perspective to traditional healing, it makes a difference in our overall interpretation of cultural dynamics whether or not a given treatment exerts a beneficial effect upon the natural course of disease. As medical anthropologists, it should be our

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<sup>282</sup> It should be noted that many bizarre and ineffective therapies persist today; they fall into the category of alternative and/or complementary medicine. For example, today there are many concoctions, procedures and even talismans that are as bizarre as those used centuries ago. There is the widespread belief among many people that these treatments are effective, even though they have not passed the rigorous tests of modern science. Therefore, the oddity, nonsense, eccentricity, and irrationality of many medicaments is not a feature of the past, because they pervade our society outside mainstream science. This is not only true for pharmacological agents or physical procedures, but also for psychological interventions. There are more than 400 psychotherapies available today for the treatment of a number of diseases and ailments (Parloff 1986; Moerman 2002) but it is hard to believe that all of them are really effective. Some psychological interventions that are bordering on magic still exist in western and non-western society, and people trust and use them, as they did centuries ago (Benedetti 2009: 3).

business wherever possible to include in our documentation of ethnomedicine some measure of benefit as assessed in biomedical terms” (Anderson 1992:14). As such, I have dedicated this dissertation to exploring the biocultural mind-body interactions of why (ultimate, distal, or evolutionary causes) and how (acute proximate mechanisms) social interactions, psychological meaning, and ritual action trigger placebogenic responses. In order to avoid the problems of medical efficacy outlined above, each chapter will highlight the evolutionary, contextual, and interpenetrating nature of these variables in healing encounters. By focusing on the elements in Asante indigenous ritual healing ceremonies with placebogenic potentiality<sup>283</sup> rather than measurements of biochemical efficacy, placebo specificity, symbolic representation, or patient satisfaction I hope to avoid some of the constraints which make ethnographic research largely inapplicable to research on medical efficacy and RCT’s generally irrelevant to research on indigenous medicine.

This approach to ritual assumes that ritual action is effective and logical and that it accomplishes the very things that our informants suggest. Looking back on the original ethnographic account of how Osei described therapeutic efficacy in Asante indigenous ritual healing ceremonies<sup>284</sup>, we have to ask ourselves: Can witchcraft, cursing or

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<sup>283</sup> As such, my research “at best...only suggests the possibility of a placebo effect—improvement *caused* by the placebo intervention and its surrounding clinical context” (Kienle and Kiene 1997; Hrobjartsson 2002; Miller and Rosenstein 2006; Miller et.al. 2008:2, *original emphasis*).

<sup>284</sup> From Chapter 1: “I don’t cause them to be pregnant,” he responded, “I fight the witchcraft or cursing or problem that is keeping them from being pregnant. I protect their womb from witchcraft and prevent it from being cursed in the future. I find the people who have wronged them and I make them confess or I appease the gods.” He hesitated and then continued, “That way they can become pregnant like other people, the normal way.” The last phrase was directed at me with a pointed glare as if he was remembering my earlier accidental accusation. “The thing is,” he explained, “I help the body do what it naturally knows how to do if it isn’t being afflicted. It’s like that with a lot of things I do at the shrine.”

psychosocial problems affect reproductive function? Does spiritual and/or social conflict lessen fertility? Does spiritual and/or social support increase fertility? I see no “logical or effective” departure from Osei’s description of how Asante indigenous ritual healing affects fertility and the latest biomedical research on the behavioral endocrinology of fertility (Bongaarts 1978; McClintock 1981; Bongaarts et al 1984, 1996; Hogan 1985; Negro-Vilar 1993; Vartiainen et al 1994a, 1994b; Paarlberg et al 1995; Jacob and McClintock 2000; Wischmann et al 2001; Younglai et al 2005; Mas 2006). In fact, there are many similarities and shared behaviors which lead to positive and negative treatment results. Asante health practices may have increased efficacy in their provisions of care (free of the rigid biological-sociocultural divide inherent in biomedicine and able to incorporate and act on many of the lifestyle, stress and social elements that impact fertility) and actually increase placebo responses (changes in the perceived social and physical environment which impact the endocrine system). Ethnographic descriptions of Asante indigenous ritual healing may offer “cultural knowledge useful to the aims of medical practitioners” (Brown 1997:316) and even enhance or exacerbate placebo responses (Kaptchuk 2002, 2011). In the end, the comparison of efficacy might be one of degree rather than kind. Moving beyond the debates and pitfalls of comparing different approaches to therapeutic efficacy is necessary in order to increase interdisciplinary dialogue and commensurability in knowledge and practice that would further research on mind-body medicine, benefitting all parties.

### **2.7.2 Why Compare?**

Anthropology is founded on the practice of comparison but it is not without criticism. Comparing ethnomedical systems cross-culturally is highly problematic. There are many ways we do both systems disservice through the comparative process; indigenous and “alternative” healing techniques are especially vulnerable to sensationalization, exotification, domination, exploitation, decontextualization and ethnocentrism. Yet there are also many benefits to a comparative methodology which, in this case, I think outweigh the costs.

By not comparing ethnomedical systems—particularly when anthropological research on medicine and healing techniques do not address basic physiological processes— we inadvertently “reinstate the existing hierarchies by not challenging them” (Friedman 2011:755)<sup>285</sup>. There is a small but growing ideological gathering in medical anthropology which seeks to better incorporate both cultural and biological variables and “redirecting attention to biocultural assessments of behavior in an effort to complement, if not place in relief, interpretive and critical studies which address the body but not physiology (e.g., Browner, Montellano, Rubel 1988; McElroy 1990)” (Nichter 1992:xiii). Research in psychoneuroimmunology, neuroanthropology and evolutionary medicine is attempting to use biocultural analyses and science in research on ethnomedicine as a way to critically confront the presumed normative standard and dominance of biomedicine.

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<sup>285</sup> Full quote: “We compare because if we do not there are consequences worse than the political, decontextualizing problems of comparison. What are the ethics of not comparing? To refuse comparison is also a political act, one that can potentially reinstate the existing hierarchies by not challenging them” (Friedman 2011:755).

But this is difficult because, “there can be no serious [interdisciplinary] experience or [interdisciplinary] perception of value without a responsible theory of comparison” (Radhakrishnan 2003:75), however, due to preexisting medical hegemonies and discursive dominance any comparison inevitably privileges biomedical methods and findings. “In a world structured in dominance, comparisons are initiated in the name of those values, standards, and criteria that are dominant. Once the comparison is articulated and validated, the values that underwrote the comparison receive instant axiomatization as universal values” (Radhakrishnan 2003:74). This is a difficult conundrum; one outlined well by Comaroff (1981, 1983) who argued against two types of theoretical closure: 1) analytical involution in which disembodied isolated elements of healing systems are extracted from their larger cultural, social, religious, political and economic contexts and analyzed for empirical value outside of all of their webs of significance<sup>286</sup> and 2) reified traditionalism where ethnomedical practices are evaluated as fixed, unchanging, closed, coherent and ahistorical systems understandable only unto themselves. Explaining the efficacy of Asante indigenous ritual healing ceremonies via biomedical terminology is a failure of the former problem and a descriptive analysis of cultural meaning, social relationships, political economic dynamics and religious

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<sup>286</sup> Which is problematic because “Comparison identifies similarities and differences, commensurability and incommensurability, areas of overlap and of discontinuity. In so doing, comparison decontextualizes: that is, it dehistoricizes and deterritorializes; it removes what are being compared from their local and geohistorical specificity. Consequently, one reason *not* to compare is the potential violence such removals can accomplish, the damage they can do to the requirements of a richly textured understanding of any phenomenon in its particularity...Comparative analysis of similarities and differences goes against the grain of the ‘thick description’ required for the kind of ‘local knowledge’ Clifford Geertz advocates in *Local Knowledge*” (Friedman 2011: 755, *original emphasis*).

ideology in ritual healing, devoid of any biological significance, is a problem of the latter theoretical closure.

The question becomes, which standard are we using to compare? If biomedical and Asante ethnomedical models of healthcare were directly compared via the disease model of evolutionary medicine, Asante indigenous ritual healing ceremonies might fail to adequately eradicate pathogens, infectious diseases and/or cancer. It might fall short in setting bones, conducting surgery and facilitating high risk births. However, these are not the ailments which patients bring to Asante indigenous ritual healing ceremonies. Patients come because of being cursed, infertility, chronic pain, familial discord, misfortune, and for advice in business, education and travel. Using these categories as the measurement of therapeutic efficacy, biomedicine would likewise fail to adequately meet patient's needs. Thus, comparisons between medical systems need to move away from ahistorical disease-only based units of analysis and toward a focus on therapeutic models in evolutionary medicine, one that explores the biocultural evolution of physiological responses to medical therapy and the trade-offs, mismatches, and physiological consequences that these practices elicit.

## **2.8 Malaria Case Study**

One of the best examples of how important evolutionary medicine is to reframing the problems and treatment options of sickness and disease is the case of malaria. Malaria is a very harmful<sup>287</sup> mosquito- borne infectious disease caused by the protozoa *Plasmodium*

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<sup>287</sup> “About 3.3 billion people-half of the world's population- are at risk of malaria. In 2010, there were about 216 million malaria cases (with an uncertainty range of 149 million to 274 million) and an estimated 655,000 malaria deaths (with an uncertainty range of 537,000 to 907,000).” (WHO 2012).



which causes severe cycles of fever and chills accompanied by joint pain, vomiting, diarrhea, headaches, and debilitating weakness and fatigue in the infected human host. I learned these symptoms firsthand throughout my fieldwork experience in the Asante region of Ghana, a malaria-endemic region of sub-Saharan Africa. Despite regularly taking malaria prophylactics and doing behavioral precautions (having proper mosquito netting, wearing long sleeves and pants [British-colony readers read “pants” to mean undies; trousers better here.], avoiding being outdoors during dusk and dawn, etc.) I was unable to prevent getting malaria five times. The first time I contracted malaria was because I unfortunately got bitten by a *Plasmodium*-carrying mosquito [or more likely, by a larger number of them.]. The remaining four times were due to recrudescence<sup>288</sup> or recurrence due to drug resistance; four different anti-malarial treatments were unable to kill all of the malaria-causing protozoa. Instead, these antibiotics selected for the strongest parasites, which incubated and reproduced in my body until the next manifestation of symptoms, when this process was repeated again. Each time the inability of the pharmacological treatment to completely clear all of the *Plasmodium* from my body exacerbated not only the virulence of the organism, but its drug resistance. [Maybe you know Mukherjee’s book *The Emperor of All Maladies*? Interesting on malaria research and why it so seldom seems to get close to a real prevention or cure.]

Malaria drug resistance is a major problem in Ghana. New drugs cannot be developed fast enough to keep up with the “super-*Plasmodium*” constantly evolving in this

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<sup>288</sup> The reappearance of symptoms and a disease after it has been at such low levels so as not to be clinically significant or because it has been quiescent. In malaria, *Plasmodium* can exist in the blood without causing symptoms for a long period of time.

antibiotic arms race. Furthermore, poverty, lack of knowledge and common health behaviors aggravate this problem. Patients will often not take the full course of first- and second-line drugs and/or they will share them with others or save them for the next occurrence. [Such a fascinating topic – how people differently perceive the effectiveness of pills, the reliability of advice given, and the likelihood of further meds. and such.] Herbal and over-the-counter remedies combined with inadequate doses of chloroquine is widespread as are misconceptions about malaria transmission (Ahorlu et al 2009). Mosquito netting and protection is [are] insufficient and primarily used for prophylaxis and not to prevent further transmission once the human host is infected. All of these pharmacological, behavioral and pathogenic processes combined makes malaria prevention and treatment difficult and eradication unlikely. The current biomedical treatment and public health initiatives, focused on an antibiotic arms race and preventing contraction rather than transmission, are not doing enough to solve the problem.<sup>289</sup> In fact, it can be argued that these behaviors are actually making malaria more lethal; our current medical model for infectious disease is providing the selective pressures through which malaria *Plasmodium* evolve into stronger more virulent drug resistant organisms.

Evolutionary medicine approaches the problem of malaria a completely different way. It seeks to understand the life cycle, transmission and evolutionary trajectories of the host-pathogen relationship—in what ways do we interact, affect and adapt to each other? Understanding that all pathogens also follow the imperative to survive and

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<sup>289</sup> “Increased prevention and control measures have led to a reduction in malaria rates by more than 25% globally since 2000 and 33% in the WHO African Region” (WHO 2012).

reproduce allows us to manipulate those factors for our benefit. My point is that there's another way of controlling these disease organisms. Instead of using these weapons -- antibiotics and vaccines and hygiene improvements -- as a way of knocking down the organism, we can use those interventions to control the evolution of the organisms themselves. We can manipulate the conditions of their environment so that the organisms to evolve to be less harmful than they have been in the past. Essentially, what I'm saying is we can use interventions like vaccines or like hygienic improvements to domesticate these organisms<sup>290</sup> (Ewald 2001).

Many of the “symptoms” of infectious disease are actually ways that the host has been manipulated by the pathogen in order to spread to other hosts or vectors such as, sneezing, scratching, coughing, diarrhea and lethargy. Interestingly, there is a direct correlation between how harmful a pathogen is and its mode of transmission. If a pathogen is dependent on their [a plural word – whose?] host to move around and sneeze, cough, scratch and touch other people in order to spread, then it has to be mild enough to leave the host mobile and socially interactive. The cold virus may make us miserable, but it leave us “well enough to get on the subway and go to work, sneezing and coughing all the way....it’s evolved to a level of virulence that guarantees our mobility and its survival” (Moalem 2007:119). When disease organisms are dependent on the mobility of the host for transmission, natural selection favors mildly irritating but

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<sup>290</sup> That argument may seem a little bit surprising, but we've already domesticated organisms in many ways. One of the most obvious ways is when we make live vaccines in the laboratory. We're actually taking harmful organisms [and] changing the course of their evolution, making them evolve to be mild enough that we can then introduce them into people as a vaccine (Ewald 2001).

non-lethal variants of that organism. However, when pathogens do not rely on human transmission, i.e. secondary vectors, water borne diseases and/or pathogens that can survive outside of a host, natural selection favors extremely virulent and potentially deadly variants of that organism. Cholera and malaria are both examples of these extremely harmful infectious diseases. Because the pathogens do not rely on the human host's mobility for transmission, both diseases evolved for maximum virulence and reproduction bringing the human host near death and often beyond in its quest to spread. Cholera spreads through unprotected water supplies via diarrhea. Regardless of the health effects on the human host, the bacteria *Vibrio cholera* has evolved to cause as much diarrhea as possible which increases the bacteria in the water supply and the likelihood of infecting a new host. Similarly, malaria incapacitates the human host to the point of extreme lethargy, weakness and fatigue "and when you're lying in bed too tired to even lift an arm, you're a pretty helpless target for mosquitoes" (Moalem 2007:111). Malaria *Plasmodium* reproduce rapidly and infect red blood cells where they are taken up by mosquitoes, thus, the more parasites in our blood and the more vulnerable the host, the better the transmission of malaria.

Understanding these evolutionary processes changes the way we understand and treat infectious disease. Instead of fighting pathogens inside the human host on the level of antibiotics, where evolutionary processes naturally select for more virulent and drug resistant variants of the organism, we can use these same evolutionary processes at the level of host mobility and transmission to manipulate selective pressures which favor less harmful variants of the organism. For example, if we can stop secondary modes of

transmission, i.e. diarrhea from leaking into water supplies and mosquitoes from biting malaria patients, than debilitating pathogens will be unable to spread. If malaria transmission were more difficult—if mosquitoes did not have access to malaria-infected hosts and mosquito numbers were reduced<sup>291</sup>—then evolutionary pressures would be redirected toward increasing host mobility via less harmful and less noticeable variants of *Plasmodium* in order to increase transmission. When we manipulate the pathogen's dependency on the host's mobility for transmission, less virulent variants of the organism survive and reproduce at higher rates and the frequency of those “domesticated” protozoa increase in subsequent generations over time.

Mainly, people have been thinking about evolution as a source of problems rather than a source of solutions. For example, when people are looking at the antibiotic resistance problem, they see evolution as sort of the bad guy -- it's the evolutionary process that's led to antibiotic resistance. That's true, but just as easily we can have evolution be the solution...In other words, we can have evolutionary processes leading to organisms becoming more mild over time, and if organisms become more mild, then we've solved the problem. [Or just made them more like cold germs, just discussed as getting under the wire of our tolerance and going on and on? If you're going to combine authors' ideas like these, make it clear enough where they do and don't conflict.] Not by getting involved in some kind of arms race in which we're using one antibiotic weapon against the organism, and [the organism] evolving a defensive weapon against that antibiotic, and then we have to shift to another, and so on, indefinitely. Instead, we have a sense of where we want evolution to end, and we adjust the environment so that the organism freely evolves to that endpoint, which is in its interest and also in our interest (Ewald 2001).

## 2.9 Culture Niche Construction Feedback Loops

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<sup>291</sup> Public health initiatives have attempted to reduce the number of mosquitoes by promoting and educating populations about the dangers of and eliminating stagnant waters where larvae mature. Similarly, there are many programs which seek to educate and provide mosquito netting to prevent contraction of malaria, but very few discuss the importance of preventing the transmission of malaria once you are infected [good point, I'd say. More bednet quarantining for the sick?] and “knowledge about malaria transmission is...shrouded in many misconceptions” (Ahorlu et al 1997).

The niche construction model highlights how an organism's own activities can affect its ecological niche to such a degree that selective pressures on that organism change....Members of a species can alter the environment, and thus how selective pressures act on them. Niche modifying creates a feedback loop from behavior to environment to selection in ways that are not generally represented in most evolutionary scenarios. The niche construction model appears to be an extremely robust way of thinking about brain evolution...because it offers a way to bring together thinking about how patterns of environmental change represent simultaneously adaptation and selective pressure, as subsequent generations face the cumulative effects of altered developmental and evolutionary landscape...Understanding cultural evolution as ongoing niche modification offers a way to reconcile what are sometimes seen as competing explanations for our ancestors' unusual evolutionary trajectory, highlighting the complex ways that cognitive, technological, and social changes were simultaneously selective challenges as well as adaptations to rapidly shifting conditions (Downey and Lende 2012:118).

#### **2.10 Trade-Offs of Social Susceptibility**

It is clear from this review of the evolutionary processes above that human brains and bodies evolved to be highly responsive to environmental cues. More specifically, neurobiological systems are designed to detect and react to social conditions as well as motivate fitness enhancing behaviors in the social domain. It would seem then, that our adaptability (e.g., genetic, neural, developmental, social, cultural, and behavioral, etc.) would produce organisms extremely well suited to their particular physical and social environments. But natural (or social) selection doesn't produce perfect or even the best possible outcomes. It merely favors fitness enhancing traits, which are then passed on to subsequent generations at higher rates than less fitness enhancing traits and, thereby, increase in frequency over time.

In fact, our bodies can be read as a history of compromises and slight modifications. Or better yet, a series of design flaws. The ability to speak makes us vulnerable to choking, our inverted retina predisposes us to visual impairment, the only role of the

appendix in humans—which was a digestive organ for plants of low nutritional value in our mammalian ancestors— makes us susceptible to appendicitis. Our primate relatives' shift toward a frugivorous diet halted the body's natural production of Vitamin C, a deficit that most humans experience (especially early sea-faring explorers who suffered scurvy as a result). Becoming omnivores with large brains made us more likely to die of a head injury than any of our phylogenetic relatives. And bipedality ensured that humans have the smallest pelvic opening to fetal head ratio, making ours the most difficult of births (Neese and Williams 1994). All of these problems and many more are due to maladaptive human design features which are a result of slight modifications accumulated on preexisting structures. Basically, we carry all of the baggage of previous phylogenetic adaptations.

There are also maladaptive evolutionary trade-offs that result from social-physiological adaptability. Adaptations that were once advantageous are now harmful and unintended health consequences of systems that evolved for other purposes. Sensitive social warning systems, while important for survival and reproduction especially in complex social environments, can leave our brains and bodies perpetually susceptible to external stressors. Hyperactive pleasure/pain reward systems, while essential for motivating fitness-enhancing behavioral adjustments, can be co-opted by cultural interventions (like alcohol, drugs, sex, entertainment, etc.) which dampen our ability to “learn from” these feelings, often have negative side effects, and can lead to addiction and increased negative emotions. Cognitive adaptations like empathy, predictive reasoning, and long term memory that were vital to the development of our social and

emotional intelligence can be exploited by anticipated or imaginary triggers. Increased social, emotional and intellectual complexity are huge factors in sickness and disease in modern societies. “Essentially, we’ve evolved to be smart enough to make ourselves sick” (Swartz 2007).

We live much longer than our phylogenetic ancestors did. “Central to an evolutionary understanding of disease is the recognition that selection operates to maximize inclusive reproductive fitness: not health and not longevity. There is generally no direct fitness advantage to living a healthy or a very long life; there is only a substantial selective advantage in reproducing successfully” (Gluckman et.al 2009:258). Thus, natural selection does not weed out deleterious traits which have no reproductive influence and/or which manifest in post-reproductive years, i.e., degenerative diseases. Selection favors traits that increase fitness early in life even if they generate trade-offs that have costs later in life (antagonistic pleiotropy). Our brains are hardwired to behave in ways that increase our social status and reproductive potential even if they aren’t healthy. For example, new research on teenage neuropsychology argues that risk taking, dominance displays, peer alliances, lack of impulse control and separation from parental supervision make sense in an evolutionary framework where these behaviors increase one’s social status and chance of gaining dominance. While many of these traits also cause high accident, mortality and injury rates in teenaged populations today, they were once advantageous behaviors to increase status (Dobbs 2011) and enhance fitness.

Some of our health problems come from excessive or hyper-adaptive body systems. Humans have very powerful defense mechanisms such as our immune system, autonomic



nervous system and protections against toxins and infections. Many health problems, such as auto-immune diseases, allergies, asthma, pyrexia, and anaphylaxis, are the result of normal adaptive responses that evolved to protect and defend the body, but are now inappropriately or excessively activated. For example, our immune system is robust, predictive, rapid and very sensitive to stress. Complex human intellectual, emotional and social adaptations can trigger immune responses too often, too easily and for too long. This can leave the body susceptible to and exacerbate autoimmune disorders.

Similarly, what is helpful in small amounts can be detrimental in large or constant doses. The tension induced by stress is an organism's generalized, adaptive response to a broad array of stressors. This response prepares the body for action and protects it from significant damage resulting from that action. A robust sympathetic system seems very advantageous, but like most aspects of evolution, there is a trade-off. Our bodies are incapable of functioning in a stressed state or with a high allostatic load<sup>292</sup> for very long without significant damage to the body. Fortunately for our phylogenetic ancestors, predator encounters and life threatening events were relatively rare and brief occurrences. Unfortunately for us, increases in intelligence<sup>[3]</sup> and emotional and social complexity create what we call psychosocial stress - or the activation of the sympathetic response via psychosocial triggers. Increased group size (growing every day with technological innovation) increases the perception and activation of social stressors—the stimuli we

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<sup>292</sup> “The physiological consequences of chronic exposure to fluctuating or heightened neural or neuroendocrine response that results from repeated or chronic stress” (McEwen and Steller 1993). Allostatic load is used to measure the cumulative damage that frequent activation of the sympathetic system does to specific organs in the body.

perceive as threatening. Furthermore, our increased intellectual complexity amplifies our ability to trigger these stressors through the act of remembering, imagining and empathizing. These stressors become harmful and even deadly when they are activated too intensely, too often or for too long. "Primates are super smart and organized just enough to devote their free time to being miserable to each other and stressing each other out. But if you get chronically, psychosocially stressed, you're going to compromise your health" (Swartz 2007). Thus, while stress has acute protective and adaptive benefits, unmediated, it has serious long-term health consequences.<sup>293</sup>

In the case of the origin of a trait, the explanations will be, by necessity, primarily developmental and epigenetic—again, as evolution is not forward looking, the initial appearance of a trait cannot be due to natural selection acting on that trait. The spread of a trait in a population, on the other hand, will often be explained in terms of selection; note that this explanation will involve selection in the informal sense of a trait interacting with a physical process in a discriminate way. Recall that formal selection is not causal, but merely describes the (mean) spread of a trait in populations of the kind in question. Explaining the maintenance of a trait in a population, will, however, involve attention to both the selective advantage of the trait (given informal selection via discriminate physical processes) and the developmental mechanisms by which the trait is reliably (re)produced in the organisms in question (Pigliucci and Kaplan: 120).

As Futuyma argues below, it is important to explain not only how and why adaptive traits and behaviors have been selected for and currently work, but also why maladaptive traits and behaviors exist.

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<sup>293</sup> Such as: fatigue, hypertension, heart disease, decreased immune functioning, increased susceptibility to illness, sluggish recovery time, , suppressed testosterone levels, reduced sexual desire, fewer circulating white blood cells and *insulin-like growth factor- I* which help heal wounds, accelerated disease pathology, interrupted diurnal rhythms, changes in neural plasticity, cortisol induced stomach fat storage, enlargement of adrenal gland, atrophy of thymus, spleen and other lymphoid tissues, gastric ulcers, decreased number of lymphocytes, suppression of leukocyte mobilization, stunted growth, fluctuating asymmetry, dull hair, skin problems, halted epigenetic gene expression, increased risk of diabetes, raised blood pressure, reproductive disorders, reduced telomeres, lost brain cells, etc. (Sapolsky 2004).

The theory of evolution by natural selection must account for the origin of the complex adaptations that promote the survival and reproduction of the organisms that bear them; but it must also account for the features that seem not to benefit individual organisms...It must account for features that enhance the likelihood of survival of the species as well as features that do not...the theory must explain the origin of cooperation within species...and between species...but it must also explain antagonistic relationships, both among members of a species...and between species...The theory, finally, must explain failures of adaptation—the great majority of species that have ever existed are extinct—and instances of apparent maladaptation (Futuyma 1998: 342-343).

Due to the constraints of natural selection and the many different competing selective pressures and trade-offs as well as the different levels and types of selection, conflicts are inherent in the evolutionary process. What is more, “central to an evolutionary understanding of disease is the recognition that selection operates to maximize inclusive reproductive fitness: not health and not longevity. There is generally no direct fitness advantage to living a healthy or a very long life; there is only a substantial selective advantage in reproducing successfully” (Gluckman et.al 2009:258). Natural selection does not weed out deleterious traits which have no reproductive influence and/or which manifest in post-reproductive years, i.e., degenerative diseases. Thus, selection favors traits that increase fitness early in life even if they generate trade-offs that have costs later in life (antagonistic pleiotropy).

Another important factor to note is that the process of natural selection is a general principle of all biology and organic life. Pathogens,<sup>294</sup> insects, and fungi (as well as all

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<sup>294</sup> “Of course, it’s not just external organisms we’ve evolved to manage—or that have evolved to manage us. Guess what? You may not have sent any invitations, but as you read this, you’re playing host or hostess to a massive party of microbes. In fact...an adult human contains *ten times* (original emphasis) as many ‘foreign’ microbial cells as mammalian cells. If you put them together, you’d find more than 1,000 different types of microbial creatures weighing about three pounds and numbering somewhere between 10 trillion and 100 trillion. And when it comes to genetic material, it’s not even close. The microbes that make

other organisms) are also hardwired to survive and reproduce and their evolutionary trajectories intricately connected to our own. “The bacteria, viruses and parasites that cause disease in us have affected our evolution as we have adapted in ways to cope with their effects. In response they have evolved in turn, and keep doing so” (Moalem 2007: xv). Many problems in modern medicine are due to misunderstanding the interconnected evolutionary histories and interactions of humans and other organisms (See Evolutionary Medicine: Malaria Case Study above). We are in a constant co-evolutionary battle with pathogens and sometimes we lose.

Not all traits are either adaptive or maladaptive. Some are just due to variation. Variation drives the mechanism of natural selection and is inherent in every trait leading to a natural proportion in phenotypic features where adaptive traits increase in frequency over time often represented by a bell curve where it is better to be in the middle of the curve than on either end. Sometimes health problems and maladaptive traits are merely a result of being at the extreme ends of the bell curve of modern human variation.

Others traits are the result of vestigial or pre-adaptations (remnants from earlier phylogenetic ancestors and used for potentially unrelated purposes if at all), exadaptations (traits which evolved for other usages or none at all and are currently co-opted for other purposes), nonadaptations (traits which did not originate via the direct action of natural selection), spandrals (traits which did not evolve through natural selection but as a side effect of a true adaptation) and genetic hitchhiking (traits which do

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you their home collectively contain 100 times as many genes as your own genome does” (Moalem 2007:98).

not enhance fitness but are associated with or passed on concomitantly with traits that do). For example, “the majority of comparative neuroscientists have concluded that the primary differences between human and other primate brains are proportional rather than the result of evolution producing entirely new structures...[this] has important implications for the neurological underpinnings of humans’ distinctive cognitive abilities: the pattern suggests most new capacities have arisen from modifications to or repurposing of existing structures, what Ernst Mayr (1960) and other biologists call ‘pre-adaptations’” (Downey and Lende 2012:110-111)

Additionally, some adaptations selected for one purpose become problematic in other settings. For example, in our EEA bleeding and dehydration were the main causes of deficient blood pumping. As a result, retaining salt and fluid when heart muscles are unable to pump blood normally, was naturally selected for and increased in frequency in the population in subsequent generations. However, in modern populations where congestive heart failure is common fluid retention exacerbates the problem and leaves patients more susceptible to death from heart disease.

#### **2.10.1 Co-Opting Body Systems: Warning Systems Overview**

Social pain, social stress and pro-social emotions are adaptive warning systems. They activate physiological processes in response to cues in our social environments in order to motivate pro-social and deter anti-social behaviors. These social adaptive warning systems evolved later in our evolutionary history, piggy-backed onto and co-opted pre-existing body systems like physical pain, sympathetic and parasympathetic responses, and emotional arousal (Nelson & Panksepp, 1998; Panksepp, 1998; Eisenberger and

Lieberman 2004). As such, they share many of the same underlying neural pathways and biochemical mechanisms and they often appropriate the physical sensations and signals of these body systems in order to signify problems or motivate cooperation in the social domain.

Due to the survival costs of social incorporation many of our negative reactions (and their biological correlates) to social stimuli actually adapted to reward pro-social and punish anti-social behaviors. For example, grief, sadness, fear, anxiety, anger, guilt, disappointment and loneliness are all unpleasant sensory and emotional experiences designed to “signify and prevent the danger of social separation” and are experienced due to threatened, damaged or lost social relationships (Eisenberger and Lieberman 2005).

Often times there are unintended consequences of evolutionary adaptations... These pain/pleasure responses may have evolved for the purpose of infant caregiving, yet they stay with us for a lifetime, radically shaping our thoughts, feelings, and behaviors till the end of our days. The downside to these social motivations is that they can have truly harmful consequences when they go unsatisfied. The severing of a social bond—whether it’s the end of a long-term romantic relationship or the death of a loved one—is one of the greatest risk factors for depression and anxiety. Although adults can survive with unmet social needs far longer than with unmet physical needs, our social bonds are linked to how long we live. Having a poor social network is literally as bad for your health as smoking two packs of cigarettes a day (Lieberman 2013: 98-99).

### **2.10.2 Increased Emotional Complexity**

Countless studies on nonhuman and human primates show that we are designed to respond to even tiny pieces of social information, especially if accompanied by a layer of emotional valance: a photo, gossip, facial expression, etc. (Brothers 1990; Young et al. 1994; Adolphs 2001; van Essen et al. 2001; Pokorny and de Waal 2009a, 2009b; Anderson et al 2011). “Our brain and visual system selectively choose information that might help protect us from potentially dangerous individuals or situations” (MacKinnon and Fuentes 2012:70). Emotions are used to distinguish between vital and banal information. Strong emotions (both experienced and seen in others) signify that something is important, become more memorable and induce behavioral adjustments more than non-emotional information or interactions.

The way in which the brain encourages us to pursue adaptive goals is that it has assembled a system of rewards and punishments through evolution. These rewards and punishments are affected through our emotions...neurochemical states in the brain that motivate us to act. In other words, emotions and motivations are two sides of the same evolutionary coin. We experience positive or negative emotions as a consequence of the particular neurochemical soup that is in our brains at any particular time, and these emotions cause us to act (or refrain from acting) in particular ways. Pain is one of nature’s ways of preventing us from doing things that are harmful; pleasure is a way to motivate us to undertake actions that will increase our adaptive fitness—reproducing, eating, sleeping, and so on (Levitin 2008: 89-90).

Another asset that incentivizes but can also affect health negatively is our motivational structures. These have evolved to motivate fitness enhancing behaviors and

punish fitness decreasing behaviors, often through hijacking phylogenetic adaptations that evolved for other purposes. For example, emotions operate in the reptilian part of our brains, working with arousal and instinctual response in order to perceive the world around us. Unpleasant emotions prompt actions that will increase our status and belonging, and thus our chances of survival and reproduction. Positive emotions reward these types of behaviors. However, as in other evolutionary trade-offs, our bodies are not meant to sustain negative emotions triggered too often or for too long.

### **2.10.3 Co-Opted Coping**

Similarly, persistent negative emotions become problematic when we don't fix the underlying behavior that would ease the negative feeling to begin with. For example, when people "feel bad" they turn to coping behaviors – like eating, sex, and gambling-- that alter their biochemistry and produce pleasurable sensations. Our bodies are designed to desire these behaviors and feel pleasure when we engage in them because getting food, mates and increased status were fitness boosting actions. The problem is that cultural innovation has allowed us easy access to cheap, fatty foods, fake sex via pornography, and systems of variable reward that exploit our evolved processes. "Basic neurological functions influence, and are influenced by, conscious experience. Variability reveals how developmental trajectories can recruit phylogenetically ancient systems, skewing their responses, linking them to evolutionarily younger cognitive capacities, or cuing them with novel stimuli" (Lende and Downey 2012:48).

Another problem is that it is much quicker and easier to alter my physical "feelings" via a biochemical agent—such as sex or food addiction, drugs, alcohol, or active



medication—than to make the lifestyle or behavioral adjustments these unpleasant physical sensations evolved to promote (e.g., feeling heartbroken after a failed relationship in order to look for a more reciprocal and trusting primary relationship in the future or feeling sad and uncomfortable after an awkward social interaction in order to evaluate, motivate, and adjust social interactions in the future). But this cycle— altering our “feelings” via medication or altering our biochemical agents— can triggers even more negative emotions (like pharmacological side effects, shame, and guilt), leading to greater need for pleasurable relief and perpetuating a constant cycle of reward/punishment. These behaviors then mask the root cause of the original negative emotion, thereby reducing the chance of heeding the original warning and making the behavioral adjustments needed to ease that original social misstep.

There are evolutionary explanations for why people enjoy certain feelings, such as fitness and social and biochemical rewards. Humans co-opt and mediate these biochemical processes in culturally specific ways. Analyzing how evolved biochemical signals motivate human behavior and how humans manipulate those processes raises important questions for mind-body medicine and helps us to better understand some of the esoteric expectations and behaviors in Asante medical contexts. For example, because the Asante conception of the body has two parts, the physical and the spiritual, examination of psychosocial stressors, social relationships, and spiritual standing are already embedded into ritual process. This may uncover potential lifestyle or social etiologies of the problem, rather than just treat the somatic symptoms.

#### **2.10.4 Exaptations and By-Products**

Sometimes evolutionary trade-offs come in the form of exaptations, which use “our body maps for new challenges and purposes...Put simply, exaptation is a shift of function for a certain trait in the process of evolution: Bird feathers are a classic example, because initially these evolved ‘for’ temperature regulation but later were adapted for flight” (Metzinger 2009). There are many aspects of modern human social interaction and social susceptibility that are by-products of earlier adaptations that evolved for different purposes. For example, the mechanisms behind mirror neurons, theory of mind (TOM) and the perception-action model (PAM)—adaptations present in other mammal species—were “exapted in altricial species to improve care of offspring and to develop emotion regulation and synchrony; which in turn are necessary for the proper development of empathy, cognitive empathy, and helping behavior.” (Preston and de Waal 2002: 9). Empathy is then exapted by humans in a variety of novel ways (i.e., think of commercials or novels that make you cry) to manipulate other people’s feelings and behaviors. Religion and ritual are also, arguably, exaptations. Hyper-active agency detection, theory of mind, costly signals, mirror neurons and various mental modules (minimally counter-intuitive concepts, reflective and non-reflective beliefs, etc.) all evolved for other utilities and yet they make religious belief and behavior not only possible, but enormously compelling and able to “get under the skin.” But this also means that things like religion and belief can produce powerfully persuasive emotions and compelling social incentives, pre-requisites for many of the atrocities carried out by extremist groups throughout human history.

### **2.10.5 Increased Intellectual Complexity**

Human cognitive capacity and sociocultural development has allowed us to thrive in vastly different environments across the globe. Our large, socially intelligent, plastic brains are responsible for many important cognitive functions<sup>295</sup> but they require very costly adaptations<sup>[6]</sup> and carry evolutionary trade-offs and negative health consequences. What this teaches us is that being smarter does not necessarily make us healthier. In fact, it might do just the opposite.

From remembering where hidden food caches, old watering holes, and fierce competitors are, to recognizing potential threats, imitating other's successful actions, and creating reciprocal bonds, increases in memory were critical to our cognitive evolution. Memory is an advantageous trait; it would follow that people with better memories might survive and reproduce at higher rates. In fact, some of our most painful memories have to do with threatened or severed social relationships, i.e., divorce, death, heartbreak, loss, rejection, ostracism, humiliation, etc. This is a design adaptation, not a design flaw. Long-term, poignant and visceral memories (especially those that can stimulate physical sensations) of traumatic experiences remind individuals to avoid similar situations and help them ruminate on what to do better next time. However, memory also increases the amount of stress, pain and negative emotion people experience. Not only are our bodies susceptible to immediate or concrete stressful experience, but they are also susceptible to painful, stressful and emotionally unpleasant memories that can be re-experienced,

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<sup>295</sup> Including long term memory, the ability to recognize future consequences, impulse control (which impacts risk-taking and rule-abiding), social intelligence, emotional complexity, mental flexibility (ability to evaluate multiple choices and adapt to novel situations), deception detection, theory of mind, connecting emotions and judgments to social consequences, sequential planning, spontaneity of facial expressions and interactions with others, attentiveness, resistance to emotional lability, and language expression.

exacerbated and even anticipated. For example, post-traumatic stress disorder (PTSD) is associated with remembering and re-experiencing of traumatic experiences. And one of the cognitive predispositions for depression is always living and thinking in the past, which can actually intensify, and/or distort emotional experiences (Campos 1994; Levine 1997; Pollak 1998).

Likewise, anxiety is a cognitive preoccupation with living in and thinking in the future. The ability to recognize future consequences, plan ahead and anticipate other's behavior is essential to social intelligence, but constant worry about future events can trigger perpetual stress responses and the concomitant physiological responses to anticipated future social pain. Being able to predict other people's thoughts and actions is another major evolutionary asset that has potential negative trade-offs because correct and incorrect predictions stimulate pain/pleasure motivational structures. When we predict correctly, we feel good. When we predict incorrectly, we feel bad. This was advantageous to navigating complex social relationships and hunting behaviors, but in the Pleistocene there was less regular exposure to novel situations. Nowadays, we are constantly bombarded by foreign stimuli and our chances of misprediction are overwhelming. "Constraints on evolutionary processes (the speed, substrate, or direction of selection, or the scope of plasticity) in the presence of environmental novelty can lead to ill health" (Gluckman et.al. 2009: 259). Our ancient prediction reward and punishment systems are not suited to modern environments. These were helpful in evaluating multiple choices but can be paralyzing today because we have too many choices. Even simple decisions, like grocery shopping, have become inundated with choice. Our

warning and reward systems tied to sifting through options and making choices can increase our allostatic load.

Normal stress responses primarily bypass the frontal lobe and engage the subcortical areas of the limbic system. But future projections and imagination require frontal lobe capacity. Thus, future-predicted stress or imaginary worry produce a stress response to prepare for potential threats, but (a) there is no acute stressor and (b) the stress is being processed cognitively rather than instinctually which can prolong, exacerbate and magnify its effects. For example, obsessive compulsive disorder (OCD) is a reaction to constant worry and anxiety because it instills “a pattern of integrated physiological mechanisms and ‘adjustments’ that are elicited when a subject engages in a repetitive mental or physical activity and passively ignores distracting thoughts” (Fricchione 2005). In fact, anthropologist Pascal Boyer argues that ritualized behavior evolved out of the “activation of a specific hazard-precaution system specialized in the detection of and response to potential threats” (Boyer 2006). Along these same lines, warning and reward signals are tied to rule-following and making assumptions about what other people think about you. These abilities are important for the development of social intelligence but can become very problematic in cultural or religious systems where guilt, shame and fear are constant features.

#### **2.10.6 Modern Mismatches of Social Susceptibility**

To complicate things further, many of our responses to social pain evolved as beneficial adaptations, helping us keep fitness and maintain communal relationships of reciprocity, but they have become maladaptive because there is a mismatch between the

Environment of Evolutionary Adaptedness (EEA) in which these traits evolved and the current environments in which we live. Most of human biology and behavior evolved in environments and in response to stressors radically different than those we face today.<sup>296</sup>

“The changing human environments had profound effects on health....In fact, many of the characteristics and behaviors that evolved in that 95% of our evolutionary history had adaptive significance then, but may even be maladaptive today” (Trevathan et.al 1999:5) For example, our immune systems evolved in an environment with a heavy parasitic load and high exposure to pathogens. It was designed to fight off strong parasites, worms and pathogens on a daily basis. Our immune systems evolved over millions of years in order to be powerful and sophisticated endogenous defense systems. However, cultural adaptations like industrialization, germ theory, urban living and hand-sanitizer have created modern environments that are largely pathogen-free environments.

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<sup>296</sup> “Approximately 200,000 years ago we find evidence of our own species, *Homo sapiens*. This is the large-brained, language-using species whose ever-expanding material culture enabled occupation, and even domination, of every known land area and habitat on earth. Although biological changes have been extensive since the origin of *Homo sapiens*, perhaps the most significant changes in terms of contemporary health problems have occurred in the environments in which humans live, beginning especially with the origins of agriculture, approximately 10,000 years ago. Taking a conservative estimate of the origin of humanness as 200,000 years ago, we can safely say that more than 95% of our biology, and presumably many of our behaviors, were shaped during the time period in which our ancestors lived as gatherers of wild food resources. This lifestyle included low-fat diets, low technology, adequate but not overly abundant food resources, low birth rate, near-exclusive breastfeeding for the first two years, long (4 years) interbirth intervals, low total population, high mobility, and living in small (25-50 people) kin-based social groups. Natural selection thus favored characteristics and behaviors that were advantageous and suitable for that kind of lifestyle. The human environments changed with the origin of agriculture, however, and many of those behaviors are no longer advantageous. These changes include sedentism, a narrowing of the food base, increase in fat intake, larger communities, infectious disease, decreased birth interval, increased birth rate, increased total population, and changes in interpersonal relations (e.g. male-female and intercommunity dynamics)....The changing human environments had profound effects on health. A better understanding of many modern health problems will emerge when we consider that most of human evolution took place when our ancestors were hunter-gatherers...Biologically, and perhaps, behaviorally, we are hunter-gatherers, but clearly most of us do not live that kind of lifestyle. In fact, ...many of the characteristics and behaviors that evolved in that 95% of our evolutionary history had adaptive significance then, but may even be maladaptive today” (Trevathan et.al 1999:5).

The parasitic load of the average individual living in the United States or Europe, for example, is a fraction of that of those living in the global south and the immune system-biome interactions of our hominin ancestors and non-human primate cousins. That mismatch means that the immune systems itself can become overactive in modern environments. With fewer visible threats, the system's adaptive strength can begin to overreact, becoming problematic, or even deadly, for a couple of reasons. First, immune systems with nothing to do begin to attack "foreign invaders" like dust particles and food sources in sometimes deadly allergic or asthmatic reactions. A system designed to kill off intestinal worms begins to fight peanuts or pollen in sterile environments. Even more troubling is when the immune system starts to recognize and attack its own cells, as in the case with autoimmune disorders.

Autoimmune disorders (insulin-dependent diabetes, Crohns, psoriasis, arthritis, lupus, etc.) attack healthy tissue as if it is an infectious agent. These flare ups are highly correlated with stress events and lead to chronic pain, inflammation and physical disability as well as fatigue, depression and mood disorders. "Autoimmune processes may directly damage tissue necessary for survival or may indirectly affect survival by interfering with normal immune responses—thereby increasing susceptibility to infection, delaying wound healing, or affecting the development or course of a malignancy" (Koenig and Cohen 2002:176). Second, biomedical solutions to hyper-active immune systems are not often rooted in evolutionary knowledge. Instead of introducing harmless pathogens that would occupy and "retrain" our immune systems, and have very little side effects, most biomedical solutions to autoimmune problems

involve strong broad spectrum antibiotics. While these work for a while, they are not very smart solutions because they destroy our endogenous biomes that have evolved over time to maintain health, artificially selecting stronger, more virulent bacteria (because the only organisms that survive are “superbugs”)—bacteria our stone-age immune systems are unprepared to fight off. Fortunately, we are beginning to see the introduction of medical interventions better suited to our evolved bodies. A handful clinical trials are being conducted right now on the effects of hookworm on allergies, asthma, Crohns, celiac, multiple sclerosis, ulcerative colitis, psoriasis and even type 1 diabetes and autism (Moalem 2007; Kaplan 2009; Nuwer 2013). Likewise, research is being conducted on the effect of reconstructing human biomes in patients with immune disorders.

Industrialized society currently faces a wide range of non-infectious, immune-related pandemics. These pandemics include a variety of autoimmune, inflammatory and allergic diseases that are often associated with common environmental triggers and with genetic predisposition, but that do not occur in developing societies...these pandemics are due to a limited number of evolutionary mismatches, the most damaging being ‘biome depletion.’ This particular mismatch involves the loss of species from the ecosystem of the human body, the human biome, many of which have traditionally been classified as parasites, although some may actually be commensal or even mutualistic. This view, evolved from the ‘hygiene hypothesis,’ encompasses a broad ecological and evolutionary perspective that considers host-symbiont relations as plastic, changing through ecological space and evolutionary time. Fortunately, this perspective provides a blueprint, termed ‘biome reconstitution’, for disease treatment and especially for disease prevention. Biome reconstitution includes the controlled and population-wide reintroduction (i.e. domestication) of selected species that have been all but eradicated from the human biome in industrialized society and holds great promise for the elimination of pandemics of allergic, inflammatory and autoimmune diseases (Parker and Ollerton 2013).

In these cases of debilitating and even deadly diseases caused by evolutionary environmental mismatches, it is essential to understand how our brains and bodies



evolved perceive and respond to environmental stimuli, as well as how modern environments impact those biocultural interactions, in order to design healthcare solutions better suited to the actual etiology of the problem: biome reconstruction rather than broad spectrum antibiotics.

## **2.11 Cultural Niche Construction**

Early anthropologists referred to this process as Culturally Constituted Defense Mechanisms (CCDM's) (Kardiner 1945; Hallowell 1955; Spiro 1965, 1968, 1970, 1972, 1987; Avruch 1990) but neglected to explain the biocultural interactions, developmental plasticity, or feedback relationships between cultural defense mechanisms and evolutionary and biological processes.

Our biosocial feedback processes, social systems, and cultural niche modifications are: (1) adaptations that help us become better suited to the conditions and pressures in our physical and social environments *and* (2) the conditions and pressures that exert the selective pressure and determine which adaptations are fitness enhancing. This is important to remember because “through niche construction organisms not only influence the nature of their world, but also in part determine the selection pressures to which they and their descendants are exposed” (Day et al. 2003: 80).<sup>297</sup> Furthermore, “in the complex built environments and anthropogenic ‘natural’ settings that humans have inhabited for a very long time...the line between the ‘environment’ and ‘culture’ can blur” (Downey and Lende 2012:11),<sup>298</sup> meaning that much of the adaptability of modern populations are

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<sup>297</sup> See *Appendix: Chapter 2: 2.8 Cultural Niche Construction Feedback Loops* for more.

<sup>298</sup> “using fire, hydraulic alterations, game management, selective culling of trees and plants, animal husbandry or varying intensities, and other techniques to subsist” (Downey and Lende 2012:119; Odling-Smee 2007).

physiological responses to built or culturally constructed environments. For example, based on ecological conditions, resource availability and pre-existing sociocultural structures, past populations dealt with the serious health problem of access to clean water in very different ways. In the East, we see the development of boiling water and the invention of tea and in the West we see the discovery of fermentation and the proliferation of alcohol. Each of these solutions had social, cultural, health and even genetic implications. Something as simple as how different people deal with contaminated water—from ritual practices and disease prevalence to inherited genes for alcohol tolerance and processing—alters the selective conditions and pressures in which our bodies adapt (i.e., sociocultural behaviors, biological processes, genetic predispositions and biocultural interactions) as well as their concomitant health consequences (Moalem 2007). “Primate social networks and complex social cognition have been central as niche-constructing strategies through time...Sociality and cognitive functioning display extensive plasticity within our phylogeny, resulting in nonlinear feedback loops among increasing brain size, social complexity, and evolutionary ‘success’ via biosocial niche construction” (MacKinnon and Fuentes 2012:86).

The implication for neuroanthropology is obvious: forms of enculturation, social norms, training regimens, ritual, language and patterns of experience shape how our brains work and are structured. But the predominant reason that culture becomes embodied, even though many anthropologists overlook it, is that neuroanatomy inherently makes experience material. Without material change in the brain, learning, memory, maturation, and even trauma could not happen. Neural systems adapt through long-term refinement and remodeling, which leads to what we see as deep enculturation. Through systemic change in the nervous system, the human body learns to orchestrate itself. Cultural concepts and meanings become neurological anatomy (Lende and Downey 2012:37).

This is not completely novel thinking in anthropology. Clifford Geertz (1973) argued over four decades ago that “man’s nervous system does not merely enable him to acquire culture, it positively demands that he do so if it is going to function at all. Rather than culture acting only to supplement, develop and extend organically based capacities logically and genetically prior to it, it would seem to be an ingredient to those capacities themselves” (Geertz 1973: 67-68). What is new is the ability to discover, view, and measure the proximate mechanisms and neurobiological processes involved in these brain-body-environment interactions.

What is needed is further interdisciplinary collaboration to combine these findings with evolutionary and behavioral explanatory models and culturally specific examples. Cultural specificity is important, because instead of waiting multiple generations until maladaptive genes become less frequent in a population or until our bodies phenotypically adapt to adverse conditions, humans manipulate “their environment to meet the needs created by their ever changing lives” (Moore et al. 1980: v). Cultural solutions are exponentially faster than biological or genetic ones and affect the course and development of both. *The Social Life of Placebos* attempts to explain the evolutionary and proximate mechanisms of biocultural interactions in Asante medical encounters.

### **2.11.1 Cultural Management of Health**

Humans have a powerful trick up our sleeves. Our bodies are designed to perceive and adapt to signals in our environment. But unlike many of our non-Hominid relatives, we do not have to rely *only* on physiological adaptability. We can navigate and respond

to environmental or social challenges with “cultural adaptations” (tools, innovations, rituals, signals, and status signifiers, etc.), adaptations that have played a significant role in human development for hundreds of thousands of years and have led to a very unique problem: a phenomenon where culture becomes both an adaptive resource *and* a selective pressure of itself (Downey and Lende 2012: 122)--especially in modernity.<sup>299</sup> For example, in our current environments, our bodies are adapting to dietary (e.g., Twinkies), material (e.g., political-economic inequality), and social (e.g., Facebook) conditions that are “man-made.” Thus, in a sense, in modern life, our bodies are mostly evaluating and responding to culturally constructed phenomena. This fact underscores the importance of understanding the dense ethnographic context of any experience of sickness and healing, including the meanings and expectations of the healing system itself, in order to decode biocultural interactions in medical encounters. Without including this cultural lens, we neglect much of the information our bodies are perceiving and responding to. Humans have a “collective ability to amass, transfer, improve upon, and deploy information, strategies, skills and technology” (Downey and Lende 2012: 123). We evaluate circumstances around us and respond via sophisticated fitness-enhancing physiological, emotional, intellectual, social, and cultural strategies in ways that increase our survival and reproduction, or in modern life, our access to high quality and quantity resources and relationships.

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<sup>299</sup> “An evolutionary account of the human brain needs to consider more than just adaptation. Increasingly, geneticists, comparative neuroscientists, paleoanthropologists, and evolutionary psychologists take into account a range of other factors, including constraints, genetic and developmental mechanisms that generate ‘evolvability,’ and the role of human actions in transforming selective pressures over our evolutionary history” (Downey and Lende 2012:104).

There will be a thorough discussion of the evolution, elicitation, and explanation of the placebo effect in the next chapter. What is important to note here is that Asante medical encounters incorporate many of these methods of encouraging optimal health resource allocation and activating and enhancing placebo responses. Because placebo (and nocebo) responses are not unique, they are part of a much larger phenomenon; that of human evolved physiological susceptibility to social conditions. Cultural niche constructions, health resource allocation and placebo responses are not “adaptations” in the traditional sense but rather our sociocultural and physiological *attempts* to navigate among the many competing social selection pressures in a modern world. By changing the actual or perceived environment or prompting meaning reprioritization, health practitioners and rituals activate these ancient biosocial feedback systems. We read cues in our environment in order to know how to respond in the most optimal way. These cues activate fitness enhancing physiological responses *or* motivation structures that incentivize fitness enhancing behavioral responses. As a result, if the conditions or cues in our environment and/or the actual or perceived resources individuals have access to in order to deal with those conditions change, so too may our physiological and behavioral motivating responses.

These processes are mostly unconscious and often predictive. That is one of the reasons why expectations have such powerful biological consequences. Our bodies are designed to respond not only to expected environments, but also to accurately anticipate and respond to predicted environments. Furthermore, we need to respond, not only to the material conditions in our environments, but also the social conditions. This means being

able to anticipate, evaluate, and respond to the thoughts, intentions, and actions of others. As we recall from the earlier Pleistocene hunting example, these anticipatory reactions were essential for survival and social cooperation. Social “adaptations intensify the bonds we feel with those around us and increase our capacity to predict what is going on in the minds of others so that we can better coordinate and cooperate with them” (Lieberman 2013: 9). Accurate prediction of our environment and those around us was so essential to our survival and reproduction that we have inherited some prediction-accompanying adaptations such as pattern recognition, statistical regularity, and environmental predictability. That perception-physical sensation system has evolved for hundreds of thousands of years to help us recognize threats in our ecological and social environments and to respond appropriately. They “prepare biologically adaptive behavioral responses (e.g., to freeze, fight, or flee), enabling humans to be as well prepared as possible for the occurrence of dangerous events in the environment” (Stevens and Byron 2007: 511).

But how do we know *if* we respond correctly? There is also a perception-physical sensation system or rather a pleasure/pain motivational structure that “cause[s] us to act (or refrain from acting) in particular ways. [Emotional] pain is one of nature’s ways of preventing us from doing things that are harmful; [emotional] pleasure is a way to motivate us to undertake actions that will increase our adaptive fitness” (Levitin 2008: 89-90). Through enculturation, we learn to expect specific patterns in social interactions and we learn what behaviors are within the bounds of social norms. When we respond inappropriately or predict incorrectly there is an unpleasant physiological sensation. We *feel* bad. Bad *feelings* feel unpleasant so that we don’t repeat the action that caused them.

This is the case with incorrect prediction. An adaptive rush of positive hormones rewards us when we predict things correctly. These predicted expectations are based on conditioning, expectancy, and pattern regularity and are culturally and contextually dependent.

Manipulating emotions through music, storytelling, folk lore, religious belief and more recently movies, books and concerts, etc. allows us to “invoke tension in a safe, nonthreatening context, react to it, imagine new forms of tension and our reactions to those, and prepare a repertoire of responses, all from the safety of the campsite, from the safety of our minds” (Leviton 2008: 104-105). Prediction is so important, in fact, that when we are not thinking about anything else, our minds practice via the “social default system” predicting imaginary scenarios-especially the thoughts, feelings and goals of others.

The final three ethnographic chapters in *The Social Life of Placebos* illustrate how Asante medical encounters activate, amplify and dampen physiological responses via action on modifying patients’ perceptions about the social world and where they fit within it.

## **2.12 Dysevolution**

In fact, many of our modern health problems are just that—the result of hyper-active pro-social adaptations such as extended social stress, social pain and pro-social emotions. Or, put another way: adaptations turned maladaptive. There are significant health consequences of our body’s susceptibility to psychosocial factors (for a detailed

discussion on the many trade-offs and evolutionary mismatches we see today, see *Appendix: Chapter 2: 2.10 Trade-Offs of Susceptibility*).

The basic blueprint of our brains and bodies have not changed drastically in the last ~200,000 years. This is where the term stone-age brains or bodies comes from. Even though we are very adaptable to our immediate surroundings, we are processing the world with (arguably) the same type of bones and guts and brains as our early *Homo sapiens* ancestors. However, we live in radically different environments (ecologically, culturally, technologically and socially) than they did. This is what is called an evolutionary mismatch. Our brains and bodies evolved in very different circumstances than most of us find ourselves living in today. Everything from the food we eat (processed foods high in sugar and gluten) to the social interactions we experience on a daily basis (increased social group size, complexity and connectivity) can impact our health in negative ways. Modern environments (built on industrialization, globalization, urbanization, and technological innovation) exponentially increase our daily social interactions. From school, work and community relationships to texts, emails and social media, the social environments of modernity are much more complex than the conditions under which our co-evolutionary relationship between physiological susceptibility and pro-social adaptability developed. “Distinctive aspects of primate cognition evolved mainly in response to the especially challenging demands of a complex social life of constant competition and cooperation with others in the social group” (MacKinnon and



Fuentes 2012:84). The complexity and sizes of our social groups nowadays ratchet up the challenging demands and the constant competition and cooperation of social life.<sup>300</sup>

Compare human social environments of the Pleistocene to the complicated and frequent social interactions of an average human today. Today, one's social group is enormous and continually expanding because it incorporates not only whom they physically interact with on a daily basis but also the imagined communities of the internet and social media. One must negotiate belonging and face rejection from multiple groups for countless reasons many times a day. Furthermore, the neocortex is so developed that one not only experiences the physical reward or punishment for present social interactions, but can also re-experience past interactions and predict or imagine future ones. While we live longer (due to technological and medical advances), our "stone-age" brains and bodies have not evolved to handle the frequency and intensity of modern social living. Remember, that evolution is not perfect. It does come up with the optimal solutions or predict future problems. It merely makes slight modifications to existing structures based on differential fitness of heritable, variable traits. In another 200,000 years we may begin to see species wide adaptations that have been naturally selected to buffer this onslaught, but for now we are dealing with an evolutionary mismatch of social susceptibility in modernity.

Our ancestors experienced a change in their ecological relationships with the advent of hunting and gathering, pastoralism and nomadism, settled agriculture, and urbanism and industrialization, all with their attendant health problems; the

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<sup>300</sup> "In addition to ecological pressures...there is a ratcheting up of this social complexity in anthropoids, which is increased in hominoids and exponentially enhanced in hominins" (MacKinnon and Fuentes 2012:84). (**Hominoids** are all great and lesser apes: humans, chimpanzees, bonobos, gorillas, orangutans, gibbons, etc. **Hominids** are just the great apes: humans, chimpanzees, bonobos, gorillas, and orangutans. **Hominins** are all of the genus *Homo* after the split from *Pan*.)

developing complexity of life is viewed as broadly detrimental to health (Roberts 2009: 15).

In short, pro-social adaptations have made us smart, socially connected and emotionally receptive but also **highly susceptible and constantly vigilant to near imperceptible changes in the social domain**. These adaptations can become maladaptive in present-day life: where **there is a mismatch between our stone-age brains and bodies and our modern social environments** and where anti-social punishments are triggered more often than pro-social rewards. There are not enough social-connecting and health-promoting culturally constituted coping mechanisms.<sup>301</sup> Status hierarchies are not stable. People, institutions and companies know how to exploit social susceptibility for their own objectives. Pain, stress and emotional warning systems are activated too often, for too long and too intensely.

Basically, humans “are super smart and organized just enough to devote their free time to being miserable to each other and stressing each other out. But if you get chronically, psychosocially stressed, you're going to compromise your health. So, essentially, we've evolved to be smart enough to make ourselves sick (Swartz 2007).

The suite of changes in the brain that created a gregarious, cooperative, teachable species also created one subject to escalating dynamics of intraspecies competition: we are our own best friends and worst competitors, propelling brain evolution. In fact...humans became ‘so ecologically dominant that they in effect became their own principle hostile force of nature,’ leading to a kind of ‘runaway social selection’ that drove brain development to an extreme (Downey and Lende 2012:120-121).

Many of the health problems we are experiencing today are the result of evolutionary trade-offs and mismatches between our stone-age, socially susceptible bodies and our

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<sup>301</sup> For a more detailed discussion on coping mechanisms and co-opted coming in a modern environment and with increased social selection pressures, see *Appendix: chapter 2: 2.10.3 Co-Opted Coping*.

modern environments. Our bodies were not designed to handle the complexity of modern social, emotional and intellectual stressors and many of our cultural niche constructions fail to adequately understand social susceptibility. As such, they help people cope with the biological symptoms of pain, stress, and negative emotion, but do not always treat the root causes. Likewise, many of our modern health problems and negative feelings stem from our physiological responsivity to problems in the social domain. Change the conditions in the social domain or someone's perception of those conditions and it will alter those physiological processes. Treat just the biological side-effects and the problem persists. This is equivalent to reducing a fever to help a patient feel better even though the fever is itself an evolved adaptation to kill off pathogens. Sometimes biomedicine inhibits and dampens evolved endogenous healing processes. Sometimes it exacerbates and amplifies social susceptibility stressors (and their concomitant biological consequences). Sometimes Asante medical therapies reduce psychosocial stress (and their concomitant biological consequences). Sometimes they activate evolved endogenous healing processes. The point is, there are sophisticated evolutionary processes that come standard in our ancient brains and bodies and that have real biological consequences. Medical therapies that influence these processes, likewise, have real biological consequences. This is why holistic treatments like Asante medical therapies might be better suited to address the evolutionary causes of certain culturally-specific illnesses or health problems that result from increased social complexity. While current biomedicine focuses mainly on acute biological pathologies, where is our relief from constant social vigilance and daily social stressors? From meaning and music, to rituals and relationships, Asante medical

techniques and practices may have a better opportunity to address some of the evolutionary mismatches impacting our health today.

This reminds me of a narrative told to me by well-known placebo researcher Dr. Ted J. Kaptchuk. A patient returns from an alternative medical encounter for his back pain and the researcher asks, “How are you feeling?” The patient responds, “I feel great. I still have the back pain, but I feel great.” What this story highlights is that patients are more than their mechanistic parts. Patients can feel better with no change in disease prevalence, or feel worse after being cured. Thus, a model of success framed merely in disease efficacy (and not patient satisfaction) neglects many of the elements of the healing encounter most important to the lived experience of the patients themselves. While biomedicine has rooted the “real” problem in the form of the objective physical presence of diagnostically categorized disease entities, many patients perceive the problem much differently (i.e., in terms of resources, money, social status, dependency, etc.). Thus, treating the pathophysiology of disease without attending to the evolutionary, cultural, and psychosocial contributors, might be treating *only* the symptoms of a much larger problem. Lieberman (2013) coined this term, dysevolution. For example, a common contemporary solution to malnutrition is providing vitamins, minerals, and essential prenatal supplements to those in need. It is a quick fix and momentarily effective, but not in any way sufficient because it does not address the ultimate cause of that malnutrition (lack of nutritious food) or create a possibility of prevention in the future. Similarly, in Ghana, medical solutions for problems such as chronic pain, that only take into account

the physical body, may be treating *an instance* of pain rather than *the psychosocial origins and stressors that continually activate* that pain.

## **CHAPTER 3: PROXIMATE MECHANISMS & PLACEBO STUDIES**

### **3.1 Placebo and Nocebo Terminology**

There are many erroneous assumptions about placebos: that they do nothing, or are the result of psychological gullibility, or that the effects are random or all in the patient's head. Some biomedical definitions of placebos replicate these partial truths. In randomized, controlled trials (RCTs) effective treatment is defined as any therapy (medicinal or behavioral) that shows more positive results than an identical-seeming placebo. The underlying assumption is that placebos are the control, the independent variable. Most clinical research and US Food and Drug Administration (FDA) approval rests on this presumption: if therapy  $x$  repeatedly shows a greater positive outcome than placebo  $x$ , it proves that therapy  $x$  is better than nothing—nothing being the placebo. However, we know this is fallacious because these same RCTs provide statistically significant evidence of positive placebo results. “On the one hand, we acknowledge the power and ubiquity of placebo responses by our requirement that all new drugs be tested in double-blind placebo-controlled situations; however, we then define those same responses as the ‘non-specific noise’<sup>302</sup> in the treatment to be subtracted out of the picture” (Harrington 1999:1-2).

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<sup>302</sup> “At this point, given the hurdles it has already passed through, drug developers already have confidence in the efficacy of the substance. This can be seen in drug developers’ use of the term “signal detection” to refer to the goal of the trial. Here the drug is already presumed to have specific efficacy—that is, a signal to transmit—and the problem is how to pick up the signal. From the perspective of drug developers, when trials fail, it is not necessarily that the drug does not work but that “noise” has crept into the process.” (Lakoff 2002:73-74).

Placebo and nocebo responses are labeled “non-specific” because the interactions between specific placeboogenic triggers and specific physiological responses for the wide variety of placebo components, body systems, and ailments are not clearly understood.

The existence of a ‘placebo effect’ is not dependent on whether a treatment is active or inert by biomedical standards; rather, it is present or absent to varying degrees in all therapeutic encounters. Placebo effects can enhance or aggravate biologically active treatments, just as they can ‘produce’ positive or negative (nocebo) ‘effects’ in treatments understood to be biologically inert (or those with mechanisms not understood within our current biomedical paradigm). (Thompson et al. 2009:117).

However, we do have good evidence of specific physiological effects of specific placebo interventions thanks to meticulous RCTs and drug trials. Though critical of the overly-mechanistic and under-theorized research in placebo studies and the lack of focus on social susceptibility adaptations, we cannot overstate the importance of neurobiology in legitimizing placebo studies. The field has not devoted as much time or funding to uncovering the specific placeboogenic elements in more complex therapeutic interventions; elements such as empathetic relationships and culturally constituted expectations and conditioning. That said, we would not be where we are today regarding respectability and scientific significance if the underlying neurobiological mechanisms of placebo responses had not been discovered.

Without understanding how and why placebo and nocebo responses evolved we may be accidentally stimulating or impeding endogenous healing mechanisms or, at worst, exacerbating, intensifying and even triggering prolonged suffering. This research seeks to both question and highlight the importance of the placebo concept. For example, if we view placebo and nocebo responses within an evolutionary perspective these “responses” become nothing more than evidence of our body’s susceptibility to psychosocial

manipulation patterned in culturally predictable ways. The placebo concept is only useful in determining whether the activation of neurobiological mechanisms was caused by specific medications and procedures (e.g., pharmacological agents and/or surgical techniques) or by nonspecific psychosocial factors (e.g., cultural expectations and/or social interactions). This manuscript seeks to study medical encounters theoretically (in Chapters 2-3) and contextually (in Chapters 4-6) from a socially-centered perspective to analyze why, how and which psychosocial factors influence physiological processes.

Placebo responses are some of the "most effective medication known to science, subjected to more clinical trials than any other medicament yet nearly always do[ing] better than anticipated. The range of susceptible conditions appears to be limitless" (Ernst and Resch 1995).<sup>303</sup> Though, officially, placebos are used in clinical research as the control arm of a trial to isolate and measure the proximate neurobiological mechanisms of a particular drug or therapy, unofficially, placebos are used "routinely"<sup>304</sup> across healthcare systems:

as a psychological instrument in the therapy of certain ailments arising out of mental illness, as a resource of the harassed doctor in dealing with the neurotic patient, to determine the true effect of drugs apart from suggestion in experimental work, as a device for eliminating bias not only on the part of the patient but also, when used as an unknown, of the observer, and, finally, as a tool of importance in the study of the mechanisms of drug action (Thompson et al. 2009:1).

This lack of standardization in theory, semantics or even practice creates unique, often paradoxical, challenges in placebo studies. For starters, the biomedical

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<sup>303</sup> This is actually O'Donnell M. Our Oath is hypocritical. *Monitor Weekly* 1995 March 1:44 quoted in Ernst and Resch 1995

<sup>304</sup> "Half of all American doctors responding to a nationwide survey say they regularly prescribe placebos to patients" (Harris 2008). The "active" ingredient in many alternative and indigenous healthcare practices is enhanced placebo effects (Kaptchuck 2002, 2011). Placebos have been a constant companion of medical practices throughout time and across cultures (Harrington 1997, 2008).



establishment and “drug companies continue to view placebo effects as impediments to proving efficacy and bringing new drugs to market” (Lakoff 2002:74). The purpose of clinical research is to avoid placebo responses rather than study them specifically and/or discover how to elicit them more robustly. This gap has led to misunderstandings and negative connotations of the phenomena, fostering problematic assumptions across medical systems. Putting the term placebo and alternative or ethnomedicine in the same sentence is often viewed as derogatory, dismissive and/or demeaning and these erroneous presumptions prevent practitioners from fully embracing the scientifically significant evidence for non-specific aspects of their practice. Because placebo research is difficult to access both in terms of availability and comprehensibility, it is often misconceived, misapplied and inaccurately touted by new age practitioners and writers so that their claims and arguments are largely dismissed (often rightly so) by those in the biomedical establishment. These limitations combined mean that “all of the stories of mind-body medicine have been fluid and elastic things, constantly on the move between one social context and another, and always available for appropriation and reappropriation by different social groups” (Harrington 2008:247).

### **3.2. Placebo History**

As evidence-based medicine increased with the practice of the scientific method, we began seeing many names for the phenomenon of an inert stimuli producing physiological change: autosuggestion (Coue 1922), placeboic remedy (Flint 1863), necessary deceptions (de Craen et al. 1999), healing imagination (Wood 1891), and the power of suggestion, positive thinking, relaxation, social ties, healing power of confession (Harrington 2008). “Medical practice in the seventeenth century continued to be characterized by beliefs in folk medicine...In this period, the status of the physician and of the quack was at its zenith” (Shapiro and Shapiro 1997:19; Garrison 1929). The variety of healing systems, techniques and products as well as the percentage of harm to

benefit reached a peak at the beginning of the 18<sup>th</sup> Century and we begin to see derision for baseless claims of healing and studies dedicated to weeding out those treatments that are efficacious versus those that are placebos. John Haygarth conducted one of the first comparisons between a widely accepted medical remedy and an identical dummy and discovered that there was no marked difference in patient results between the two “treatments” (Haygarth 1800; Booth 2005). His publicized results as well as many of his colleagues’ helped establish a foundation for allopathic medicine (which would become biomedicine) and proved “to a degree which has never been suspected, what powerful influence upon diseases is produced by mere imagination” (Wootton 2008). The foundations of the history of biomedicine are attempts to eradicate these “imagined” responses via science-based medicine where placebo responses became the enemy of good science and good medicine.

A consequence of biomedical hegemony has been the dismissal of what may be the most significant aspect of traditional medicine: the placebo effect, ‘one of the most powerful tools in any healer's armamentarium’ (Laderman and Roseman 1996:7). Rather than accepting the placebo as evidence of a therapeutic ‘general medical effect’ (Moerman 1983), a profound example of the ability of the body and mind to work together to achieve healing, the placebo is rendered “illegitimate” and is expelled from the controlled clinical trial. “Placebo effects,” writes Sullivan [ ] ‘are marginalized as unexplainable and therefore always somewhat unreal healing phenomena’ (1993:229; see also Hahn 1995:96). One of the main pieces of evidence for the efficacy of traditional medicine is therefore ruled inadmissible... But it is naive to assume, as Kleinman suggests, that biomedicine simply chooses ‘not to elaborate nonspecific therapeutic sources of efficacy that are associated with the rhetorical mobilization of the charismatic powers of the healer-patient relationship that persuade patients and families to believe in successful outcomes and thereby enact scenarios of efficacy’ (1995:33). The dismissal of the placebo is an intentional act and part of biomedicine's quest to identify those aspects of human experience over which it can claim authority and therefore assert control” (Waldram 2000:617).

The history of placebos is one of stages. In stage one placebos were phlogiston or oxygen previous to the 18<sup>th</sup> century—an undiscovered phenomena present in all healing but not recognized. In stage two placebos become a representation of quackery, deceit,

and the unfounded imaginations of tradition. The conscious awareness, limited acknowledgement, and testing of placebos becomes codified. Placebo responses are met with derision but placebos themselves become a research tool for uncovering the “real” effects of other medications and interventions. The placebogenic phenomena is useful only when it can be controlled and ignored as “noise” when it cannot be. Advances in research tools and methodologies over the past 60 years are bringing us into stage three: one where placebo responses are studied “in its own right (Harrington 1997). “Early clinical articles like Henry Beecher’s ‘The Powerful Placebo’ (1955) had made it clear that placebos cause objective (structurally and functionally measurable) changes in physiological functioning, some of which (as researchers at the time marveled) could even ‘exceed those attributable to potent pharmacological action” (Harrington 1997:2). Beecher paved the way for the legitimacy of placebo studies and neurobiological research has only magnified his claims. But many are still stuck in stage two. “The placebo effect has been a source of fascination, irritation, and confusion within biomedicine over the past 60 years” (Miller et. al. 2009). Only a small subset of researchers have placebo responses as the main object of their study and even then there has been disagreement about how and why placebos work.

The 50’s and 60’s were inundated with attempts to prove that certain patients were placebo responders but no consistent, reliable and repeatable characteristics across research designs developed and we still don’t have clear evidence to accurately predict which patients will be placebo responders. Research in the early 70’s focused on suggestion and the doctor-patient relationship, particularly the practitioner traits and

behaviors that influenced patient placebo responses. Also, debates about placebo responses being the result of classical conditioning and/or encultured expectations have been present for decades and both continue to be potent placebo activators. Many of these debates we are still having today. Our capacity to measure microscopic neurobiological processes increased in the late 70's and findings in other disciplines had huge impacts on placebo studies. The discovery of endogenous opioids, like endorphins (or endogenous morphine), that act as natural painkillers and influence immune and endocrine processes, captured and continues to capture the imagination of placebo researchers. It gave a measurable embodiment to placebo responses that wasn't there before and opened up the door to study placebo responses in and of themselves. Anthropologists showed up to the discussion around the 80's and "the anthropologists asserted that symbolic healing of other cultures is often quite effective, just as placebos are often effective, and that they are so because human beings structure and partly create their experiences of illness and recovery through shared symbols and metaphors (Moerman 1983; Hahn and Kleinman 1983). In short...placebos were symbols of healing, but symbols have real effects on human bodies" (Harrington 1997:7). Anthropologists brought new insights into placebo studies and proved "The meaning response" by showing how placebo responses are culturally and contextually relative. Medical anthropologists expanded the scope of placebo studies to include health care systems across cultures, but methodological and ethical problems arise when comparing different models or applying the efficacy measures of one to the outcomes of another (as discussed in previous sections).

These arguments made a dent in the field, but as we entered “the 1990’s, in short, with a range of diverse, disciplinary perspectives on the placebo effect that jostle for a hearing, and at the moment we know of no higher formula for either adjudicating between or synthesizing them” (Harrington 1997:7). The overrepresentation of medical and clinical researchers in placebo studies shifts the field into increased neurobiological and proximate mechanism specificity. On the one hand, this is a good thing. Science on the physiological mechanisms of placebo responses makes them difficult to ignore or dismiss. It validates neurobiological underpinnings of biocultural interactions in measurable ways, the likes of which we have never seen before. On the other hand, this isolating specificity neglects some of the most important and potent aspects of placebo response feedback systems, which are often explained away or disregarded as nuisance, noise, nonspecific, and irrelevant. The fact that psychological beliefs and culturally expectations can manifest somatically is not enough to explain why this happens and what specific stimuli produces what specific response—the physiological mechanisms behind placebo responses are as varied as the responses themselves. As we began this century, placebo researchers were embracing these questions and calling for interdisciplinary collaborations (Harrington 1997; Guess et al. 2002) and we are beginning to see studies traverse into new territory: comparative approaches (Kaptchuk 2011; Kirmayer 2011), comprehensive theory (Miller and Colloca 2010; Jones 2011; Ellingson et al., 2013), evolutionary explanations (Humphrey 2000, 2002, 2005; Miller et.al.2009; Fabrega 2011; Trimmer et al., 2012) and ethnographies of healing: (Fabrega

2011; Kirmayer 2011). I predict that the future of placebo studies continues to expand this scope.

If we can identify in more detail the major mechanisms involved in placebo responsiveness, we could also develop strategies aimed at minimizing placebo effects, thereby uncovering the real effect of a therapy. Likewise, nocebo effects can be a serious drawback, as negative reactions to drugs are sometimes due to psychological effects rather than to specific negative effects of the drug itself. Therefore, research aimed at investigating nocebo mechanisms would enable us to disentangle the negative effects of the drug from those of the psychological state of the patient. In addition, a better understanding of the neurobiology of the placebo and nocebo responses will form the basis for designing behavioral protocols that can be employed as supportive therapy together with standard pharmacological regimen, the aim being to maximize the therapeutic outcome for the patient's benefit. We believe that the future years will be characterized by a deeper understanding of both the placebo and nocebo phenomena, which in turn will give us profound insights into many aspects of human biology (Enck et al 2008).

### **3.4 Defining Placebogenic Perimeters**

One of those is the field of psychoneuroimmunology (PNI) studies how psychological processes interact with our nervous and immune systems (Keicolt-Glaser 1992, 1998, 2002a, 2002b, 2002c; Ader and Cohen 1993; Maier et al 1994; Ader et al 1995; Cohen 1996; Goodkin and Visser 2000; Koenig and Cohen 2002; Irwin and Vedhara 2005; Ader, Felten and Cohen 2006). While PNI, and its cousin that incorporates behavioral endocrinology psychoendoneuroimmunology (PENI) (Ray 2006), purports to deal mainly with the interactions between mental processes and health, contemporary PNI and PENI research attempts to uncover the proximate mechanisms behind behaviorally induced changes in body systems and body system motivations that induce behavioral changes. For example, "the brain is the body's first line of defense against illness, and the mind is the functioning of the brain. PENI incorporates ideas, belief systems, hopes, and desires as well as biochemistry, physiology, and anatomy. As we change our thoughts, we are changing our brain and thus our biology and our body. Belief systems set a baseline for the brain upon which other variables will act and have

their effects” (Ray 2006:35). A focus similar to what is outlined in *The Social Life of Placebos* specifically and in placebo studies generally. So the question remains what distinguishes the mind-body phenomenon being studied in PNI and PENI (and even something like neuroimmunomodulation) from that being studied in placebo research?

Another field that tries to explain and research the mechanisms and applications of mind-body interactions is psychoneurophysiology. This field is divided between those who see it as a research discipline, those who view it as a term that explains the psychoneurophysiological pathology of specific mind-body mechanisms, and those who use it as the theoretical basis for clinical psychoneurophysiological biofeedback therapies. Unsurprisingly, many of the ailments that show high psychoneurophysiological response rates are the same as those with high placebo response rates. For example, pain modulation (Fields and Price 1999; Shealy 2005), stress and depression (Shealy et al 1995), psoriasis (Polenghi et al 1989) irritable bowel syndrome (van der Veek 2009), asthenia or weakness (Gordeev et al 2003a), chronic fatigue and gulf war syndrome (Volovick et al 2006), and permanent autonomic disorders of psychogenic etiology (Gordeev et al 2003b). However, psychoneurophysiology has expanded to areas not fully broached in placebo studies like intergenerational trauma (Anderson 2015), altered states of consciousness (Simoes et al 1988; 2002), and virtual reality environments (Riva et al 1997)—the latter a fascinating concept in light of the evolution of health resource allocations based on perceived environments (Trimmer et al 2013). Another novel approach is the use of applied psychoneurophysiology by clinical psychologists in the

therapeutic practice of biofeedback (Swingle et al. 2004; Swingle 2008; Giedzinska-Simons 2014)

The clinical applied sciences of psychophysiology and psychoneurophysiology are, by every account, true mindbody medicine. The very essence of an individual's ability to attend to the overactivation of his or her peripheral nervous systems and regulate these systems in the direction of his or her intention is—in itself—an act of integration. Include neurofeedback into this model, while coaching the individual toward an enhanced awareness of conscious state (Siegal, 2010), and mind-body integration becomes a multidimensionally profound experience (Giedzinska-Simons 2014:115).

Again, the research findings here are not markedly different than those in placebo studies

and some researchers have argued the distinction by claiming that

psychoneurophysiology is merely the psychophysiological and neuromediating and modulating mechanisms of the placebo-nocebo phenomena (Teixeria et al 2010:119).

Again, we are left to conclude that both psychoeneurophysiology and placebo studies are discussing different aspects of the same phenomena.

So far we have been looking at ways that our psycho-social-cultural contexts influence body systems, pathophysiology of disease, and therapeutic practices but there are entire disciplines dedicated to studying psychological, social, and cultural stimuli as etiologies of illness. For example, psychogenic illness<sup>305</sup> refers to illnesses caused by mental states without an underlying physical cause. Culturogenic illness is when culturally constituted environments, expectations, and behaviors cause, exacerbate, and/or prevent treatment of an illness. These include culturally specific illnesses not

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<sup>305</sup> “A charitable interpretation of “psychogenic” would include causal effects of the range of psychological and associated physiological influences discussed throughout this article, but the term is all too often used reductively and pejoratively to imply fictive influences (“merely” induced by psychological and personality influences) in contrast to “real” somatic ones (i.e., changes registered in and measured in terms of the chemistry and physiology of the body) (Kirmayer, 1988)” (Kirmayer 2011:120).



found outside of culturally specific contexts like culture-bound syndromes, folk illnesses and behavioral epidemics. Mass psychogenic illness (MPI) or sociogenic illness is when psychosocial factors cause disease, i.e., “ the rapid spread of illness signs and symptoms affecting members of a cohesive group, originating from a nervous system disturbance involving excitation, loss or alteration of function, whereby physical complaints that are exhibited unconsciously have no corresponding organic aetiology” (Bartholomew and Wessely 2009). What is unclear is how all of these phenomena are any different than placebo responses? They are negative health outcomes attributable only to psychosocial factors, which is the very definition of a placebo response.

The opposite of these psycho-, social-, and culture-genic illnesses is socioculturally constituted defense mechanisms (Spiro 1987) or healing systems. Considered “inert” and without any active biochemical intervention, actions on social relationships and meaning systems can influence and regulate physiological processes in culturally specific ways. There have been two main approaches to this field of study: psychosomatic medicine and symbolic healing. Psychosomatic medicine comes out of interdisciplinary collaborations in biomedical research (and a precursor to the contemporary field of behavioral medicine) and is concerned with understanding how psychological, social and behavioral factors influence physiological states. In contrast, anthropologists have been the primary researchers in the field of symbolic healing (Hahn and Kleinman 1983; Dow 1986; Moerman 1979, 2000, 2002; Waldram 1990; Hahn 1995; Lee, Kirmayer and Groleau 2010)—“that is, healing that does not rely on any physical or pharmacological treatments for its efficacy, but rather on language, ritual and the manipulation of powerful cultural

symbols” (Helman 2007:274). On the surface these definitions do not appear significantly different. Both are interested in the interactions between psychosocial factors and physiological processes. However, in practice their units of analysis and methodologies are quite different. The anthropology of symbolic healing has only minimally discussed the neurobiology or pathophysiology of how symbolic information “gets under the skin” (Goodman 2006, 2009) via psychosomatic medicine, biofeedback, placebo or nocebo responses, host-pathogen interactions, and the neurobiology of Altered States of Consciousness (Moerman et al. 1979; Hahn and Kleinman 1983; Csordas 1983; Dow 1986; Kleinman 1988; Moerman 2002; Winkleman 2004). Instead, the focus has largely been on the ways that ritual and meaning alter perceived psychological, environmental, and social conditions. Which in turn influence body systems and the course and outcome of sickness and healing (though the exact mechanisms of the physiological affect of symbolic meaning are not understood). Anthropologists have uncovered patterns generally present in all forms of symbolic healing, providing a useful template for *what* aspects of medical encounters are symbolically “effective.” “These responses are not ‘nonspecific’ but involve specific mechanisms that may be evoked by particular cues. Placebo responding stands at the heart of the symbolic efficacy of all forms of medicine (Brody, 2010)” (Kirmayer 2011:211). The anthropologists job is to figure out the meaning behind those culturally particular cues in order to ascertain what mechanisms they might evoke or rather how different meanings would influence the body in different ways.

Psychosomatic medicine focuses on complex case studies in medicine involving psychiatric disorders that don't fit neatly into the biomedical model of clear diagnosis and treatment and that are greatly affected by mental processes. In psychosomatic medicine, practitioners attempt to provide more holistic approaches to treating the symptoms and causes of psychiatric disorders (i.e., depression, anxiety, stress-based illnesses, etc.). At the same time that psychosomatic medicine diverge positively from the traditional biomedical model primarily concerned mainly with objective biological standards and deviations, they are still only considered to have relevance in those medical encounters where mental states directly influence medical outcomes (Levenson 2006). This statement assumes that psychology are not a regularly influencing feature of all medical outcomes.

Furthermore, psychosomatic disorders are an anomalous category within biomedicine. Unlike many 'real' diseases in the medical textbooks, they often include conditions that are difficult to diagnose, explain, predict, treat or prevent, and there is often no definite physical abnormality to be found. In some cases, therefore, this may lead to 'victim-blaming' (putting the responsibility for therapeutic failure on patients and supposed defects in their psyche) (Helman 2007:264).

A more accurate, inclusive, and integrated model was proposed in 1977 by George Engel called the biopsychosocial (BPS) model. BPS is the basis of behavioral medicine which focuses on those illnesses significantly altered by behavioral adjustments like lifestyle changes (i.e., obesity, addiction, insomnia, etc.) than through pharmacological interventions alone.

The biopsychosocial model refers to the idea that biological, psychological, and social processes are integrally and interactively involved in physical illness and health, medical diagnosis, medical treatment, and recovery....It means that single-factor, or even single-domain explanations are likely to be inadequate. Second, it argues that a change in one domain (e.g., the biological) necessarily results in changes in other domains (e.g., psychological), and social factors should lead to improved diagnosis. Furthermore, interventions involving all these elements should fare better than treatments grounded on any single class of variables....In sort, the biomedical model directs the researcher and practitioner to look for a biological/physiological cause and curing agent, while

the biopsychosocial model alerts the researcher, practitioner or policymaker to the need for multiple levels of analysis and appreciation of all potential domains that contribute to the problem and its 'solution' (Sul et al 2011:18; Schwartz 1982; Sus and Rothman 2004).

While this model is a huge improvement on biocentric progenitors, it has not caught on as a widely accepted umbrella for all of these previously mentioned mind-body phenomena.

This failure is mostly due to BPS lacking clear empirical explanations, methods, and applications.

Since the collapse of the 19<sup>th</sup> century models (psychoanalysis, biologism and behaviourism), psychiatrists have been in search of a model that integrates the psyche and the soma. So keen has been their search that they embraced the so-called 'biopsychosocial model' without ever bothering to check its details. If, at any time over the last three decades, they had done so, they would have found it had none. This would have forced them into the embarrassing position of having to acknowledge that modern psychiatry is operating in a theoretical vacuum (McLaren 2006).

What McLaren's statement highlights is that most disciplines have been struggling for the last six decades to come up with a comprehensive definition, scope, methodology, and explanatory theory of mind-body medicine. The main advantage of placebo studies over PNI, PENI, psychoneurophysiology, BPS and symbolic healing is that it has more robust controlled neurobiological data than all of the other fields combined.

Most of the hyphenated explanatory models ignore social and cultural components in theory and praxis. For example, one author attempts to unpack these fields by explaining that psychoneurophysiology is about mind-body connection, psychoneuroimmunology refers to mind talk and immune function, somatoneurophysiology is the body-mind connection, proprioception focuses on the effect of positive body thoughts, nociception highlights the effect of negative body thoughts, and interoception elucidates visceroneurophysiology or the effect of perceiving internal bodily states (Chestnut 2005). After reading Chestnut's meandering description, it is no wonder that insiders and outsiders alike are all confused about the perimeters of mind-body research.

Despite this disciplinary entanglement, a few fields have risen above the rest in their ability to explain macro- and micro-scale mind-body interactions. This analysis illustrates that these fields are so similar and the cross-over so regular I wonder sometimes if we aren't all blind scientists describing different parts of the elephant. Thus, a more integrated interdisciplinary model that pulls from the assets of each of these disciplines is needed. The biocultural evolutionary explanation of social susceptibility and biocultural interactions in Asante medical encounters in *The Social Life of Placebos* attempts to do this. Though imperfect, I think it helps us in moving away from the fractured world of researching "phlogiston" toward a more comprehensive understanding of "oxygen" and its effect on many aspects of our lives. As such, placebo studies is probably the most useful, but not sufficient, route toward understanding the mind-body phenomena.

Often we are left with inadequate definitions and truncated breadth. "Mind-body interactions" are a part of every aspect of human social life across cultures and throughout time and yet the examination and measurement of mind-body interactions is often isolated to narrow, randomized controlled trials, and clinical research. But meaning has psychological and physiological effects in many other settings. Are those meaning responses? Learned expectancies and conditioned associations can help on exam and athletic performance. Psychotherapy can increase relaxation and create attentional and attributional focusing. Religion can modify patient perceptions about internal and external conditions. Are these placebo responses? At the present, there is an arbitrary boundary that designates physiological responses elicited by psychosocial stimuli within medical contexts as placebo responses, and ignores most everything that falls outside this

boundary. However, this singular focus on health contexts has been one of the biggest hurdles in establishing a more comprehensive theoretical foundation (See the Theory Deficient section 3.6.3 below for more).

### **3.5 Isolating and Measuring Placebo Responses**

Even in the most scientifically controlled experiments, like double-blind RCTs, it is impossible to eliminate all of the potential stimuli that could trigger physiological reactions. Anything you can perceive, predict, anticipate, expect, imagine, and empathize with, etc., and all the myriad ways you can interpret those thoughts, can have an effect on the healing process and body systems.

As one pharmaceutical biostatistician in charge of clinical trials lamented, “‘On the one hand...you want to standardize raters’ behavior as much as possible in order to glean consistent data—but then you might ‘dampen the signal’ by failing to note clinical signs not measured by the rating scales.’ Yet if too much focus is placed on close clinical observation, rates of placebo response might increase because of the attachment that could then form between the rater and the subject. ‘There are so many different problems in this area...‘it’s like taking a balloon and trying to squeeze it in a certain place—the air just gets pushed elsewhere’” (Lakoff 2002:74).

Due to the pharmaceutical industrial complex most of the money and research with placebos is attempting to dampen or minimize them. Successful drug trials require statistically significant positive treatment results. Drug developers want to measure only the “signal” of the drug in order to prove its efficacy and eliminate all of the entangled “noise” of a contextualized medical encounter and a complicated person. In this manner, “the patients’ role is to transmit [the drug’s signal]—they are the drug’s medium” (Lakoff 2002:74). The ideal patient for drug developers is one who is imperceptible or physically unresponsive to environmental and social cues so that the only response measured in the trial is the isolated “signal” of the drug and not any of that other noisy messy stuff like: trial site, patient attributes, investigator behavior, etc. “The fact that even dummy

capsules can kick-start the body's recovery engine became a problem for drug developers to overcome, rather than a phenomenon that could guide doctors toward a better understanding of the healing process and how to drive it more effectively" (Silberman 2009).

On the one hand, clinicians see the value of maximizing placebo responses to enhance active treatments for disease. On the other hand, researchers aim to control for placebo effects in clinical trials. A second paradox consists in the need in the clinic to individualize treatments to maximize placebo effects in a particular patient. In contrast, subjects in a clinical trial are generally treated according to a standardized protocol to ensure that all patients are treated alike (Guess et al. 2002: 7).

Reducing placebo triggers is so critical in drug trials that research designs are being constructed in order to eliminate human interaction altogether as in the case of hidden injections where the patient is given either active or inert medication via an intravenous apparatus controlled via computer. "Importantly, one research programme—the 'hidden drug versus open drug paradigm' as developed by Benedetti and colleagues—demonstrates that even when active medications are used, the ritual of treatment can be a significant component of biomedical treatment outcome... Such experiments suggest that ritual is an active component of biomedical treatment, especially when patient-centred subjective symptoms are the measured outcome" (Kaptchuk 2011:1855; Amanzio et al 2001; Colloca et al 2004; Miller, Colloca and Kaptchuk 2009). Another attempt to get rid of the pesky susceptible human aspect of drug trials is placebo lead-ins where all participants are put on placebos in the first stage of the trial and the "placebo responders" are eliminated before the actual trial begins.

Here, experimenters in effect stage the trial before it actually begins, giving all patients placebo for a week, and then eliminating those who respond from the trial. This staged trial is called a 'single-blind placebo run-in period,' inasmuch as the doctors know that all of the patients are receiving a placebo, while patients remain ignorant that the real trial has yet to begin [Quitkin et al. 1998]. With this approach, it does not matter why patients

respond to placebo, nor does the knowledge or technique of the investigator matter. One simply needs to know which patients have responded in order to eliminate them. However, these efforts have also proven disappointing—placebo response rates during these run-in periods tend to be low, and so it has not been possible to eliminate most of the potential placebo responders. In the actual trial that follows the run-in period, other subjects continue to respond to the placebo, drowning out the signal of drug efficacy and undermining the trial (Lakoff 2002:75).

Diseases that are highly susceptible to environmental and psychosocial cues like depression or anxiety, have higher placebo response rates than diseases securely encased within the (seemingly) impermeable body such as worms or infectious diseases (though those too are affected by stress and perceived environmental conditions).<sup>306</sup> The former diseases also often show more heterogeneity in symptoms, course, and placebo response rates. As such, it is very difficult to prove the efficacy of psychotropic drugs and developers have changed their research design accordingly. Instead of regular trials where the efficacy of the drug is the uncertain element and the disease and patient response was fairly predictable, psychotropics assume that the drug is efficacious but the patients are unpredictable. “Instead of seeking to test the drug on an established category of patients, they seek to find the right patients for the drug” (Lakoff 2002:74). Hidden injections, research re-designs, and placebo lead-ins are becoming more and more necessary because the placebo response rate is steadily increasing.

The difficulty of demonstrating efficacy in large-scale, randomized clinical trials has been a major obstacle in the development of novel anti-depressants, [for example,] raising costs and delaying regulatory approval. Indeed, although the results of failed industry trials are not published, it is well known among developers that the majority of industry-sponsored antidepressant trials fail, and that some companies have had to run as many as ten trials before establishing the efficacy of a given drug....The high placebo response rate in depression trials poses an especially vexing problem. The placebo effect is unpredictable and seemingly unmanageable, and costs drug companies hundreds of millions of dollars in failed trials and delayed or shelved compounds. Because the response rate in to placebo in depression ranges from twelve to fifty percent—not greatly different from response rates to antidepressants themselves (thirty to seventy percent)—it can even seem to impugn the efficacy of established and marketed drugs, used as active

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<sup>306</sup> “Placebo effects are strongest for disorders that are predominantly mental and subjective” (Raz 2011).



comparators in trials of novel compounds [Walsh et al. 2002]. Moreover, it seems that the placebo response rate has actually been increasing in recent years, for unknown reasons (Lakoff 2002:72).

It is important to have clear standards of efficacy and “besides the profound implications of placebo research for a better understanding of human biology, some practical aspects should not be forgotten. For example, placebo and nocebo phenomena are a major hurdle in the development and validation of new treatments, as high placebo responses sometimes distort the effects of a therapy” (Enck et al 2008). At the same time limiting placebo studies to the discarded pieces that remain on the cutting room floor of clinical trials is a tragedy. This phenomenon existed long before pharmaceutical interventions and extends beyond biomedical contexts. “While the bench scientist can with relative impunity single out and isolate for sequential study components of an organized whole, the physician does so at the risk of neglect of, if not injury to, the object of study” (Engel 1980: 536). It is the patient who gets substandard treatment in this model because if we are not using all interventions known to produce positive health outcomes at our disposal, aren’t we providing less than ideal care?

The problem is that psychological, social, and cultural elements are difficult to isolate and measure. “We fail to notice that these factors are not inherently nonspecific but are only so because insufficient energy and attention has been spent on specifying them” (Harrington 1997: 2). There is very little financial incentive to design research that specifically measures the placebo response rates of dosed verbal suggestion, for example, yet that is exactly what modern placebo researchers are beginning to uncover (Vern et al. 2003; Vase et al. 2003; Price 2008). “Investigating the size and mechanisms of the placebo response in clinical trials have relied on experimental procedures that simulate

the double-blind randomized placebo-controlled design. However, as the conventional design is thought to elucidate drug rather than placebo actions, different methodological procedures are needed for the placebo response.” (Enck et al. 2011).

It is in placebo studies where we are seeing the most innovative methodological procedures and attempts to re-imagine how we conceptualize and measure placebo responses. Yet, as an anthropologist of indigenous medicine the tools are not yet applicable to many outside of biomedical contexts. I cannot ethically, practically, or diplomatically run a sham Asante ritual healing ceremony and ask one healer to “pretend” to be spiritually possessed and another to be “really” spiritually possessed and then measure the treatment results. There are still significant limitations in the expansion of placebo methodology and the best I can do at this point in time is to judiciously but speculatively apply the results of clinical trials to findings in the field and run natural experiments when possible. Hopefully the next decade of placebo studies will get us out of the laboratory and into the field to figure out new ways to isolate and measure mind-body interactions.

### **3.6 Placebo Problems**

#### **3.6.1 Cross-culturally Limited**

Complementary and alternative medicine has become the subject of analysis in recent years,<sup>307</sup> though even these, arguably, remain centered in largely American alternative medical settings and biomedical efficacy methodologies. Regardless, this transition toward placebo research outside of clinical and laboratory biomedical settings marks an

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<sup>307</sup> Zollman and Vickers 1999; Peters 2001; Kaptchuk and Eisenberg 2001; Kaptchuk 2002, 2011; Ritenbaugh et al.. 2003; Birch 2006; Kaptchuk et al.. 2006; Bausell 2007

important step in the development of a more comprehensive theoretical framework for the scope and perimeters of placebo phenomena, as upwards of 80% of the world's populations still rely on health-care practices not researched in placebo studies (Mukherjee 2002; Bodecker et al. 2005; Bandaranayake 2006; Ekor 2013). "If we are trying to get as comprehensive a handle as possible on the phenomenology of this beast, we would not want to limit our investigation to what is documented inside the literature of clinical trials. We would like to know something too about placebo effects that occur in various uncontrolled clinical settings, where patients are suffering and the stakes are high" (Harrington 2002:46). Though it is impossible to control for or isolate all the varied psycho-socio-cultural interactions in indigenous medical settings, often (especially among the Asante) healing rituals take place without any active pharmacological interventions. This absence of "active" treatment makes them a perfect place to explore a broader perspective on placebogenic phenomena and its implications for mind-body medicine.

It is paramount that placebos be understood "as embodied processes that are socially situated and culturally mediated" (Kirmayer 2011:212). As we have seen, social adaptations have made humans especially adept at learning. Large brains, infant dependency, and prolonged development allow for greater plasticity<sup>308</sup> and adaptability<sup>309</sup> to one's environment, creating the conditions through which socioculturally-specific

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<sup>308</sup> Genotypic, phenotypic, neurological, physiological, developmental, and behavioral capacity to change in response to environmental conditions via short term, long term, genetic, and cultural adaptations.

<sup>309</sup> The capacity to detect, assess, and (genotypically, phenotypically, neurologically, physiologically, developmentally, and behaviorally) adapt to environmental conditions.

expectations and behaviors imprint on the brain and body. These capacities of adaptability, plasticity, and learning are ultimate mechanisms of placebo responses. They are also the reason why culturally-contextualized research is essential for understanding *what* specific rituals, interactions, and beliefs trigger *which* specific psychological and neurobiological placebo response mechanisms and *why*.

At the same time, these elongated periods of dependency and brain development also produce high degrees of attachment, interpersonal dependence, and vulnerability to social signals of inclusion or exclusion. Therefore, on the one hand, our evolutionary history provides us with some general processes and mechanisms through which placebo responses evolved, developed, and operate. On the other hand, this same phylogenetic history makes human brains and bodies highly responsive to the conditions of specific sociocultural environments and, thus, necessitates an ethnographically-grounded approach to placebogenic phenomena. “Cross-cultural studies of healing ... identify parallels with the process of responding to placebos in biomedical contexts...[and] research on the social-contextual basis of placebo responding can contribute to an integrative theory of healing” (Kirmayer 2011: 112)

Furthermore, it has been argued that alternative medicine and ritual healing not only incorporate many placebo responses, but because of their unique settings, treatment practices, meaning systems, and therapeutic relationships, they actually increase these effects (Kaptchuk 2011). Individually, placebo responses are powerful, but working simultaneously they produce enhanced results (Kaptchuk 2002). Since these rituals are especially successful at targeting and activating placebo responses, we must ask the

question: what can we learn from them to increase placebo responses in various healing encounters?

One of the express purposes of this manuscript is to provide a general ethnographic account of the broad interactions of placebo responses in indigenous medicine and a specific claim that placebo responses are a large part of Asante indigenous medicine by explaining how they are activated via social rituals and culturally specific meaning systems. Studies like this have been done in recent years in placebo studies by only a handful researchers.<sup>310</sup> Some anthropologists might take issue with my privileging biomedicine by explaining Asante practices in terms of psychological and neurobiological placebo components. This is a valid critique. At the same time, it provides a measure of commensurability that so many studies on indigenous medicine lack. Attention to the culturally specific *super-natural* elements of Asante witchcraft, spirit possession, curses, and animal sacrifice (without ontogenetic or phylogenetic analysis) have made Asante rituals seem *unnatural*, exotic, and “other.” It is by showing their *very-natural* underlying physiological, social, and cultural elements that these processes become comprehensible and even applicable to cross-cultural comparison (Konadu 2008).

### **3.6.2 Evolutionarily Deprived**

By expanding our vision ... we may find ourselves inspired to ask questions about that larger territory that otherwise might not have occurred to us. A historical perspective, again, can help us to understand why it is so important to make this intellectual move. It is an historical act that our ways of ‘seeing’ the placebo effect have been conditioned by changing agendas within clinical medicine over time. These agendas need to be made a visible part of our

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<sup>310</sup> Cerhoef et al. 2005; Kaptchuck 2002, 2011; Kerr et al. 2011; Pollo et al. 2011; Fabrega 2011; Foddy 2011; Harris and de Jong 2011; Kirmayer 2011; Kirsch 2011; Moerman 2011; Raz 2011

consciousness in part so that we are not inappropriately hijacked by them. If clinical medicine has taught us to think of the placebo effect as a response to a sugar pill, **our strategy must be to ask what larger human capacity is revealed through this historically specific ritual of ours** that classically involves doctors, white coats and pills (Harrington 2002 46).

Harrington calls for a historical perspective, much like ethnographic thick description, which outlines the encultured learning, industry agendas, and taken-for-granted assumptions of medical precedent. In breaking apart these cultural constructions, i.e., placebo=sugar pill, we peel back a layer of the mind-body onion to reveal panhuman hardwired social susceptibility capacities that extend well beyond the culturally relative confines of a century of biomedical predefinition. Placebos are not just sugar pills. Placebogenic settings are not limited to hospitals, clinics, or laboratories. Placebo responses do not fall neatly into the boundaries set by clinical researchers. Therefore, it is essential to peel back the cultural “softwiring” layers of how placebogenic phenomena has been encapsulated and measured in a biomedical context, to get a clearer picture of a) how they operate outside of that context and b) “what larger human capacity is revealed through this historically specific ritual of ours” (Guess et al. 2002). It is exactly this question that makes up the foundation of this manuscript’s biocultural evolutionary explanatory framework.

Evolutionary explanations of placebo responses have likewise been largely neglected in placebo studies until recently<sup>311</sup> and even then we are just beginning to unravel why our bodies are susceptible to placebo responses. Another important objective of *The Social Life of Placebos* is to raise questions and make interdisciplinary connections in

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<sup>311</sup> Some good examples of evolutionary theory and placebo studies are: Humphrey 2002, 2005; Stein 2006; Miller et al. 2009; Fabrega 2011; Trimmer et al. 2013

order to better understand our evolved ability to physiologically respond to perceived social and environmental conditions. However you want to define them, mind-body feedback mechanisms evolved in dynamic psychological, social, and cultural environments. Instead of just studying the impact of psychosocial stimuli on placebo responses in clinical settings, we need to research the placebogenic effect of ethnomedical interactions in psychosocial environments. None of our mind-body interactions developed in or adapted to the fitness consequences or pressures of clinical trials. Yet, this is the setting in which almost all of placebo research takes place. *The Social Life of Placebos* argues that most of the remaining theoretical problems—outlining the boundaries and scope of placebo responses, explaining the evolutionary trajectory of why and how these endogenous responses evolved and what impact this has on psychosocial-physiological feedback processes, and understanding the cross-cultural frequency and variation in placebogenic triggers and responses—can be addressed by situating placebo phenomena in an evolutionary framework and analyzing placebogenic phenomena within their psychosociocultural contexts.

An evolutionary perspective also contributes to unraveling the mystery of the nocebo response. Very little research has been conducted on the evolution of the nocebo effect. The most persistent argument out there is from Dr. Nicholas Humphrey of Cambridge, U.K. (2002) who has done the most work on the evolution of placebo and nocebo responses to date. He argues that the nocebo could be fitness enhancing if, for example, everyone around you is getting sick and you are able to induce vomiting (via your negative expectations), you might survive at a higher rate than people who don't

experience this “nocebo response.” Nocebos can also be warnings that signal fitness enhancing behaviors—negative sensations like pain, stress, emotion, vomiting, fainting, anxiety, etc. might warn us of impending danger, compel us to get medical attention, and/or avoid threatening people, places or actions in the future. Scholars are just beginning to parse out the positive, neutral, and negative outcomes of placebo and nocebo effects from an evolutionary perspective (Trimmer and Houston 2016) and the ancient broad spectrum cognitive processes underlying expectations in placebo and nocebo responses (Schwarz and Pfister 2016), but more research is needed along these lines.

What is missing is a theory that combines both the evolutionary underpinnings of placebo and nocebo responses with the importance of and adaptations associated with increased sociality and physical adaptability to circumstances. Where the placebo response is activated by therapeutic relationships and meaningful actions, the nocebo response is triggered by social rejection and anxiety producing beliefs. It is clear that placebo and nocebo responses are both part of a much larger mind-body phenomenon, but there is less research on the physiological mechanisms of nocebo responses and the interaction between nocebo and placebo responses. Do they share the same neural pathways? Can they be activated at the same time? Are they dialectical partners meant to ensure homeostasis (much like the sympathetic-stress and parasympathetic-relaxation systems)? Or are nocebos maladaptive spandrels, evolutionary trade-offs, or genetic hitchhikers of powerful placebo responses? Discovering some of the complex physiological processes and evolutionary trajectories that make up human endogenous



mechanisms will go a long way to understanding how placebos and nocebos are able to elicit or inhibit them. Research is just barely beginning on these subjects (Colloca and Benedetti 2016), but fortunately the field of placebo studies is moving in that direction.

### **3.6.3 Theory Deficient**

Another problem in placebo studies is creating a definition and theoretical framework for the scope and perimeters of the placebo phenomena. This is very important because current definitions can be contradictory and misleading (Miller et al. 2009), and theory is often neglected. “Using the language of Kuhn (1970), scientific research on the placebo effect has taken the shape of ‘normal science’ without guidance by any systematic theoretical paradigm” (Miller, Colloca and Kaptchuk 2009: 15). “The concept of theory has been applied narrowly within the literature on the placebo effect to refer to various mechanistic theories of how the placebo effect works: e.g., expectation and conditioning” (Ibid:1).<sup>312</sup>

This idea is best illustrated by Lydia Temoshok’s (1986) description of the scientific discovery of phlogiston where researchers are contributing large amounts of descriptive information about placebo responses without any unifying or coherent framework. “The placebo concept hides our ignorance and perpetuates partial truths about clinical work and outcomes while at the same time obscuring a better understanding” (Peters 2001: xiii) of the therapeutic relationship and mind-body interactions. Though less common

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<sup>312</sup> “Writing over a decade ago, Ader (1997, p.138) noted that ‘[t]here has been relatively little systematic exploration of the scope of placebo phenomena, a fact that may reflect the lack of any theoretical position(s) within which to organize existing data and upon which to base the design of new research’...the poverty of theory has continued to characterize placebo research. We suggest that lack of adequate attention to theory has hindered scientific investigation of the placebo effect and translation of scientific research into improved clinical practice” (Miller et al.. 2009:1).

than traditional placebo research, some researchers have attempted to construct a broader theory of placebo responses. Please see *Appendix: Chapter 3: Theory Deficient* for the full list and description of each of the following theories: The response to the healing situation, symbolic healing and/or ritual of medicine, the therapeutic relationship, the interactive multi-dimensional model, the learning model, pleasure desire/pain avoidance, mind-body regulation (MRB), the meaning response, interpersonal healing, health resource allocations, and the optimal healing environment.

All of these perspectives are necessary but not sufficient to independently explain the large (and diverse) phenomenon of psychosocial-physiological feedback loops. What is needed are more interdisciplinary explanatory models that incorporate the evolutionary, neurobiological, and sociocultural aspects of *why* placebo responses evolved, *how* they operate and *what* they look like in culturally contextualized settings.

Despite the recent explosion of neurobiological placebo research using sophisticated tools, such as neuroimaging, in vivo receptor binding, and single-neuron recording in awake subjects, our knowledge of the mechanisms underlying the placebo effect is still in its infancy, and several issues need to be addressed in future research. The major questions to be answered are where, when, how, and why placebo effects occur. In fact, we need to know where they work exactly, that is, in which medical conditions. For example, are all diseases and symptoms subject to placebo effects? We also need to know when they work, that is, whether there are special circumstances that are particularly amenable to placebo effects. How they work is also a major question, as we need to understand the brain mechanisms at both the macroscopic (brain regions and their interactions with body functions) and microscopic (cellular and molecular) level. Finally, determining why placebo effects exist at all represents a major scientific challenge, and **meeting that challenge will give us insights into the possible evolution of endogenous healthcare systems** (Enck et al. 2008; emphasis added).

Here are some of the attempts to construct a broader theory for the study of placebo responses:

- **The response to the healing situation:** “Any effect attributable to the symbolic importance of a treatment, treatment, setting, or treatment process (Papakostas and Daras 2001:1619),
- **Symbolic healing and/or ritual of medicine:** “It has become clear that the performance of healing, without any biomedically defined active ingredients, unleashes endogenous chemicals with salubrious effects” (Kaptchuk 2011:1855).
- **The therapeutic relationship:** The effect of a physician’s empathetic understanding, trust, and suggestion on patient healing (Kleinman 1988), or interplay of provider, patient, and treatment process (Bootzin 2002),
- **The interactive multi-dimensional model:** The direct, indirect, and interactive synergistic interplay between the placebo effect and other psychological and physiological variables in the therapeutic process (Bootzin 2002),
- **The learning model:** The reframing of the placebo response as an information processing and learning phenomenon whereby what people learn guides the expectancy and behavioral changes that activate placebo responses (Colloca and Miller 2011),
- **Pleasure desire/pain avoidance:** Expectation regulates placebo responses “depending on whether the expectation is reduced pain or increased pleasure” (Ellingson et al 2013; Takakura et al 2013),
- **Mind-body regulation (MRB):** “MBR enables and shapes (and in this sense constitutes) a robust adaptive response pattern or program which is also plastic” (Bateson and Gluckman 2011; Fabrega 2011; Kirmayer 2011),
- **The meaning response:** “The psychological and physiological effects of meaning in the treatment of illness” (Moerman 2002: 14)
- **Interpersonal healing:** The palliative effect that the clinical encounter independently has on the alleviation of illness or symptoms of the disease (Miller et.al. 2009),
- **Health resource allocation:** Endogenous resource allocations that are determined by the perceived internal and external conditions of ones environment and ones access to quality and quantity resources and relationships (Trimmer et al 2013), and
- **Optimal healing environment:** “A framework for disentangling what is useful from placebo research for adopting into clinical practice in a manner that is ethical and evidence-based” (Jonas 2011: 1896) by maximizing healing using evidence-based techniques proven to increase placebo responses through action on a) the inner environment, b) the interpersonal environment, and c) the external and behavioral environment.

### 3.7 Solutions

This manuscript uses multiple approaches to answer these questions. It does so purposefully to illustrate the many different perspectives, contexts, assumptions, and

biases that unidisciplinary accounts (be they in anthropology, medicine, or evolutionary psychology) neglect. As such, there is legitimate criticism for not going deep enough in any one particular inquiry and I am certain that this would be an equally valuable endeavor. This research, however, is dedicated to the non-specific entangled “noise” of continuous psychological, social, cultural and physiological interactions that make up the lived experience of being human. What I am attempting—parsing out the connections, interactions, and relationships between psycho-social-cultural context and physiological processes—is messy and complicated. Mostly due to the fact that humans are not controllable, in the strictest statistical sense of the word; in even the most tightly regimented experiments with humans subject there are extraneous variables (enculturation, power dynamics, memory, expectation, emotion, etc.) mediating the effect of independent and dependent variables.

In anthropology, this is where we begin our inquiry. We do not presume that it is possible to isolate human experience or behavior from historical or situational influence. From our first memory, to how we learned to walk and talk, our bodies carry within them the phylogenetic history of millions of years of social, physical, and cultural evolution and the ontogenetic development of millions of environmental variables and interactions.<sup>313</sup> At any given moment these histories collide with specific contextual

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<sup>313</sup> Not even to mention the trillions of host-pathogen interactions happening inside of our bodies in any given moment, each with their own agenda. These numbers are multiplied exponentially if you live near equatorial climates or in the developing world, whose populations have a parasitic load or parasite stress nearly twice greater at any given time than those in industrialized nations. On top of this, researchers have argued that our parasitic interactions significantly influence human psychology and behavior in everything from openness to experience, religious diversity, sexuality, in-group/out-group mentality, and gender equality (Fincher and Thornhill 2008; Thornhill et.al. 2010). It is impossible, to “control for” or “isolate” a human response; estimations, probabilities, averages, yes, that is how pharmacology works. But, do not

elements—procedural, social, psychological, emotional, cultural, religious, economic, political, ethnic, and status interactions (each with their own elaborate histories and expectations)—during a particular encounter. All of which are largely unimportant and, mostly, unconscious, to the felt experience of the human subject. To whom the proximate mechanisms of any interaction (how all of these variables are cognitively assessed, stored and then physiologically enacted) are largely imperceptible in the gestalt.

At its most basic level, research on health and healing has a problem. We can use the scientific method to empirically test “isolated” ailments and “control for” extraneous variables (the approach of medical and pharmacological research) which gives us measurable results, objective categories, and a basis with which to build new technology, research, development. This approach’s success cannot be overemphasized and the benefits are huge, but materialist perspectives are radically simplistic, have side effects,<sup>314</sup> and are increasingly<sup>315</sup> unable to provide long term solutions for cases which don’t fit exactly within its narrow perimeters. Or, we can focus on the complexity (the approach of medical, psychological, and neuroanthropology)—the interaction between physical and environmental variables, the impact of social relationships and cultural meaning on the body, and the role that religion, politics, economics, ethnicity, and gender have in mediating and mitigating sickness and health-- which is far more accurate to

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forget that despite of all of that context affects the potency of a drug, its metabolism, expectations of pathology and efficacy, and presence and intensity of side effects. Again, context trumps controlled environments.

<sup>314</sup> Millions of patients suffer from the bacteria-antibiotic arms race located in hospitals, human error, risk of infection, and the common practice of prescribing pills over lifestyle changes, etc.

<sup>315</sup> Rates of alternative healthcare usage in the USA increase every year.

actual experience, but its claims are non-specific, they cannot be experimentally evaluated, each elements' influence cannot be isolated, and, ultimately, its findings cannot be measured, standardized, or systematically applied. What we are left with is a series of trade-offs—much like in evolutionary trajectory— one approach might elucidate an important factor but at the cost of ignoring a crucial connection.

One approach is not inherently better than the other rather they are different tools to arrive at particular knowledge. It all depends on what you want to find out. If I want to discover *what hormones* are activated in doctor-patient interactions with the verbal suggestion of pain relief and *the pathology* of those hormones,<sup>316</sup> double-blind randomized controlled trials with “positron emission tomography (PET), functional magnetic resonance imaging (fMRI), magneto-electroencephalography (MEG), and electroencephalography (EEG), have brought important contributions to the understanding of where and when placebo analgesia [is] generated in the central nervous system (Rainville and Duncan, 2006; Kong et al., 2007; Colloca et al., 2008)” (Pollo and Benedetti 2009: 286). However, if I want to uncover *why* the verbal suggestion of a doctor is able to activate the release of endogenous opioids and induce the felt experience of pain analgesia in patients I need a better understanding of the evolutionary significance of status, hierarchy, social interaction, suggestion, charisma, empathetic understanding, neural mirrors, imitation, trust, and experimenter expectation. Moreover, if I want to

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<sup>316</sup> Much subsequent work has corroborated the model whereby the secretion of endogenous opioids in the brain is the central event of the pain modulation by a placebo, with the activation of the descending antinociceptive pathway as its anatomical substrate (Fields and Levine, 1984; Lipman et al., 1990; Benedetti et al., 1999a, b; Pollo et al., 2003).

uncover *why* the verbal suggestion of *this particular doctor* is able to activate the release of endogenous opioids and induce the *felt experience* of pain analgesia *in this particular patient*, I need to understand the entire context of the medical encounter, this patient's unique genetic, epigenetic, and neural history, the social and cultural background in which she interprets symbols and interactions, her personal health history and doctor biases, her current emotional state and stress load, her expectations for the consultation, all of the events that day leading up to this encounter, and the hospital layout, the doctors tone of voice, race, age, diploma, clothing, mannerisms, communication style, biases, expectations, and empathetic visage, which have all been found to contribute to placebo responses and which may have influenced the ability of this particular patient to feel decreased pain because this particular doctor was able to activate the secretion of her endogenous opioids using verbal suggestion.

Promoting evolutionary medicine frameworks of human biopsychosocial interactions in medical encounters help us to understand the selective pressures under which our stone-age bodies adapted and how those adaptations can be maladaptive in contemporary life. Recognizing these mismatches between our ancient bodies and modern environments should be a primary tenet of medicine. In fact, there has never been a more crucial time to figure out these psychosocial-physiological interactions. Our emotional, social, and intellectual complexity has never been greater. Humans experience pain, stress, negative emotion, rejection, unstable social hierarchies, and uncertain access to resources and protections at a frequency that our brains and bodies were never meant to handle. To combat this people need quality and quantity resources and relationships of

care more than they ever have. At the same time, biomedicine continues to move further and further from the type of meaningful content, attentional caregiving, and social trust practices that alleviate these negative psychosocial burdens. Despite knowing that conditions and cues trigger physiological adjustments, at the moment we do not fully understand how these environment-physiological response feedback loops work and to what degree they affect our health. There is not much we can do about our evolved physiological susceptibility to these conditions, but we can take steps toward uncovering the evolutionary and proximate mechanisms of those interactions in order to find ways to redirect them in a positive direction.

Evolutionary and cross-cultural studies of placebogenic phenomena help us to better understand indigenous approaches to healthcare, which might more readily elicit and enhance placebo (and nocebo) responses. As such, there is a lot we can learn about the ways that indigenous practitioners use “placeboes” (the inert elements of their medical practice) in ways that beneficially and adversely impact treatment outcomes. This knowledge can encourage the implementation of non-pharmacological placebogenic behaviors into clinical practice as well as help us to take more seriously and protect against the damaging elements of nocebogenic behavior. An increased understanding of the complex variables and interactions involved in medical encounters can change the way we research and, ultimately, practice mind-body medicine.

### **3.8 Comprehensive Theory**

#### **3.8.1 Always Adapting**

Every human on the planet has a superpower. It is not as obvious as x-ray vision or the ability to fly, but it is just as remarkable. Humans have the ability to adapt; to



transform physiologically in response to signals in the environment. While not as instantaneous as the Marvel Comics portrayal of Darwin--an X-Men mutant with the power of reactive evolution to suit any situation--science fiction writers were not too far off. Every year we discover more and more ways in which the human body is shaped by phenotypic, genotypic, neurological and developmental plasticity—the interplay between internal and external modifications and cues. Adaptability has been the main ingredient in our ability to survive and thrive across most of the planet’s diverse habitats and throughout a long history of evolutionary transitions.

But this ability also makes us enormously susceptible. All it takes is looking around you at a movie or concert to see that our brains and bodies are easily manipulated. Even imaginary situations or false perceptions can activate physiological processes. Our ancient reward/punishment motivational systems are inconsistent with the food, substances, and coping mechanisms of the 21<sup>st</sup> century and often drive us toward unhealthy behaviors. This human hyper-responsivity to environmental cues can leave us vulnerable to and/or exacerbate illnesses. This raises an important question: if there are so many negative consequences, why would human bodies have evolved to be so responsive in the first place?

Our ability to physically respond to environmental cues is a highly sophisticated and complex superpower with which all humans come hardwired. This capacity operates via a variety of perceptually responsive proximate mechanisms: motivational structures, body systems, information processing, etc. It can be activated via innumerable (largely culturally specific) cues, which determine the activation, intensity, duration, and type of

physiological, psychological and/or behavioral response. Furthermore, this capacity helps us to better understand how things like status, emotions, and meaning are embodied; how they get under the skin. The foundation of my comprehensive theory on *The Social Life of Placebos* begins at human adaptability. More specifically, why it evolved, how it works and how it impacts mind-body medicine.

### **3.8.2 Perceptual Power**

The importance of our human adaptability to physiologically respond to perceived cues in the physical or social environment cannot be overstated. However, one key word needs to be explicated further: physiological responsivity to the *perceived* environment. This one word takes a step to overthrow age-old binaries (objective/subjective, disease/illness, healing/curing, etc.) because if individual bodies respond to the conditions in their *perceived* environments, standardized measurements matter only inasmuch as they eliminate heterogeneity and/or fit within the expected cultural script. Also, they only really measure those elements less susceptible to environmental change, as we admittedly see researchers doing in RCTs. Thus, one of the reasons that placebo responses are notoriously non-specific is because they are susceptible to individual perceptions. This is why patient history, practitioner behavior, and other psychosociocultural elements of the medical context are placebogenic components. This is also why it is crucial to employ anthropological methods (such as cultural consensus, person-centered ethnography, patient interviews, extended fieldwork, participant observation, and consistency checks) in order to analyze individual perceptions within a more fully contextualized medical encounter.

But not all perceptions are based on cognitively processed information, i.e., environmental awareness, assessment, and physiological response. “It has become clear that the brain does not just receive information from the outside world, but also from a rich array of sensory nerves that permeate our internal organs. The information they convey to the brain is vital in co-ordinating many physiological processes, even though this information rarely becomes the object of conscious attention” (Evans 2004: xii). Moreover, individual body systems have “perceptual” capacities free of any external stimuli. For example, human immune systems “sense,” evaluate, and respond to chemicals in the bloodstream (Blalock 1984).

What is fascinating is that humans are highly reactive to both external and internal perceptions—and the activation of physiological responses happens regardless of the truth of the information. Many of these physiological reactions are activated by the anticipatory or forward thinking area of the neocortex. During any experience our brains try to predict the outcome and prepare the body. Placebo responses are one of our body’s ways of preparing for what we anticipate will happen shortly. Therefore, to our physiological mechanisms, the reality of what is happening is less important than what we think is happening. Along the same lines but to a much smaller degree, we physically respond to movies— with increased or decreased heartrate and respiration, elevated or depressed mood, adrenaline rushes, oxytocin releases, amplified cortisol, etc— even though they are imaginary (Scheff 1979; 1997). Moreover, studies by Isbister (2016) and Lieberman (2013) are beginning to prove that we can manipulate powerful hormonal and

neural processes in humans in “sham environments” like while they are playing games and immersed in second life technology.

A stress response can be activated by reading a fictional account of danger. Immune systems routinely attack perfectly healthy pollen and dust particles as if they were pathogenic intruders. While this may seem maladaptive now, our bodies did not evolve to accurately process information about the external world. In fact, our ancestors who checked to make sure that the movement in the bushes was actually a lion before they escaped, did not survive and reproduce in as high of frequencies as those who immediately ran away the second they perceived the bushes moving, as if it were a lion (including the concomitant physiological responses), regardless of the reality. Over time, this produced hyper-responsive, even predictive, body systems (stress, immune, endocrine, etc.) adapted to anticipatorily over-react to cues in the perceived environment.

Unlike most descriptions of human nature (and modern conceptions of the self) most human perceptions, decisions, and behaviors are based on expected and predicted information, not objective reality. In fact, humans have limited ability to perceive, evaluate, and recall accurate information. Humans are prone to optical, auditory and sensory illusions, and many other perceptual errors. “Illusions are the result of visual processes shaped by evolution. Using that process may have been once beneficial (or still is), but it also allows our brains to be tricked” (Kelly and Kelly 2014). Thus, hyperactive stress and immune responses are advantageous for survival, but not for processing reliable information. Similarly, ancient motivational structures are easily tricked by modern innovations. Our motivational structures encourage individuals to find, eat, and

defend highly caloric foods by craving the taste of glucose and receiving dopaminergic rewards upon consuming. These same systems are at play today when people desire fatty, sugary foods and feel pleasure eating them. The reward is not tied directly to the nutritional value of the food, just as perceptions (and subsequent physiological and behavioral adjustments) are not tied directly to the accuracy of environmental information.

Even our memories are distorted. We remember some information better than others. Most of our most poignant memories—positive and negative—are of threatened or strengthened social relationships, (i.e., divorce, death, rejection, betrayal, marriage, birth, promotion, acceptance, etc.) because of underlying motivational systems that reward pro-social and punish anti-social behaviors. “The most traumatic experiences happened mainly in the domain of interpersonal relationships (conflicts)” (Simoes et al. 1988). Socially intense memories can even re-activate physical sensations, and we physically re-experience positive and negative social memories especially strongly in order to better predict, evaluate, and plan for future social decisions.

False memories can also be induced. In fact, the very process of recalling a memory alters it. “Suggestion and imagination can create memories of events that did not actually occur” (Loftus 1997). Verbal suggestion can alter our perceptions and physical reactions. To the degree that we can misattribute memories we have learned to *be* memories that we have experienced; this permeability between our own knowledge and the knowledge of others is a very useful trait for cultural acquisition. Humans, more than any other species, rely on others’ information. Rather than learning everything needed to function in the

world via trial and error, as even juvenile chimpanzees often do, humans acquire unchecked knowledge from each other. But that information is hierarchized. Information from trusted individuals is accepted more readily (without taking the time and energy to validate) than information from deceptive or unknown individuals. Trust is an essential element in shaping the perceptions of others and it should come as no surprise that trust is a key component of placebo responses induced by therapeutic relationships.

Furthermore, perception, “the organization, identification and interpretation of sensory information in order to represent and understand the environment” (Schacter et al. 2011), is remarkably culturally constituted. Medical anthropologists theorize that perception, especially about sickness and healing, is culturally constructed and socially produced. Illness categories, appropriate sick behavior, explanatory models, and expected treatment outcomes are highly determined by the cultural script and normative social behaviors. These encultured beliefs and practices are socialized from birth and acquired by each individual as a member of a society. Just as a child looks to its caregiver to see how it is supposed to respond after a fall, we all learn how we are supposed to respond to particular conditions.

It is impossible for humans instantaneously to process every piece of information about a context. In order to counteract this deficiency, we have mental tricks and shortcuts to expedite essential information processing. For example, stereotyping is not always accurate but it gives us a way to label, organize, and make assumptions about people in macro-scale, patterned ways rather than trying to individually learn and evaluate every person we meet. Trust, also, is not infallible. Relationships end and people

betray one another, but trust in others alleviates constant social vigilance and allows us to develop secure relationships of predictive care. Likewise, costly signals are not always correct, but because they are costly and hard-to-fake they are good indications of honest traits. A doctor's white lab coat and diploma on the wall or an *Okomfor's* proof of power and authority (See Chapter 6: Stress for a detailed explication of this) lends credence to their claims. They are costly signaling devices which (when the signal is interpreted as being honest) are proven to produce trust, empathetic relationships, confidence in the healer and the medical system, etc., all of which increase placebo response rates and increase the practitioner's ability to manipulate patient perceptions.

“Communication in a health care environment is particularly powerful and important: It literally kills or cures patients” (Eisenberg et al. 1980:4). From the distracted yawn, glance at the watch, rapid examination, or educated jargon, to the concerned look, attentive care, compassionate touch, and genuine explanation, verbal or non-verbal language affect how a patient perceives, internalizes, and then reacts to health-related care. “Everything in the health care setting communicates something to patients” (Ibid: 55).

Our perceptions are manipulatable and malleable. One promising theory that explains this process further is health resource allocations, which argues that during sickness the human body evaluates how many endogenous resources to devote toward healing dependent on external and internal perceived conditions.

The state of the world includes external factors, such as temperature or food supplies, and internal factors, such as energy reserves or nutrients. Decisions (in the most abstract sense, so including the action of the

immune system) should depend on the expected value of each possible action, which in turn depends on the perceived state of the world.

Consequently, an altered perception of any of those factors (internal, external, or expected future rewards) can, in theory, affect the optimal response of the immune system (Trimmer et al. 2013).

In a physical or social environment where resources, safety, and shelter are limited, more energy will be allocated toward immediate needs than repair and health maintenance. In the opposite scenario, where individuals perceive the conditions of their environment to be good and they have internal reserves, more energy will be allocated toward repair and health maintenance than immediate resource and relationship needs. According to the theory of health resource allocation, “how much effort put into health should change according to the perceived environmental conditions” (Trimmer et al. 2013).

Individuals who devoted too many health resources toward recovery without secure relationships of caregiving, enough resources, and/or the energetic reserves would have worn out tentative relationships, run out of resources, and drained endogenous healing systems leading to continued ill health (with exhausted solutions for recovery) and possibly death. Individuals who devoted all of their health resources toward recovery would have left themselves vulnerable to starvation, predation, and/or exploitation and those who devoted no health resources to recovery would have eventually succumbed to the illness. As such, a balanced assessment and allocation based on internal and external resources would have had greater fitness results. “Rather than fight diseases unconditionally, it can be adaptive to wait for (what is perceived to be) a better opportunity. Placebos may act as cues that a better opportunity now exists.” (Trimmer et



al. 2013). Thus, trusting relationships (quality verbal suggestion), brand names (positive treatment expectations), and effervescent delivery (perceived evidence of potency), for example, can modify patient perceptions about their conditions and, therefore, increase placebo response rates and treatment outcomes.

Our susceptibility to illusions and trickery, false memories, encultured expectations and normative behaviors, and our health resource allocations, and sensory and information processing seem to **be less about cultivating an accurate depiction of the world and more about motivating behaviors best suited for success in our physical and social environments**. For better or worse, perceptions are plastic, error prone, and malleable. Individuals such as healthcare practitioners can alter our perceptions about the conditions of our environments and, thereby, modify our physiological responses to those conditions. These perceptual “errors” occur because of the social selective pressures in which our bodies evolved, where conditional adaptability trumped informational accuracy; creating conditions in which the most adaptive response was a general responsiveness to environmental cues.

### **3.9 Ways to Modify Perceptions**

Because perceptions play such a large role in eliciting physiological responses and allocating healing endogenous resources toward health, repair, and/or maintenance, it is essential to understand the ways in which practitioners can modify patients’ perceptions.

Here are some of those:

- Modify perceptions of the external environment,
- Modify perceptions of internal health reserves,
- Modify perceived costs of getting well or costs of remaining sick,

- Modify perceived pay-offs of getting well: the value of being well versus remaining unhealthy (Neese 2005),
- Modify perception of the current situation versus perceptions of how conditions are likely to be in the future,
- Modify belief that resources (access to or potential to get) are higher than they really are “optimal allocation of energy to immune defence increases with energy reserves” (Trimmer et al 2013),
- Suggest any prompts which refocus or shift priorities, i.e. from this-life to afterlife perspective: creates a new model of resource allocation,
- Suggest regular prompts that refocus priorities, which have larger effects than one-off, daily prompts (Trimmer et al 2013; Walach and Jonas 2004),
- Provide treatments with more frequent dosing (de Craen et al 1999),
- Suggestion poignant prompts that refocus priorities and have increased effects,
- Limit suggestion prompts to small regular prompts and occasional larger prompts that refocus health as priority, as constant re-prioritization can decrease health,
- Increase perceived social status, i.e., through forgiveness, social transition rituals, increased personhood, and conflict resolutions (see Chapter 5 on Emotion for more),
- Increase degree of perceived social support, i.e., through imaginary religious leaders and social hierarchies, family-based group healing rituals, and/or eliciting entrainment group responses,
- Reduce perceived and actual culturogenic and sociogenic illness, i.e., through actions on meaning systems, personal relationships and social regulation,
- Increase salutogenic<sup>317</sup> or health-promoting factors (perceived and actual), health sustaining practices, coping mechanisms, and beliefs,
- Mediate autonomic response to increase endogenous opioids and adrenaline through minimal arousal responses (i.e., through polyrhythmic drumming or increased heart rate) but limit cortisol and the negative health effects of prolonged or chronic stress (See Chapter 6 on Stress for more),
- Increase autonomic parasympathetic response by incorporating “reassurance, relaxation, suggestion, and anxiety reduction methods into the delivery” (Walach and Jonas 2004: 109; Vase et al 2003; Stefano et al 2001),
- Mediate social conflict and motivate changes to social relationships that contribute to negative perceptions of external and internal conditions (refer to Abena’s case study throughout the manuscript),
- Motivate changes to lifestyle that contribute to negative perceptions of external and internal conditions,
- Motivate changes to coping mechanisms that contribute to negative perceptions of external and internal conditions, i.e., side effects of coping through over or under eating, substance abuse, self-harm or addiction, etc. (See Chapter 10 Conclusion for more),

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<sup>317</sup> Salutogenic is a word created by medical sociologist Aaron Antonovsky (1979) referring to those aspects of life which contribute to health and wellbeing.

- Modify culturally constructed expectations of various components of the *micro-context* of the medical encounter, i.e., the Total Drug Effect,<sup>318</sup>
- Modify culturally constructed expectations of various components of the *macro-context* of the medical encounter, i.e., religious morality, cultural values, political-economic circumstances, etc.,<sup>319</sup>
- Modify culturally constructed conceptual-perceptual worldview or meaning system and the patients place within it,<sup>320</sup>
- Increase emotional and informational dependence on practitioner, thereby, increasing perceived trust, reliance, and adherence to prescriptions,
- Increase (patient and practitioner) confidence in practitioner's credibility (Uhlenhuth et al 1966), knowledge, authority, power, and "effectiveness of techniques" (Levi-Strauss 1963), thereby, increasing perceived trust, reliance, and adherence to prescriptions,
- Increase patient, practitioner, and community's expectations and confidence in the healing system's effectiveness,<sup>321</sup>
- Modify perceptions of predictable caregiving by delivering "therapies in a warm and caring way" (Jonas 2011: 1900; Thomas 1987),
- Modify perceptions by unifying patient, community, family, and practitioner's beliefs into a coherent explanatory model,
- Modify perception by understanding what treatments and technologies are highly valued by the community and using the latest, most well-known, and highly reputed treatments and technologies (see Patricia's story below for more),
- Modify perception by understanding and manipulating symbolic meaning in the context, i.e., light, air, nature, color, art, sound, music, privacy, (Jonas 2011:1901), design (Ulrich 2004), nature (Shanahan et al 2015), clothing, body decorations, smells, tastes, foods, sounds, words, silences, rhythms, movements, gestures (Helman 2007:225-226),

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<sup>318</sup> In addition to its active pharmacological properties, the effect of any medication will depend on: "1. the attributes of the *drug* itself (such as taste, shape, colour, name). 2. The attributes of the *recipient* of the drug (such as their age, experience, education, personality, socio-cultural background). 3. The attributes of the *prescriber* or supplier of the drug (such as their personality, age, attitude, professional status, or sense of authority). 4. The physical *setting* in which the drug is prescribed or administered—the 'drug situation' (such as doctor's office, a hospital ward, a laboratory, or a social occasion)" (Claridge 1970; Helman 2007:196).

<sup>319</sup> The effect of any medical intervention will depend on: "[1] the moral and cultural values attached to it, which either encourage or prohibit its use, [2] the prevailing socio-economic climate, such as levels of poverty or unemployment, [3] the role of economic forces in producing, advertising and selling the drug, [4] the social grouping in which drug use actually takes place—such as a family, group of friends, members of a healing cult, or even a sub-culture of heroin addicts" (Helman 2007:196).

<sup>320</sup> "This cognitive system, shared with other members of one's culture or society, makes the chaos of life (and of ill health) understandable, and gives a sense of security and meaning to people's lives" (Helman 2007:198).

<sup>321</sup> "The faith and expectations of the group...constantly act[ ] as a sort of gravitational field within which the relationship between sorcerer and bewitched is located and defined" (Levi-Straus 1963:168).

- Modify perception by exposing patients to word of mouth positive assessments by people in the community they trust,
- Modify conditioned responses and associative learning by repeatedly pairing powerful active and non-specific elements,
- Modify perceptions by exposing patients' to observational learning and modeling of others (See quantitative data results of shrine workers physiology before, during, and after healing rituals compared to regular patients in Chapter 6 on Stress),
- Modify perceptions by “determining what treatment your patient believes in or not” (Walach and Jonas 2004: 109; Cassidy 1998; Frank 1961; Kirsch 1985) and emphasizing elements accordingly,
- Suggest potent verbal expectancies and even reframe or induce suggested memories of powerful expectancies,
- Modify perceptions by increasing emotional intensity and establishing unquestioning need for practitioner and healing system (See Chapter 5 on Emotion for more),
- Modify perceptions by engendering receptive modes of participation that increase suggestibility,
- Motivate desired physiological and behavioral change by providing ways to increase pleasure and decrease pain,
- Motivate desired physiological and behavioral change by manipulating social status and cues,
- Modify perceptions by matching desired effect to treatment interventions and parameters, i.e., effervescence, color, brand, minimally painful, etc. (Moerman 2002; Kaptchuk 2002; de Craen et al 1996, 1999, 2000; Jonas 2011),
- Modify perceptions by matching desired effect to treatment settings and by conducting therapy in culturally-established therapeutic spaces, manners, and settings, i.e., therapeutic context, social support, religious elements, etc. (Moerman 2002; Kaptchuk 2002; de Craen et al 1996, 1999, 2000; Jonas 2011),
- Modify expectations by promoting culturally-established potent mode of administration, i.e., injection, cut, poke, and minimal physical pain,
- Modify perceptions of predictable caregiving by being attentive to the treatment administration and patient (de Craen et al 2000),
- Modify perceptions by filtering and shaping attentional and attributional processes, i.e., distracting, normalizing, reframing, shifting focus, and redirects, etc. (See Chapter 5 on Pain for more),
- Modify perceptions by increasing positive emotions and decreasing negative emotions,
- Modify perceptions by increasing patient self-regulation and “control” over what is happening and what they do about it,
- Modify perceptions by increasing psychoprophylactic expectancies, i.e., protection, preparation, and prevention (See Chapter 6 on Stress for more),

- Modify perceptions by walking patients through exactly what they should expect (which increases verbal suggestion as well) (Bernmann et al 1994; Skovlund et al 1991),
- Modify perception by individualizing meaning where possible, but keeping symbolic analysis polysemous and open to patient interpretations whenever possible,
- Increase positive expectancies by providing clear diagnosis and treatment guidelines, but always promoting hope (see Dr. Joshua's story below),
- Modify perceptions by engaging in esthetic play which makes medical encounters more compelling<sup>322</sup> (See *Okomfo* Nsuo's story in Chapter 5 on Emotion for more),
- Activate opioid and adrenaline production by causing minimal amounts of pain (to patient or through mirror neurons of practitioner's pain) (See practitioner proofs of power and authority in Chapter 6 for more),
- Activate oxytocin production by showing attachment and attentional caregiving through touch (Moerman and Jonas 2002; Cherkin et al 2001),
- Activate oxytocin production through empathetic listening and understanding, i.e., "deliver therapies in a warm and caring way" (Walach and Jonas 2004:109; Thomas 1987; Brody 2000),<sup>323</sup> and
- Change metabolic activity in the brain through singing, dancing, or other rhythmic or kinesthetic actions, (See music section in Chapter 6 on Stress).

### 3.10 Ways to Modify Meaning with Ritual

While the previous list focused on ways that practitioners can mediate patients'

perceptions, this list details all of the cultural, institutional, and environmental factors that have been proven to affect positive placebo treatment outcomes:

- Practitioner behaviors such as dress (Blumhagen 1979), manner (Gracely 2000), and language (Ehlenhuth et al 1966) signal competence, confidence, and trust,
- Clarity or vagueness of the diagnosis (Brody and Waters 1980) and prognosis (Christakis 1999) influence treatment outcomes,
- Verbal suggestion, whether strong and weak (Gryll and Katahn 1978) and even on a sliding scale can "dose" expectancies and ultimately placebo responses (Nakamura et al 2012),
- Elements of the placebo intervention, such as brand (Moerman 2002), color (Moerman 2000), value (Waber et al 2008), number and type (Thompson et al 2010), are little storage units packed with years of cultural knowledge (Helman

<sup>322</sup> "Esthetics play an important role in healing rituals, making the performance attractive, compelling, absorbing or entrancing" (Kirmayer 2011:117).

<sup>323</sup> "The therapeutic potency of this relationship probably results from 'a reactivation of the feelings of basic trust adherent to the original mother-infant dyad" (Adler and Hammett 1973; Helman 2007:198).

2007; Turner 1969) that carry with them specific physiologically and behaviorally altering meanings,

- The medical context itself (i.e., the space, words, and symbols, etc.) can impact patient pain, stress, emotion, status, psychological state, perceived conditions, and disease symptoms (Brody and Waters 1980; Kaptchuk 2002),
- Medically pluralistic cultures can give patients control over what form of treatment they preemptively believe effective for various ailments and this self-selection increases positive expectancies (Kaptchuk and Eisenberg 2001),<sup>324</sup>
- Polysemous meaning in alternative healing systems can help patients to find individually relevant and/or coherent unifying explanatory models which increase “dosed” placebo responses,<sup>325</sup>
- “The healing ritual with its dramatic narrative and compelling aesthetics has a ‘performative efficacy’: the participatory experience of the ritual itself automatically shifts perceptions, emotions, meaning and self-awareness” (Kaptchuk 2011:1854; Tambiah 1981 and 1977) and “provide an opportunity to reshape and recalibrate selective attention” (Kaptchuk 2011: 1856; Allan and Siegel 2002; Parker et al 2008; Cioffi 1991),
- Meaning and ritual participation have neurobiological correlates in which “specific areas of the brain are activated and specific neurotransmitters and immune markers may be released” (Kaptchuk 2011: 1856),
- All of these meaningful components can be combined in both culturally patterned and individually unique ways to alter effectiveness. “For example, adjusting components of a ritual could make it more or less persuasive” (Ibid 1856). Layers of sensations and behaviours address different patient sensitivities and probably work synergistically (Ibid 1853),
- Stories, metaphors, and/or rituals that stimulate strong emotions or persuasive socioculturally worldviews,
- Meanings that signal ideal conditions can make patients more open, persuadable, and susceptible to physiologically manipulation or mind-body regulation (see concept of *Nkate* in Chapter 3) (Frank 1961).<sup>326</sup>

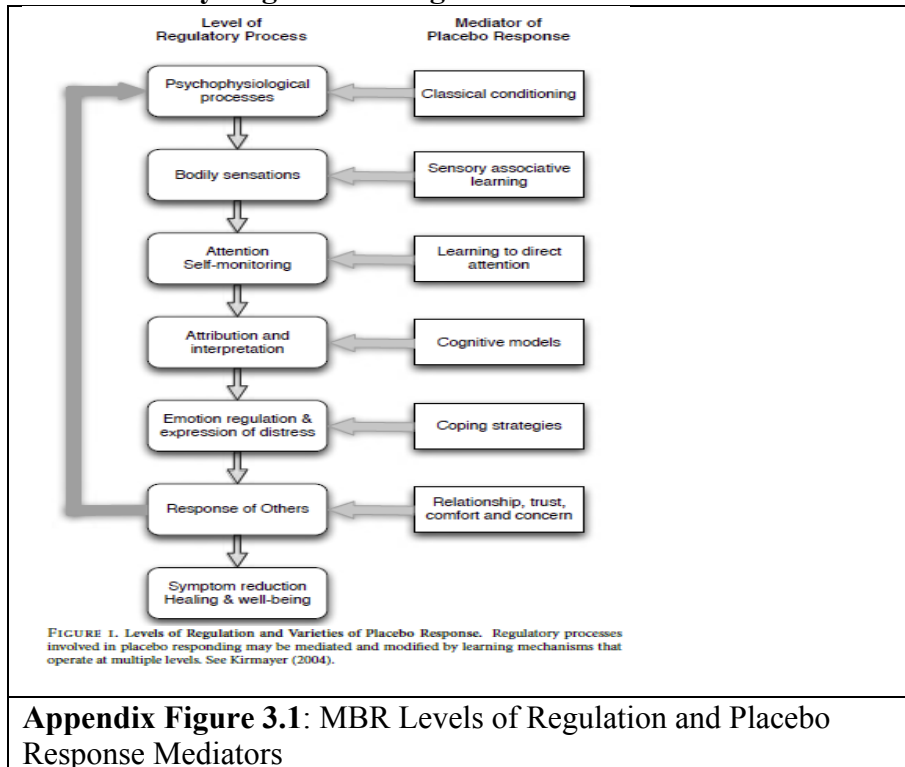
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<sup>324</sup> “The ‘patient is not passively incidental to the ceremonial process, but is possessed with hope, frustration, confusion, uncertainty, understanding and relief’ [Csordas 2004]. While illness is accompanied by despair, worry, anxiety and pain, patients’ health seeking behaviours represent hope (desire for improvement), potential re-moralization and an openness to new possibilities, if not necessarily absolute confidence and positive expectations (belief in likelihood of improvement)” (Kaptchuk 2011:1853).

<sup>325</sup> “The attraction of alternative medicine is related to the power of its underlying shared beliefs and cultural assumptions. The fundamental premises are an advocacy of nature, vitalism, “science,” and spirituality. These themes offer patients a participatory experience of empowerment, authenticity, and enlarged self-identity when illness threatens their sense of intactness and connection to the world” (Kaptchuk and Eisenberg 1988).

<sup>326</sup> “Expectations generally involve cognitive models or frameworks and affective attitudes or stances. These models can be encoded as stories, propositions, metaphors or images that may be explicit (conscious) or implicit (non-conscious). Both implicit and explicit cognitive models can direct thinking in ways that amplify or diminish symptomatology and distress. Indeed, cognition can influence symptoms through the

### 3.11 Mind-Body Regulation Diagram



### 3.12 Therapeutic Relationships and Interpersonal Healing

In fact, this is the reason why we have double rather than single-blind RCTs. Even with controlled therapeutic all overt communication, practitioners' knowledge can influence placebo response outcomes in positive and negative ways. In studies when the doctor's behavior is highly scrutinized and there are no apparent signals from the practitioner to the patient about what control group they are in, if the doctor knows whether or not they are receiving a placebo intervention, the outcome changes. Double-blind RCT's are considered the gold standard of research because they are supposed to eliminate the subjective bias of patient and practitioner toward a particular treatment group. If no one

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ways in which sensations are focused on, interpreted, labeled and attributed (Kirmayer & Sartorius, 2007)" (Kirmayer 2011:115).

knows what therapy (active or inert) they are giving or receiving, then we can assume the study results have more to do with the active ingredients or imitation intervention than with the social interaction during the RCT. During any medical encounter a doctor is sending tacit signals (via modes like emotional intelligence and empathetic understanding, see Chapter 5 for more) and patients are responding to those; including whether or not the practitioner thinks that a treatment will work.

Practitioner beliefs and biases influence the potency of placebo responses (Crow et al. 1999). For example, there are many studies which prove that practitioner “social behavior moderates the effect of expectations on physiological outcomes” (Howe et al. 2017) and that show significant correlation between treatment outcomes and practitioner attitudes (optimistic and enthusiastic versus neutral or doubtful) for numerous mental and physical ailments. This effect is so potent that even in double-blind RCTs practitioner belief can alter results. Studies show that practitioners’ belief or certitude in the treatment results, regardless of their knowledge of which treatment they are giving to a patient, directly effects how patients respond to the treatment and calls into question the gold-standard of double-blind RCTs (Kaptchuk 2001). One example of the practitioner bias is an RCT in which patients in the first trial were given either placebos, analgesics, or narcotic antagonists, whereas patients in the second trial were given only placebos or narcotic antagonists. Although the dentists were uncertain as to the administration of these options to particular patients, their knowledge of the lack of analgesics in the second trial (despite no difference in observable behavior) changed the patient outcomes drastically. Patients of all categories reported that their pain was significantly worse in the second trial



(Gracely et al. 1985). The practitioner bias in knowing that a therapy *might* help was the difference between patients experiencing pain and those who didn't.<sup>327</sup>

### 3.13 Mind-Body Regulation Synopsis

Kirmayer's *MRB* concept links ultimate evolutionary processes to culturally-specific mediators and neurobiological proximate mechanisms.<sup>328</sup> It portrays the agile, individually-tailored, multi-system complexity of placebo responses that other models can't quite account for. It legitimizes placebo responses by situating them within established biological systems and it prioritizes anthropology by focusing on the importance of culturally-specific mechanisms of regulation.

MBR has hard wired and machine like features and also is changeable, accommodative, and flexible. A template or structure of organized complexity that continues to persevere and do its job despite myriad of homeostatic perturbations and potential pathological obstacles helps explain why and how it is important to emphasize MBR as [the] foundation or structure for diverse mechanisms, processes, and responses that... so well describes as involving PP [placebo phenomena] and EH [ethnographic healing]. That MBR enables and shapes (and in this sense constitutes) a *robust adaptive response pattern or program which is also plastic* seems an appropriate way to capture its character... Thinking of MBR and its relevance in this way places it within the framework of general biology of sickness and healing and facilitates examining it in complementary ways (Fabrega 2011:169).

While this model is a good starting point, it is not rooted soundly enough in evolutionary studies of biology, psychology, medicine, and religion. For example, though many of our regulatory processes have evolved for adaptability and plasticity to our

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<sup>327</sup> "The doctor-patient relationship involves all of these cognitive, emotional influences but therapeutic relationships can have additional effects through neurobiological mechanisms that are fundamental to human sociality... For example, experiences of trust can stimulate brain oxytocin release, which increases feelings of comfort and trust, with potentially far-reaching effects on well-being, interpersonal relationships and long-term health outcomes. This feedback loop from quality of relationships to physiology and back... is just one of many such potential loops, which may involve larger social processes" (Kirmayer 2011:115).

<sup>328</sup> See a diagram of Kirmayers Mind-Body Levels of Regulation and Placebo Response Mediators in the *Appendix: Chapter 3: 3.10 Appendix Figure 3.1*).

environments, others have evolved for completely different functions and have become exapted<sup>329</sup> in placebo generation. Whereas others are by-products of unrelated adaptations that are now used in different ways. What is the ultimate explanation for the development of these ancient regulatory processes? What function did they serve our ancestors? How has that changed over time? And how do they influence sickness and healing today? MBR doesn't capture the perimeters of placebogenic phenomenon. Are all mind-body interactions placebo or nocebo responses depending on whether they are culturally-constituted as positive or negative? How do these regulatory processes operate outside of medical encounters? These are huge unanswered questions and the fact that MBR does not address them is not a critique of the theory or Kirmayer. Rather it highlights the enormous breadth and magnitude of the questions involved in a comprehensive theoretical framework for placebo studies. My own theory below and throughout the rest of the manuscript will have similar holes. The hope is that interdisciplinary researchers building on one another's expertise will eventually lead to the types of historical, contextualized, robust, and thorough theory that placebo studies needs.

Moreover, MBR is actually at its most valuable when combined with other placebo studies theories—each providing a necessary piece of the larger puzzle. As it stands, we do not know all of the different neurological, epigenetic, biochemical, and physiological

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<sup>329</sup> For widely accepted definition and a discussion of adaptations as well as to understand the difference between an adaptation, exaptations, preadaptations, byproducts, and genetic hitchhikers, see *Appendix: Chapter 2: 2.1 Evolutionary Theory Background* and *Appendix: Chapter 2: 2.10.4 Exaptations and By-Products*.

processes involved in placebo responses. We do not know all of the psychological, social, cultural, and contextual triggers for these processes, nor their culturally-specific manifestations in various healthcare systems. We do not know the full range of illness and diseases influenced by placebo or nocebo interventions and to what degree (though we have a good idea of what types of ailments are more susceptible than others, i.e., subjective/conscious versus objective/unconscious). Nor do we know what makes someone a placebo-responder (though we also have some sense of elements that increase or decrease the possibility (Lakoff 2002)). As such, a system of organizing the many different components of placebo responses is enormously helpful. Kirmayer (2004) attempts this with his chart outlining the levels of regulation and different placebo response mediators. Bootzin and Caspi (2002) do this with their *interactive multi-dimensional model*, which outlines the direct, indirect, and interactive synergistic interplay between the placebo effect and other psychological and physiological variables in the therapeutic process. Bootzin and Caspi argue that by studying the interplay of provider, patient, and treatment process (the therapeutic relationship) in context you can see that “the causal effects are reciprocal, synergistic, and recursive and involve factors that are both internal and external to the individual” (Bootzin and Caspi 2002:108).

[First] The placebo effect is not static. It constantly evolves and changes in response to other biological and psychological signals that play a role in the therapeutic process...[Second] The placebo effect always interacts (in a synergistic rather than in an additive way) to an unpredictable degree with other elements of the therapeutic intervention, such as biological and psychological instruments (Bootzin and Caspi 2002:126)

### **3.14 Health Resource Allocation in Placebo Studies**

This model sets an entirely new course for placebo studies; one that retains the knowledge of previous models, but replaces mechanistic “theory” (explanations derived

from evidence-based mechanisms) with systematic theory (explanations derived from historical, contextualized, large-scale patterns and proven via consistent mechanistic findings). Prior to Trimmer et al. much of placebo studies theory consisted of sometimes haphazard descriptions of contextual cues influencing placebo mechanisms, i.e., meaning responses or therapeutic relationships, even though the specific cues and their relationships to specific psychological and neurobiological mechanisms were unknown— analogous to explaining oxygen by constructing a theory about the fact that it burns. Though accurate, burning is but a small property of a much larger phenomenon and, frankly, is describing an effect, interaction, or by-product of the phenomena but not really much about why, how, and what it is. *Health resource allocation*, in contrast, shifts the focus from non-specific proximate mechanisms in clinical settings to general adaptive capacities. It situates the placebo phenomenon within a much larger explanatory model, similar to viewing oxygen as a chemical element present in all organic life. This is an important transition for placebo studies. “This outcome suggests that placebo response may be a complex behavioral phenomenon that has properties that comprise a state, rather than a trait characteristic. This could explain the difficulty of detecting a signature for “placebo responders”” (King et al. 2013) as well as the difficulty of constructing a model that incorporates all of the different signals, systems, mediators, and mechanisms of placebo responses. Viewing placebo responses from the *health resources allocation* model helps us to see some of the ultimate biocultural capacities as well as the conditional nature of their development and elicitation.

### **3.14.1 Individual Variation in Placebo Responders**

For example, if we conceptualize the placebo response in terms of patient evaluations about their (internal and external) conditions, the diversity of their possible “responses” and the importance of expectation, context, and social support makes a lot of sense. In fact, even the variety of “placebo responders” can be viewed in a new way. Instead of personality traits or behaviors, we might look instead at optimal resource and relationship conditions (Conboy et al. 2010 talks about the effect of social support on placebo responders) and individuals with greater social or emotional intelligence who might be more perceptive, sensitive, or suggestible to social cues.

There are people more perceptive to social cues than others, and arguably, more physiologically responsive to changes in the social domain. These highly sensitive individuals, especially in a modern world inundated with triggers, would seek after and benefit from attentional focusing and care receiving. In drug trials, pharmaceutical developers try to weed out “sensitive” individuals (variably defined and rated) that they deem more likely to respond to placebos or rather the ritual of medicine and provisions of care that make up drug trials. Drug developers want to eliminate all of the entangled “noise” of a contextualized medical encounter and a complicated person. They want to measure only the “signal” of the drug in order to prove its efficacy in this manner, “the patients’ role is to transmit it—they are the drug’s medium (Lakoff 2002:74).

Thus, conditional health resource allocation attuned primarily to social information becomes a much more inclusive explanatory framework for many of the mechanisms of placebo responses. It also incorporates many of the strange characteristics of placebo responses that are difficult to align in a unifying theory, i.e., why contextual elements, cultural beliefs and expectations, and social interactions have such a powerful influence on health outcomes.

### **3.15 A New Model**

In *The Social Life of Placebos*, I hope to set out a theoretical design which may alleviate some of the reductive and hegemonic concerns of privileging biomedical

knowledge while still providing applicable scientific evidence of physiologically beneficial features in Asante indigenous ritual healing ceremonies. If we reframe the concepts of efficacy, ritual, meaning, and social interaction in an evolutionary context, it forces us to reevaluate the benefit of both biomedical *and* ethnomedical healthcare systems according to the compatibility “between the lifestyles and environments in which humans currently live and the conditions under which human biology evolved” (Trevathan 1999:3) rather than pitted against one another. In other words, this model juxtaposes both systems of health maintenance and provisions of care and measures both by the same tertiary criteria: how well does each medical niche construction manage the evolutionary trade-offs and mismatches of our stone-age brains and bodies in a modern world? (See Chapter 2) “Moreover, the comparison doubles back to highlight aspects of each that might have gone undetected without the attempt at translation” (Friedman 2011:758). Evolutionary perspectives on medical therapies have been mostly overlooked in both medical anthropology and clinical biomedicine. Situating both biomedical and indigenous practices in an evolutionary model gives us a fresh starting point from which to analyze therapeutic efficacy, level the playing field and de-exoticize indigenous healthcare systems because, although still guilty of “Western” scientific theoretical predispositions, biocultural co-evolutionary processes dissolve some of the academic and medical boundaries and discourse dynamics which demarcate specific features of biocultural interactions in medical encounters as distinctly “active,” “inert,” or “efficacious.” A social susceptibility framework also helps us to examine the

interpenetrating entanglements of mutually-influencing biocultural dynamics in a way that is more representative of the lived experience of patients.

For example, another form of “efficacy” might be added into consideration. In the last chapter we learned why human bodies evolved to be susceptible to the cues in the social environment. Bodily states, especially in social contexts, were never designed to be static. Bodily processes like immune functioning, autonomic elicitation and health resource allocation (i.e., how many resources can be diverted to recovery) “change according to the perceived environmental conditions” (Trimmer et al. 2013:11). “Feelings,” even those as visceral as pain, do not exist in and of themselves; they are not entities. “Feelings” are signals that communicate information about physiological responses to external conditions or incentivize action toward fitness-enhancing behaviors—the stronger the feeling, the more important the information.

*Feelings* shift depending on the context, including feelings of sickness or health. We would not have survived very long if we *felt* sick during a predation event regardless of our “objective” state of dis-ease, i.e., during childbirth labor, sickness or physical trauma. Instead, our sympathetic nervous system takes over and directs our bodily systems, metabolic allocations and *feelings* toward survival enhancing actions (such as feeling, fighting, freezing, fainting, following, etc.) and away from adverse conditions. So our state of sickness or health (as determined by circumstances amenable to *feeling* sick and how much energy is invested toward fighting off disease) is, largely, determined by external conditions (or perceived external conditions). This capacity doesn’t go away just

because we no longer have to worry about predation. It just gets activated via different triggers: by threats to our safety, resources, and status.

Conditional health resource allocation protected our ancestors from the fitness consequences of sickness by only activating endogenous repair and maintenance processes when they had access to quality and quantity resources and relationships of predictive care. Thus, it is possible to activate, increase or decrease both the amount of endogenous resources allocated toward health and how someone *feels* by changing perceived social and environmental conditions. “In other words, if an individual believes (falsely or not) that its situation has improved, it can be expected to put more resources into fighting the disease; i.e., the placebo effect should be induced” (Trimmer et al. 2013:11). We will discuss whether or not this is a “placebo effect” in the following section, but what is important to note here is that there are more than just two-sided therapeutic efficacy models, i.e., disease/illness or healing/curing. There is a perception-health resource allocation-bodily response/motivation or conditional health response model (see Figure 3.2). We do not yet have adequate terminology for this complicated biocultural feedback phenomenon. Some have referred to it partially as a “sensory, motivational, and bodily changes model” (Downey and Lende 2012:106). I call this social susceptibility, which refers to our physiological responsivity to changes in our social environment. Either way, it represents a new way of looking at therapeutic efficacy and of comparing biomedical and indigenous medicine. If sickness—both the physiological, measurable, objective manifestations and the sensory, perceived, subjective experience—is conditional (based on body system adaptability and health



resource allocations responsive to perceived external conditions), then changes in those external conditions or perceptions that optimize health resource allocations will be efficacious.

Model	Problem	Measurement	Acts on	Success
Curing	Disease	Objective	Physical Change	Absence of disease
Healing	Illness	Subjective	Expectations	Coping, well-being
Social Susceptibility	Adaptedness	Conditional	(Perceived) Conditions	Optimized health allocation
<b>Figure 3.2: Efficacy Models</b>				

Comparing these models in an evolutionary framework means that a system of medicine that focuses primarily on the pathophysiology of a disease might be only looking at the body's response to external conditions and pressures affecting a patient. Action on the disease course would result in changes of the bodily state, but not the ultimate cause of the problem. Furthermore, the "problem" itself might be a signal of adverse external conditions (i.e., heart disease), warning for behavioral adjustment (i.e., depression) and/or a symptom of endogenous healing processes at work (i.e., a fever). Treating the disease pathology, then, only treats the symptoms (see dysevolution below)—a critique which is regularly lobbed at symbolic, palliative, placebo and indigenous healing as a way to dismiss their efficacy.

Much of this inconsistency stems from the use of the term *placebo* to refer to ostensibly inert treatments in two contexts that are held in tension by their dissimilar goals. In clinical care, where the goal is to heal patients, clinicians use placebos to give patients hope; to do something rather than nothing; or, perhaps, to attempt to trigger some

innate healing capacity within the patient (Harrington 2002; Kaptchuk and Eisenberg 1998; Moerman 2002).<sup>330</sup>

Thus, viewing therapeutic efficacy in an evolutionary framework inverts current paradigms and discourse dominance patterns. It might not be (and most likely is not) THE correct model of therapeutic efficacy, but it helps us to view the processes of sickness and healing in a new way—one that neither dismisses nor privileges indigenous healing or biomedical systems over the other. “We should aim, in my view, for modes of comparison that work with the contradictions inherent in comparison, that expand the voices put in play, that creatively open up dialogue and new frameworks for reading and acting in the world.” (Friedman 2011: 760). In this way, I feel similar to mind-body historian Ann Harrington (2008) who struggles to combine humanities and natural sciences in her research without over or underemphasizing either, but continues to do so because she believes “in the potential of mind-body medicine to destabilize and creatively redraw tired ‘two-cultures’ approaches to knowledge of what it means to be human” (Harrington 2008:251).

“While the days of viewing evolutionary processes in a strictly adaptationist (and static) light seem to be fading, it is unfortunate to see that many of the exciting developments in modern, cutting-edge evolutionary biology not only do not trickle down to the common layperson’s ideas about how evolution works, but also have not seemed to

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<sup>330</sup> “In medical research, where the goal is to determine the efficacy of a specific treatment, placebos have become the control by which ‘active’ treatments are judged efficacious in the ‘gold standard’ of biomedical research: the randomized controlled trial (RCT)” (Thompson et al. 2009:113). Also, see Kaptchuk (1998) for a more in-depth examination of the importance of RCT’s in placebo studies.

trickle across to other academic disciplines, at least of all to university textbooks” (MacKinnon and Fuentes 2012:73). As the last chapter highlighted, many of the old fears of biological determinism and reductionism are incompatible with new findings in epigenetics, connectomics, social neuroscience and social susceptibility where psychological and socio-cultural processes are elevated to instrumental factors in sickness and healing. Unfortunately, so far a relatively small group of interdisciplinary anthropologists have the interest, biocultural training or methodological know-how to contribute to these fields (Fabrega 1979; Moore et al. 1980; Armelagos et al. 1992; Wiley 1992; Worthman 1993; Moerman 2002; Wiley and Allen 2009; Lende and Downey 2012; Sobo 2013) and much of the latest research on how psychological, social and cultural factors influence the body is coming from the sciences.<sup>331</sup>

Going back to our original ethnographic example, each time Osei answered my questions he gave an honest answer and the final response was no more “real” than the first. Osei outlined the broad sociocultural context that contributed to infertility but he also discussed how those psychosocial processes affected the body and the role that ritual played in manipulating those processes in ways that enhance health and wellbeing. There are many different approaches to the study of ethnomedicine (for an excellent review see Nichter 1992: x-xi). A cultural approach that provided a descriptive account of Asante ethnomedicine highlighting all of the continuities, discontinuities, patterns of resort, explanatory models, systems of classification, power relations and social resistance and

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<sup>331</sup> Sternberg 2001; Koenig and Cohen 2002; Demasio 2003; Harrington 2008; Benedetti 2009; Lieberman, M. 2013; Lieberman, D. 2013

resilience would be an important ethnographic contribution. Likewise, a biological approach that explained the scientific efficacy in terms of their universal human capacity for eliciting physiological states would be a significant step in the cross-cultural study, comparison and application of ethnomedical knowledge. However, this research seeks to follow more closely with an Asante ethnomedical worldview where both macro and micro cultural and biological processes interact in each healing encounter. For Osei, cultural and biological explanations of infertility were not mutually exclusive, in fact, they interacted with each other both in the manifestation of the problem and in the route toward the solution. My job is not to ignore, separate or disprove this claim, but rather, to figure out a way to explain those multivariate interactions while also avoiding biological reductionism, Western/industrial ethnocentrism, scientific paternalism and cultural traditionalism.

A biocultural evolutionary approach to placebo studies is much more complicated and problematic than straight cultural or biological approaches; however, I think it is much more accurate to the lived experience of both patients and healers--embodied psyches in sociocultural environments. I think it is also an arena of significant potential future research in which anthropology is uniquely qualified to address the impact and interactions of culturally specific psychosocial variables and "*The Social Response*" usually neglected from biomedical assessment and where there is as much value in the questions raised as the conclusions reached.

Each critique gets us closer to a more coherent theory of placebos that extends back to evolutionary explanations and across cultural settings. I have structured Section III in

such a way that the ethnography and individual chapter claims would hold up even if this comprehensive theory does not. I also want to repeat that I am making no novel evolutionary or placebo science claims in this chapter. Rather, I am putting together already established evidence-based findings from disparate fields in new, and hopefully illuminating ways.

## **Chapter 4: Pain**

### **4.1 Proximate Mechanisms in the Sociocultural Management of Pain**

The following list represents a review of literature on the proximate mechanisms in the sociocultural management of pain. It is not an exhaustive list, but it illustrates the ways that Asante pain behaviors and social responses to pain as well as the cultural management of health via indigenous ritual healing ceremonies, influence pain outcomes by magnifying patient's social susceptibility, eliciting placebo responses and dampening the sensation, intensity, and duration of a pain experience.

- **Manage Expectations:** Expectations are by far the most powerful of all the placebo response pain mechanisms. Expectations can replicate, modulate, and even counteract active drugs.<sup>332</sup> “Our expectations, mood and perspective on pain powerfully influence how much something actually hurts....The expectation that a sugar pill will relieve pain reduces the extent of the agony even though the pill has no pharmacological effect. Conversely, if you are convinced that an injection, say, will be very painful, you are likely to unwittingly amplify the sting...Positive expectations for healing from painful injuries can lead to faster actual recovery” (Fields 2009).<sup>333</sup>
- **Modify Anticipatory Responses:** Our bodies respond physiologically to what we predict will happen, i.e. whether or not you anticipate increased or decreased pain will influence how you anticipatorily experience physical and social pain. “One way that placebo aids recovery is by hacking the mind's ability to predict the future” (Silberman 2009).<sup>334</sup>

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<sup>332</sup> “The deceptive administration of a placebo treatment can lead the subjects to believe that the treatment is effective (Kirsch and Weixel, 1988; Kirsch, 1999). In this situation, the expectation of analgesia leads to a significant placebo analgesic effect (Amanzio and Benedetti, 1999; Benedetti et al., 1999b; Price et al., 1999; Pollo et al., 2001)” (Benedetti et al 2003)

<sup>333</sup> One example to illustrate this is a case study of participants who received a magnetic placebo pill that was being analyzed throughout the rest of the study. When patients were told they were receiving a relaxant their bodies responded accordingly, per the magnet mobility. Corresponding results were shown when patients were told they were receiving a stimulant and a placebo. Gastric behavior was consistent with what patient expectations even though all of the pills were inert (Sternbach 1964). Expectations are malleable. Furthermore, in RCTs designed to test expectations, results concluded that “enhancing patients' expectations through positive information about the treatment or illness, while providing support or reassurance, [seemed to] significantly influence health outcomes” (Di Blasi et.al. 2001).

<sup>334</sup> “The promise of treatment activates areas of the brain involved in weighing the significance of events and the seriousness of threats. ‘If a fire alarm goes off and you see smoke, you know something bad is going to happen and you get ready to escape,’ explains Tor Wager, a neuroscientist at Columbia University. ‘Expectations about pain and pain relief work in a similar way. Placebo treatments tap into this system and orchestrate the responses in your brain and body accordingly.’ In other words, one way that placebo aids

- Tap into Conditioned Responses: “The pain we experience is a synthesis of what happens in our body and what we expect, which depends on what we are told or have otherwise learned” (Fields 2009)<sup>335</sup> as well as “non-conscious mechanisms based on learning processes mediated by specific neural systems” (Kirmayer 2011:214):<sup>336</sup>
- Mediate Reward-Desire: “The analgesic properties of anticipated rewards are consistent with the placebo effect. If relief of pain is rewarding, then a placebo pill is a sign of a forthcoming reward, leading to pain suppression. Thus, the expectation of relief becomes a self-fulfilling prophesy. Conversely, predicting pain has the opposite effect, amplifying activity in the transmission pathway and leading to greater pain perception.”<sup>337</sup>
- Modulate Pleasure-Pain System: Placebo responses can improve pleasure and mitigate pain through a dual-system approach of opposite modulation of sensory processing (Ellingson et al 2013).
- Use Verbal Suggestion and Guided Expectations: Practitioner assurance of pain relief can promote positive expectancies and attentional focus (Cioffi, 1991; Geers, Weiland, Helfer & Kosbab, 2007; Geers, Wellman, Fowler, Rasinski, & Helfer, 2011). “Different verbal instructions lead to different expectations and

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recovery is by hacking the mind’s ability to predict the future. We are constantly parsing the reactions of those around us—such as the tone a doctor uses to deliver a diagnosis—to generate more-accurate estimations of our fate” (Silberman 2009).

<sup>335</sup> For example, advertisers have explained that “the secret of running an effective campaign...is associating a particular brand name medication with other aspects of life that promote peace of mind” (Silberman 2009), such as playing with children, clear skies, happy couples holding hands, drinking a cup of coffee, speed, virility, etc. Evoking positive associations manipulates patient expectations and conditions them to respond more positively to the drug they associate with positive things. Along those same lines, studies have proven time and time again that placebos packaged with a brand name are more effective and respond similar (in treatment outcome and side effects) to their active counterpart than placebos which are anonymous.

<sup>336</sup> “For example, placebo analgesia involves the activation of endogenous opioid pain control systems in the brainstem (Levine, Gordon & Fields, 1978). Indeed, much of the individual variability in response to both opiate and non-opiate analgesics may be determined by individual differences in the response of endogenous opiate pain modulation systems (Amanzio, Pollo, Maggi & Benedetti, 2001). Placebo responding to analgesics also involves additional top-down influences from frontal cortex acting on rostral anterior cingulate cortex, along pathways that do not involve endogenous opioid neurotransmission (Petrovic et al., 2010). Placebo analgesia involves activation of an internal regulatory system that normally functions to control pain. These systems have multiple effects so that, for example, placebo effects on enhancing memory may also be mediated by endorphins (Stern et al., 2011). Similar systems exist for regulating inflammatory processes and various autonomic, endocrine and immune functions and these may provide the basis for a variety of specific placebo responses (Ader, 1997; Meissner, 2011; Pollo, Cariño, & Benedetti, 2011)” (Kirmayer 2011:214)

<sup>337</sup> “Food, sex and other natural enticements — and even the mere anticipation of such pleasures — activate the brain’s reward circuitry in both rodents and humans. In doing so, they can also produce pain relief. The effects of opioid drugs further suggest that reward and pain relief have a partially shared neural basis. After all, the most powerful of these drugs, such as morphine and oxycodone (OxyContin, a prescription painkiller that has been widely abused), can relieve severe pain but also unleash a “high” — leading to their addictive potential” (Fields 2009).

thus to different responses, and this plays a fundamental role in the placebo effect (Kirsch, 1985, 1999; Price and Fields, 1997)” (Benedetti et al 2013). “From an evolutionary standpoint, we are able to see why an increased expectation of something bad, such as pain, may tend to result in that very outcome. From a mechanistic perspective, Benedetti, Lanotte, Lopiano, and Colloca (2007) write: ‘Recent experimental evidence indicates that negative verbal suggestions induce anticipatory anxiety about the impending pain increase, and this verbally-induced anxiety triggers the activation of cholecystokinin (CCK) which, in turn, facilitates pain transmission’” (Benedetti et al 2007).

- Mediate Attentional Focusing: “Focusing attention on discomfort can intensify symptoms” (Kirmayer 2011:115) and focusing attention on other things such as positive expectations of pain relief, patient-centered activities or rituals, meaningful imagery, etc. can alleviate and/or numb painful symptoms.
- Distract: “Conversely, distraction, or absorption in other sensations, imagery or activity can markedly reduce symptoms like pain, nausea and other forms of discomfort (Pennebaker, 1982)” (Kirmayer 2011:115). Furthermore, distraction can interrupt negative rumination, expectation, and anticipatory nocebo responses that can increase pain intensity, duration, and sensation.
- Tell a story: Stories are a particularly compelling combination of pain alleviating mechanisms, i.e., distraction, expectation modulation, normalization, and meaning. It is no wonder that so many indigenous healing rituals are based on or incorporate stories of people or supernatural beings going through painful conditions and overcoming them. Stories about someone in a similar situation who was able to make it out of a seemingly impossible situation and then went on to have a better life are particularly compelling (especially those of low status individuals doing something extraordinary which triggers status competition and makes people motivated to do better than them). Stories provide polysemous meaning where the patient can then figure out their own “better life” scenarios, feel control over circumstances, and individual applicability. They also normalize pain and, consequently, (and very importantly) reduce the impact of the dorsal vagal break which left unregulated can cause heart problems and even death (See Chapter 6 for more). Lastly, stories often have minimally counterintuitive elements that are easier to remember than information transmitted other ways (songs have similar effects) (Norenzayan et al 2006; Norenzayan and Atran 2004; Barrett 2000, 2004; Slone et al 2007; Gonce et al 2006).<sup>338</sup>
- Introduce Music: Music likewise mediates pain through distraction, normalization, conditioned responses, and relaxation responses. Furthermore,

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<sup>338</sup> “Uses of metaphor may facilitate some form of embodied simulation of pain experiences on the part of listeners/readers, which may in turn provide the basis for an empathic response..... I suggest that different kinds of metaphorical descriptions of pain vary in terms of their potential for eliciting a response involving embodied simulation, and in terms of the nature and intensity of the simulation they may elicit. I argue that the most relevant characteristics of metaphorical descriptions of pain in this respect are their level of detail, degree of creativity and textual complexity” (Semino 2010).



polyrhythmic drumming (like that found in Asante ritual healing) can modulate heart rate and maintain healthy stress levels (eliciting endogenous morphines and lowering the risk of shock), cause group entrainment (which increases the sensation of social support), and it can cause a trance like state (which distracts, reduces pain, promote numbness, etc) (See Chapter 4 for more). Research “findings suggest that we might want to try listening as a salve for physical pain” (Slinger 2014).

- Do a Ritual: Similar to music and storytelling, the ritual process mitigates pain through action on expectations and meaning and “offers a charged constellation of expectations. Alternative medicine’s romantic vision is inhabited by benevolent and intentional forces (for example, the innate intelligence of chiropractic or the *qi* of acupuncture) that are unrestrained by the laws of normative physics. An exaggerated notion of the possible readily elicits patients’ magical anticipation (Kaptchuk 2002: 818) (See Chapter 6 for more effects of the ritual process)
- Normalize: Normalizing is one of the fastest ways to reset anticipatory pain expectations via social pressure and stop negative rumination. For example, saying things like “this happens all the time” (diminishes exaggerated thinking which can spiral out of control and makes the pain feel manageable), “I’ve seen this exact thing before” (engenders confidence in your words), and/or in the Asante childbirth case “how do you think we all come into the world” (puts social pressure to normalize the pain).
- Exude Confidence and Control: Displays of confidence and control mitigate pain because they signal that someone else can take care of you. This is one of the reasons why placebo pain analgesia is nearly impossible to self-activate and relies on others to elicit because pain and social pain warning systems are designed to get you to a safe place in order to get help.<sup>339</sup> Healthcare practitioners who you can trust to care for you provide that help and, thus, reduce pain warning systems. Also, confidence and control trigger mirror neurons in patients and they activate following response which foster patient imitation of practitioner states. This is one of the reasons why it is so powerful that many indigenous healers get their authority from having gone through similar types of pain experiences.
- Promote Patient control and self-regulation: Our pain and social pain warning systems are designed to warn us against action that will cause further damage. As such, when pain is happening to a patient without any way to manage it, the body can become immobilized so as to not cause further damage. However, when patients are actively engaged in managing the pain they can actually handle more objective pain intensity for longer and they experience it as less painful (Macknik and Martinez-Conde). Find ways to include patients in the treatment process

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<sup>339</sup> “But the question remains why the “inner pharmacy” doesn’t kick in to relieve pain when the organism is at rest and is doing what is needed to avoid further damage to the organism? Why does it so often take the intervention of a healer (or a parent in the case of young children) to relieve the pain?” (Miller, Colloca and Kaptchuk 2009:11)

(although avoid all attention to injury site) such as giving them a time consuming, simple, repetitive tactile task (i.e., beating a rock against another rock in the morse-code S.O.S. pattern (this one also helps with trance and music assets above), whittling or breaking off branches of a tree branch to use as splint, weaving palm leaves in a lattice pattern, etc.) these behaviors reduce anxiety, refocus attention (especially if the task needs), decrease negative thought patterns (which can exacerbate pain), give patients a sense of control (which sets expectation boundaries), and trigger patient's reward centers when they accomplish the task (which increases positive emotions and pain overriding biochemical hormones and increases a sense of hope).

- Increase Patient Participation: Give patients small manageable goals and ask questions that include them in the treatment plan, i.e., "How do you want to solve this?" This gives patients a sense of control (which is very important for stopping exacerbated stress, worry, and negative rumination) it also switches the brain into analytical mode and gives the patient something to think about/solve besides letting their thoughts and memories and future predictions run wild.
- Avoid Attention to Injury Site: Any attention or actions which cause the patient to focus on the injury (attention to the actual moment of injury or the injury site) will exacerbate pain. In fact, remembering can trigger similar sensations as when the trauma first happened. Asante healthcare practitioners never talked about and rarely looked at the actual wound and the never mentioned the actual moment of injury. Instead they focused on what the patient could have done differently to avoid putting themselves in that situation which distracted, normalized, drew attention off of the injury moment and site, and induced social pain through light chastisement.
- Acknowledge pain: If others do not acknowledge patient pain they might be inclined to over exaggerate their symptoms in order to feel validated and/or receive sympathy and care. This actually increases pain intensity and duration. The lack of acknowledgement is one of the key problems in chronic pain because so many patients feel like they have to prove their pain and/or their pain is dismissed by biomedical practitioners which only makes them want to prove their pain more, creating a negative cycle of pain exacerbation. However, too much focus on the pain can elicit a nocebo response and make things worse.
- Mirror Positive Hope: "We need the emotional trigger of hope for relief in order to activate internal healing mechanisms to counteract the otherwise biologically useful defense mechanisms of pain and anxiety" (Miller, Colloca and Kaptchuk 2009:11-12).
- Don't Overstate: But don't under exaggerate how painful something will be or oversell how pain relieving a treatment can be or you can lose patient trust in your verbal suggestions will have less effect on modulating expectations. Also, do not over exaggerate how painful something will be or undersell how pain relieving a treatment will be or you can trigger nocebo responses which increase pain.

- Manipulate Emotional Expectations: Positive unexpected interruptions like humor or compliments can distract, stop negative rumination, normalize, encourage, and increase feelings of emotional resilience and social support.
- Meaning Modulation: Targeting meaning, especially emotionally persuasive, symbolically imaginative, individually significant, and/or distracting, can influence the experience of pain. Wager and colleagues (2011) discovered that placebo pain responders brain “activity dropped in areas processing pain, but increased in areas involved in emotion. This suggests that, rather than blocking pain signals into the brain, the placebo is changing the interpretation of pain...In responders, ‘a lot of the action happens when people are expecting pain [ ] what makes a placebo responder is the ability to re-evaluate the meaning of pain before it happens’” (Wager et al 2011; Hamzelou 2011). Dependent on the person’s background, make appeals to God (which decreases a sense of worry and isolation and increases a sense of hope and miraculous possibility). Religion= enormous, perfect large imaginary social support!
- Culturally-Specific Mediation [Again, make parts of speech consistent in a list] : Because certain socioculturally-specific beliefs, such as a belief in being cursed by witchcraft, increase negative expectations of pain and social pain, any culturally-sanctioned methods for mediating these beliefs would in turn influence painful sensations. “Perhaps, not unreasonable to think that in forms of pathology where beliefs and expectations play a central role (e.g., the vicious circles of a panic attack or hypochondriasis) an intervention that directly targets beliefs and expectations would have great efficacy”. (Kirmayer 2011:120).
- Perceptual Modification (See Ways to Modify Perceptions in Appendix: ): “Placebo effects on pain have repeatedly been shown to be greater than those on other symptoms” (Richardson 1994; Ernst and Resch 1995:552) mostly because pain is a perceptual construct designed to motivate fitness enhancing behaviors, thus, modifying perceptions about internal and external conditions will result in modified pain and social pain warnings.
- Mitigating the Actual or Perceived Cause of the Pain: “When it’s known that the threat posed by the cause of the pain is soon to be lifted, there’s much less need to feel the pain as a precautionary defence” (Humphrey 2002, p.274)” (Miller, Colloca and Kaptchuk 2009:11-12). Similarly, much like the pain induction and cessation of pain in self-harm, stopping the cause of pain (or positive expectations of the rapid cessation of the cause of pain) can alleviate negative anticipatory pain warnings.
- Triggering Opioid Release: Pain relieving endorphins are just a conjunction of the words endogenous morphines, which means that humans have powerful evolved analgesic endocrine cocktails that alleviate pain and any actions or perceptual modulations that trigger the release of these internal health resources mitigates pain (Benedetti 2009).
- Stimulating Stress: “Some amounts of stress are good to push you just to the level of optimal alertness, behavioral and cognitive performance” (Kaufer 2013). Stress

is not always a bad thing. It is designed to help us instantaneously be ready to fight, flee, freeze, or follow depending on specific threats in our environment (See Chapter 6 for more). “In some circumstances of acute and extreme stress, such as in battle, injured people may not feel pain (Beecher 1956), likely because of endogenous opioid release (Willer and Albe-Fessard 1980); and this serves survival in the face of immediate threats to life. In this case, the signaling function of pain is overridden, owing to the stronger survival-oriented need to be free of pain” (Miller, Colloca and Kaptchuk 2009:11). In fact, without the important stress hormones of epinephrine, norepinephrine (adrenaline)<sup>340</sup> and cortisol, patients can experience shock which reduces inflammation and blood clotting and increases the likelihood of death and severe pain from the injury and “the right stress can lead to quicker recovery” (Pappas 2009). Thus, we need a certain level of stress to survive and alleviate pain from traumatic injury. Being too relaxed or comfortable can actually be detrimental. Therefore, you need to find an ideal stress balance.<sup>341</sup>

- Promote Relaxation: For example, stress is not healthy when it is over activated and/or prolonged and in these cases the body does not have the capacity to go into maintenance and repair mode. This, cases of chronic stress and pain there needs to be an emphasis on reducing stress and promoting relaxation responses. In cases of social pain, not acute physical trauma, eliciting the parasympathetic response via music, stories, rituals, meaning, social support, comforting language, etc. reduces stress, anxiety, negative emotions, and pain.
- Modify Treatment Parameters: Alter contextual, setting, and treatment parameters in order to promote trust and positive expectations in the practitioner and medical system.<sup>342</sup>

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<sup>340</sup> Adrenaline (or epinephrine) and Norepinephrine help us to immediately respond to acute pain and trauma, increased focus, energy, heart rate in order to “fight, flee, freeze or follow” and to protect your injury and get somewhere safe. They increase general arousal and make us more aware and responsive to our environment (this includes our social environment!). They shift blood flow from unimportant processes (skin, digestion, etc) toward immediate to immediate needs.....During acute trauma, optimal amounts of cortisol can be life saving! It regulates critical processes, fluid balance and blood pressure while suppressing less immediate functions (reproductive, immune, digestion, growth, skin, etc.) It can reduce pain. It increases with separation anxiety or social threats. (i.e. Asante) but is very dangerous when prolonged and exacerbated.

<sup>341</sup> “Small increases of cortisol produce positive effects like improved memory, reduced sensitivity to pain, and increased sustained energy. However, elevated cortisol levels from prolonged or chronic stress can cause side effects such as suppression of thyroid function, cognitive impairment, increased blood pressure, decreased bone density, and blood sugar imbalances. High levels of cortisol can also lower your immunity and inflammatory responses, as well as slow down the wound healing process” (Lee 2013).

<sup>342</sup> We know that elaborate procedures, such as ritual healing ceremonies, fare better than pills (Kaptchuk et.al. 2000; de Craen et.al. 2000). The more painful the treatment, the more efficacious it is (i.e. Ghanaian biomedical healthy injections). The more side effects from the treatment, the greater the placebo response. The more visible the treatment, the more efficacious it is. These treatment parameter placebo response components are so powerful that it is near impossible to test a drug in a completely placebo-free.

- Create Active Feedback Loops: Any biofeedback evidence that suggests a treatment is powerful or working will increase positive expectations and reduce pain. Often “alternative medicine treatments have unique feedback loops that are likely to facilitate, if not heighten, substantial placebo responses” (Kaptchuk 2002:820). We see these active feedback loops in many Asante indigenous ritual healing practices, i.e., animal sacrifice, drumming, chanting, healer proofs of power and authority, witch punishments, touch, divination, spirit possession, etc.
- View Pain as Normal: When pain is viewed as normal part of life it loses much of its intensity. Setting proper pain expectations as a natural part of life i.e., in childbirth or aging, is key to reducing instances of prolonged or chronic pain as seen as abnormal and/or an aberration. Pain is an “intimate feature of lived experience of individuals in the context of their local social world and historical epoch” (DelVecchio et al. 1992: 2).
- Foster Trust and Confidence: Patients who have trust and confidence in practitioners are more likely to align their expectations according to verbal suggestions of pain analgesia and adhere to short and long term pain alleviating and infection preventing treatment prescriptions Patient adherence is the “patient’s own contribution to the activation of the placebo response” (Kaptchuk 2002:818; Horowitz and Horowitz 1993; Czajkowski and Chesney 1990) and can be more effective than even active pharmacological agents (Mattocks and Horowitz 2000).
- Increase Patient Investment and Commitment: Displays of patient investment and commitment such as travel, pay, choice, and sacrifice increase patient adherence to pain treatment prescriptions and make patients more susceptible to perceptual and expectation mediation. We know that “paying out-of-pocket and other signs of commitment, such as following daily lifestyle regimens, undoubtedly marshal adherence effects” (Kaptchuk 2002:818).
- Social Pain Induction: Due to the social pain overlap theory, you can mitigate physical pain by inducing social pain. Censure, threats to social status, teasing, humiliation, and/or dominance displays can induce social pain which will take over the neural pathways previously occupied by physical pain and alleviate physical pain and if this social pain is reduced through acceptance, confidence building, social regulation, and/or restitution the experience of social pain alleviation will trigger physical pain relief as well.
- Physical pain indication: Similarly, you can mitigate social pain by inducing physical pain. Causing low-harm acute pain can alleviate social pain by overwhelming the neural pathways with acute physical pain (mitigating the social pain) and then when the cause of the physical pain is stopped, this will activate social pain relief as well. In a different manner, you can mitigate physical pain by inducing physical pain in a different area. This is what people do when they squeeze the inside of their palms to alleviate a headache. Redirecting physical pain works the same way in that when the cause of pain is offset it can trigger pain sensation reduction. Furthermore, sometimes pain induction actually causes patients to trust

and have stronger positive expectations in healers and treatments. Much like brand names, active feedback loops, effervescent qualities and repeated administration (or reprioritization) increase placebo responses, pain can signal strength, power, and potency. Among the Asante, for example there is an Akan idiom that claims, “*Ɔhare so adeyɔ ntaa nwie papa*” which means that *Medicine given readily does not often cure a disease*” (Nkansa-Kyeremateng 2000:46).

#### **4.2 Motherhood and Emotional Resilience**

Medical anthropologist Nancy Scheper-Hughes (1985, 1993) has made some pretty controversial claims based on her extensive ethnographic research with maternal and infant health practices in the *favelas* of Brazil. She posited that there is a trade-off between strong mother-infant attachment and emotional resilience. While mother-infant attachment behaviors increase infant survival rates they also weaken a mother’s emotional resilience, which is a necessary quality for survival in an environment where infant mortality rates are high and resources are scarce.

Scheper-Hughes argues against the classic model of maternal bonding by describing the Alto culture of maternal behavior as “muted and *protectively distanced*” (1985: 311, original emphasis) and “impersonal” (ibid, 311). She claims, “what is constructed is an environment in which loss is anticipated and bets are hedged. ‘Mother love’ with its attendant emotions of holding, keeping, and preserving is replaced by an estranged and guarded ‘watchful waiting’” (Ibid, 312). Describing Alto social responses to grief, she says, “Household visitors are expected to admire the sweet angel, but not to grieve. Mothers are scolded by other women if they shed tears for an infant, and few do. There do exist cases of Alto women who refuse to forget the death of a particularly favored baby, but their emotions tend to be dismissed as inappropriate or even as symptomatic of a kind of insanity” (ibid, 312). Scheper-Hughes details the dispassionate maternal grief

behavior and Alto social response to grief within a contextualized ethnographic model that takes into account a more holistic picture of Alto social, political, economic, and cultural processes and how those variables affect grief behavior and response.<sup>343</sup>

Though heavily critiqued by local mothers and anthropologists alike, Nancy Scheper-Hughes raises an important question: are cold and impersonal caregiving behaviors adaptive ways to protectively distance oneself from infants with low chances of survival and, thus, buoy up the emotional resilience needed to handle such a common loss or redistribute energy, resources and maternal care to people more likely to survive (Hrdy 1999)? Scheper-Hughes' work inspires additional questions: are cultural-specific patterns of caregiving adaptive? Do some mothers grieve less than others or in the Asante case have less compassion for their pained children? Does seeing other people suffering affect Asante practitioners in measurably different ways than it would affect someone from another culture?

Contrastingly, after witnessing many cases of acute pain in my own life in the United States (from natural childbirth to traumatic injury) where Americans reacted with much more vocal and performative suffering, I began to question do Asante patients naturally feel less pain? Are Americans weaker? Or do Asante pain behaviors and social

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<sup>343</sup> “The classical maternal bonding model focuses altogether too much attention on too few critical variables and on too brief a period in the mother-child life cycle. The model grossly underestimates the power and significance of social and cultural factors that influence and shape maternal thinking over time: the cultural meanings of sexuality, fertility, death, and survival; mother's assessment of her economic, social support, and psychological resources; family size and composition; characteristics and evaluation of the infant-its strength, beauty, viability, temperament, and ‘winsomeness.’ The bonding model has neither relevance to, nor resonance with, the experiences of the women of *O Cruzeiro* for whom the life history of attachments follows a torturous path marked by many interruptions, separations, rejections, and losses reflecting the precariousness of their own existence and survival” (Scheper-Hughes 1985: 314).

responses to pain actually reduce the sensation, intensity and/or duration of a pain experience?

#### **4.3 Why Painful Memories are the Most Poignant**

I usually start out my presentations by asking those in the room to think of their most painful and their most joyful memories. I then ask them to raise their hand if either or both of those has to do with strengthened or severed social relationships. For example, for most people, their most painful memory is connected with a threatened or broken social connection (i.e., death, abuse, heartbreak, rejection, ostracism, etc.) and their most joyful memory with a new or fortified social relationship (i.e., birth, marriage, promotion, acceptance, etc.). The reason socially-based memories are more long-lasting and poignant is that they act as motivational warnings to either continue positive social connections or to avoid repeating past mistakes by choosing different social partners, changing relationships approaches, and/or avoiding socially unacceptable behavior because of negative social repercussions.

Memory also shapes our expectation of future experiences and habituates which current emotions, appraisals, and coping efforts, as well as personality traits, are all associated with bias in recalling past emotions. Bias occurs as memories of emotional states are updated in light of subsequent experience and goals. Biased memories in turn influence future plans and emotions, and may contribute to the formation of enduring personality traits. People's memories for emotions provide highly condensed and accessible summaries of the relevance of past experiences to current goals (Levine 2002:169).



Because our memories affect the way that emotions are experienced, signified, and expressed in current situations (Campos 1994; Levine 2000), it is important in doing research on emotions to have a diachronic understanding of the significant life events of an individual. Person-centered ethnography is one method that anthropologists have used to uncover these significant events and to see how they interact with other aspects of an individual's life. I argue that this aspect of memory and emotion is directly linked with how one experiences medical encounters. Patients bring with them more than just their illness when they seek healthcare. They also bring personal history, illness narratives, significant life events, knowledge distributions, and positive and negative memories and expectations of treatment. All of these affect the doctor's ability to effect the desired change and the individual's ability to be healed. Placebo healing is directly linked to how individuals experience and recall the emotions associated with memories and expectations of medical encounters. I argue that if we can understand these processes and apply them to meet the particular emotional needs of patients, we can actually influence their reactions, expectations, memories, and attitudes toward treatment.

The effect of personal attitude in medical encounters becomes very vivid when we analyze its definition: "an attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related." Smith (1979) argues that there are three components to attitudes—cognitive, affective, and behavioral. We can relate all of these to health care settings. The cognitive component is the expectation and assumptions one holds during a thought process, which only changes when new

information is presented. The affective component is the underlying emotion which sparks a degree of intensity or evaluation. This affects when one has a positive or negative reaction, and changes depending on stimuli from the environment. The behavioral component is a predisposition toward a specific action, and is based on experiences so common that they become taken for granted. This changes only when one's cultural paradigm shifts at experiencing something unexpected. At each of these levels, outside influences have the power to alter the emotional and evaluative processes. We can, therefore, see how one's attitude is influential in determining the outcome of medical encounters (See Chapter 2).

#### **4.4 Hierarchy of Resort**

Ghana is an extremely medically pluralistic society with numerous health care options geographically and economically available to the average patient, including biomedical doctors, herbalists, Christian faith healers, chemists, pharmacists, bone setters, traditional birth attendants, Muslim Malams, and *Okomfor* or indigenous healers. In my research I discovered a pattern of Asante hierarchy of resort (Janzen 1978) in which patients typically wait for their ailment to go away on its own. If it does not, the second resort is usually self-treatment, which means that they take the advice and medication of mothers, relatives, friends and local pharmacists, herbalists, or blood tonic chemists. If the problem persists, a patient will often then go to a biomedical health center and follow the prescriptions of a doctor. Only after the problem continues despite these interventions or becomes extraordinary in some way (the ailment lasts longer, presents unclear symptoms, is coincidentally timed, or involves social or spiritual

etiologies) will patients seek out *Okomfor*. Thus, by the time patients come to Asante indigenous ritual healing ceremonies, many ailments with simple, isolated, biological explanations and specific pharmacological solutions have been weeded out. These problems are easily fixed by straightforward biomedical intervention. Furthermore, self-limiting ailments or those that would go away following the natural course of the illness are usually already on the mend by the time people seek out indigenous remedies.

Originally I attempted to directly compare Asante biomedical and indigenous disease categories and health outcomes. This methodology failed because it was impossible to juxtapose specific diagnoses, treatment plans, and outcomes. Biomedical records showed a few main diseases (malaria, typhoid, infection, hypertension, injury/accident, etc.) and specific treatment plans, whereas Asante indigenous ritual healing records listed hundreds of different ailments (ranging from waist pains, infertility and swelling to business, travel and education problems) and each patient and healer offered a treatment plan tailored to the individual case. I learned quickly that Asante indigenous ritual healing ceremonies needed to be evaluated on their own terms.

Because there is so much medical pluralism in Ghana, Asante indigenous ritual healing is rarely the first resort for patients unless the illness has certain spiritual causes or extraordinary features (See more on this in Chapter 6). Since there are so many available healthcare options (e.g., biomedical doctors, herbalists, pharmacists, Christian faith healers, Muslim malams, etc.), the very act of attending a ritual healing ceremony demonstrates a significant patient preference. There are also a large number of indigenous healers. Every village (roughly 150-1,500 people and usually 1-5 miles apart)

has an *Okomfo* and most mid-sized villages (600 + people) have several. Just getting to a particular *Okomfo* can be complicated and patients have to negotiate many different factors, from figuring out the healer's schedule to getting a taxi to very remote shrine locations. Often patients visit *Okomfor* and shrines far from their natal village or where they currently live in order to a) remain anonymous (because their current church or profession doesn't approve of indigenous medicine), b) they want an unbiased consultation outside of their home area, c) they have to meet with this particular *Okomfo* because they are part of someone else's treatment plan, or d) they don't trust their local *Okomfo*, they have tried another *Okomfo* unsuccessfully, and/or they have heard of the reputation of a particular *Okomfo* and travel to meet him/her. Like most medical encounters, before the ritual begins, patients are exhibiting many preferences which, ultimately, affect their treatment outcomes.

#### **4.5 Exceptions to the Rule**

Often sociocultural norms become so engrained that it is only when they are violated that we see the patterns. The following cases of exceptions, where adults did not exhibit the proper pain behaviors or social responses to pain, stood out so much that I analyzed them over and over for months. I asked people about them and I studied them until I realized why they were different from the usual cases I had encountered. It was in this examination that I discovered important insights that set me on a path toward the biological anthropology and evolutionary approaches to placebo studies that make up the bulk of *The Social Life of Placebos*.

Ignoring the injury, not acknowledging the pain, laughing at patients' fears and discussing mindless topics during treatment is an effective way to normalize pain, distract

patients and assure them that there is nothing out of the ordinary happening. Expressing anger, hostility and social threats for weakness is a great way to minimize shock, reinforce cultural values of safety, give patients control over their bodies, help them not to give in to self-pity and pain-exacerbating rumination, and maintain a sympathetic stress response (which actually increases adrenaline and endogenous morphines—or natural pain killers). Because we get cues of what to expect from our social environment, when pain is ignored, belittled and apathetically treated not only is our immediate perception of pain diminished, but our fear of pain and anxiety toward future pain is reduced.

In an Asante context where pain management is unavailable, empathetic responses toward pain not only increase the intensity of pain perception but they also do not provide any coping mechanisms to deal with the acute sensations. Saying *sorry* toward pain acknowledges its extraordinary nature and communicates our inability to do anything about it. The social response of saying *sorry* connotes that pain is something that has already happened to you as a passive victim, and that there is not much you can do now. Your peers feel *sorry* “regret, sympathy, pity, and sorrow” for your inevitable suffering. Saying *score*, however, communicates that pain is normal and that you can actively do something about it. “*Score, score, score*” signifies that pain is something ongoing, that you have control over, and that your social group is trying to help you confront. Your peers have confidence in your ability to *score*: “get up, stand up, wake up.”. It was when I encountered deviations from the norm of behavior that I began to understand this

difference between sorry and *sore* and the physiological logic behind Asante pain responses.

While the above cases represent socially appropriate Asante pain behavior and responses, there were a few significant social responses to pain that were anomalous or deviated from the typical cultural script that can give us more holistic insight into the Asante ethnography of pain. The final three cases came toward the end of my fieldwork and I would not have recognized them as abnormal without having previously spent extended amounts of time in healthcare clinics in Ghana. What the following incident with Thomas taught me was that Asante do not necessarily experience their own or another's acute pain differently from other people, but that they have shared and patterned ways of responding to pain that are deeply engrained and often unconscious. These response patterns make up a hearty system of coping and defense mechanisms. The second case study with Ebenezer showed me what happens when those coping mechanisms break down; when a patient is too far gone to help. The final encounter with Jamie elucidated all the tacit information about Asante pain behavior and social responses to pain that I had subconsciously internalized over the years and forced me to more fully examine the adaptive health consequences of these behaviors.

#### **4.5.1 Thomas' Car Accident Trauma**

Thomas was a worker at the local health clinic, where he did janitorial work, maintenance repairs and odd jobs. I did not know Thomas well, aside from recognizing his warm daily greeting and his status as a valued member of the clinic community. One day when I arrived I immediately sensed an ominous feeling in the hush of the clinic, the solemn faces of the staff and the quiet, serious whisperings that were at odds with the

usual jovial banter typical of the small but close workforce. I quickly learned that Thomas had been in a car accident and had a deep, foot-long cut in his upper thigh, penetrating to the bone. He was being stabilized and everyone was discussing how he would be moved to a larger facility. What struck me most about Thomas' situation was how differently he was treated than most patients who came to the clinic with acute trauma. Instead of nonchalance, there were the looks of terror on everyone's faces. The nurse's direct and harsh communication was replaced with kind expressions and soft inquiries. Instead of censure about the cause of the accident, Thomas was given compassionate greetings and physical touch. When I was brought into his room it was clear that everyone had made an effort to give him as much comfort as possible. He was in a private room, his wife was given a chair and he was attended to by all of the doctors and nurses available. It was also clear that he was in a lot of pain. Each subtle movement, from the body tremors of shock to his attempts to find a comfortable position, manifested in unconscious guttural groans and whimpers. All of his visitors showed pained expressions which were exaggerated outside of his room and poorly veiled while in his presence. No one told him to quiet his verbalizations.

The reason Thomas' injury was such an anomaly is that he was treated differently than regular patients. He was given more empathy and more compassion. This concern was overtly discussed in the courtyard, and his caregivers were visibly distraught. While he was still expected to remain silent and strong and to endure his pain, no one chastised or censured his moans. In that moment I realized that not only do Asante experience physical pain in the same way as all people (i.e. they do not have a higher pain threshold,

they are not physically stronger, and they are not genetically immune to acute pain), but they empathize with others' pain just as strongly as any person. I had been so caught up in the emotionless-didactic social response to pain I had witnessed so often in this very health clinic that I assumed it was the primary reaction to seeing someone else in pain. Watching the staff struggle with Thomas' serious wound and observing them control their distressed emotions as they entered his room illustrated to me that an Asante empathetic understanding of pain was not lacking; in fact it was quite robust and I presume more difficult to hide the closer one's relationship to the patient. My earlier judgments about the harsh and uncompassionate treatment of patients from these same nurses and doctors melted away as I saw them wrestle with Thomas' accident.

#### **4.5.2 Ebenezer's Gangrene**

Another abnormal case was that of Ebenezer, a farmer who came into the clinic with an infection after cutting the top of his foot with a machete. It was a fairly deep gash, but he explained that as it had stopped bleeding, he had not thought he needed to come into the clinic. He had wrapped it in a piece of cloth and assumed it would repair itself. After a few weeks it continued to worsen and he finally decided to come in. He did not complain about the pain, but was concerned that he did not know what to do about the swelling and was having difficulty walking. We had to take his word on the original wound because by the time the nurses unwrapped the cloth his foot was so covered in puss and gangrene that we could not even see the remnants of a gash. What we could see, as the nurses took cotton balls and wiped the gangrenous skin and putrid smelling yellow-green puss from his foot, was the tops of three of his metatarsal bones. Each swipe of the cotton ball removed another layer of skin, muscle, and tendon until I was staring at the



white bones of a living skeleton. During this process Ebenezer was remarkably resolute. He inhaled and gasped at the pain, but no sound passed his lips. His eyes were glazed and he stared at the wall in front of him, but he did not move or vocalize. He exhibited what I would label the quintessential Asante pain behavior. He was solemn and numb, aware of how serious his injury had become but surrendering to whatever the consequences might be.

The nurses were clearly disturbed by the severity of his wound and wanted to clean it out before sending him to a larger hospital. They were uncharacteristically quiet. There were a few clicks of the tongue and nearly inaudible whispers of “you should have come to us sooner,” but the care was surprisingly devoid of the types of impertinence, harshness, and chastisement that I had become accustomed to. It was a somber consultation and very different from others I had witnessed. The entire appointment was hushed and the man was given great care and even overt signals of empathy—a pat on the back, a hand on the thigh, an inquiry into how he would get to the city, help from the nurses to walk out to his family, etc. Afterwards, while gossiping with the nurses and doctor before the next patient arrived I realized that everyone thought this man was going to die. The infection had already spread up his leg, it would need to be amputated immediately, and even then the odds were against him.

Despite having never seen (or smelled) anything as horrific as Ebenezer’s foot, I was surprised by the unanimous pessimistic judgement on his fate, especially since the medical staff did not seem to communicate this during the actual consult. I went outside and watched as his family ushered him into a waiting car. The entire group was

noticeably distraught, visibly changed from the mildly concerned family I had observed in the waiting room before their appointment.<sup>344</sup> Ebenezer's fallen face seemed to convey that he had understood the deadly predictions of the clinic staff--yet how was that possible? I had been a witness to the entire encounter. I had watched Ebenezer check in and wait for his consult. I was there during the entire unveiling, cleaning and rewrapping of the foot. I had heard everything the doctor and nurses had said. They had made it clear that he needed to go to a larger hospital right away, but no one had communicated to Ebenezer or his family that this wound was lethal. So how did he seem to know?

#### **4.5.3 Jamie's *Faux pas***<sup>345</sup>

The moment when I began to make sense of why Thomas and Ebenezer's cases were different than all the others before them actually came from a realization about my own Asante enculturation. Just as I didn't fully realize in the field that I was becoming acculturated into Asante pain behaviors, I also didn't realize I was becoming immune to the original cultural clash between my own American way of seeing things and the new Asante way of seeing things, until I witnessed a novice American student "incorrectly" respond to an Asante patient's pain. It was my reaction of annoyance at her mistake that caused me to begin analyzing the difference between "sorry" and "*sore*,"— between

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<sup>344</sup> I use the term *waiting room* to convey a place where patients and families gather to wait their turn to consult with the doctor. In the health clinic, the "waiting room" is actually a series of long benches outside the main structure.

<sup>345</sup> See Resonance Methods: Emotional intelligence and/or Empathetic Understanding in *Appendix Chapter 1: 1.2 Qualitative Methods* for even more behind the scenes descriptions of this encounter. See also *Appendix: Chapter 5: 5.2 Methodological Considerations* for a discussion about how these experience challenge traditional notions of anthropological methods and the importance of acquiring emotional intelligence in cultures where we research.

empathy and the expectation of resilience—and what that means in the context of an Asante ethnography of pain.

This insight happened in 2007 when I was back in Ghana for a summer research trip, funded by leading a group of undergraduate students on a medical anthropology field study program. I oversaw the research portion of student senior thesis projects. Depending on the day and their individual topics students would accompany me on my rounds at nearby hospitals, health clinics or local shrines, *Okomfo*, herbalists, bone-setters, healers, etc. It was my job to teach a Ghana preparation course to these students for a semester before they came into the field. I prided myself on the fact that my students could speak a little Twi and that they were usually very culturally appropriate in the field. That is why I was so shocked one day to find Jamie, one of my students, sitting on the side of a patient's hospital bed hugging and comforting her during rounds at the district hospital.

I watched for a second as Jamie stroked the patient's forearm, listened empathetically to her physical complaints, and promised her that she would be okay. Nothing Jamie was doing was necessarily offensive or wrong. I had never explicitly taught her to avoid empathetic responses to pain or to distance herself from patients. All I knew was that in that moment what Jamie was doing felt overwhelmingly wrong. Everything about her gentle, compassionate, assuring behavior—from her tender voice to her comforting posture—made me feel not only extremely uncomfortable but surprisingly anxious and fearful. I knew that logically Jamie's actions were a common American

response to pain, but they felt wrong and even unethical in an Asante setting. Why did I react so strongly to Jamie's social response to pain?

The paradigm shift came when I eventually figured out that her behavior most closely resembled that of the healthcare providers at Thomas' and Ebenezer's abnormal and, ultimately, tragic clinic visits rather than any other experience I had witnessed in Asante medical encounters. Something about Jamie's actions tacitly communicated a fatal level of severity of the disease that I picked up on instantaneously. That is why I felt so uncomfortable with her behavior.

Furthermore, her actions might have increased pain sensations. "Studies show that empathy also extends to pain, just as it does to other emotions, even when the victims are...strangers" (Macknik and Martinez-Conde 2013). In much the same way, Ebenezer did not need to be told that his wound was lethal, because being treated with kindness instead of toughness, receiving sympathy instead of chastisement, and hearing ominous silence instead of distracting chatter meant that he had very little chance of survival. He did not need a lecture on how to prevent future injuries, a slap or strong word to maintain strength, or a teasing diversion, because he was probably not going to make it. In Ebenezer's case, these coping mechanisms were replaced with empathetic, hospice-like care.

In fact, in a brilliant study conducted in 2008, Lang et al. watched the coping behavior of patients who received standard care, patients who were given self-administered relaxation techniques, and a control group who received "empathetic care" by way of positive language, soft reassuring touch, immediate response to a patient's

needs, sharing one's own experiences, etc. Interestingly, patients who were given the relaxation techniques (e.g., "self-hypnotic relaxation including defined empathic attention behaviors" (Lang et al. 2008: 897) and a relaxation script) did better than all of the other groups (standard care and empathetic care) in that they reduced "pain, anxiety and medication use" (Lang et al. 2008:897). This takes us back to Herbert Benson's early treatise on the placebo response, which he coined "The Relaxation Response" (1976) and how critical perceived conditions, parasympathetic arousal and expectations are to positive health outcomes. Even more fascinating was how the empathetic care control group performed. "These patients ended up far more anxious than those who received standard care. They needed more drugs, and suffered so many complications—things like falling oxygen levels, or a dangerous spike in blood pressure—that Lang had to stop the study early" (Marchant 2016). Lang et al. concluded that the nurse's empathetic care inhibited patients' own abilities to cope and heal. "empathetic approaches without hypnosis that provide an external focus of attention and do not enhance patients' self-coping can result in more adverse effects" including increased pain, anxiety, side effects, treatment complications, and medication use (Lang et al. 2008: 897). What this study shows us is that there are measurable negative health effects to empathetic care and that Jamie's behavior may have actually inhibited natural healing and coping processes as well as potentially triggering greater pain, anxiety and other complications. It also shows us that health practitioner avoidance of empathetic care is not unique to the Asante. Yet, there are many studies on the therapeutic relationship that argue comforting language and

touch increase positive placebo responses (Lambert and Barley 2001).<sup>346</sup> More research is needed to parse apart the many cultural, psychological, social and biological elements that make comforting practitioner behaviors positive in one setting and negative in another. Similarly, more research is needed on the health outcomes of self-coping, internal focused attention, and self-regulation versus practitioner comforting, external focused attention, and reliance on others. Are people systematically good for health outcomes? Is alone time better? Or is there some mixed alternative of psychoprophylaxis-like techniques where giving patients the tools they need to cope themselves, rather than leaving them alone to figure it out *or* doing it for them, consistently produces better health outcomes?

For the purposes of this manuscript, what Jamie's actions elucidated was that I had acquired the proclivity toward an Asante social response to pain over the course of my fieldwork. The same behaviors I had once thought were an instinctual human response to suffering, now seemed bizarre and therapeutically unhelpful. It was only via extended field research in a sociocultural context that I was able to see how Asante pain behavior and social responses to pain were logical and effective. This internalization (or enculturation) of Asante behavioral pain management brought up two important questions. First, *why* pain is experienced and responded to in this particular way in the Asante context? And, second, might healthcare practitioners be exacerbating, or at worse

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<sup>346</sup> See also: Fiedler 1950; Suchman and Matthews 1988; Bachelor and Horvath 1999; Horvath 2000, 2005; Price 2008; Thompson et al. 2009; Norcross 2010).

eliciting, greater pain sensation and distress if they are unaware of these particular cultural expectations and meanings?

#### **4.6 Evolutionary Explanations**

##### **4.6.1 Pain**

Pain communicates important information critical for survival. Pain signals that something is wrong. In the case of acute physical trauma, pain reflexively signals to the body to retract from the painful stimuli, protect the affected body part and avoid that particular situation in the future. “One reason is that pain serves an important biological function, signaling a threat to the physical integrity of the organism [is because] the main function of your feeling pain is to deter you from incurring further injury, and to encourage you to hole up and rest” (Miller, Colloca and Kaptchuk 2009:11). During the major physiological transitions of life, such as puberty, pregnancy, childbirth and senescence, pain warns the body of impending changes and the need to adjust one’s typical behavior and routine to these new constraints.

Much like placebo responses, pain warning systems have a long biocultural co-evolutionary development. This means that the feedback loops of pain stimuli and pain responses are hardwired, but the actual specific psychosocial stimuli and specific physiological response are culturally-contingent, learned, and enculturated.

pain and culture [are] a greatly complex knot of bodily, psychological, and philosophical conundrums. Using evidence from neurobiology, hermeneutics, psychosomatic medicine, and ultimately epistemology, they portray the ramifying connections between peripheral pain fibers transmitting messages from sensory receptors to the central nervous system, where they are modulated by hormonal, affective, and perceptual processes—all influenced by cultural categories and social relations” (DeVecchio et al. 1992: 2).

Like other evolutionary adaptations, the pain response developed phylogenetically via a series of trade-offs. In an evolutionary context, the fitness consequences of

overreacting to pain are less severe than under-reacting to it. Weak pain signals can be detrimental to survival. People with the rare condition of congenital analgesia, where a genetic mutation causes insensitivity or indifference to pain, have reduced life expectancy (Nagasako et al. 2003). However, pain signals that are exaggerated are also maladaptive. Intense or chronic pain prevents normal physiological and psychosocial functioning and can lead to serious health consequences, much like the harmful health effects of chronic stress (see Chapter 6).

Pain is not always a bad thing; it serves to warn and protect from further harm...Therefore, if an individual is entering a situation in which it may be hurt, it can be logical to sharpen the senses relating to such danger. In its simplest form, this can be regarded as a signal detection problem...There are two possible errors: believing the situation to be safe when it is not and vice-versa. If expectations about the situation are modified, the optimal threshold for responding in a particular way will also be modified. Consequently, more false alarms (e.g., of seeming pain, which might otherwise have been put down to 'pins-and-needles') may be experienced. Placebos in the form of rituals of care-giving can moderate these signals by signaling either safe or dangerous cues depending on desired outcomes....drawing attention to a particular issue may result in more effort being applied to it. In situations where further attention is deleterious (such as suffering from stress), it is easy to see how feedback loops of self-reporting and action can result in the nocebo effect after a problem is reported to the focal individual (Humphrey 2005).

While there is always individual variation within a population, natural selection has favored a hyperactive over a hypoactive pain response. Our ancestors who overreacted to painful stimuli survived and reproduced at higher rates than our ancestors who under-reacted to painful stimuli, so that the frequency of this trait has increased in subsequent generations over time. Some researchers argue that this propensity (oversensitivity to physical pain threats) also makes people more sensitive to emotional and social threats. Research suggests that certain individuals who are more sensitive to physical pain are also more sensitive to emotional pain (Eisenberger et al. 2006). Individual responders



with “mu-opioid receptor (OPRM1) polymorphisms based on inheritance... are shown to be more sensitive to physical pain (require greater quantities of morphine to deal with postoperative pain. On self-report and fMRI studies, [some] also show greater sensitivity to social pain” (Lieberman 2013: 66). This might be a fruitful avenue for placebo studies into shared characteristics of placebo responders.

Ronald Melzack and Kenneth Casey, in their 1968 landmark study, described pain in three main dimensions: “‘sensory-discriminative’ (sense of the intensity, location, quality and duration of the pain), ‘affective-motivational’ (unpleasantness and urge to escape the unpleasantness), and ‘cognitive-evaluative’ (cognitions such as appraisal, cultural values, distraction and hypnotic suggestion)” (1968: 432). They argued that pain is activated by changes in these dimensions triggered by endogenous, psychological and environmental stimuli. All these dimensions of pain are susceptible to psychosocial manipulation and none is determined by the painful stimulus itself because “pain intensity (the sensory discriminative dimension) and unpleasantness (the affective-motivational dimension) are not simply determined by the magnitude of the painful stimulus, but ‘higher’ cognitive activities can influence perceived intensity and unpleasantness” (Melzack and Casey 1968: 432). Some such higher cognitive capacities could be the meanings associated with specific conditional cues and social interactions.

We also know that pain is made up of two components, the original sensation (involuntary, instinctual reaction to painful stimuli) and the reaction (the voluntary response to the pain such as avoidance, removal, and help-seeking) (Engel 1977). While the sensation may be instinctual, all pain reactions (facial expressions, bodily

comportment, descriptive language, etc.) are culturally learned and socially produced. It was clear in the Asante case studies above (particularly comparing children to adults) that patient and social “reactions” to pain were enculturated and that those expectations influenced the sensory-discriminative, affective-motivational and cognitive-evaluative dimensions of pain. In fact, “pain is more than the sum of these neural activities. Mental states/properties/events seem to be ineliminable aspects of pain and placebo analgesia” (Lefebvre and Bednar 2016: 200).

For the biomedical researcher, pain is the result of change in ‘material’ structures: sensory receptors, afferent neuronal relays, way stations in spinal-cord, mid-brain, or higher cortical modulating systems. The paradigm of investigation—on either the molecular or physiological level—is reductionistic. It reduces the experience of pain to etiologically ‘mechanisms’: biological processes that are measured in ‘objective,’ quantitative terms, most valid when most material. But this value formation directly eschews what is most essential to the experience of pain—namely, the relationship between neurobiological and social psychological processes...Complex processes transform painful relationships and pain feelings into chest pain and, vice versa, transform chest pain into a painful world. These ‘sociosomatic’ processes, processes that inscribe history and social relations onto the body, simply cannot be reduced to biological terminology without distorting in the most fundamental way what pain or for that matter, experience per se is about (DelVecchio et al. 1992: 9).

#### **4.6.2 Social pain**

Social pain is processed like physical pain and indicates vulnerability and the need to form connections, neutralize threats, and protect ourselves.<sup>347</sup> Belonging to the group, having access to resources, and being assured of predictable relationships of caregiving and reciprocity could be the difference between life and death for our ancestors. As the fitness consequences of prosociality increased, social adaptations like social pain

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<sup>347</sup> “There are evolutionary reasons why our brains process social pain the way they process physical pain. Pain is a sign that something is wrong. Social pain signals that we are all alone—that we are vulnerable—and need to either form new connections or rekindle old ones to protect ourselves against the many threats that are out there” (Smith 2013).

piggybacked onto existing physical pain warning systems (Pankepp et al. 1978) which motivating us against behaviors that threatened our social connections and towards those that increased these connections.

This response, far from being an accident, is actually profoundly important to our survival. Our brains evolved to experience threats to our social connections in much the same way they experience physical pain. By activating the same neural circuitry that causes us to feel physical pain, our experience of social pain helps ensure the survival of our children by helping to keep them close to their parents. The neural link between social and physical pain also ensures that staying socially connected will be a lifelong need, like food and warmth (Lieberman 2013:4-5).

This shared co-evolutionary trajectory of physical and social pain also means that physical pain is less physical than we think and social and psychological pain is more physical than we think (Lieberman 2013:45-46).

What we take as purely psychological events are more physical than we typically assume, in the sense that all psychological events are rooted in the physical processes of the brain. The serenity of meditation is the result of biochemical and neurocognitive processes occurring in the brain and body. If the joy of connecting with others did not have a physical basis in the brain, then there would be no way for a pill to shape and induce those feelings, and yet that is exactly what the drug ecstasy does. And how else can we explain that a drink that selectively depletes the brain's serotonin will render a person more sensitive to insults moments later? I don't mean to suggest that the psychological aspects are somehow done away with. I am not a reductionist. Rather, in daily life we tend to create an artificial separation between things like pain and emotion. Pain, emotion, and all that we experience are necessarily simultaneous expressions of psychological and physical processes (Lieberman 2013:46).

Pain warns us to be vigilant about our surroundings and makes us hyper-focused on our internal and external health resources and conditions in order to make optimal decisions and energetic allocations when we are vulnerable. The opposite of this pain state is physical wellbeing, in which instead of hyper-vigilance and conditional allocation, there is a homeostatic system of repair and maintenance. Social pain works the same way. It warns us to be constantly vigilant about our social position and when that is

threatened we become hyperaware of our access to resources and relationships of care so that we can best leverage these to get back into a healthy social position. Social pain warns us against threatened or severed relationships and forces us to make changes that will be beneficial. In the absence of social pain, we feel trust, protection, and safety in our communities. We continue to create and maintain social relationships in a balanced and manageable way without the threat of social dissolution, which elicits potent negative feelings in order to motivate us either to fix those threatened relationships, learn from our mistake of misplaced trust and/or avoid those people in the future. Referring back to the benefits and costs of group living described in Chapter 2, we can only “relax” and focus on other tasks (like tool making or relaxing so our body heals) when we trust that other people “have our back.” Social support, trust in others, and relationships of predictable reciprocity and care allow us to “turn off” social pain warning systems. In fact, the most common response to social loss in many species is to become more social, make more friends, and create more allies (Seyfarth 1976).

But how do you know you can trust someone? How can you be sure of reciprocity and predictable care? How do you know when you can “turn off” the social pain warning system? These questions will be discussed further, but for now what is important is that we all communicate costly, hard-to-fake signals of our trustworthiness and group commitment and we are always detecting these signals in others. This is one of the reasons why therapeutic relationships and interpersonal healing have such a powerful influence over health outcomes. Patients, especially those in vulnerable states, are on the lookout for signals of trust, authority, power, status, etc. If practitioners can display these

signals, they can “turn off” social pain warning systems and modify patient perceptions about their internal and external conditions.

Human perceptions and their concomitant physiological responses were not naturally selected for accuracy, but rather were weighted for rapid predictive best guesses over more lengthy, but more accurate, information processing. Our brains and bodies are finely tuned to predict and respond to cues in our environments (based on a long history of social learning, observation, enculturation, expectation, and conditioning). Hyperactive or ultra-sensitive pain, stress, and emotional warning systems usually do not give us accurate renderings of the actual conditions in our environment, but they keep us vigilant about our physical and social environments so that we are safe. Evolution made a huge trade off: it is better to be anticipatorily reactive to informational cues than to be judiciously reactive only once information has been proven accurate. In fact, humans are actually quite bad at accurate depictions of our surroundings and remembering things correctly (See Chapter 3). Thus, with physiological reactions, the perceived environment is as influential (or more) than the actual environment; so any contextual changes that influence patient perceptions, likewise influence physiological responses. This expectation-response shortcut is the reason why patient perceptions, expectations, learning, and social and contextual cues have so much sway over the elicitation and intensity of placebo and nocebo responses.

For example, our survival and reproduction was dependent on our ability to navigate complex social relationships; to discover who is honest, deceptive, trustworthy, loyal, a cheat, an ally, an enemy, etc. Since actions and language can be deceptive, humans need

to be particularly adept at detecting “honest” cues via micro-facial expressions (Scherer and Ekman 1982; Ekman 2003), social and emotional intelligence (Goleman 2006), and empathetic understanding. This is why practitioner bias influences single-blind RCTs so strongly even when doctors “try” not to give away their knowledge. Humans rely on largely unconscious processes to judge someone’s “real” intentions and abilities because tacit emotional or social signals are much harder to fake than language. Thus, a large part of a medical encounter is patients predictively responding to conditional cues and detecting “real” signals in less studied “ways of knowing” (i.e., sensations, empathetic resonance, emotional and social intelligence, etc.). As a result, our brains and bodies are highly susceptible to contextual and psychosocial manipulation. Changes in social and environmental cues invariably lead to changes in physiological responses and health resource allocations.<sup>348</sup>

#### **4.6.3 Pain Perceptions**

Pain and social pain are not physical organs that exist in the body. They are systems which communicate information about threats to our individual and social bodies (Scheper-Hughes and Locke 1987) and that trigger endocrine and neurobiological processes and behavioral adjustments.<sup>349</sup>

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<sup>348</sup> “Recovery effort level will often positively correlate with how good the individual perceives the world to be (e.g., probability of food supplies). In other words, if an individual believes (falsely or not) that its situation has improved, it can be expected to put more resources into fighting the disease; i.e., the placebo effect should be induced” (Trimmer et al. 2012:11)

<sup>349</sup> “In the classic view of pain perception, a stimulus to the body excites pain-sensitive sensory neurons in the body’s periphery; these neurons then transmit information in the form of electrical signals that eventually activate parts of the brain that enable us to perceive pain ... But for decades doctors have noted that a person’s mental state can also dramatically affect pain perception. Over the past few decades researchers have uncovered a circuit in the brain and spinal cord that functions as a kind of volume control for pain, adjusting the amount a person perceives depending on the circumstances: (Fields 2009).

The reality of a medical encounter and the actual proximal and distal properties of the stimuli are less important than the significance of the information (as processed via affective and emotional cues) and which response systems are activated (via perceived conditions and expectations) (Tye 2005). As Lucius Annaeus Seneca said, “we are more often frightened than hurt; and we suffer more from imagination than from reality” (Macknik and Martinez-Conde 2013). Positive health outcomes and placebo responses can be activated by modifying patient perceptions (i.e., increasing patient trust, resetting patient expectations, manipulating patient sense of social support, etc.)<sup>350</sup> as much or even more so than by changing the actual conditions of the environment. This is one of the reasons why pain managing behaviors like normalizing and distracting, which we found among the Asante, are so advantageous.<sup>351</sup>

An illusion is a perception that does not match the physical reality. Is pain, then, as with illusions, a mind construct that some people can decide to turn off...Pain varies as a function of mood, attentiveness and circumstances, lending support to

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<sup>350</sup> “Arthur ‘Bud’ Craig is a pain neuro-scientist who discovered the neural mechanisms underlying the terrifying ‘thermal grill illusion,’ in which no damage occurs, but it feels as if it does. Think of it as waterboarding wired directly into your pain system. The device consists of a grill in which every odd horizontal tube is cold (not painful but cold), and every even tube is hot (not painful but very warm). When a subject’s hand rests simultaneously on both sets of tubes (cold plus hot), excruciating pain results. This is an illusion; the hand is not damaged, and its actual temperature remains unchanged because the cold and hot tubes cancel out each other thermodynamically. The effect occurs in part because the hand’s heat-burn sensors cancel the cold-freeze sensors, creating an imbalanced and painful sensation of burning cold within the brain. But by themselves, the coldness and hotness are not painful, so the subjective perception of hurt is simply incorrect: no damage, high pain. Craig has put forward the revolutionary proposal that your brain processes pain like an emotion. If you are tackled while playing the annual family football game before Thanksgiving dinner, it can be fun. But the same tackle, out of the blue, while crossing the park on the way to your promotion review, can hurt like you-know-what: same damage, different pain” (Seneca 2013).

<sup>351</sup> In Macknik and Martinez-Conde 2013 article “Is Pain a Construct of the Mind” they argue for the benefit of illusion and distraction for pain management by explaining a study where “severe burn victims must have their healing skin pulled and prodded daily to keep it from shrinking like plastic wrap, thus maximizing their mobility. Hunter Hoffman, David Patterson and Sam Scheerer of the University of Washington developed a virtual-reality game called Snow World, in which patients in burn units who are undergoing such painful treatments are distracted as they shoot Frosty and his penguin minions with a snowball BB gun. Virtual immersion in the frozen environment reportedly works better than morphine at counteracting the pain: massive damage, low pain.”

the theory that pain is an emotion... The research indicates that people can experience pain for the wrong reasons or fail to experience it when it would be very reasonable to do so. Moreover, when pain is disconnected from the physical reality, it is an illusion, too (Macknik and Martinez-Conde 2013).

This evolutionary tradeoff (high physiological responsivity to rapid perceptual assessments as opposed to carefully evaluated activation of specific physiological mechanisms based on accurate environmental assessments) has significant consequences in our modern environments. For example, it is enormously beneficial to make rapid assessments and physiological and behavioral adjustments in the case of predation. Those who responded quickly, regardless of the actual reality of the threat being real (i.e., a lion or the wind moving a bush) probably survived and reproduced at higher rates than those that waited to find out for sure.

Furthermore, evolutionary changes unrelated to pain, such as increased frontal lobe capacity, memory,<sup>352</sup> communication, intelligence, group and social network size and cultural and emotional complexity, can exacerbate previously advantageous evolutionary adaptations like pain, stress and fear to the degree that they become disadvantageous and maladaptive. For example, many species display pain behavior as an acute, reflexive, and relatively quick experience that helps them avoid danger, protect their body and take time to heal. Only in highly social species do we begin to see pain behaviors caused or exacerbated by social interactions and extended beyond the initial trigger. But of highly social species (like insects or ungulates) not all display social pain behaviors; only those

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<sup>352</sup> Memory represents an interesting biocultural evolutionary phenomenon because studies have shown that painful memories are more poignant than non-painful, mainly in order for us to learn, remember and avoid those situations in the future. Similarly, social memories are more long-lasting than non-social memories because of the fitness consequences of sociality. See *Appendix: Chapter 4: 4.3 Why Painful Memories are the Most Poignant* for more on this discussion.



species with emotional complexity. Distress, rejection, exclusion, ostracism, and social cues that communicate low status activate pain behavior and are found in emotionally complex social species like spotted hyenas, elephants, dolphins and whales. Primates take this one step further. They experience pain and exhibit behaviors that other emotionally complex social mammals don't. This is because as well as being emotionally complex, highly social animals, primates are also extremely intelligent. The combination of these factors means that not only do primates experience both physical and social pain, but they find new ways to harm and heal themselves and can relive, worry about, intensify, and prolong those experiences, as well as provoke them in others. "If you're a gazelle, you don't have a very complex emotional life, despite being a social species. But primates are just smart enough that they can think their bodies into working differently" (Shwartz 2007). All of this increased intellectual, social and emotional complexity in conjunction with our current environments (i.e., larger social networks, increased psychosocial stress, obesogenic environments, inequality, etc.) play a major role in sickness and disease in modern societies. "Essentially, we've evolved to be smart enough to make ourselves sick" (Swartz 2007). These brain-based adaptations not only affect health in isolation (i.e. social intelligence rewards pro-social behavior and threatens antisocial behavior, triggering physiological mechanisms at instances of loneliness, rejection, ostracism, belonging and social support) but they also interact with each other (i.e., increased memory and future reasoning in conjunction with social intelligence can cause patients to re-experience past, exacerbate current and anticipate future social pain and the concomitant accompanying physiological responses).

It is no surprise, then, that humans have the most elaborate pain behaviors and social responses to pain of any species. We not only remember painful incidents, but we can actually activate the physiological sensations (i.e. unpleasant sensory or emotional experiences somatically perceived) via a memory or empathetic understanding of someone else's painful experience. We can activate the same neural pathways in the dorsal anterior cingulate cortex (dACC) of the frontal lobe that are involved in the experience of acute physical pain via expectation of pain, empathetic imagination, suggestion, conditioned responses, and unpleasant social interactions (Eisenberger and Lieberman 2005). Moreover, we can suppress pain via psychosocial behaviors (e.g., verbal suggestion) which elicit pain-relieving endogenous opioid neurotransmissions to the many parts of the brain (Zubieta et al. 2005, Price 2008).<sup>353</sup>

#### **4.7 Palliative Care and Dysevolution**

Palliative care is intended to relieve suffering, provide psychological and spiritual care, and provide support to patient and family (Gombeski et al. 1994). These actions create a sort of hyper-placebo, combining many pain-relieving, pain-managing proximate mechanisms in order to alleviate the symptoms of pain and distress. However, it is often argued that palliative care does not treat the underlying cause of the problem. This attitude toward palliative care stems from the fact that most research and programs in this area are conducted in industrialized nations where palliative care programs often deal with end of life or terminal illnesses, and where palliative solutions are often material and pharmacologically focused. This can obscure underlying disease and have potential

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<sup>353</sup> Specifically, dorsolateral prefrontal cortex, orbitofrontal cortex, anterior cingulate cortex, anterior insula, and nucleus accumbens.

addiction and other adverse side effects. “But what of the inexpensive palliative measures for those experiencing pain? I don’t have to dig very deep in my memory to pull up countless images of people I’ve witnessed in excruciating, seemingly never-ending agony....Only six percent of all palliative care services are located in Asia and Africa – the regions where the need is undoubtedly greatest” (Ruxin 2012).

I agree with Ruxin that palliative care needs to be a focus in the global south where pain management is almost non-existent, that it should not be reserved for only end-of-life care, and that the alleviation of pain, suffering, and distress is itself a valuable end goal—especially with increased trauma due to modernization, motor travel, and increased populations throughout South and Central America, Asia and Africa. Ruxin’s solution is to increase pharmacological access and promulgation of inexpensive pain relief medication throughout the developing world. However, my experiences among the Asante make me question his methods.

Social, cultural, and ritual aspects of care are already present in many indigenous ethnomedicines and are free and available to all. These resources need to be cultivated. While it would be wonderful for everyone to have access to medicinal pain management, there are reasons why it isn’t available in many parts of the world. First, pain medicine is difficult to access. Most over the counter pain relief is developed and manufactured in industrialized nations, and there is no financial incentive for pharmaceutical companies to distribute these medicines to countries that can’t afford them. Second, in many cases in the global south, pain relief is a desirable but not necessary part of the treatment of the underlying problem. Because of this lack of pain medication, many cultures have

developed robust psychosocial pain management systems. When a resource is scarce, expensive and unnecessary it will not become a stable feature in a healthcare system. Ruxin's promotion of increased access and distribution of cost-effective palliative pain medication is still a solution built upon material resources and, regardless of intentions, it will continue to benefit only the wealthiest (and most urban) people in any given environment. In a critical medical anthropology perspective, pharmacological pain relief is a privilege that only certain parts of the world experience.

Studying Asante pain behavior and social responses to pain provides an innovative addition to material based solutions. Promoting and promulgating effective psychosocial and behavioral pain management techniques could provide palliative solutions that are free, non-invasive, available to all (even the most rural communities), and independent of material conditions. I'm not suggesting the unethical or uninformed consent use of placebos for pain management, (although that is also a very common practice among the Asante, as seen in Dr. Joshua's case study in Chapter 3), but rather, understanding the processes by which cultures are *already* easing pain, stimulating endogenous morphine (or endorphins), mediating stress, and using the placebo pain analgesia via ritual means, and then trying to enhance or increase the use of these when no medicine is available or in combination with pharmacological solutions. Healthcare practitioners around the world could benefit from understanding some of these behavioral pain management techniques since they side-step the placebo ethical debate (because they don't rely on deception) and the harmful side effects of persistent pain medication (i.e., liver failure, addiction, chronic pain, etc.) are increasing every year.

What is fascinating is that even despite its inability to *cure* the underlying cause of disease and its limited focus on terminal illness, palliative care has increased in biomedicine in the last two decades and more than half of all hospitals in the United States provide palliative-care programs (Center to Advance Palliative Care 2011). One of the reasons for this increase is the need to provide a more holistic approach to health and suffering that incorporates social, psychosocial, emotional, cultural, spiritual, economic and familial aspects of sickness and healing (World Health Organization 2006). “The key to effective palliative care is to provide a safe way for the individual to address their physical and psychological distress, that is to say their *total suffering*...Usually, a palliative care patient's concerns are pain, fears about the future, loss of independence, worries about their family, and feeling like a burden [and] psychological or spiritual concerns” (Strang et al. 2004).

Asante Indigenous Ritual Healing Ceremonies are a good example of a palliative care system that addresses physical and psychological distress, total suffering, pain, fear, worry, social support, and spiritual concerns. In fact, when placed in a biocultural evolutionary framework that takes into consideration the effects of our stone-age brains and bodies in a modern world, behavioral pain management might actually get at the root causes of some of these health problems (i.e., social disconnection, exacerbated social pain warning systems, and prolonged social pain, stress, and negative emotions, etc.) and the “real” cause (the biomedically-validated cause) might actually just be a symptom of these evolutionary mismatches. Viewed this way, tried and tested sociocultural coping

mechanisms are seen as valuable and practices that once seemed bizarre become much more understandable.

Because the fitness consequences of belonging and ostracism are so great, our physiological sensitivity to our social environment seems to have evolved over hundreds of thousands of years to induce pro-social behaviors and discourage anti-social ones. However, our bodies evolve via a history of compromises and slight modifications that are phylogenetically constricted— meaning that adaptations are accumulated on previous structures that have evolved for other uses. Our social warning system piggybacked on our pain warning system; and while it does a good job at signaling unpleasant negative emotional or sensory stimuli when social ties are threatened, it also leaves us vulnerable to psychosocial manipulation. The suppression or expression of pain is based on a complex adaptive unconscious assessment of external and internal stimuli (Wall 1993). Many healthcare behaviors manipulate these external and internal stimuli in order to suppress pain. At first glance Asante pain behaviors and social responses to pain seemed antithetical to pain relief, but upon closer examination of the evolutionary and proximate mechanisms of pain these behavioral patterns demonstrate complex and effective methods of pain management in a setting where pharmacological solutions are unavailable.

## **CHAPTER 5: EMOTION**

### **5.1 Asante Indigenous Religion**

#### **5.1.1 Physical and Spiritual Duality**

One of the most important things to know about African traditional religion in general is that it is both a cosmology and a healthcare system. The balance of these two aspects has shifted throughout time, however, they cannot be separated from one another. It is important to understand that Asante religion is not an isolated component of Asante life, but, rather, is ubiquitous and pervasive. It penetrates every aspect of daily life and is an “absorbing character” (Lucas 1970: 40) of behavior and interaction. Religion is at the root of African culture. It is ubiquitous in everyday life and one of the main determining factors decision-making and explanation. “It is no exaggeration, therefore, to say that in traditional Africa, religion is life and life, religion. Africans are engaged in religion in whatever they do—whether it be farming, fishing or hunting, or simply eating, drinking or traveling. Religion gives meaning and significance to their lives, both in this world and the next. It is hence not an abstraction but a part of reality and everyday life” (Opoku 1978:1).<sup>354</sup>

African cosmologies have for their purpose the explanation of the vast diversity of everyday experience in terms of the action of a few kinds of forces. The forces in question are the personalized gods. Like atoms and molecules and waves in modern scientific theories, concepts clothed in an impersonal idiom, the gods clothed in a persona idiom in Africa are really theoretical constructs that stand for, or introduce, the constraints of order and regularity. The African theoretical idiom is in a personalized mode because for Africans social relations are the main source of concern, and of their sense of order, while the world of nature is alien and beyond their control. The modern Western Scientific idiom is in an impersonal mode because the reverse is true—nature and its workings are better understood, and they provide the idiom of causation even with regard to social

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<sup>354</sup> Similar perspectives have been shared about other African cultures, such as Jomo Kenyatta (1965) in “Facing Mount Kenya.”

relations, for these are less understood and less predictable (Tambiah 1980: 90).

There are many aspects of similarity across African traditional religions, but each culture has unique features. The cosmology is complex, but it is made up of some basic tenets.

First, there is no beginning, no founding father or mother (Awolalu 1979:27; Opoku 1978: 9). This is a religion about the order and reality of the world, in which “the spiritual is as much a part of reality as the material, and there is a complementary relationship between the two” (Opoku 1978:8). Chinua Achebe called this concept the “notion of duality” (Achebe 1975). For the Asante, duality extends from the social world into the biological in that man is “made up of body and spirit, but by far the greater part of man is made up of the spirit” (Opoku 1978:9) Sarpong (1974) calls this duality of blood and spirit *Sumsumyare*.

This key tenant of Asante indigenous belief impacts their understanding of sickness and healing. Basically, the earth and everything on it is made up of both physical and spiritual matter. For example, the afterlife is located on earth, but beyond man’s ability to recognize it. After death, the spiritual realm continues with relationships, desires, obligations, etc. Thus, there are two great dramas taking place in every situation: the physical reality and the spiritual interactions taking place behind the scenes. Similarly, everyone’s body is made up of physical and spiritual matter that interact with each other. If the occult eats or curses a spiritual brain or body, the physical body manifests these problems and will get sick and even die if not treated. Therefore, physical manifestations can have spiritual etiologies and vice versa. However, not all physical ailments have



spiritual components. Most people go to biomedical doctors for physical problems and *Okomfor* for spiritual ones because biomedical doctors cannot see or heal spiritual sickness, whereas *Okomfor* are specially trained. Yet, when a case is extraordinary, e.g., it lasts longer or is more extreme than normal, people will go to an *Okomfor* for a physical ailment because, since it wasn't treated with physical medicine, it is believed to have a spiritual cause and only *Okomfor* can treat spiritual illnesses (See *Hierarchy of Resort* in Appendix | Chapter 5: *Emotion* for more). Extraordinary ailments include any regular sickness or problem that isn't cured by regular biomedicine, coincides with family drama or social accusations, lasts unusually long, doesn't follow the traditional course of the disease, and/or exhibits any strange features.<sup>355</sup>

Any physical ailment that is extraordinary in form or lasts an extraordinary amount of time is considered spiritually affected. For example, if an Asante person fell sick unexpectedly, or if an infection or malaria lasted an extraordinary amount of time, he or she would not attribute the illness to any type of biomedical problem, but would conclude that it had a spiritual cause, i.e. a curse from a relative, witches, or a punishment from the gods for misconduct (Twumasi 1972). To the Asante, even extraordinary financial problems— i.e. bad luck in business— often have spiritual causes (Bannerman-Richter 1982). Because of this belief, the Asante will often turn to the *abosom* and the *Okomfor*, rather than a psychologist or medical doctor, for solutions to their problems (Twumasi 1975). Healing then becomes a solution to the spiritual root of the problem, not just the

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<sup>355</sup> This is also true for women who show any sign of extraordinary birth patterns, i.e. twins, miscarriages, unusual male-female ratio, childbirth abnormalities, child physical and mental deformities, etc.

physical manifestation, something only an *Okomfor* can uncover. For example, one patient I interviewed said the following:

I get this problem every year. My hand swells up to twice its normal size. At first I just thought it was an infection from a cut or something, but then I got scared when I realized it happens every year on the same date. This date is important because it is when I decided with my girlfriend for her to get an abortion. I knew that it was wrong, but I did it anyway. The gods do not like this and ever since then they have punished me on this day. At first I tried to go to [local hospital] to get it fixed, but it continued to swell until my entire arm was swollen and they said they might have to amputate. Then I realized I needed to go to an *Okomfor*. I had heard about [local *Okomfor*] from some of my friends and so I went to him last year and he fixed me and they didn't have to cut off my arm. See my swollen hand? I have come back to him again this year.<sup>356</sup>

Photo 5.10



5.10: Annual Swollen Hand

As mentioned in the above quote, *Abosom* can curse people for breaking taboos, sinning, and not fulfilling their familial and shrine obligations. There are also occult powers equally as powerful that impact the daily lives of most Asante. While the rates of witchcraft accusation, legal trials, and killings is drastically lower than in previous generations, the reality of witches and occult powers is, nevertheless, ubiquitous today. In over a decade of conducting research in Ghana I have never had one person argue that

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<sup>356</sup> Interview with patient on November 29, 2008

witchcraft isn't real. Modern religions have changed the average person's relationship to witches and witchcraft. Most people say they are a devoted follower of *x* religion and do not attend shrine, but not because they don't believe in it, quite the contrary, because it is too powerful and dangerous. The only power capable of healing or protecting one from the occult is that of the *Abosom* as mediated by the *Ɔkomfor*. Many of the cases at shrines are of this nature.

In Ghana there is widespread medical and religious pluralism. What this means is that people attend and negotiate between many different healthcare and religious options simultaneously. For example, a patient can go to: a pharmacy, a local district biomedical hospital, a large government run hospital in the city, a privately operated clinic, an indigenous shrine, a Muslim malam, a Christian faith healer, a local herbalist, a bonesetter, a tonic specialist, etc. Patients can use any form of medicine they want and often try several simultaneously. This is similar with religion. One informant said, "Why do you choose only Jesus Christ or Allah or *Onyame*? When I learned of Christ, I thought, 'Yes, I believe.' Why not have more gods on my side?"<sup>357</sup> Thus, as the perceived boundaries around religions and medical institutions are very flexible among the Asante, so is the boundary between health and religion.<sup>358</sup> Because your body is inextricably connected to your spirit it is impossible to separate health and religion. Thus, Asante indigenous ritual healing ceremonies are a form of both religion and healthcare.

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<sup>357</sup> Interview with Mr. Boa

<sup>358</sup> The [African Religious Health Assets Program \(ARHAP\)](#) in South Africa studies this pan-African phenomenon—the idea that health and religion are not two separate things. They advocate that there are health-promoting aspects of African indigenous ritual and religion that can (and should) be used as health assets.

### 5.1.2 Order of God and Man

This physical-spiritual duality extends beyond the body. In Asanteland, the social order in the spiritual realm is similar to that of the physical realm. Much like one's community, spiritual beings have feelings, personalities, and desires. They must be respected, honored, and even gifted with valuable things or they might cause you harm. This organization begins with the Creator God, *Onyame*, who is omnipotent, omniscient, and created all things (Bannerman-Richter 1982). After the creation, *Onyame* often visited the people of earth. One day he was offended when climbing down the rope that separated heaven and earth, when a woman accidentally hit him with a fu-fu pounder. He said that if the people didn't look forward to his coming, then he would no longer come. Then he cut the rope that separated these worlds has no direct contact with the world and humans (Rattray 1923).

Instead, a pantheon of lesser gods act as intermediaries between *Onyame* and earth. These gods, known as *Abosom*, are smaller deities, each with a unique personality, much the same as humans. Some are strong and some are weak. Some speak English and others only Twi. There are female *Abosom*, funny *Abosom*, violent *Abosom*, and elderly *Abosom*. *Abosom* deal with all happenings in spiritual realm (Rattray 1923). *Abosom* are connected to a specific location or object are usually associated with a physical place or an, such as a body of water or a ritual talisman. *Okomfor* build their shrines close to where *Abosom* are known to live (Bannerman-Richter 1982), and objects known to house *Abosom* are protectively hidden at shrines and consulted regularly. It is important to note

that it is the *Abosom*, not the *Ɔkomfor* that has power. The *Ɔkomfor* is just the medium through which the *Abosom* communicate.

Ancestors and occult powers also live in the same plane of the spirit world as *Abosom*. Ancestors are able to send cursings or blessings to the people on earth. Cursings come from ancestors if people are not fulfilling their obligations or maintaining the proper filial piety. Blessings and protection from evil spirits can be asked of the ancestors through an *Ɔkomfor*.

*Ɔkomfor* are intermediary tools whose mystical connection to the spiritual and supernatural world allow them access to the power of unearthly spirits. There are many different ways to become an *Ɔkomfor*. Some receive a revelation or a divine calling. Others are abducted by the *mmoetia* and taught the art of trance in the forest. Some *Ɔkomfor* receive the calling as a gift from a recently passed *Ɔkomfor* ancestor because they showed some early predisposition to possession. Sometimes, people are even chosen to become *Ɔkomfor* against their will.<sup>359</sup> While the main beliefs and structure remain the same, *Ɔkomfor* have different practices and rituals in their healing ceremonies because the *Abosom* varies at each shrine and are vastly different.

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<sup>359</sup> *Ɔkomfo* Kojo was a young college student who wanted to become a business man. He did not want to move back to the family village and become an *Ɔkomfo*. However, on his uncle's death bed, he pronounced that Kojo would be his successor. People in the village tried to warn and tell Kojo about this revelation, but he refused to believe it, move home, or learn about occupation. Soon after his adamant refusal, he got very sick. No biomedical or herbal remedies could cure him and he was unable to attend school. He had to move back home because he couldn't work or attend classes. Even despite his sickness, Kojo refused to be an *Ɔkomfo*. Soon after this, his father woke up one morning and was blind. He couldn't see anything. The family took him to every kind of doctor they could find and no one could figure out why he couldn't see. Eventually, Kojo realized that it was his fault and humbly accepted his calling. Shortly thereafter his father's eyesight improved. I met both Kojo and his father at their village shrine and they as well as the village shrine workers and family members confirmed this story.

There are also spirit beings who have their own concerns but will act to help or harm mankind at times, such as *Dzemawon*,<sup>360</sup> *mmoetia*,<sup>361</sup> ghost spirits,<sup>362</sup> *Abiku*,<sup>363</sup> *sasabonsam*,<sup>364</sup> and witch spirits.<sup>365</sup> In all my time in Ghana working with hundreds of *Okomfor* I only ever heard about witches and *mmoetia*. The concept and practices of *Abiku* were mentioned, but not by name.

Next, there are people who are causative agents of good and harm (i.e. traditional healers or witches), those who can harness the mystical powers of sorcery, witchcraft, and magic. Last, there are natural objects—such as trees, rocks, talismans, charms, etc.—which can be protective or harmful. All of these aspects of the social organization of the spirit world are treated with reverence and caution because they can inflict punishments or disperse blessings to those in the material world (Adgebola 1998; Awolalu 1979; Opoku 1978; Quarcoopome 1987).

In summary, the order of God(s) and man is hierarchical in nature and has many different participants. The omnipotent but impersonal God, *Onyame*, created and

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<sup>360</sup> ***Dzemawon*:** A Ga word for an immaterial being able to take on many forms. These are generally good.

<sup>361</sup> ***Mmoetia*:** An Akan word for invisible forest dwarfs who reveal themselves to special people. They are mischievous, but have been known to help hunters in trouble and teach traditional healers curative herbs. Their most interesting trait is that their feet are backwards. *Okomfor* and shrine workers leave out tables of food and gifts at the shrine for *mmoetia*.

<sup>362</sup> **Ghost Spirits:** Those who die a bad death and wander aimlessly on earth bothering people. The fear of ghost spirits is one of the reasons why funerals in West African are so elaborate. If you don't have or offer a satisfactory funeral, you could become or be haunted by a ghost spirit.

<sup>363</sup> ***Abiku*:** A Yoruba word for born-to-die spirits. These spirits inhabit the bodies of small children and desire to return to the spiritual realm. Most early deaths are attributed to *abiku* spirits and there are some protective rituals and sacrifices which can be made to convince *abiku* spirits to stay living.

<sup>364</sup> ***Sasabonsam*:** An Akan word for wild and hairy forest creatures who are in league with witches and sorcerers and seek to cause harm to others. Many anthropologists have equated *sasabonsam* with the Judeo-Christian devil.

<sup>365</sup> **Witch spirits:** Possess living humans, usually old women, in order to cause destruction and sorrow.

oversees the earth and all its inhabitants, but does not deal with humans directly. He communicates to *Abosom*, or lesser gods, who oversee particular locations. *Abosom* have unique personalities, much as in the Greek pantheon, and they also have power, albeit less than *Onyame* and greater than occult practitioners. The *Abosom* can communicate directly to *Ɔkomfor* through spirit possession and they do so regularly. *Ɔkomfor* are intermediaries between both the gods and man, as well as between the occult and man. They are chosen many different ways and are physically at the mercy of the *Abosom*, e.g., if they disobey they can get sick and/or die. There are many spiritual guides who help the *Ɔkomfor* and ancestors who have died that require filial piety from the living, all of whom live in the spirit world and exist in a society much like the physical one.

### **5.1.3 Asante Indigenous Ritual Healing Ceremonies**

Asante indigenous ritual healing ceremonies can be broken down into four major stages: preparation, disassociation, divination, and reconciliation. At the beginning of this chapter there was a long description of a specific ritual healing ceremony at the Atirimkyere shrine. Below is a brief synopsis of the shared patterns across Asante shrines for a typical indigenous ritual healing ceremony.

The *Ɔkomfor* usually prepares many days ahead in terms of his/her eating, sleeping, and bathing rituals. On the day of the ritual, the shrine workers and musicians gather at the shrine and make preparations for the ceremony. Patients gather and sit patiently. Ceremonies do not start at exact times, but whenever the gods decide to show up. The musicians begin polyrhythmic drumming and the chorus begins chanting. This can last

anywhere from thirty minutes to three hours. The healer is dressed in a ritual gown and sits and waits to be possessed by the gods.

Once he/she is possessed they are led by the shrine workers into an enclosed part of the shrine and outfitted in ritual garments depending on which god is possessing him/her. They emerge from the shrine and usually spent fifteen to thirty minutes dancing, walking around the shrine, and/or displaying the proof of their spirit possession. After this they sit in the shrine or consultation room and see patients one by one. The patients come in and the healer begins the process of ritual divination in order to discover the problem plaguing the patient. This divination can take many different forms: Kola nuts, cowrie shells, broken eggs, sacrificed chickens, etc. Because many *Abosom* don't speak Twi, these divination objects are the mode of communication. The patient talks about their problem and the healer drops an object (or sacrifices an animal). There is a lot of discussion back and forth and then the *Ɔkomfor* finds meaning from the way that the animal or object lands. These "ways of knowing" often open up meaning and possibilities that neither the healer or the patient originally thought (Peek 1991). After this, the *Abosom* leaves and shrine workers discuss the outcome with the patient and healer and together they come up with the treatment or solution for reconciliation. Most of the treatments are elaborate in time, resources, and process. After this, the patient either pays the *Ɔkomfor* or promises to pay when the problem has been solved (this is the most common approach) with the knowledge that failure to do so will bring a serious curse.

#### **5.1.4 Witchcraft**

While numbers of contemporary Asante remain highly reluctant to discuss the matter (an evasive silence which is of itself significant),



no one who has worked for any length of time in Kumase or in the villages of metropolitan Asante can fail to be struck by the conclusion, insistent and pervasive, that the Asante inhabit a cognitive universe saturated with apprehensions respecting witchcraft (McCaskie 1981:126).

This statement is as true today as it was when it was uttered by McCaskie over three decades ago. Witchcraft is ubiquitous. You cannot go a single day without witnessing an act of witchcraft. For example, everywhere you look there are purposely unfinished houses or children marked so they won't make anyone envious. Almost every day, I came across piles of ceremonial talismans marking a path or a house. Witchcraft is a pervasive influence in daily Asante life and its power is always considered malevolent. It has regular contact with civilians and can be used by specific humans. Witchcraft cursings usually stem from jealousy, envy, and maliciousness. Witches are given their power through other witches and sometimes hide the power in actual physical forms that can be given or taken materially. Witches are able to cause spiritual harm to people they curse (Bannerman-Richter 1982). This harm will sometimes manifest itself in a physical symptom or ailment. *Okomfor* are the only people who can meddle as intermediaries between the physical and the spiritual world and the only practitioners who are strong enough to protect against and/or cure someone from these spiritual illnesses.

Often witches who confess their crimes are "cured" (e.g., via long and often tortuous methods), however, it is those who refuse to confess who run the risk of the death penalty. Witchcraft is something believed to be curable, reversible, and defensible. It is only those witches who don't confess who create real panic because their curses can't be fixed and the cursed can't be healed. Thus, the importance of confession and proper ritual

cleansing. It is when people don't admit their witchcraft that witches, even today, are killed, locked up, and/or taken to a witch-jail.

In fact, in Ghana there are records of institutionalized witchcraft murders up until Independence and some claim much later. Early Christian missionaries denounced many indigenous religious and healing practices. They often taught that witches and witchcraft did not exist and that only Jesus Christ had the power to heal or save souls. Despite these protestations, most parishioners continued to attend indigenous ritual healing ceremonies, arguing that if Christian churches do not believe in witchcraft, how can they protect them from it? Because many parts of Africa are religiously pluralistic, (i.e., you can believe in Allah, God, Jesus Christ, Joseph Smith, *Onyame*, and lesser gods with no contradictions or mutual exclusivity), many people adhere to multiple religions at the same time. Thus, many people have no problem going to Christian religious ceremonies on Sundays and fetish priests on Wednesdays. "Why not have Jesus, Onyame, and Allah?" argued my friend Nibo with a big smile, "Who wouldn't want more help?"

Over time, missionaries grew weary of trying to combat indigenous religious adherence. Witchcraft was such an integral part of people's daily lives that throughout Africa, early missionaries often had a difficult time retaining members or getting people to let go of their "traditions." Slowly, missionaries began to acknowledge that witchcraft, sorcery, and fetish priests did exist but subverted that power by arguing that these practices worked through the power of the devil. Christianity was, therefore, the only source of "good" power and could protect people from these "evil" practices. This concept has held its ground for a long time and many of the newer religions have built

upon the historical precedents of early Christian missionaries' claims that indigenous religions and ritual healing ceremonies are associated with "evil."

It was only when Christian churches started equating witchcraft with Satan and satanic powers, it seems, that practitioners could see how their Christian churches could defend, protect, and help them against these powers through the power of Jesus Christ (although traditional means are still sought in extraordinary cases). Today (and in my location), the main difference when it comes to dealing with witchcraft is that Christian Faith healers utilize the power of prayer and Jesus Christ to protect and cure witchcraft, whereas traditional healers use indigenous gods, spirit possession, and the ritual process (sometimes the boundaries aren't so distinguishable). There are a few Christian churches that neglect "witchcraft" as a reality and do not provide means to defend or protect against it and many of their practitioners utilize traditional healers when the need arises. This is one of the reasons that religious pluralism is so common.

The enabling power of witchcraft in many cultures is the malevolent feeling of jealousy, envy, or hatred. When a child is accused of causing a family or village misfortune they are asked if they had any negative feelings toward specific people and if they engaged in any witchcraft behaviors like cursing a specific person or object. Children are socialized from a young age that negative feelings and statements can cause negative results and the line between witch, witchcraft, and coincidence becomes very

gray.<sup>366</sup> I have seen kids as young as 10 years old writing signed confessions of their witchcraft.

This notion is not new. E. E. Evans-Pritchard explained nearly a century ago that “The notion of witchcraft explains unfortunate events” (E. E. Evans-Pritchard 2011). Notwithstanding modernity and in opposition to secular scholars who predicted witchcraft would be outgrown, there is no sign of this belief’s lessening in West Africa. In fact, to call it a “belief” is itself inaccurate because, I learned from my own experience, no one “believes in” or “disbelieves in” witchcraft. It just is. Its existence is independent of your belief. So I was told many times by healers when I attempted to link belief or expectation with strength of the ritual’s effect, as we do in placebo studies (See Tambiah’s description of the impossibility of disbelief in the Appendix). Trevor-Roper (1969) also talks of the impossibility of unbelief in a cultural context of witchcraft and relates it to the witchcraze in the 17<sup>th</sup> century. He argued that there were two main things to consider:

The first is that the witch beliefs...have to be placed in their general context and this requires our seeing them as an integral part of the whole

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<sup>366</sup> “The African does not account for the existence of things or even the actions of things through witchcraft or by mystical causation. What he explains by witchcraft are the particular conditions in a chain of causation which relate an individual to natural happenings in such a way that he sustains injury...It is the particular and changeable conditions of an event and not the general and universal conditions that witchcraft explains. Fire is hot, but it is not hot owing to witchcraft, for that is its nature. It is a universal quality of fire to burn. But it is not a universal quality of fire to burn *me*. This may never happen, or once in a lifetime, and then only if you have been bewitched...The answer is simple: only witchcraft could have brought these vastly unrelated happenings together in time and place....The agnostic would explain the incidence away by appealing to coincidence. For him the whole thing happened by chance. The Christian, at a loss to find a good explanation would say that God is wise and knows what He is doing. In His goodness He has allowed this to happen. The African, unable to reconcile this with the goodness of God, and not being satisfied with the vague answer that the agnostic gives because it is in fact no answer, attributes it to an agent who is by nature evil: *The Witch*. Therefore, it appears that so long as the Whys of happenings are not adequately found, belief in witchcraft and magic will persist for ages in Ghana.” (Sarpong:50; original emphasis).

cosmology of the time and as part of deep-seated social forms, rooted in permanent social attitudes. Hence it is unsound to detach the witchcraft beliefs from their total embedding, and to ask how these beliefs could have been taken to be true given their manifest absurdities as seen by the ‘rational’ standards of today....It is misguided to regard the ‘reason’ and ‘logic’ of today as a self-contained, independent system of permanent validity....We recognize that even rationalism is relative...that it operates within a general philosophic context, and that it cannot properly be detached from this context (Trevor-Roper 1969).

#### **5.1.4.1 Lived Experience of Witchcraft**

On a daily basis, I witnessed my informants, case after case, participate in witchcraft-based behavioral adjustment, decision making, and rumination. The constant vigilance needed to look over your shoulder, watch your back, and monitor your words to prevent being cursed produces a very pervasive culture of fear. This culture of fear is tacitly inculcated in children as soon as they are born. Mothers wipe dirt along their newborn’s forehead so that no one will be jealous and curse them or kidnap them back to the spirit world. Songs, proverbs, stories, children’s games and Asante legends are inundated with messages about being wary of others. According to the World Values Survey<sup>367</sup> Ghanaians are a low trust society where there is an ever-present fear that people cannot be trusted and constant vigilance is mandatory. I was told many times that students are taught to avoid the highest grade, new houses are left partially unfinished in the front where everyone can see, and family members hide their possessions from one another, in order to prevent witchcraft cursings. These low trust/high fear expectations are a constant feature of everyday life. They don’t disappear with close family or friends. As my teenage neighbor Priscilla would often say, “those who know you most will hurt

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<sup>367</sup> <http://www.worldvaluessurvey.org/wvs.jsp>

you worst.”<sup>368</sup> In fact, fear of those closest to you is magnified because of another omnipresent feature of Asante culture: reciprocity and mutual aid. We will discuss this concept of hospitality and hostility in the next chapter on stress. For now, it is important to note that many culturally constricted behaviors and emotions are wrapped up with accusation and the experience of witchcraft (namely, a culture of fear, the notion that envy or jealousy produces harmful results, mutual aid and familial obligation, reciprocity, and a cycle of open hospitality and hidden hostility).

One of the great contradictions of the Asante worldview is often the same things that alleviate negative emotions and stress also cause it! You can always go to any family member and ask for housing, food, and money. However, this same openness means that any relative can come to you and ask for part of anything that you have. A common idiom argues that *Papa so akatua ba hiada*: Kindness is like a loan, not a gift. Often people seen as successful become the biggest target of ridicule, envy, jealousy, gossip, and witchcraft.

Dr. Adjima, a professor at the University of Ghana, would often tell me that the crab-effect was the biggest problem in Ghana. “Fear of witchcraft is the one thing keeping Ghana down. People always want the second highest grade, the second largest house, to be the second richest man. No one likes to be on top or people will be jealous or envious. This is why we never succeed.” Dr. Adjima explained that people are constantly trying to succeed while also avoiding succeeding too much.

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<sup>368</sup> This is a sentiment common in many cultures and explained well in Lindholm’s (1982) “Generosity and Jealousy: The Swat Pukhtun of Northern Pakistan” and LeVine’s (1962) “Witchcraft and Co-Wife Proximity in Southwestern Kenya.”

Confession and public witchcraft curing are so important because witchcraft and the punishments and harm caused by malevolent or occult forces can only be stopped when the perpetrator is exposed and confesses. Ghana has a long history of witch killing and as government stops these practices people feel they have no protection from the very real threats surrounding them. Asante indigenous ritual healing ceremonies provide a way to deal with these psychosocial crimes and reconciliations. *Ɔkomfor* are able to discover a variety of cases: holding back money, not fulfilling social contracts, lying, cheating, stealing, cursing, and breaking social taboos. They protect people from being cursed, expose social threats and punish witchcraft. They help patients succeed in business, education and travel while limiting social repercussions. Asante indigenous ritual healing ceremonies are able to mediate community-based problems in a way that religions, biomedical practices and governmental systems are not.

This becomes the cultural emotion schema or underlying culturally constructed emotional structure of the Asante where there is a constant conflict between individual power and success and social obligations. Too much of one and you take away from the other. Show too much wealth, higher expectation, greater chance of getting cursed. But have to show enough to increase status and prove you are fulfilling your familial obligations. It is a perpetual cycle of tension, envy and frustration.

## **5.2 Symbolic Versus Corporeal**

The fundamental difference between George's question "why would you fear a beating when your life is at stake?" and my own "how can you fear something so much that your life is at stake" was that, for me, the ritual of witchcraft curing was a culturally

constituted defense mechanism (Spiro 1987) not an actual life-or-death reality. This distinction is a common incommensurability between academic and emic perspectives and a major critique to representational theory where there is “the tendency to interpret ritual in terms of what it ‘symbolizes’ rather than what it actually does” (Sax et.al 2010:6). I was “trying to find out ritual’s hidden logic, its principles of efficacy, the things that it *really* represents—which must by definition be other than those related to us by the natives” (Sax et.al. 2010: 6-7, *original emphasis*).

Unni Wikan (1990) expressed a similar concern in her ethnography on Bali, *Managing Turbulent Hearts*. She argued “that the theatrical model in which much recent anthropological discourse casts Balinese is fundamentally misleading. It eliminates the feeling-thinking agent and miscasts people’s deeply compelling concerns” (1990: xx).<sup>369</sup> Similarly, Roy Rappaport (1999) argued that the focus on “belief” and cognitive models neglects the social commitments and bonds formed and produced by the ritual process itself.<sup>370</sup> Where Wikan is concerned with the emotional relevance of individual actors, and Rappaport focuses on the social attachment ritual produces, Talal Asad highlights the

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<sup>369</sup> “Suppose I have discovered that black magic is of compelling concern to Balinese: how best to convey it? Suppose too that they have a variety of forms and techniques: how best to render the information? It will depend, of course, on what I see as my task. Let's presume it is to “bear witness to the variety of ways of being human, ...to bear the burdens of one's observations” (Delaney 1988:293). In this context my task was to present an emotionally inclusive picture of one aspect of a ritual healing ceremony” (Wikan 1992: 475).

<sup>370</sup> “Rappaport, like Durkheim, understands ritual lying at the root of all social connection. It is through ritual, Rappaport argues, that the bases of commitment and trust are forged. Although he does not mention it here, this reverses the preoccupation of earlier thinkers with the role of belief, as though it happened prior to action. For Rappaport, the act of performing ritual both brings into being moral states of affairs and entails commitment to their terms and to the order of which the ritual forms a part. To engage in a marriage ceremony when one is eligible to do so is to get married and become obligated to live by its conditions—*whatever one’s personal feelings on the matter*. Whether or not the parties intend to keep their commitments, the point about ritual is that it produces [the commitments]” (Rappaport quoted in Lambeck 2002:446, *original emphasis*).



enculturation process in the practice of ritual itself that “establishes powerful, pervasive and long-lasting” (Geertz 1993:90) dispositions in participants. He argues, comparing notions of ritual in medieval Christianity with contemporary ritual theory, that “the sacraments are not the representations of cultural metaphors, they are parts of a Christian program for creating in its performers, by means of regulated practice, the ‘mental and moral dispositions’ appropriate to Christians....[But] learning to develop moral capabilities is not the same thing as learning to invent representations” (Asad 1993:78-79).

Not one of my informants had any interest in the minutiae of the ritual healing ceremony themselves. The healers, shrine workers, and patients I interviewed on a daily basis were kind and patient with my detailed questions about the color of the garments, the use of talcum powder, the rhythm of the drums, etc. However, my insistence on understanding the particulars of each action and symbol and meaning was met with tempered annoyance. Over and over my informants would rush through the explanation of a talisman or description of a sacrifice in order to get back to what was truly important—the relationships and consequences of those relationships. “That is not important,” was a common answer when I focused instead on the ritual structure. “That is just the way it is” was another attempt to move on to the more important things. Obviously much of culture is intrinsic, hard to verbalize, taken for granted, doxa, but my informants did not lack conscientiousness. I could access very elaborate analyses detailing the ritual process. Rather, they could not understand why I was interested in the ritual ceremony when the most fascinating thing about the ritual experience was the

people right in front of me. “Don’t you see?” said one shrine worker when I asked one too many questions about spirit possession. “She lied to her husband, her sister-in-laws cursed her, and he tried to deceive the gods!” These were the important things I should be interested in. The ritual and symbolic meaning were merely the space in which the real drama of life took place. It was as if they were asking, why would you ask about the architecture of a building to get to know its inhabitants when you could step into the homes and relationships of the people inside?<sup>371</sup>

I was so concerned with the ritual process, the actions, the symbols, the sequence of signals and their enouncements (Foucault 1972), that I did not take seriously the embodied expressions of fear and rituals of alleviation. I did not give enough credit to the impact of culturally-specific emotions and methods of alleviation on the processes of sickness and healing. Despite “the fact (noted by many ritual theorists) that rituals, with their emphasis on sensory experience (prescribed bodily postures, music, dance, incense, food, etc.), work primarily on the body and not exclusively by cognitive means” (Sax et.al. 2010:8), in my objective observations, the color of the robe worn during spirit possession and the patient’s statement of witchcraft accusation were equivalent pieces of information. Structured this way and without emotional and social relevance, my understanding lacked the corporeal embodiment of those emotions and the degrees of intensity (or banality) that parallels lived experience.

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<sup>371</sup> “Mainline anthropologists have studiously ignored the central matter of this kind of information—central in the people’s own view—and only used the material as if it were metaphor or symbol, not reality, commenting that such and such “metaphor” is congruent with the function, structure, or psychological mind set of the society. Clearly, this is a laudable endeavor as far as it goes. But the neglect of the central material savors of our old *bête noire*, intellectual imperialism” (Turner 1997).

Furthermore, unlike most stories, where the end follows as a logical conclusion to the premise, the reality of this story was uncertainty.<sup>372</sup> None of us knew if the girls would be cured, if Beatrice would get better, if Kwame could combat the occult powers, if their family would take them back. Ultimately, Beatrice recovered and Eunice and Mercy were welcomed back home. In the end, it was a typical story, but telling this story without explaining the social and emotional exchanges that took place during the ceremony would have neglected the inherent uncertainty and emotional significance of this encounter.

Over time, I understood better what it would have been like for Eunice and Mercy to be so jealous of someone that they would curse them, to be so overcome with guilt that they were physically ill, to feel the relief of confession, the pain of retribution and the joy of restitution and reintegration back into their family. I had more empathy for the parents' willingness to give their children away and watch them be beaten because they feared more for their social and physical lives than for their immediate suffering during the ceremony itself. I could see how the healer at Atirimkyere could view any witch as a threat to the health of the community and thus as his responsibility to eradicate. This increased Asante emotional intelligence made it easier for me to pick up on the tacit emotional and social dynamics of ritual healing encounters that were observable, but not necessarily didactically explained or even consciously understood by informants.

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<sup>372</sup> “Undergirding the entire study is a critique and rejection of modernists’ approaches to interpretations of African ritual systems that are hermeneutically inspired and that not only objectify reality, but also project a homogeneity and unchangeability of experience” (Adjaye 2004:3).

Thus, person-centered ethnography, thick descriptions of the characteristics of each participant, the ritual process, and the interactions between patient and healer, and emotional intelligence are all needed to understand biocultural interactions in Asante medical encounters and to “elucidate the role of psychosocial moderators of placebo effects...that enhance or diminish beneficial effects on health and wellbeing” (Guess et.al, 2002:29).

### **5.2.1 What is “Real?”**

In Twi, one way to describe the act of “feeling” is *atenka*, which means a slow crawling or striking warning that signals something through the senses. With our bodies as susceptible as they are to psychosocial stimulation, as shown in previous chapters of *The Social Life of Placebos*, we can conclude that it is highly likely that a visceral “slow crawling” or a “striking warning” would have an effect on the body.

As we have learned, different body systems (adaptive warning signals, reward/punishment mechanisms, health resource allocations, pain, stress, etc.) are activated depending on the perceived conditions of one’s environment. We’ve also learned that many of these body systems have been co-opted to be highly responsive to conditions specifically in the social environment. Thus, it follows that something as emotionally intense as a witchcraft healing ritual, with serious long term social significance, would elicit intense physiological responses—responses that ultimately impact the processes of sickness and healing, so much so, that it would not matter if Eunice and Mercy were actual witches or if I, an outsider, believed in witchcraft. It

matters **only** that the patients believe in order to activate powerful endogenous mechanisms.

While scholars often engage in philosophical debates about the reality of witchcraft, from an evolutionary perspective, truth claims about beliefs and expectations are important only to the degree that individuals embody them, or rather, to the degree that those beliefs become external cues about how one's perceived environment triggers internal physiological processes. A thing can be completely untrue, but if it alters a person's view of their circumstances or access to resources and relationships, it can have a very "real" effect on the body,<sup>373</sup> much as the inert sugar pill's "effectiveness" comes from meaning responses that activate powerful neurobiological processes.

But the legitimate critique of this line of thinking persists: it is nearly impossible to show one-to-one, direct correlation between a specific culturally-triggered emotion and an isolated physiological response that is provable and replicable in a random control trial. The "independent variable" being observed (the physical body), is by nature (or rather through evolved social susceptibility adaptations) highly responsive to psychosocial factors. Everything from the context of the medical encounter to the number of people present can influence body systems, not to mention all of the physiological processes triggered by enculturation, embodied expectations, positive and negative

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<sup>373</sup> "It was psychologically true in that it was 'reasonable' in terms of addressing certain psychological needs of the individual, and it was sociologically true because its practice raised the optimism and hopes of the human beings, who heard and saw it performed, and because it had multiple positive consequences. A magician's spell and manipulations may not objectively, causally and directly affect the processes of nature (the garden soil and the plants growing on it could not respond to the magical words and acts), but these words and acts did influence the human witnesses and through them produced consequences by affecting their intentions and their motivations and their expectations....magic was pragmatically effective by creating a change of state in the human actors" (Tambiah 1980:81).

emotions, social cues, and adaptive responses. Moreover, not every biological change brought about by psychosocial factors is a placebo or nocebo effect. “Alterations of the emotions and mental health (owing to trauma or posttraumatic stress, for example), now less than physical diseases, can pave the way for other diseases to develop because our bodies *biologize emotional experience* (that is, transform it into bodily reactions and responses)” (Singer 2009:55, original emphasis). Thus, much as a weak immune system is more susceptible to bacterial or viral infections, constant negative emotions might not be the direct cause of a nocebo response but they can leave the body susceptible to naturally occurring pathogens and diseases in a way that people without these negative emotions are not. So the purpose of *The Social Life of Placebos* is not necessarily to prove that Asante beliefs cause nocebo responses and that Asante medical encounters cause placebo responses. Rather, it is to highlight the social susceptibility of the human body and the many sophisticated biocultural interactions that influence the processes of sickness and healing in every single medical encounter.

### **5.3 Evolutionary Explanations**

#### **5.3.1 Adaptive Warning Systems**

Emotions are adaptive warning systems. Some researchers go so far as to argue that the sole purpose of emotions is to send important signals necessary for our survival.<sup>374</sup> For example, disgust adapted to warn us to avoid toxic foods via unpleasant sensations.

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<sup>374</sup> “The only emotions we experience are emotions that have arisen through natural selection as adaptations that enhance survival. Jealousy, embarrassment, hunger, disgust, ecstasy, suspicion, indignation, sympathy, itchiness, love—all are adaptations...Nature doesn’t build mental devices whose purpose isn’t related to adaptive fitness” (Huron 2005:2).

In other cases, such as fear and apprehension, emotions were naturally selected to protect our bodies from unnecessary risk taking.<sup>375</sup>

Because emotions are contextually relative, they have co-evolved to have physiological, emotional, and sociocultural components. When we feel something, it is a physiological-emotional response to perceived environment. As we encounter stimuli, the limbic system generates the physiological cue to pump adrenaline, cortisol, testosterone, and other hormones throughout our autonomic nervous and neuroendocrine systems (we will talk more about this in our next chapter on Stress). Arousal upon stimuli is pan-human and universal. However, how our brains and bodies process and divert those arousal hormones is dependent on emotional intelligence within a particular sociocultural context.

“From this perspective, the nocebo effect is a biological message that we can’t ignore, triggered by psychological cues in our environment that something is wrong. **The more threatening we perceive our surroundings to be, the more sensitive we are to such symptoms.** But they can be triggered in anyone if the suggestion is strong enough. It’s a self-preservation mechanism” (Marchant 2016: 35). Interestingly, **the ubiquity of witchcraft, hospitality/hostility obligations and a culture of fear<sup>376</sup> among the Asante might lead to persistent, prolonged and amplified nocebo responses.** This is a topic

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<sup>375</sup> Interestingly, there is a large sex difference between male and female risk-taking. Evolutionary theorist attribute this to the fact that women are born with all of their potential eggs and men regenerate sperm regularly. Thus, damage done to a woman’s body has greater long-term fitness consequences. Also, studies among the Hazda hunter-gatherers in Africa show that risk-taking among men (climbing dangerously tall trees to retrieve honey and hunting for meat) leads to greater reproductive success; however, we don’t see any such status, reproductive, or survival advantages for female risk taking (Marlowe et al. 2014).

<sup>376</sup> Culture of fear will be discussed more in the following Chapter 6: Stress.

that not many have broached. We know that social determinants of ill health such as poverty, discrimination, inequality, etc. lead to statistically significant increased negative health outcomes (WHO 2011:48). Poverty “together with economic and social inequality, is responsible for more physical and mental ill health than any other cause” (Helman 2007:426; Gwatkin et al. 1999). But the question has to be raised, might certain culturally specific beliefs, expectations and behaviors increase nocebo effects and unpleasant adaptive warning signals (pain, stress, negative emotion, anxiety, distress, etc.) and lead to the inhibition of healing processes and the exacerbation of ailing processes, leading in turn to increased negative health outcomes? If there is the possibility for certain cultural worldviews and practices to negatively impact health, wouldn't it also be possible that the culturally conscripted defense mechanisms or healing techniques of that culture may be particularly suited to combat these culturally induced healing blockers/sickness magnifiers. In fact, it might be, as *Okomfo* Osei said at the beginning of this manuscript, his role was to take away all of the aspects making someone sick so that their body could do what it naturally knows how to do to heal.

### **5.3.2 Reward and Punishment Motivations**

There are two kinds of social rewards—the social rewards we receive when others let us know they like, respect or care for us and the social rewards we receive when we care for or treat others well. It is no accident that this parallels the two sides of the mother-infant relationship. Having strangers tell us they like us is pleasurable, in part, because we humans have generalized the positive feelings of being cared for by our mothers. Many mammalian species have shown opioid-linked pleasure responses in the brain while being groomed by their mother or peers. But in humans most of our grooming is verbal rather than physical. When others spend time verbally grooming us, it is a sign that we are safe and cared for. And given our long period of immaturity, this is an incredibly reinforcing signal to receive... Thus, the two kinds of social rewards depend on



different kinds of neurochemical processes. Being cared for promotes opioid-based pleasure processes in the brain. In contrast, the effects of oxytocin may be better characterized as modifying the dopaminergic processes that promote approach behavior....In simple terms, we gravitate towards things the brain has learned to associate with dopaminergic release.” (Leiberman 2013:93).

Emotions can act as motivational structures linking the brain’s perceptual ability and behavioral responses to the body’s biochemical production and intensity. Because certain emotions feel so pleasant (i.e., love, positive anticipation, acceptance, and safety), we adjust our behavior to continue feeling good. Similarly, because certain emotions feel so uncomfortable and unpleasant (i.e., heartbreak, negative anticipation, rejection, and instability), we do whatever we can to stop feeling bad. Sometimes that means dampening unpleasant feelings through distraction, avoidance, and/or redirected attentional focus. Sometimes that means altering our biochemistry by inducing positive emotions through pro-social actions like earning praise, and/or succeeding in an action that is status-building. These examples make it easy to understand why emotions hold so much sway over our physical states and behavioral actions.

### **5.3.3 Appraisal Theory via Rapid Responses to External Cues**

Emotional sensitivity to external social and environmental cues evolved to motivate the body to respond rapidly and appropriately to external cues. In 1872, Darwin theorized that emotions were a “serviceable associated habit,”<sup>377</sup> which prepared the body to be ready for effective action. Unlike stress, where the immediate and often anticipatory physiological response is undifferentiated arousal, emotions “require more differentiated

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<sup>377</sup> “Certain complex actions are of direct or indirect service under certain state of mind, in order to relieve or gratify certain sensations, desires, etc.; and whenever the same state of mind is induced, however feebly, there is a tendency through the force of habit and association for the same movements to be performed” (1965:28).

autonomic activity for body protection and behavior preparation” (Kreibig 2010).

Emotions had specific functions throughout human adaptation (Stemmer 2004) as well as distinct behavioral warning and motivational goals (Stemmer 2009). As such, “our brains still house a set of ancient emotional triggers and templates. These vintage templates are elicited whenever we are confronted with situations that echo those faced by our ancestors” (Van Vugt and Ahuja 2011:149). Emotions help us to process and evaluate the significance of information and respond to it as quickly as possible. They help direct important internal resources toward the most fitness enhancing behaviors based on our current situation. Feelings of safety and feelings of threat produce radically different physiological responses.

In fact, appraisal theorists (Arnold 1960; Fridja 2006) argue that humans are constantly vigilant to their perceived conditions and how those conditions might impact their wellbeing. Rather than responding to specific situations in specific ways or with specific emotions, appraisal theories argue that humans have learned to respond to non-specific situational triggers, particularly in the following situations:

1. Novelty and environmental changes,
2. Intrinsic pleasantness/unpleasantness,
3. Goal obstacles or facilitators,
4. Unpredictability,
5. Agency (event caused by self, other, or circumstances),
6. Controllability, and
7. Compatibility with social norms or personal values....Whenever one of these appraisals change, the emotional experience changes (Neese and Ellsworth 2009:134).

This focus on viewing emotions as appraisals instead of universal emotional categories or objective features fits well with the other research presented in *The Social Life of Placebos*. For example, health resource allocation is a series of appraisals about one’s perceived environmental conditions, access to resources and relationships, and individual

goals. The intensity, duration, and distress levels during a pain event are similarly tied to one's appraisal of their situation and access to care. As we will read in the next chapter, much like emotional arousal, stress is a naturally selected arousal state which then becomes more specific (e.g., fight or flight) as the individual appraises the conditions of their immediate circumstance. In all of these cases, we have some persistent features. Evolutionarily, there are fitness-enhancing endogenous mechanisms and processes that have been naturally selected over the years to increase well-being, particularly in complex social situations. Proximally, there is the biocultural process of situational appraisal, which includes individual biases, perceived environmental and social conditions, and interpretation via encultured meaning, to name a few. While our knowledge of the neurobiology of emotions is increasing every year (Mayer et al. 2008), there is still much to learn about the evolutionary and proximate mechanisms of emotional situational appraisal, especially in regard to placebo and nocebo responses during instances of sickness and healing.

Placebos depend on a person's psychological and brain responses to the treatment context, which influence appraisals of future well-being. Appraisals are flexible, cognitive evaluations of the personal meaning of events and situations that can directly impact symptoms and physiology. They also shape associative learning processes by guiding what is learned from experience. Appraisals are supported by a core network of brain regions associated with the default mode network involved in self-generated emotion, self-evaluation, thinking about the future, social cognition, and valuation of rewards and punishment. Placebo treatments for acute pain and a range of clinical conditions engage this same network of regions, suggesting that placebos affect behavior and physiology by changing how a person evaluates their future well-being and the personal significance of their symptoms (Ashar et al. 2017: 73).

While I think it is more complicated than Ashar et al.'s analysis, there is an important relationship between fitness-enhancing adaptations (like physical adaptability to social cues), conditional appraisals and biocultural interactions in medical encounters that have not been adequately studied to date.

#### **5.3.3.1 Spindle Neurons**

The relationship between autonomic arousal and distinct emotional sensation becomes more clear through the biocultural evolutionary lens of social susceptibility. Spindle neurons are a good example. Spindle neurons are only found in the brains of highly social animals with large brains like humans, great apes, whales, dolphins, and elephants (Hakeem et. al. 2009). It is argued that spindle neurons are “a possible obligatory neuronal adaptation in very large brains, permitting fast information processing and transfer along highly specific projections and that evolved in relation to emerging social behaviors” (Butti et al. 2009: 254). We know that spindle neurons are responsible for conveying important information quickly across the brain (from the amygdala where emotional arousal begins to the frontal lobe where executive decision making occurs), but also interesting is the fact that hominids are the only species where spindle neurons are found in the anterior cingulate cortex (ACC) (Nimchinsky et al. 1999).<sup>378</sup> This is particularly important for a couple of reasons.

First, the ACC links physical and affective sensations, as was discovered in attempts to ease incurable chronic pain. Neurosurgeons discovered that if they perform a

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<sup>378</sup> Humans and chimpanzees have a larger volume of anterior cingulate cortex spindle neurons than other great apes, like gorillas and orangutans (Nimchinsky et. al., 1999). Whales have a greater volume of spindle neurons that are maintained for longer (Hof and Van Der Gucht 2007), but they exist in a different part of the brain, possibly signifying that they are used in different ways.

cingulotomy-- permanently destroying tissue of the ACC--chronic pain sufferers “report that they are still able to feel the pain but that it no longer bothers them, highlighting the ACC’s role in the distressing, rather than the sensory, component of physical pain” (Eisenberger 2004: 294; Foltz and White 1968). People with an intact ACC experience both the physical and emotional components of pain synchronously, i.e., “I feel pain and it is distressing” compared to people with a lesioned ACC who only experience the physical component of pain, i.e., “I feel pain but it doesn’t distress me.” So the ACC unites physical and emotional pain. Feeling pain and feeling distressed by pain are two different sensations. It is that distress, not just the pain itself, that usually prompts behavioral adjustment.

Second, research also found that the ACC is highly correlated with mothers' sensitivity to infants' crying. Rat pups with mothers who have impaired ACCs have higher mortality rates than mothers with intact ACCs. Ultimately, compromising the ACC makes mothers less emotionally responsive to the distress cries of their infants and, therefore, less likely to make the sacrifices necessary to care for dependent infants. The ACC is responsible for regulating ambiguity, cognitive dissonance, and choosing between different alternatives. The unpleasant sensation a caregiver experiences when their child is in distress is what motivates action. When this is compromised it impacts behavior significantly (Feldman 2012).<sup>379</sup> The fact that hominids are the only species to have very strong spindle neurons in the ACC is significant. We have very robust neurons

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<sup>379</sup> See also: Eisenberger and Lieberman 2004, 2005; Eisenberger 2006; Decety 2007; Way and Taylor 2009; Kitayama and Park 2010; Decety et. al. 2011

that transfer information from the amygdala to the frontal lobe in order to allow us to perceive, evaluate, and respond to social information rapidly. This communication channel includes information not only about the unpleasantness of a physical sensation, but about the emotional significance as well. When the ACC is damaged, that emotional intensity is lost and physical sensations alone are often unable to motivate fitness-enhancing behavioral responses. Thus, the emotional component brings the degrees of intensity and significance needed to motivate behavioral action.

Those emotional-to-executive “bullet train” spindle neurons in the ACC were naturally selected. Our huge brains, increased sociality, and developmental plasticity created the conditions in which individuals capable of reading and responding to social cues with acuity survived and reproduced more than their less emotionally intelligent counterparts, and their genes increased in frequency in subsequent generations. Over time, this is when we start to see significant alterations to hominid spindle neurons, representing the importance of amygdala input in rapid information processing and response, especially with emotional content.

#### **5.3.4 Costly Signals**

Conditional perceptual physiological responsivity means that our bodies respond to perceived conditions in the physical or social environment. As our ancestors achieved ecological dominance and began consciously altering their physical and social conditions, cultural niche constructions (see Chapter 2 for more on this) had greater and greater physiological consequences, the big trade-off being that our adaptability helps us survive and thrive, but it also makes us highly susceptible to perceptual manipulation and

counterfeit stimuli. To combat this, humans have evolved some important and very sensitive deception detection and costly signaling recognition systems that help us read and respond to hard-to-fake social cues.

The basic assumption in costly signaling theory is that we cannot adequately know the reputation, trustworthiness, and goals of everyone around us. Hard-to-fake costly signals, however, communicate these hidden attributes and provide the critical insight needed to make rapid decisions. Because many of these signals are costly to the communicator (e.g., wearing expensive cloth or confessing to witchcraft) and are hard-to-fake (showing genuine emotion or displaying physical feats) these signals carry more significance to the viewer than other forms of communication (verbal persuasion) and they are granted greater truth value (Bird and Smith 2005).

We share hard-to-fake costly signaling behavior with many other animal species. Costly signals are ways to communicate important information quickly (like health, status, or vulnerability) and they are so difficult to fake (like perfect skin, fearless confidence, or a terrifying scream) that they represent honest indicators of accurate information.

#### **5.3.4.1 Evolutionary Examples**

A simple evolutionary example of this is the peacock's plumage. It is very costly for males to display silky, colorful, full plumage, because of the endogenous resources needed and the inability to hide from predators. In fact, it is nearly impossible (without human intervention) to fake healthy plumage. If you have less than stellar genetics or are suffering from internal diseases or malnutrition, the energy devoted to plumage will be

redirected toward more life-saving functions. Thus, female peacocks can very quickly interpret the health and genetic quality of a mate merely by evaluating its plumage.

Costly signaling can occur across species as well. For example, healthy, agile deer will often stot when they see a predator instead of immediately running away. Stotting is when a deer leaps into the air in a graceful fashion. It actually slows down the deer's escape. Stotting baffled researchers for many years until they discovered that predators pursued deer who stotted quantifiably less than deer who did not. Apparently, the stot communicates "I am so fit that you will never catch me." It shows an athleticism that dissuades predators who quickly determine that they will waste their energy pursuing an athletic deer and may end up hungry, so instead, they dedicate their efforts to other deer who don't have the ability, confidence, or extra resources to stot (Fitz Gibbon et. al 1988). Signaling evolved to display evidence of internal genetic quality. A deer's stot signals speed and agility, and a peacock's feathers signal surplus resources used for symmetry and color, an allocation that would be impossible if other more vital body processes weren't already functioning satisfactorily.

#### **5.3.4.2 Emotional Expression as Costly Signal**

Costly signals are a little more complex in humans, mostly because culture allows us to counterfeit once hard-to-fake signals (e.g., with plastic surgery, credit cards, propaganda, etc.) and because we have incentive to do so (false signals benefit the sender at the expense of the receiver if they are not discovered). So there are very few signals that are still considered highly-reliable. One of those is emotional expression.<sup>380</sup>

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<sup>380</sup> We will talk more about some of those reliable costly signals in healthcare and religious practitioners in the next chapter.



“In the case of emotional expressions, the signal is related to the underlying state of the individual and is reliable because it can only be produced when an emotion is experienced... because it involves a physiological component that could constitute added cost to signal production” (Altenmuller et al. 2013: 15). Emotions are viewed as honest, reliable signals of internal states because there are physiological components to their expression. Furthermore, emotions, especially micro facial expressions, are very difficult to control voluntarily. This leads to the perception of authenticity when one witnesses emotional expression (Mehu et al. 2012). For example, it is nearly impossible to express what seems like a genuinely fearful scream or tearful sob without their underlying concomitant physiology.<sup>381</sup> To express an emotion is to experience it.

#### **5.3.5 Emotion as Significance**

In fact, tests have shown that physiological arousal is a precondition for emotion, but *which* emotion will be experienced and *how* it will be expressed is dependent on the way the arousal is interpreted (Schacter 1962; Lindholm 2005), the cognitive appraisal of the perceived situation (D’Andrade 1995:220), the sociocultural context (Geertz 1959), and the culturally sanctioned patterns for emotional expression (to mention a few). Thus, emotional expression does not just communicate a reliable signal about how someone feels in a particular moment. It is much more than that. Emotional expression also gives us a window into how someone interprets the world around them and how deeply

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<sup>381</sup> Even actors talk about eliciting real emotions in order to convey the experience of the character they are portraying. They do this by putting themselves in the character’s shoes and empathizing with how they might feel, perceiving the “set” as real, or remembering a moment when they experienced that emotion. All of this to highlight that even manipulated emotions have physiological components; in other words, even if the context or intent of acting is false, the actual emotion is real and that’s why it resonates with viewers.

encultured they are in the emotions and defense mechanisms of their people. It shows us how cultural information becomes embodied and how bodily information becomes encultured. Emotional expression teaches us what is normal behavior and what is abnormal behavior and the degree of significance we should assign to each.

#### **5.3.6 Emotional Embodiment**

Emotions are embodied. They bridge the gap between abstract and acute experience. For knowledge to elicit physiological processes or to motivate behavioral adjustment it has to be significant or urgent in some way. One of the ways that information becomes significant or urgent is via emotions. It is not enough to know cognitively that we should act in certain ways in our culture, we need the emotional experience of fear and rejection or pride and adoration to actually motivate action. Emotions are a vehicle through which meaning becomes embodied. The interpretation of emotional arousal occurs in culturally-specific ways, highlighting the importance of sociocultural meaning on the processes of sickness and healing.

#### **5.3.7 Emotional Enculturation**

Emotions are by nature bio-cultural. They are rooted in ancient amygdala-to-endocrine interactions and yet experienced, expressed, and interpreted in patterned, culturally-learned ways. As such, “emotional cues are symbolically constructed and historically transmitted within a culture” (Fitch 1998), and there are many aspects of that enculturation. The cognitive aspect involves “perspective taking, understanding people, knowing social rules, and openness to others ...[The behavioral aspect involves] social adaptability... interpersonal warmth, [and the] motivational ...manipulating, leading, and motivating others” (Elenkiv and Pimentel 2015: 292). Metacognition “focuses attention

on the knowledge of culture, skills for intercultural interaction, and the processes of cultural influence, as well as on an individual's motives, goals, emotions, and external stimuli relevant to the situation" (Thomas et al. 2008:132).<sup>382</sup>

Some are more adept at these processes than others. Some inculcate these norms deeply, while others resist or push back. But regardless of individual variation,<sup>383</sup> every society shares distinct culturally-specific emotions as well as ways of eliciting, expressing, and modifying those emotions. As we are born with language ability, so also are we born with the genetic and neural capacity for emotion. However, the specific form in which emotion is experienced and expressed is qualified in several ways. It must be learned, is shared with others, is distinct from that of other cultures, and follows clear rules of acceptability. A major part of enculturation is learning the tacit rules of emotional expression as well as the means, in the form of culturally-specific rituals and behaviors, to cope with particularly troublesome emotions. In fact, deviating from the

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<sup>382</sup> "We define *cultural metacognitive monitoring* as attention to conscious cognitive experience, as well as to affective and personal-motivational states with regard to the cultural milieu that determines the course of the strategy in intercultural interaction. This involves maintaining heightened awareness of, and enhanced attention to, the current cultural experience or present reality, including awareness of the assumptions, emotions, motivations, intentions, behaviors, and skills of oneself and culturally different others" (Thomas et al. 2008: 131; original emphasis).

<sup>383</sup> Emotional expressions are subject to individual variation to the degree to which each individual accepts his/her cultural schema. Culture schemas don't necessarily make anyone do or feel anything. Rather, it is the degree to which the cultural schema is embedded with emotional significance in connection with individual predisposition, susceptibility, and personality, which determines how emotional interactions will unfold. Differences in emotional expression are "culturally motivated variations resting upon a common psychic ground. The real task is the double one of seeking to discover what that ground may be and of finding what factors determine the alternative paths taken in the repression, expression, and interpretation of desires" (Lindholm 2005:291). "Furthermore, all of these related aspects of being are seen as connected and affected in important ways by the emotions. A person's inner 'self,' for example, is believed not only to respond passively to external situations and occurrences but also to mediate and monitor actions so as to maintain both consistency with and proper amounts of emotions" (Fabrega 1974:235).

normative rules of emotional experience, expression, and coping are often what differentiates someone as psychotic (Lindholm 2007).<sup>384</sup>

People learn their emotional lexicon over time so that when emotions arise their enculturation, their perception of the situation, and their individual adherence to the cultural norms all contribute to how that emotion is experienced and expressed. For example, culture can affect the experience of fear by shaping what is defined as a threat, thereby influencing the way that fear is experienced by an individual (Whorf 1956; Levy 1973). Additionally, emotions can be elicited and mediated through cultural factors like belief, expectations, rituals, and religion. These cultural factors define which environmental, metaphysical, and social cues are seen as threatening, which are banal, and which are beneficial. To respond to a banal experience (e.g., walking down the street) in an extreme way (e.g., terrified someone is following you) can be a sign of deviance (e.g., paranoia).

#### **5.3.8 Emotional Intensity**

Our culture also gives us degrees of intensity through which to hierarchize emotions and situations. Referring back to the language example, if someone only communicated by screaming they would be considered deviant. However, there are situations established in every culture where it is acceptable to scream. It is not the norm, but in the correct context (e.g., in a fight or in danger), it is acceptable. The same thing happens with emotions. There are degrees of intensity in the expression of emotion which add extra significance.

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<sup>384</sup> See also: Spiro 1965; Obeyesekere 1981; LeVine 1982; Kleinman 1988.

Emotions, in general, add significance to situations. Events only become poignant for the individual when they are infused with emotion (Campos 1994). “Without its amplification nothing else matters; and with its amplification anything else *can* matter” (Tomkins 1982: 355-56). Emotions lend the amount of intensity needed to situations to render certain interactions significant and others insignificant. There are ordinary and extraordinary circumstances in regard to emotion and there are normative patterns to both. Degrees of intensity in emotional expression, where some events are more poignant than others, are different than deviance, where individuals completely break the culturally-shared rules of emotional expression. In intense emotional situations, people still follow established patterns of emotional experience and expression. However, each culture hierarchizes certain interactions as particularly egregious or important and others as less so, and this is communicated by varying degrees of emotional intensity. This distinction is important to note as we go back and analyze Eunice and Mercy’s story.

#### **5.4 Methodological Considerations**

It is important to note that cultural fears and expectations (like witchcraft or familial obligation) represent methodological quandaries for anthropological research because they are represented in culturally particular ways that do not resonate with or influence outsiders’ emotions in the same way as an insider. In fact, outsiders are less susceptible to foreign psychosocial triggers. However, cross-cultural emotional intelligence—the ability to recognize, evaluate and mediate the emotions of self and others<sup>385</sup>—can be learned

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<sup>385</sup> “Furthermore, all of these related aspects of being are seen as connected and affected in important ways by the emotions. A person’s inner ‘self,’ for example, is believed not only to respond passively to external situations and occurrences but also to mediate and monitor actions so as to maintain both consistency with and proper amounts of emotions” (Fabrega 1974:235).

through the anthropological methods of extended fieldwork, participant observation and cultural immersion. Much like learning a language, which takes a long time and requires knowledge of both grammatical and pragmatic rules (how social context alters language use), acquiring emotional intelligence entails large investments of time in social interactions and can lead to both cultural and affective proficiency.

In language acquisition, it is not enough to learn the prescriptive grammar of a new language (i.e., the shared meanings and rules of usage behind specific combinations of consonants, vowels and, especially in *Twi*, tones) but you also have to acquire the proper descriptive grammar (i.e., how people actually speak on the ground), rules of pragmatic behavior (i.e., an awareness of language ideology, speech communities, rank, relationship, and formality, etc.) and social and emotional intelligence (the underlying tacit social and emotional meaning) to truly understand the significance of what is happening.

Moreover, emotional and social intelligence brings vast amounts of contextual, nonlinguistic materials to bear on the analysis of what is happening between people during a medical encounter. This attempt has yielded some outstanding results (see, for example, Basso 1990a; Brenneis and Myers 1984; Haviland 1977; Watson-Gegeo and White 1990) that show the pragmatic uses of language in relation to broader life matters. The emotive, performative, expressive, and relational meanings of a culture are learned only by experiencing emotions, interactions, and relationships within a culture. Emotions, particularly, are not only a way to know something, but they signify what knowledge is

important, what is not, and why.<sup>386</sup> Fear, love, shame, disgust, and confusion, etc.

communicate more than just cognitive information and are embodied in actual physical experience.

Understanding the placebo response as a meaning response calls for an integration of diverse forms of knowledge...In objectifying the body and the world, the biomedical paradigm excludes or distorts illness meanings, therapeutic relationships, and healing practices and separates objective knowledge of the mechanical body from clinical understanding that integrates multiple forms of knowledge. By marginalizing clinical know-how, healers are degraded to knowledgeable technicians who repair the body-machine on the basis of evidence-based guidelines...and not the wise, skillful clinicians who respond to the particularities of each patient and clinical situation...**Human beings and clinical judgement are too messy, complex, situated, and embodied to yield to a paradigm that divorces the medical from the social.** The placebo is a puzzle that calls for a broader understanding of healing as relational, embodied, and augmented by clinicians who integrate biomedical findings with clinical understanding based on many forms of knowledge. The sentient body reciprocates the world and responds to therapeutic encounters, healing rituals, and care-giving practices. Healers cultivate the sentient body's openness to the world by listening to the patient's lived body and life-world with humility and respect for our corporeality and the limits of all forms of human knowledge. Moving in this direction invites an integrative view of patients' perspectives, clinical knowhow and biomedical knowledge, and brings back from the margins nurses' skilled attunement to the lived body and life-world as central to wise and effective care-giving" (Pohlman et al. 2011:78-79, emphasis added).<sup>387</sup>

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<sup>386</sup> "Emotional literacy involves factors such as people understanding their own and others' emotional states; learning to manage their emotions and to empathize with others. It also includes the recognition that emotional literacy is both an individual development and a collective activity and is both about self-development and the building of community so that one's own sense of emotional well-being grows along with that of others, and not at their expense. Emotional literacy involves connections between people and working with their differences and similarities while being able to handle ambiguity and contradiction. It is a dynamic process through which the individual develops emotionally and involves culture and empowerment. For example, it includes understanding how the nature of social class, 'race' and gender (sexism and homophobia) impinge on peoples' emotional states to lead to an understanding of how society could change. Hence it incorporates an understanding of power exchanges between people and a challenging of power differentials" (Matthews 2006: 178).

<sup>387</sup> See also: Benner, Tanner, and Chesla 1996; Marcum 2004; Frenkel 2008; Sunvisson et al. 2009; James et al. 2010; Benner, Kyriakidis, and Stannard 2011; Kaptchuk 2011; Moerman 2011; Benner and Leonard 2011.

One of the leading experts on emotional intelligence, Daniel Goleman (2006) explained, “one rule of thumb in communications research is that 90 percent or more of an emotional message is nonverbal. And such messages—anxiety in someone’s tone of voice, irritation in the quickness of a gesture—are almost always taken in unconsciously, without paying specific attention to the nature of the message, but simply tacitly receiving and responding” (Goleman 2006:98). Paul Ekman (1957) brings evolution, non-verbal communication, and emotions all together in his research on recognizing emotions through facial micro-expressions (Ekman 1957).

Emotional intelligence is the ability to tacitly receive and respond to an emotional message inherent in but not reducible to the nature of that message. Thus, any analysis based solely on the nature of that message is missing an important emotional component, one that is often the most important component to the communicators themselves. To make matters more complex, “the skills that allow us to do this well or poorly are also, for the most part, learned tacitly” (Goleman 2006:98). **Thus, the ability to understand emotional significance is a large part of communication in any culture, but it is a skill that is difficult to express verbally, teach someone else, and/or make explicit. It is only acquired with consistent, participatory, and extended observation, imitation, and practice.**<sup>388</sup>

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<sup>388</sup> “I have argued that the notion of managing the heart (*ngabe keneh*) is a key to Balinese experience—truly a formula for living. Significantly, I had grasped the notion—and written about it as “emotion work” (Wikan 1987, 1989)—long before I realized that Balinese had, and used, the very concept. Stumbling across the Balinese concept was exhilarating and assured me I was on the right track. But it was not formative to my understanding. It merely lent credence to a theory I had already formed by way of other sources of insight. How did I come to grasp it? By perceiving people’s struggle; by coming up against the enigma of clear bright smiles in the face of ordeals like bereavement and other crucial losses; by perceiving the quivers in a voice; by “reading” somatic complaints about overwhelming pain and suffering, and....What else was there?



Expressive symbols differ in ease of interpretation. There are some expressive symbols we just seem to know how to 'read' with little training (e.g., any child can 'read' the facial expressions for 'happy,' 'sad,' and 'mad,' and everybody somehow 'knows'<sup>389</sup> that 'up' stands for 'authority' and that intensity of pitch does not indicate 'calm'). Other expressive symbols remain inchoate except to those who, through hints, demonstrations, or instruction, are 'let in' on the code (how else could we know what the sounds of a language are all 'about' or that a sideways headshake means 'no') (Shweder and LeVine 1984:46).

In the field of knowledge management, experts argue that one can learn tacit knowledge in six ways: 1) by interviewing experts via structured or informal interviews, 2) by being told or shown how to do something, 3) through observing action, 4) by participating in action, 5) through Socialization, Externalization, Combination, Internalization (SECI),<sup>390</sup> and 6) by becoming part of the social network where informal communication is shared laterally (Nonaka and Takeuchi 1995; Parsaye 1998). I do not highlight these points because they are particularly helpful or even new to anthropological inquiry, but rather because they make explicit what our disciplinary methodology takes for granted. Most anthropological endeavors rest on acquiring and understanding tacit knowledge. Our methodology, extended fieldwork, participant observation, (structured, semi-formal, and unstructured) interviews, and becoming part of the community, etc. reflect the exact methods needed to uncover this knowledge. As a discipline, anthropology invests the most time, energy, and attention on acquiring tacit

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Too many things for me to remember now, for such clues do not stand out in the field notes I took, even when, after Oman, I had learnt to pay close attention to silent communication" (Wikan 1992: 473).

<sup>389</sup> "Everybody somehow 'knows'" this is an example of a biocultural area where more research is needed. Why does everyone somehow "know" how to read emotional expression? Evolutionary theory on the ultimate development and proximate mechanisms of emotions is necessary to understanding these basic shared human abilities" (Shweder and LeVine 1984:46).

<sup>390</sup> Gourley 2004; adapted from Nonaka & Takeuchi 1995, pp. 57, 62, 71

knowledge and skills,<sup>391</sup> yet often our methods and objectives are misunderstood.

“Regarding ethnography as an impressionistic, hence inferior, form of scientific description or as mere background to systematic study, many nonanthropologists fail to grasp what is distinctive—and uniquely valuable—about anthropological knowledge. As a consequence, they frequently underestimate certain properties of culture that the ethnographer experiences as central” (LeVine 1984:68).<sup>392</sup> Becoming competent in dual cultures is an considerable task, one that should not be viewed as a non-serious methodology.

Nonrational suppositions, ideas about worth, and classifications of a people (a cousin is a person not to marry; a pig is an animal not to eat, a mother’s sister’s husband is an ‘uncle’; members of a family eat together at the same time and food gets distributed equally) are not derivable from reason or direct experience with nature—one must, somehow, be ‘let in’ on the secret, one must, somehow, receive the ‘frame’ of understanding from others. In the study of the history of ideas this anti-developmental view leads...to a concern for procedures of indoctrination and conversion into paradigms of thought...In a study of the ontogeny of ideas in children it leads...to a concern for the acquisition of ideas as tacit communication (Shweder and LeVine 1984:49).

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<sup>391</sup> For example, Nonaka et.al. arrived at their conclusions based on the self-completion questionnaires of 105 managers during one business seminar, vs. anthropologists spending many years living and participating in knowledge acquisition and production.

<sup>392</sup> For example, “Social-science investigators of individual and subgroup differences sometimes view anthropological descriptions of group consensus with skepticism, as if the ethnographer’s failure to conduct a survey biased his report toward the false attribution of uniformity in a population. This view overlooks the fact that the skeptics themselves regularly determine without a survey that certain characteristics are distributed in a j-curve fashion and should be excluded from investigation...Survey researchers, for example, are unlikely to ask a national sample of Americans whether they believe that deaths are caused by witchcraft and sorcery performed by jealous neighbors and relatives of the deceased. Why? They consider it self-evident that no more than an insignificant proportion of Americans hold this belief; it is thus unnecessary to conduct the survey as well as useless for correlational study. Anthropologists would agree that the survey is unnecessary but might find the phenomenon itself worthy of ethnographic study in order to understand in more depth the grounds for rejecting a belief we once shared with other peoples of the world and the larger context of intellectual and value orientations that make witchcraft and sorcery implausible as causes of death. What is a mere background parameter for the survey researcher could become a topic of revealing cultural inquiry for the ethnographer” (LeVine 1984:70-71).

This study on the role of emotion in ethnography leads to a concern for the evolution of emotions in social environments and the acquisition of cross-cultural emotional intelligence and resonance. It also leads to a method in which we "put ourselves in the place of other persons, inhabiting their world" (Rose 1990). One solution to anthropology's methodology problem is to make more explicit why it is important to gain tacit knowledge and how we acquire it in order to encourage other fields to recognize and value its significance. One way we can do that is to more readily promulgate the importance of emotional intelligence and the complicated methodology required for its acquisition.

Through involvement with others in everyday contexts of practical action ... [and] becoming immersed in joint action ... in a shared environment... I experience the components of this environment as they do, not because I have learned to construct them in my mind according to the same categorical conventions, but because I have learned to attend to them in the same way, according to what they afford in the situational context of herding activities. Such communion of experience, the awareness of living in a common world, establishes a foundational level of sociality that exists-in Bourdieu's (1977:2) phrase "on the hither side of words and concepts," and that constitutes the relational baseline on which all attempts at verbal communication must subsequently build (Ingold 1993:18-19).

Just as our universal linguistic capacity makes it possible for us to learn new languages, our pan-hominoid emotional intelligence "fosters empathy and compassion, it enables appreciation, without which resonance, ideas and understandings will not spring alive. There is an underlying appeal to shared experience here, akin to what Shweder notes: 'psychic unity is...that which makes us imaginable to one another' (Rosaldo 1991:18 in Wikan 1992:465).

My internal denial of Eunice and Mercy's actual association with witchcraft and its reality affected my interpretation of the actual emotional weight that these experiences had on the daily lives of my informants.<sup>393</sup> "The litmus test of a frame is that no evidence or experience can possibly count as disproof....One either supposes these particular presuppositions and comprehends the world in their terms or one doesn't" (Shweder 1984:40). In the medical context, it is particularly problematic when practitioners disregard patient's beliefs because we know endogenous processes, perceived conditions, and placebo and nocebo responses are all influenced by them!

In the paradigm of my informants, witchcraft meant that lives were at stake. This wasn't an ethnographic exercise in ethno-medicine, this was a matter of life and death, both physically and socially. Empathizing with that reality emotionally changed my relationship to witchcraft, my informants, and my ethnography. Once I attempted to recognize and participate in the emotional fieldwork around me, I not only began to understand my informant's actions, feelings, and decisions more clearly, I could also experience them to some degree. "To acknowledge a proposition is to realize in one's being its full significance, to take it in and be changed by it" (Nussbaum 2001:45). I felt a sense of fear when talking to an accused witch. I worried that my informants would curse me if I failed to live up to my end of a reciprocal relationship. When something negative

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<sup>393</sup> Edith Turner (1997) speaks of this when she herself experiences the weight of spiritual beings and says, "then I knew the Africans were right. There is spirit stuff. There is spirit affliction, it is not a matter of metaphor and symbol, or even psychology. And I began to see how anthropologists have perpetuated an endless series of put-downs about the many spirit events in which they participated—'participated' in a kindly pretense. They might have obtained valuable material, but they have been operating with the wrong paradigm, that of the positivists' denial" (Turner 1997).

happened—the taxi broke down, I got malaria, I could not sleep, etc. — in the back of my mind I had to wonder: Is this coincidence or is this consequence? I could never comprehend my informants or their actions if I continued to make assumptions about what was and what was not ‘real.’ Accepting the Asante witchcraft paradigm was the first step in not only comprehending the world in their terms better, but also learning to empathize with their fears.<sup>394</sup>

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<sup>394</sup> See Chapter 5 Appendix for a deeper discussion on methodological considerations for emotional intelligence and intersubjectivity.

## **CHAPTER 6: STRESS**

- 6.0 Chapter Overview
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- 6.2 Culture of Obligation and Fear
  - 6.2.1 *Hospitality/Hostility Cycles*
  - 6.2.2 *Status*
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- 6.5 Conclusion

### **6.1 Culture of Fear**

#### **6.1.1 Hospitality/Hostility Cycles**

Most Asante travel guides and cultural handbooks are filled with references to Asante hospitality, generosity, cheerfulness, and humor. They emphasize the communal nature of Asante society and the importance of solidarity.<sup>395</sup> These overt characteristics are

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<sup>395</sup>“The following maxims remind us, the individual inevitably requires the relationships of others and the cooperation of others for most of his or her pursuits” (Gyekye 2003: 37). Important Akan maxims stating this fact: “When a person descends from heaven, he descends into a human family,” “One finger cannot lift up a thing,” “If one person alone scrapes the bark of a tree for use as medicine, the pieces fall to the ground,” “The left arm washes the right arm and the right arm washes the left arm,” “If all the people were to carry the heavens, no one individual would become humpbacked” (Gyekye 2007:36-37).

unmistakable, pervasive, and shared throughout Ghanaian ethnic and regional boundaries. They facilitate ease of travel and the development of fast friendships. Yet, their simplistic and largely positive connotations crumble under the scrutiny and lived experience of extended reciprocal relationships among the Asante.

It took 26 months of fieldwork, watching friends and healers grow and change over the course of a decade, and becoming embedded into the social network of a small community, for me to begin to recognize the underbelly of the Asante stereotype—the stressors, fears, secrets, and obligations fueling an almost compulsive and unquestioning need to take care of family and friends, give anything that is asked, and do it all with a happy face. “If we hide our money, even slightly; if our pain of hosting family is found out, even when they stay without end; we are dead,” said Oforiwa, a successful restaurant owner during a moment of lamentation on why, despite her fortunate circumstances, her money “is never enough.” At the time I thought Oforiwa was being dramatic. She had a flair for language, one too many drinks in her system, and had just attended an Asante family funeral—notorious for requiring countless donations during the multi-day process. However, I quickly discovered that not only was Oforiwa not alone in this complaint, but that the rhetoric of “life and death” seriousness often accompanied conversations about the motivation behind reciprocity, hospitality, generosity, mutual aid, solidarity, selflessness, and the presentation of self during these culturally conscripted behaviors. This dissertation is filled with these stories of the underside of Asante hospitality culture—the hostility culture: the life or death claims of healers declaring that they were forced into their communal role by threats of death, patients feeling trapped into

obligatory entanglements with ritual healing shrines where disobedience carries a life sentence, witches beaten into submission so that they can be reintegrated into their families or else killed, and successful individuals' livelihood and lives threatened by accusations of cheating and curses from envious associates.

Over time, I have come to think of these battles of status, fear, obligation and power in terms of a hospitality/hostility contradiction,<sup>396</sup> or dialectic. Hospitality is a way to protect against hostility and hostility is a way to guarantee hospitality. At the root of Asante culture is the belief that everyone was taken care of as a child. "As a child I didn't feed myself, farm the food, cook it, and serve it," explains Kwase, "my family and people in the village looked out for me and now everything I have they have somehow contributed toward and now I owe them." Kwase, a prominent and successful businessman in Accra, described how familial obligation was an impossible cycle to break.<sup>397</sup> Any financial success must be equally distributed among family members and any perceived hesitation or slight is met with harsh punishments.

This seems to me to be somewhat of an inversion of the process of schismogenesis (Bateson 1958), as a "system of holding back" where both parties feel the other party is not giving enough and so they hold back, thus, perpetuating the cycle (Saarinen and

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<sup>396</sup> Anxiety, stress, emotional somatization, gripping fear of retribution, cursing, or witchcraft, never-ending obligation, overwhelming self-sacrifice, representational and behavioral constriction, and the possible consequences of isolation, ostracism, and loss of community and safety-net, etc.

<sup>397</sup> For the Asante, the body is a stage for the larger social drama. One example of this is the concept of family. While I was conducting patient health histories people continually included non-biologically related "family" despite my explaining that it was important to record only blood related family in order to find genetic roots of disease. For the biomedical researcher only blood relations have any effect on one's health history and, thus, on one's current health concerns. However, this was not acceptable to many of my Asante informants because the people with the largest impact on one's sickness and health were those you were in contact with regularly—those with ties of obligation and support—regardless of blood-related status.



Hämäläinen 2007). In Asante culture, it is a “system of giving away” where both parties feel like they need to give everything they have because there are serious repercussions (via witchcraft, cursing, loss of financial support, harming of reputation, etc.) if someone senses they are holding back. Thus, there is a ubiquitous fear of not giving or being hospitable enough, or being accused of not giving or being hospitable enough, and because everyone feels that they are giving everything they have, they feel justified in punishing those who hold back. Saarinen and Hämäläinen argue that systems of holding back are “the single most important key to life-decreasing, reciprocity-trivializing and vitality-downgrading mechanisms in human life” (2007: 46). While this is a bit overstated, I would argue that there are serious psychological, social, and physical consequences to such a pervasive cultural cycle.

This is one of the paradoxes of the Asante worldview: the same things that alleviate stress cause it. You can always go to any family member and ask for housing, food, and money. However, this same openness means that any relative can come to you and ask for part of anything that you have. A common idiom argues that *Papa so akatua ba hiada*: Kindness is like a loan, not a gift. This creates a self-perpetuating system because those people seen as successful become the biggest target of ridicule, envy, jealousy, gossip, and witchcraft.

Adjima, a professor at the University of Ghana, would often tell me that this was the biggest problem in Ghana. “Fear of witchcraft is the one thing keeping Ghana down. People always want the second highest grade, the second largest house, to be the second richest man. No one likes to be on top or people will be jealous or envious. This is why

we never succeed.”<sup>398</sup> Adjima explained that people are constantly trying to succeed while also avoiding succeeding too much. Ways to do that are to make sure to underperform scholastically, dirty the hair or face of a beautiful child, never completely finish the outside of one’s house construction, etc. The quickest way to social death is to be rich without giving to others. If you don’t follow the cultural script you are considered a “deviant and unworthy member of society”<sup>399</sup>. You will lose all connections with family and friends if you are unwilling to “play the game”<sup>400</sup>, and suffer both psychologically and physically if you try to secretly do something for yourself at the cost of others.<sup>401</sup> There is a popular high-life song entitled, “Enemies of Progress” that details the process in Ghana of pulling people down like crabs in a barrel when they are trying to succeed. The lyrics argue that “we are in a battle in this world. If you don’t give them money, you are in trouble. If you give them money, you are in trouble. When you wear normal clothes, they call you bushmen, but when you wear expensive clothes they think you are too big.”<sup>402</sup>

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<sup>398</sup>This is very similar to “the evil eye” in other cultures, as described in Dr. Lindholm’s “Culture and Envy” (2008) and reminiscent of Barthe’s (1972) explanation of why the Balinese are so polite to each other: because they are scared to death of each other!

<sup>399</sup>This quote comes from a very close friend, Peter, who was upset that his brother was constantly asking money from him and eventually said he couldn’t give more because he was trying to accrue savings. Peter’s family was angry at him for having surplus and not sharing with a family member in need.

<sup>400</sup>This quote comes from Ben, a British-Ghanaian ex-pat who runs a company along the coast, and was ostracized from and stigmatized by his Ghanaian extended family when he refused to donate money, host family, and participate in society as custom dictates.

<sup>401</sup>This quote comes from Oforiwa, who lamented the inability to increase one’s standard of living without socially signaling wealth and thus increasing one’s obligatory level of donations to all family and events. If you then failed to meet these new higher hospitality standards your life, livelihood and health would be cursed.

<sup>402</sup>Interestingly, this type of “crab antics” and the battle between status and obligation exists today in the Caribbean among former West African immigrants from the Trans-Atlantic slave trade (Wilson 1995).

Often Asante describe their daily life as a battle between self-interest and reciprocity; the fear of never succeeding<sup>403</sup> and the fear of being cursed for succeeding. This worldview impacts the nature of Asante social relationships. The sentiment was best stated by Patience, a student at the local secondary school, when I asked her what was the best advice she ever received. Patience said, “beware of friends, because those who know you most can curse you best.”<sup>404</sup> I was stunned at this cynical view of the world from such a young and happy girl. However, the longer I lived among the Asante the more common this idea seemed. In fact, in the 6<sup>th</sup> annual World Values Survey Ghanaians rank among some of the least trusting nations in the world, in which only 8.5% of Ghanaians say that people can be trusted and 91.5% say that you can’t be too careful.

Because you can’t trust people you have to keep an eye on them. Thus, on top of monitoring their own behavior most Asante spend a great deal of time evaluating the behavior of those around them. This propensity is a very effective means for social control. Real crime rarely happens in villages. When it occurs the culprit is immediately uncovered and the punishment is quick and harsh. Theft usually happens in large crowds where anonymity is possible. I witnessed one such occasion in Kumasi market, the largest outdoor market in the world. A young man pick-pocketed another man’s wallet and tried to disappear into the enormous mass of bodies packed into the market.

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<sup>403</sup>Success for most Asante is encapsulated in the universal prayer for “health, food, money, kids, partner, ambition.”

<sup>404</sup>She went on to explain that friendship was the most difficult relationship because you need and want it, but at the same time it is the riskiest thing that you can do because it gives power to someone else to hurt you. She went as far as to state that this is one of the reasons why you should never be best friends with your boyfriend or spouse because they already know you so well that any more familiarity would mean your demise. This matches famous Akan proverbs which state (in Twi Language): “*Ɔkwantufɔɔ a Ɔtaa so faako ho ye mfonnoee*” and “*ema wobu no animtiaa*.” English translation: “Familiarity breeds contempt.”

Unfortunately, the man noticed immediately and then yelled and the entire crowd around these two men got involved. Complete strangers found and held on to the perpetrator. The crowd yelled at this man until he admitted his crime and gave back the wallet and then the crowd began to hit and stone him. I asked someone close to me why people were so upset and why the punishment was so harsh. He explained, “You cannot get something for nothing.” When I arrived home that night I told my roommate Howa about this experience and asked her what she thought. I was curious because Howa regularly went downtown to ask her uncle for large sums of money because he was a businessman and she was just a student. I was often surprised that he never said no or limited her requests and that she had the “right” to just ask any family member for money if she wanted it and they had it. She explained that her money was not something for nothing. When she finished school and got a job she would be the one supporting her uncle in his old age.

#### **6.1.2 *Status***

Along with trust, social status is a constant concern among Asante. People attempt to increase their social status via education, wealth, children and conspicuous consumption. They try to bring others' status down via gossip, social exclusion, witchcraft and cursing. These contestations are bartered with capitalist symbols of wealth and inequality. With an extensive trade history, the largest outdoor market in the world, and one of the most complex numerical systems in the world, Asante culture places economic acquisition and a keen business mind as some of the most highly sought after of their values. In fact, for centuries economic liaisons have been the primary determinant in marriage and status relationships, impacting the foundations of other social relationships cultivating an

underlying thread of mutually beneficial exchange and economic monitoring at the roots of Asante sociality. The economic underpinning of Asante social relationships is extremely prevalent. I witnessed economic exchanges in almost every relationship I observed (parent-child, nephew-uncle, boyfriend-girlfriend, mistress-lover, priest-parishioner, friend-friend, etc.) and was required to participate in those economic exchanges while I was a member of the society (e.g., offering a gift when entering a house or shrine, contributing financially to funerals and weddings, paying tithes during church services, etc.).

Asante economic preoccupation has been researched at great length<sup>405</sup> and I don't have space to replicate it here; however, there are basic rules of the social economy that have a profound influence on sickness and healing, and no one is outside of the rules. I've sat with patients *and* *Okomfor* lamenting the financial burden of giving to others in order to increase their own status. This is because Asante do not necessarily gain status from conspicuous consumption (although this is a major feature of Asante wealth and prestige: showing off cars, traditional clothes, homes, abundance, etc.), but rather, from conspicuous generosity. It is acceptable to have wealth, but only if you are sufficiently generous. Wealth without generosity brings about cursings. Thus, there is a constant battle between displaying wealth and increasing one's status, but also being obligated to give more money away the more one displays one's wealth.

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<sup>405</sup>Including, but not limited to: McCaskie 1986; Arhin 1990; Berry 1997; Clark 1989; 1994, 1999a, 1999b; Austen 2010; Parish 2010.

When I inquired about the roots of this concept a neighbor of mine explained that it was because whatever one earns does not belong to them alone. No one changed their own diapers when they were young or fed themselves. If you are blessed with wealth, you owe everyone who helped you get to where you are. In a sense, money is seen as a communal thing. Cousins, nieces, and former teachers often feel justifiably entitled to the excess wealth of someone they have a social relationship with. Most of my friends and informants were terrified of succeeding in ways that would bring cursing, witchcraft and jealousy back on them and yet, in my experience (and that of many other Ghanaian/Asante scholars), the primary Asante desire and status symbol is economic success. The constant vigilance needed to look over your shoulder, watch your back and monitor your words to prevent being cursed produces a culture of fear. This culture of fear is tacitly inculcated in children as soon as they are born. Mothers wipe dirt along their newborn's forehead so that no one will be jealous and curse them or kidnap them back to the spirit world.

### **6.1.3 *The Role of the Okomfor***

Low trust and communal social control is also one of the reasons for the exaggerated Asante hospitality. Anonymity is intolerable.<sup>406</sup> People without social ties do not fit into a system of mutual reciprocity and obligation. Strangers (in everything from a meeting to visiting a village) are expected to announce themselves, make their mission known and greet those around them in a respectful manner. In turn they are immediately gifted with

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<sup>406</sup>This becomes problematic in cases where anonymity is needed. I encountered many cases of rape and sexual abuse where anonymity was not allowed. Cases and problems would not even be discussed on a broad level--names needed to be named.

some kind of beverage and welcomed. Often this back and forth continues with offers of further hospitality (a place to stay, meals, contacts, etc.) and requests for donations, thus entrenching even the most peripheral people into the system of social control.

Fear of anonymity is also one of the reasons that witchcraft is such a serious threat.<sup>407</sup> Cursings can only be stopped when the perpetrator is exposed and confesses. Ghana has a long history of witch killing and as government stops these practices people feel they have no protection from the very real threats surrounding them. Asante indigenous ritual healing ceremonies provide a way to deal with these psychosocial crimes and reconciliations. *Okomfo* are able to discover cases of holding back money, not fulfilling social contracts, lying, cheating, stealing, cursing, and breaking social taboos. They protect people from being cursed, expose social threats and punish witchcraft. They help patients succeed in business, education and travel while limiting social repercussions. Asante indigenous ritual healing ceremonies are able to mediate community-based problems in a way that religions, biomedical practitioners and governmental systems are not.

The pervading fear and burdensome consequences of communal obligation seem directly contradictory to the Asante “cheerful-hospitable” stereotype, but they are the very motivation that drives the mutual aid and perpetuates a reliance on indigenous ritual healing. “If you suspect something of someone [they’ve stolen, cheated, kept back

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<sup>407</sup>“While numbers of contemporary Asante remain highly reluctant to discuss the matter (an evasive silence which is of itself significant), no one who has worked for any length of time in Kumase or in the villages of metropolitan Asante can fail to be struck by the conclusion, insistent and pervasive, that the Asante inhabit a cognitive universe saturated with apprehensions respecting witchcraft” (McCaskie 1981:126).

money, etc.] you curse them and crack an egg. If you wrongly cursed- you die. If you lied- you die. The only way to change the curse is to go to a fetish priest” (Duabo curse). Modern religions and biomedical healthcare are unable to protect or heal patients from the physical ailments acquired through social threats. Asante indigenous ritual healing ceremonies provide a specific niche of healthcare for sociogenic problems and sociocentric solutions.

The hospitality/hostility model also extends beyond familial relationships. The same cultural logic extends to obligatory relationships with healers, gods and Asante indigenous ritual healing ceremonies. They can take care of your needs, protect you from harm and grant you future success, but you owe them for the rest of your life for any success you achieve, you need to keep paying them to continue to succeed and there are negative repercussions if you “hold back” or are disrespectful to the shrine. One of the paradoxes of Asante ritual healing is that despite being a people renowned for the commodification of every aspect of life, many *Ɔkomfor* do not charge their patients a fee originally. They write down all of the specifics of the case and explain that when the physical, social or economic problem for which the patient sought help is solved, they owe the shrine. They charge via obligation with fear of retribution. It is more of an emotional and future cost than a current cost. It may be cheaper now, but the consequences are far reaching. This was one of the reasons why Anthony did not want to begin a relationship with Kofior shrine. Not only would he owe the shrine an incalculable amount for the pregnancy but he would be obligated for the rest of that child’s life.



Economic and social opportunities and obligations make up the foundation of Asante indigenous ritual healing ceremonies. Unlike other world religions with their focus on the after-life, Asante indigenous religion is almost entirely focused on the problems of this life.

In contrast to the silence (or near-silence) on matters relating to the destiny of the soul in the afterlife, **the emphasis on the pursuit and attainment of human wellbeing in *this* world is unrelenting.** Indeed, religion is considered essentially as a means for attaining the needs, interests, and happiness of human beings in this life. In accordance with this perception of religion, prayers offered by practitioners of African religions are full of requests to the supernatural beings for material comforts and the things necessary for a happy, satisfying life....But the point that is very clear is that the prayers are mostly requests for material wellbeing and earthly blessings, such as riches, health, social peace, and harmony, fertility, birth of many children, and continuity of life and vitality, and protection from evil, danger or death. Petition for healing and longevity is one of the most important and common subjects of prayer because of the African love of life (Gyekye 1996:14-16, original emphasis).

Similarly, Asante indigenous religion is less concerned with the cognitive aspects of religion (belief, faith, cosmology, unity with God, etc.) and more concerned with the social (belonging, support, comfort, conflict management, etc.) and practical aspects (“health, food, money, kids, partner, ambition”). “The perception of social support may be more important than actual social support (Blazer 1982). The importance of perception may indicate that a positive perception of the environment can influence the mind to influence the hormonal milieu of the body” (Rabin 2002).

The prayers are aimed at using the powers of the supernatural beings for the promotion of human welfare and happiness. There is much evidence to indicate that should a deity fail to deliver on a request sought in prayer, that deity will be censured, treated with contempt, and ultimately abandoned by the people. This means that, as far as the followers of the religions are concerned, the deities exist, and are to be called upon, to supervise and enhance the well-being of human beings. This fact underlines the perception that religion is founded on morality and must have social relevance. Religious faith is, thus, perceived as utilitarian and practical, rather than as a means for spiritual upliftment or the union of the human soul with God... **Many African converts continue to consult**

**traditional religious shrines in times of need or of personal or familial crisis in expectation of some mystical way of fulfilling their needs or dealing with the crisis.** For them, religion must have immediate relevance in coping with the various problems of life on earth (Gyekye 1996:16-17, emphasis added).

One of the best clarifications of the role of Asante indigenous religion, the motivation to attend Asante indigenous ritual healing ceremonies and the acceptance of religious pluralism (most Asante believe in witchcraft, attend indigenous ceremonies throughout their lifetimes and belong to a Christian or Islamic religion) occurred during a discussion with one of the village Elders, Mr. Boakye. We were walking along a desolate stretch of dirt road. I was asking him to help me understand why people attend shrine but then say that they don't, why good Christians that spend 4+ hours a week attending church don't keep any of the rules and why even the most modern, cosmopolitan, educated Ghanaians believe in witchcraft. He explained that "traditional healing has everything that is in the Bible: punishment for stealing and fornication, ways to deal with devils, evil spirits, illness, and health. But the punishment is immediate. If you sin you have immediate troubles." He clapped his hand to emphasize the immediacy. "That's why everyone rushed to these foreign religions because the punishment is eventual," said Mr. Boakye with a shrug. He continued, "That's why people fear traditional healing so much. And yet when big trouble comes who do they turn to? Traditional healing, immediately and secretly. It's the only thing that can help right now. It's also the reason why you see so much Christian fornication even from the faithful. Would you rather be punished terribly today or in some eternity with the chance to repent?" Mr. Boakye smiled at me, raising his eyebrows as if he had just shared a special secret. We continued our walk in silence.

For example, *Okomfor* aren't just healers who go into spirit possession. Most of them have decades of apprenticeship and training. Most have seen hundreds of thousands of patients and spend their entire lives in the study of people, spirits, and health. The *Okomfor*'s expertise is in Asante interpersonal relations, sociocultural processes, and ritual healing practices. They understand the complexities and nuances of Asante culture and social relationships. While some people travel to shrines so they won't be seen or because a particular *Okomfo* has a reputation for being powerful (and the patient's preceding health actions have proven unsuccessful), the majority of people at any given shrine are locals. They are the relatives, shrine workers, village mothers, and neighbors of the *Okomfo*. The *Okomfo* is often intimately familiar with the patient's family obligations, business successes and relationship failures. In cases of unfamiliarity, *Okomfor* have very impressive divinatory processes and consultation discourse techniques (Trix 1993) to uncover important social aspects of their patient's lives (Peek 1991).<sup>408</sup> They pay close attention to issues of money, relationships, and fear. They ask many open ended questions where they allow the patient to elaborate: Why do you think this is happening? Is there anything in your past you haven't resolved? Who in your life might be upset with you right now?

*Okomfor* pay attention to meaning and relationships as contributory factors in any medical encounter, in ways that other healthcare practitioners do not. On top of this, they wield the culturally sanctioned methods necessary to mediate patient fears and anxieties,

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<sup>408</sup>I personally witnessed over 10 cases where *Okomfor* were able to tell patients (even foreigners from drastically different cultural backgrounds) something unique about themselves, their social relationships, or their history in the first few minutes of meeting; things the *Okomfor* should not have known.

discover illness etiologies, solve social, spiritual or economic conflicts, provide a meaningful explanatory model and create a patient-centered treatment plan. We've already learned how Asante expectations and health behaviors can decrease pain and negative emotions. In this chapter we will learn how they can decrease stress and amplify relaxation.

Ultimately, Asante culture produces a host of chronic negative stressors, which effect health in myriad ways (infections, immune dysfunction, inflammation, digestive problems, etc.). Solving the biological aspects of those health problems, without any action on the stressors themselves, only fixes part of the problem. Asante medical systems work with the body's evolved physiological reactivity to threats in the social domain by regulating patient perceptions about meaning within their environment and social relationships. The relationship between health, stress and social interactions becomes very vivid as we dive deeper into the ultimate and proximate mechanisms involved in fear, obligation and status as well as those involved in ritual, entrainment, and music, which are all triggered, exacerbated and/or alleviated via specific psychosocial expectations and behaviors present in Asante medical encounters. There are real biological health consequences of these cultural beliefs and social relationships. Illness is not always caused, treated or housed in the individual body alone, but also exists in the social body; social relationships, obligations, and expectations. In short, the knowledge and skills of the *Okomfor* and the structure of indigenous ritual healing ceremonies are able to influence and enhance meaning responses, social responses, and placebo responses in ways that foreign or biocentric medical systems cannot (Kaptchuk

2002:819). This is especially true for body systems that are highly susceptible to cues from our environments, particularly the human autonomic nervous system (sympathetic or stress response and parasympathetic or relaxation response).

## **6.2 *Okomfor* Proofs of Power and Authority**

### **6.2.1 Physical Proofs of Power**

Asante indigenous healers or *Okomfor* have many ways of establishing their spiritual and social authority. Many of these techniques are physically or psychologically “extraordinary” and often take up a large portion of the ritual healing ceremony. While the structure and sequence of the ritual is relatively constant throughout the Asante region, each *Okomfor* performs differently. One day I asked the Kwabena the *Okomfo* at Mmpam about the variation I observed in performing techniques throughout Asanteland. He explained that part of it was personality. He said, “I do not dance. You will not see me dancing like some of these others. Many people complain about it. They say I should dance. But you will never see me doing it. But others do not do what I do. So...” He left that sentence hanging. I quickly surmised what he was referring to and I asked if he could feel the pain of the bucket of sand poured into his eyeballs during possession, a deluge so profuse that when he opened his eyes all you could see was grainy tan orbs. This was a specific technique I only ever saw him attempt. Kwabena was very quick to correct me. He admonished, “*I* am not feeling that pain. *I* am not there. It is the *Abosom*.” “So you don’t even remember pouring the sand into your eyes?” I asked curiously. “No.” He shook his head “I just wake up very tired and my eyes hurt a lot. It is only after people explain that I know what happened.” “Why do some *Okomfor* pour sand and others dance or stab or do other things?” I asked. “It depends on the gods. All of the shrines have

different gods. Some like to do sand, some like to shoot guns. My gods are different than any other village.” He shrugged. “But” he rushed to clarify “I can access them other places like when I am performing for the king. They can be there. Even though they are located in the stream near my farm. Some shrines the gods are located in an object hidden beneath the shrine.” He went on to explain that every shrine has a different amount and type of *Abosom* and that some are more powerful than others. “Mine are very powerful,” he made sure I understood. “You can tell that they are powerful because they can know many things. People travel far to consult with powerful gods. They will return to their home land. Speak of me and more people will come.” He described how each god spoke in a different language, acted in a different way and wore different clothes. “The one that wears the grass is very old. He is the patriarch. He shakes and has difficulty walking and he does not consult. He comes only to check the shrine and make sure that it is good. Then he goes.” Kwabena went on to describe the personalities of the rest of his gods: the no nonsense mother who does most of the work and gets frustrated because no one can understand her language well and the son who is a warrior, aggressive and powerful.

This conversation with the *Okomfo* Kwabena explained a couple of important points about *Okomfo* performance. Firstly, the *Okomfo* is not present but his/her body is merely a receptacle for the *Abosom* to communicate with humans. Secondly, the *Abosom* have different personalities, skills, strengths and weaknesses and that they communicate those mainly via variations in dress, posture and non-verbal communication. Thirdly, many of the variations in Asante *Okomfor* performance are due to the specific gods at each shrine as well as the personality of the healer. Finally, it was very important to Kwabena that his

gods were viewed as powerful and the way that power was established was by knowing many things. What he was referring to was the ability to know about: circumstances and relationships outside of one's personal knowledge, future events, past dealings and occult curses and activities. Another way to establish power was to do some type of physical activity that is beyond normal abilities to withstand, such as Kwabena's *Abosom*'s habit of pouring a bucket of sand into his open eyeballs and walking around as if he could see even when the entire eye is obscured by sand. Most of the ritual healing ceremony is made-up of these physical and psychological proofs of power and authority.

Authority is critical in Asante indigenous ritual healing ceremonies and is proven via practitioner behavior in many ways. Usually this occurs during spirit possession and before practitioner-patient consultation so as to facilitate patient belief and expectation. One *Ɔkomfo* stabbed herself with a knife very visually and extremely hard many times in a row and then showed the attendees that she was not harmed. Another *Ɔkomfo* poured sand into his open eyes and then walked around the shrine with zero visibility and his eyes covered completely in sand and then asked politely after possession why his eyes hurt. Another would rub the equivalent of poison oak all over his body and then show that he did not have a reaction, whereas, the shrine workers who handed him the leaves would break out in a physical reaction to the plant.

Almost every Asante indigenous ritual healing ceremony has some form of physical proof of power and authority. Some are very small such as rubbing white talcum powder on one's eyes, face, body and every footstep to signify the body and actions are of the *Abosom* and not the *Ɔkomfo*. Others are quite elaborate, dangerous and/or "magical" like

when an *Okomfo* was kidnapped by the gods and taken into the forest with no clothing, food or water for 30 days. Below is a list of the physical proofs of power and authority that I encountered during 26 months of fieldwork among Asante *Okomfor* . This list is neither exhaustive nor exclusive, rather it represents a wide swath of the variation one will encounter in Asante indigenous ritual healing ceremonies. It is also important to note that many of the *Okomfo* doing these actions are elderly and not particularly fit. Part of what makes them so powerful and persuasive is because these *Okomfo* are not normally as agile or flexible in their daily lives. Below are some of the physical proofs of power that I witnessed during Asante indigenous ritual healing ceremonies:

- Fasting for extended periods of time
- Very restricted diets for extended periods of time
- Abstaining for sex for extended periods of time
- Becoming deathly ill with an unknown ailment, or blind, deaf or paralyzed if you disobey the *Abosom*
- Being miraculously healed if/when you acquiesce to their will
- Going missing for extended periods of time (months) with no recollection
- Traveling great distances with no recollection
- Being kidnapped by spiritual forces and restrained for extended periods of time
- Taking psychotropic drugs: Kola nuts, smoking, drinking and other ethnobotanical hallucinogens.
- Smoking two cigarettes with both nostrils
- Pouring talcum powder over one's body
- Rubbing mud or sand over one's body
- Dancing, twirling, whirling, jumping, kicking and other kinesthetic movements
- Cartwheels, summersaults, and other acrobatic acts
- Balancing on one leg, jumping over objects and other acts of fitness
- High kicks, lying prostrate on the ground, kneeling, crouching and other acts of extreme flexibility
- Passing out, going unconscious, blacking out and falling down
- Stabbing oneself loudly, rapidly and not feeling pain bleeding
- Gripping a knife or machete tightly and not feeling pain or bleeding



- Whipping one's self and not feeling any pain or bleeding
- Haphazardly shooting a gun without looking
- Pouring sand into one's eyes
- Rubbing one's naked body with poisonous plants and not physically reacting with a rash or itching while the shrine workers who brought you the plants have infections on their hands from the plants
- Assuming the body comportment of the opposite gender, race or different nationality
- Balancing an egg on one's head and walking great distances
- Lighting and holding fire in one's hand without feeling pain or getting burned

### **6.2.2 Psychological Proofs of Power and Authority**

Many *Okomfo* take on the personality, i.e. their dress and behavior changes according to whichever god possesses them. For example, if it is a foreign god they put on eyeglasses and can all of a sudden speak in English, if it is an older god their dress is traditional garments and walk around the shrine slowly shaking, if it is a drunk god they act drunk, if it is a powerful god they act aggressive, if it is a mute god they can only communicate via gestures, etc. In possession, *Okomfo* will engage in behavior they would normally never do, such as, dancing wildly, whipping themselves, talking and blinking rapidly, shooting guns into the air, being demanding, doing somersaults, passing out, disrobing, teasing others, commanding attention, wasting resources, changing garments, etc.

Similarly, most Asante indigenous ritual healing ceremony have some form of psychological proof of power and authority. Some are very small such as throwing an egg and predicting how it will land and divining what it means. Others are quite elaborate and/or “magical” like when an *Okomfo* was able to explain the bad break up of one of my research assistants in great detail without having ever met him. Below is a list of the psychological proofs of power and authority that I encountered during 26 months of

fieldwork among Asante *Okomfor*. This list is neither exhaustive nor exclusive, rather it represents a wide swath of the variation one will encounter in Asante indigenous ritual healing ceremonies. It is also important to note that many of the *Okomfo* doing these actions are uneducated and have no access to social networking. Also, many of the explanations for psychic efficacy such as leading questions and patient-directed answers are irrelevant to most of the psychological proofs. Part of what makes them so powerful and persuasive is because these *Okomfo* are not normally as intelligent or omniscient in their daily lives.

For example, one *Okomfo* asked me to take a cedi<sup>409</sup> and walk 500 feet outside the shrine where no one was around and whisper the desires of my heart and then bring the cedi back to her. Upon receiving the cedi she placed it on her forehead and pondered for a moment before asking two unrelated questions and then revealing my desire. Another *Okomfo* asked me to write down my name and despite his illiteracy, he used the symbols to uncover what brought me there that day. Another *Okomfo* brings his patients into a consultation room and asks them a series of questions and drops a kola nut after each one. The way that these nuts land communicate to him about the person's story. After a few minutes, he reveals to them what is happening in their life and why they are really here. I've had a research assistant declare that one *Okomfo* knew things about his life and past that were impossible to know and not asked in the questions. All of these rituals of proof signal to patients that their practitioner is capable, powerful, confident, good at what they do, and that they have authority from the gods. Below are some of the

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<sup>409</sup> Ghanaian currency

psychological proofs of power that I witnessed during Asante indigenous ritual healing ceremonies:

- Proving one's power by saying one thing weighing on the patient's mind before the patient says a word
- Asking the patient to go into the middle of the rainforest alone and whisper into some banal object (like a rock, a cedi, a twig, etc.) the desire of their heart and then revealing that desire as soon as the patient enters consultation
- Knowing secret things about the patients past that no one else knows
- Predicting specific events in the future
- Explaining the social dynamics of complicated familial or friend relationships without knowing any of the parties
- Speaking foreign languages fluently that the *Okomfo* does not know and has never studied
- Communicating with foreign nationals in their language that the *Okomfo* does not know and has never studied
- Knowing facts about witches, witchcraft and occult forces that have not been revealed
- Knowing specific facts and figures about transactions and conflicts that the *Okomfo* has not been privy to
- Providing a unifying explanation of many disparate phenomena affecting the patient's life
- Ability to curse someone and cause a physical ailment, even death
- Ability to pronounce a cure and cause physical alleviation of symptoms, healing of the problem and often complete cure
- Ability to predict reoccurrence of physical or financial misfortunes
- Keen and intelligent oratory skills

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## CURRICULUM VITAE

