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Resilience Through Attending to the Power of the Mind

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Figure 1. Flowchart of the cyclical processes depicting the symbiotic interplay between the external environment whereby perception and reactions hold the client in a position of immotility.

Abstract

The science of psychological genomics, otherwise known as epigenetics, demonstrates how thoughts and emotions affect our physiology and even our genes. Genetic expression is a determining factor in many physical diseases and mental conditions. There is recent evidence that suggests that effective resilience-focused counseling may enable genes to express themselves in salubrious ways, frequently averting disease. Early counseling interventions can eliminate a future need for more costly invasive medical procedures. People can be mentally and physically healed when they are ministered to in their totality. The science of epigenetics has profound ramifications for all in the healing professions including physicians and counselors as well as the insurance companies that reimburse these professionals.

Keywords: counseling, resilience, epigenetics, psychological genomics

Chapter 1: Introduction

Fictional Vignette

The phone rang, startling me out of my angle of repose. I answered to hear the distraught voice of my mother. The hammock upon which I had been resting suddenly seemed uncomfortable. I could no longer hear the sound of the rope as it grated against the tree trunk. The pungent scent of autumn leaves dissipated from my senses. My mother's words resonated loudly in my ear and loomed large in my brain. She had gone to the doctor and the diagnosis was in, "BREAST CANCER." My breath caught in my throat. There must be a mistake. I did not know how to respond. Did Mother want me to be strong for her or to join with her in grieving? I could not imagine how she felt. I could not imagine life without her. It all seemed so surreal.

In addition to bearing the weight of this diagnostic implication, Mother had the presence of mind to inform me that this gene which is specifically responsible for breast cancer also predisposes me. It all seemed so unfair. This gene was present in Mother's body all along – a poser just waiting for the opportunity to strike. The nagging realization also hit me — this same imposter might also reside in my body, masked from my immune system, waiting to strike.

Unfortunately, this fictional vignette and the cacophony of the word, "cancer" rings familiar to many people. In my graduate counseling studies, I have learned that the human mind is resilient. What if the resilience of the mind could positively affect the body to be resilient too?

Purpose and Overview

The purpose of this literature review is to highlight recent evidence regarding the powerfully impactful influences of the internal thought environment, including perceived stress and emotions, on mental and physical health. The way we perceive our external environment – the events in our lives and the interactions with others – affects our internal environment, including our thoughts and emotions. Neuroscientists, biologists, and geneticists are now studying how our thoughts and emotions affect our physiology, which in turn, affects even our genes (e.g. Rossi, 2002; Lipton, 2008; Church, 2009; Amen, 1998).

The concept of resilience will be the theoretical framework for this discussion, providing compelling implications for the counseling field. I will briefly highlight several genetically associated conditions counselors will see. Then, I will discuss how putting on the lens of epigenetics can be a helpful perspective when viewing these conditions.

This review begins in Chapter Two with a summary of the impact that environmental conditions, particularly stress, can have on psychological and physical well-being. We will discuss the important role that counselors play in providing an environment that heals down to the cellular level of one's being. Psychological and biological references will set the conceptual foundation for understanding resilience from a holistic perspective.

In Chapter Three, we will take a brief glimpse at the effect of the internal and external environment on some genetically predisposed mental disorders. Counseling from a resilience perspective can improve life functioning and psychological well-being. It is

my desire that this chapter will imbue hope for those previously given a “genetic life sentence.”

Lastly, Chapter Four will contain an exploration of what Earnest Rossi termed, “psychological genomics” (Rossi, 2002) and what cellular biologist Bruce Lipton referred to as “epigenetics” (Lipton, 2008). Rossi defined psychological genomics as “how the subjective experiences of human consciousness, our perception of free will, and social dynamics can modulate gene expression, and vice versa” (Rossi, 2002, p. 3). Considering the hopeful implications of epigenetics, this review will contain practical implications for counselors. It is hoped that the reader will come away with an understanding that a resilience-focused counseling approach, founded in a person-centered philosophy, has implications for healing not only the mind but the body, too.

Chapter 2: Stress – Mind-Body Connection

Adverse Effects of Stress

The effects of stress are well publicized. An Internet search on “effects of stress” yielded over six million results. There are numerous ways to categorize stress. For example, Richard Lazarus (1993), defined stress as anything external or internal that taxes or exceeds the individual’s adaptive resources. The American Psychological Association (2011) described three categories: acute stress, episodic acute stress, and chronic stress. Acute stress is short term in nature and refers to the demands and expectations surrounding events of the recent past and impending future. Examples include an upcoming examination, and unexpected events such as delays and accidents. Episodic acute stress could be described as a way of being in which people take on more than is reasonably doable. The APA (2011) described people with ‘Type A’ personality as living in a state episodic acute stress. Living under the tyranny of an over-filled to-do list can cause episodic acute stress. Chronic stress is systemic and ongoing. The APA offered examples of chronic stress as the stress of poverty and dysfunctional families. People in chronic stress have often lost hope as this type of stress is extant in nature and appears to be out of a person’s control. These are the stressors that affect people on a daily basis.

Many researchers have found it helpful to make a distinction between the concepts of stress and stressor. A stressor is the environmental event that triggers the effect, or the stress. Environmental stressors can be divided into two categories: external environment and internal environment (Lipton, 2008).

External Environment. External environmental stressors include toxins we intake from pollution, for example. Multiple studies have cited the dangers of heavy metal exposure (e.g. Barbier, Jacquillet, Tauc, Cougnon, & Poujeol, 2005; Turkez, Geyikoglu, Tatar, Keles, & Kaplan, 2010). External environmental risks, such as crowded urban areas and certain lifestyle variables, have been associated with an increased risk of allergic diseases and asthma (Gern, 2010).

The external environment is impactful even in utero. The developmental origins of disease hypothesis theorizes that a baby's body, in both the pre and postnatal stages, responds to an inadequate environment using adaptive coping strategies that are helpful in the time of adversity but often eventuate in disease later in life (Barker, 2004; Phillips, 2006). Nanthanielsy (1999) even went as far as saying that the womb environment programs our susceptibility to disease later in life.

The examples above include physical attributes of the external environment. The external environment also includes the interactions we have with others. The external environment can be described as the resources and circumstances available for our body to intake and our mind to perceive.

Internal Environment. The internal environment involves the emotions that result from the way we perceive the world around us. Anxiety, fear, and anger are examples of stressful emotions. Contentment, security, and gratefulness are very beneficial states of being that yield positive emotions such as happiness. These states of being do not have to be situationally based. Robert Emmons described the ability to look at adversity and transform it into opportunity. Being thankful despite challenging situations enables us to conclude that gratitude is not just painting smiley faces or a "technique of happyology but

rather a deep abiding recognition and acknowledgement that goodness exists under even the worst that life offers” (Emmons, 2007, p. 9). This explains how we have the ability to influence our internal environment.

Some stressors are both internal and external. Poverty is an example of this. People living in poverty may not be receiving the level of nutrition they need from their external environment. Parents working multiple jobs to make ends meet could yield a lack of psychological nurturance to a child, quite possibly affecting the child’s internal emotional environment.

Physiological Stress Response. Why is the emotional environment such a dominant focus? The effect of the emotional environment can be positive or negative, healing or destructive (Lipton, 2008). For example, failing to effectively process negative feelings, emotions and tensions invites the harbored ongoing stream of negative thoughts and emotions to pugnaciously attack the body (Church, 2009). Each thought, feeling, and emotion causes a release of biochemicals into the blood stream. The bloodstream deftly deposits these biochemicals into the appropriate organs (Church, 2009). This may explain somatic symptoms such as stomachaches and headaches that often accompany emotional distress (Amen, 1998).

The human body is purposefully and intricately made. For example, when the mind perceives that danger is imminent, cortisol is deposited into the bloodstream to mobilize and regulate the body’s energy. Blood flow to the torso and major organs is constricted, giving deference to functions that support the limbs. This action shuts down the body’s growth mechanism and immune system, so energy can be directed to fighting or escaping the imminent threat (Lipton, 2008).

This process works very well for escaping danger. However, when one lives in conditions of sustained stress, blood flow to the forebrain, which is responsible for language, intelligence, and abstract thought, is restricted. Dawson Church (2009) estimated that as much as 80% of the blood in the frontal lobes is redirected to the muscles to support fight or flight, explaining why it is difficult to make decisions when under conditions of stress. The limbic system, containing the thalamus, hypothalamus, hippocampus and amygdala, serves to regulate autonomic and endocrine function, associated with the stress response. Cozolino (2002) has conducted research demonstrating the neural network connecting the limbic system to the frontal cortex. The thalamus monitors the environment for survival. The hypothalamus monitors for internal homeostasis, sending chemicals into the bloodstream to better enable the body for threat response. The amygdala appraises situations, giving the stamp of “fight, flight, freeze” or the stamp of “safety.”

The impact of the fight-or-flight process reflects the body’s two operating modes – protection and growth. The body cannot function in both modes concurrently (Lipton, 2008). In growth mode, all organs and the frontal brain are receiving adequate blood flow. In protection mode, blood flow to the frontal brain and visceral organs is constricted so that extra blood can be diverted to the extremities and hindbrain. When living under conditions of sustained stress, one is living without full immune protection and without normal growth functioning. With this scenario, disease receives its ineluctable invitation (Lipton, 2008; Church, 2009).

Resilience!

There are many modalities that ameliorate the effects of stress. People who have successfully endured, despite adversity, are known as resilient. Studies have shown that social support is crucial to physical and psychological health maintenance in the presence of genetic and other environmental risks (Ozbay, Fitterling, Charney, & Southwick, 2008). Berkman (1995) reported on a study demonstrating that people with a strong social network were less likely to die from stroke, cardiovascular disease, and cancer.

The concept of resilience demonstrates that good outcomes can eventuate in spite of adversity. Studies have shown that children who succeeded despite adversity had more internal and external resources, including cognitive ability and effective parenting. These children had developmentally appropriate and meaningful relationships with adults who held high expectations for them (Masten, et al., 1995, 1999). Although elements of the external environment may have been hostile, an adult serving as a secure port amidst the storm positively affected the child's outcome.

Genuine Emotion, Not Brightsiding

This literature review cannot be complete without addressing the phenomenon of "brightsiding." In this review, it will not be suggested that victims of illness should just paint on a happy face and "look up" so they can magically transform from victims to survivors and thrivers. The external environment, including the toxins we ingest and the air we breathe, yields illness or health. Likewise, the internal environment, including positive emotions or those that result from the weightiness of life, are also impactful. We cannot look at ill persons and make causal judgment regarding their internal or external environment, as this is complex indeed, involving much more than painting happy faces.

Lipton (2008, p. 97) stated, “the mere thinking of positive thoughts will not necessarily have any impact on our lives at all!” In fact, Lipton claimed that this philosophy can cause people to become “more debilitated” as this thought process can lead to hopelessness (Lipton, 2008).

Implications for Counselors

Counselors who understand resilience implement various interventions to help clients cope effectively with stressful environments. Some of these include a cognitive behavioral stress management approach, hypnosis, and relaxation techniques.

In a cognitive behavioral approach, a counselor will help the client to envision other possibilities, reframe current situations and challenge the client’s thoughts and responses to stressors. The counselor may assign “homework” to help create new neuropathways which solidify new thoughts and behaviors.

In hypnosis, during the mentally relaxed, yet alert state of concentrated attention, the counselor works directly with the unconscious mind, giving new meaning and allowing for new perspectives (Yapko, 1995).

Relaxation techniques help to cool the limbic system and create a physiological sense of peace. This supports blood flow to the forebrain, better enabling the client to construct a thoughtful response to stressors. Exposure to chronic stress has been linked to neuron loss in the hippocampus, overall hippocampal volume loss and dendrite atrophy (Borcel et al., 2008; Issa, Rowe, Gauthier, & Meaney, 1990; Kerr, Campbell, Applegate, Brodish, & Landfield, 1991; Landfield, Baskin, & Pitler, 1981; Sandi, 2004; Sandi et al., 2003; Woolley, Gould, & McEwen, 1990). However, research suggests that this does not have to be permanent. A study conducted at Massachusetts General Hospital

demonstrated through MRI's taken before and after eight weeks of Mindfulness Based Stress Reduction found increased grey-matter density in the hippocampus, which is associated with learning and memory, and in areas associated with self-awareness, compassion and introspection. Participants who reported less stress also were shown to have decreased grey-matter density in the amygdala functions associated with anxiety and stress (Massachusetts General Hospital, 2011).

Spiritual and religious practices can also moderate the effects of stress. Herbert Benson and William Proctor (2010) in their book, *Relaxation Revolution: Enhancing Your Personal Health Through the Science and Genetics of Mind Body Healing*, described the spiritual discipline of surrender or submitting to God as being a vital component in health and healing. They describe this as a passive attitude that places God above the human will. Benson, a medical doctor, explained that physiologically “letting go” interrupts the mind/body connection of stressful thought patterns, allowing for the relaxation response that provides healing (Benson & Proctor, 2010). Thousands of years ago, this process was laid out in the Bible in Philipians, chapter 4 which instructs not to be anxious for anything but through prayer and seeking, let your requests be made known to God and this yields peace that surpasses all understanding.

In describing the body physiologically at peace, Herbert Benson coined the term, “relaxation response.” This is the opposite of the fight, flight, or freeze response described in detail earlier. The relaxation response is the physiological reaction that enables the body to be in the growth mode that Lipton (2008) described.

We have discussed the environmental adverse impact of stress and the propitious impact of a resilience-based counseling environment. What are the environmental

implications for genetically predisposed mental conditions? In Chapter three, we will take a look at the implications of epigenetics for resilience-based counseling of genetically predisposed mental conditions.

Chapter 3: Genetically Predisposed Mental Conditions

Thus far, this literature review has presented an argument for integrating counseling as a component of whole health with implications for physical health. A holistic, epigenetically mindful approach can also be healing for those struggling with mental health challenges.

We know that the external physical environment affects physical health. The previous chapter explained the powerful impact that the internal emotional environment has on physical health. How much, if any, impact does the environment have on genetically predisposed mental conditions? In the following sections, I discuss how an epigenetic perspective can enrich our understanding of these conditions.

Alcoholism

Alcoholism has been noted to run in families (Centers for Disease Control and Prevention, 2005). Much research has focused on the genetic component of this condition. Epigenetics paves the way for an understanding of the environmental impact on gene expression, yielding hope for change. Although a genetic component for alcoholism has been identified, there are environmental factors that seem to impact outcomes.

Using a multivariate twin analysis to study the structure of genetic and environmental risk factors for six mental conditions (including alcoholism) among women, researchers concluded that genetic influences on these disorders are ambiguous (Kendler, et al., 1995).

More can be done preventatively on behalf of those who are genetically predisposed to alcoholism. According to the National Institute on Alcohol Abuse and

Alcoholism, in the year 2003, the average age a person first used alcohol was about 14. Approximately 5,000 people under the age of 21 die from alcohol related causes (National Institutes of Health, 2006).

Alcohol education should be brought to early teens. Some assume that people who “can hold their liquor” are not in any danger. In fact, the ability to “hold liquor” is a sign of alcohol tolerance. Knowing the correlation between alcoholism and tolerance compels us to teach others that a first drinking experience in which a teen displays greater tolerance than others is a danger sign. Counselors need to be the vanguard on this issue, alerting people to the signs along this road as well as educating teens on where exactly this road leads.

Marc Schuckit (1998) has done extensive research suggesting that people with a low level of response to alcohol have a greater propensity to become alcoholics. “Level of response” was used because it has yet to be determined whether acute or chronic tolerance, innate sensitivity or a combination of these factors, determine a person’s response level to alcohol (Schuckit, 1998). A low level of response to alcohol can be further influenced by environmental, non-genetic factors such as alcohol expectancy, drinking to cope, and coping styles.

Daniel Amen’s research correlates with these findings as well. In his video, *Roots of Addiction* (CNS Productions, 1999), Amen listed three alcoholism susceptibility factors: heredity, environment, and prior use of psychoactive drugs or behaviors. Heredity only accounts for 10-40% of susceptibility (CNS Productions, 1999). In fact, when separating environmental factors from genetic factors, prior use of psychoactive drugs or behaviors could also be classified as an external environmental impact.

With an awareness of environment, including familial history, a person can, in the freedom of the counseling room, address core concerns and learn new coping mechanisms, replacing former patterns of escape, avoidance and distancing so as to diminish the need for high expectations in alcohol. This approach gives hope to a condition with a previously assumed life-choking hold.

For those struggling with alcoholism, the Transtheoretical Model of Change offers hope. Counselors can use this model to conduct motivational interviewing with knowledge of the moderating effects of the environment, including the alcoholic's internal thought environment.

One of the principles of motivational interviewing is that all people have the potential to change if they are supported by a freeing environment (van Zyl-Knab, 2011). Motivational interviewing provides this environment by honoring a client's present location on the continuum of change rather than fighting against it in an attempt to "right" the client. An attempt to "right" a client by presenting a most cogent argument for change often yields opposition and defensiveness. The more a person is forced to defend a position, the more entrenched in that position the person becomes. A more open environment, providing listening, understanding and validation melts all defenses. When people feel respected and understood, they become open to change. Tug-of-war only becomes tug-of-war if another person comes along and grabs the other end of the rope. Instead of grabbing the other end of the rope, the person-centered counselor stands beside the alcohol-addicted client and asks about the benefits of walking around holding this rope. After the client's communiqué has exhausted all the benefits of holding this rope, the client, often unprompted, will offer the downside of having to hold onto this rope. In

the presence of a freeing environment, substance abuse counseling is hopeful work, yielding gratifying results.

An epigenetic perspective alerts us to the fact that the environment can also have an impact on depression. The following section contains a review of the epigenetic implications regarding depression. Counselors have an opportunity to impact the environment, even from infancy, either directly or indirectly via parental psycho-education.

Depression

Depression appears to have a genetic link, however, research has shown that the environment can impact outcomes. In the twin analysis research aforementioned, the structure of genetic and environmental risk factors for several mental conditions, including major depression disorder among women was studied. Not only were genetic influences on these disorders are ambiguous, but researchers could not find a specific set of genetic factors for each disorder studied. (Kendler, et al.,1995).

Another study on the epidemiology of major depression noted the complexity of the issue, stating that major depression does not result solely from either genetic or environmental influences but rather from both (Sullivan, Neale, & Kendler, 2000). Genetics predispose and environment affirms or disaffirms that predisposition.

We have previously discussed the mechanism whereby cortisol output is increased when the brain perceives a stressor. Ongoing stress with no apparent relief in sight can cause hopelessness and depression. Studies have shown that people suffering with major depressive disorder have higher levels of cortisol circulating through their blood (Heuser , Yassouridis , Holsboer, 1994; Ruben, Poland, Lesser, Winston, Blodgett,

1987; Plotsky, Owens, Nemeroff, 1988; Murphy, 1991). The prefrontal cortex houses a glut of cortisol receptors that regulate gene expression (Patel, Lopez, Lyons, Burke, Wallace, Schatzberg, 2000; Webster, Knable, O'Grady, Orthmann, Weickert, 2002). In this case, it is not difficult to see how a depressed person's prefrontal cortex is at risk of receiving an excess cortisol, which subsequently causes genetic changes. In fact, researchers have found that sufferers of major depression disorder have hundreds of genes in the prefrontal cortex that are expressed differently than those of people who do not suffer from this disorder (Choudary, et al., 2005; Evans, et al., 2004; Iwamoto, et al., 2004; Sequeira, et al., 2006.)

Carl Zimmer (2010) reported on a study examining 36 cadaver brains. Twelve of these 36 died of natural causes, another 12 were suicide victims who had been abused as children. The final 12 had committed suicide but endured no abuse. Researchers looked at the hippocampus region of the brain for stress switches, akin to the light switch metaphor previously mentioned. The brains of those who experienced child abuse had significantly more methyl groups capping the switch.

Methylation, or methyl capping, is the process that alters gene expression. Consider a banana covered by its peel. The peel renders the banana inaccessible for eating. As soon as the peel is removed, the edible portion of the banana is revealed and available to receive a bite from the hungry banana eater. A methyl group is akin to the banana peel. In the study described above, these additional methyl groups covered up the stress hormone receptors, rendering the child abuse suicide victims deficient in stress hormone regulation.

Similarly, a study was conducted on rats, comparing offspring raised by rats that

licked their pups frequently with rats that did not lick their pups much. The pups of mothers that did not lick much were switched with the pups of mothers that did lick much so each mother was raising the other rat's pups. The pups' environment – frequent licking versus infrequent licking – determined these pups' personality as adults. Genes had no bearing in this case. When both groups of pups' brains were examined, stress hormone receptors were capped in the rat pups that received less nurturing (Caldji, Diorio, Anisman, & Meaney, 2004). With these receptors capped, rats (and people) are left without the ability to receive and process stress hormones. These subjects with altered genes are limited in their ability to effectively manage stress. Unmanaged stress on an ongoing basis fosters hopelessness, the harbinger of depression. The good news is that effective counseling works to alter gene expression (Feinstein & Church, 2010).

Louis Cozolino reported on the plasticity of the brain and the importance of the environment. During the first year and a half of life, the right side of the brain is in a critical growth period. At this time the brain is trying to develop attachment to important caregivers. Emotional regulation is occurring and if there is an overabundance of activation as the brain tries to work to attach and regulate emotion, depression and shame can result. The science of brain plasticity supports the fact that this early environment does not have to yield a life of depression and shame. The processes that stimulate brain plasticity activate when mental arousal is at moderate levels (Buczynski, 2011). These processes are not supported at low or high levels. This is consistent with the Yerkes-Dodson Law which states that performance increases at moderate levels of mental or physiological arousal. Cozolino stated that effective counseling uses a caring environment to modulate an effective level of arousal and that counseling recreates the

bonding experience (Buczynski, 2011). In terms of epigenetics, he explained, “There's a stimulation of metabolic processing, and there's probably activation through epigenetics of the client's brain being stimulated to grow in the context of a safe relationship. I think that is a key component of it.” (Buczynski, 2011, p. 5)

How does a counselor provide a safe environment? The counselor, with a listening ear, understanding heart, and validating voice (Presbury, Echterling, & McKee, 2008) can attend to a person traveling through the valleys of depression. After a therapeutic relationship has been established, counseling can help the client to see “the old” from a new perspective. Benson and Proctor (2010) have found that relaxation techniques have been proven to alleviate depression.

PTSD

In this section, we will review PTSD. This is a condition triggered by the environment. Knowing that the environment triggers PTSD, can a non-threatening, supportive environment also ameliorate the effects of PTSD?

Most studies on PTSD focus solely upon a precipitating event when connecting cause and effect for this condition. Recent studies show that a supportive environment might mitigate propensity to PTSD. People who have variations of the stress-related gene, “FK506 binding protein 5” are more prone to develop posttraumatic stress disorder (PTSD) in response to trauma than people who do not have these gene variations (Feinstein & Church, 2010). Although PTSD appears to have a genetic predisposition, Binder, et al reported that genetically predisposed people who have experienced a non-traumatic and supportive family do not have FKBP5 activated (Binder, et al., 2008).

There is some research to support the theory that people with low cortisol levels are more prone to PTSD as they are less capable of managing stress. Cortisol helps the body cope with stress during the period of stress and turns off the body's stress reaction once the threat is over (Paul, 2010).

Rachel Yehuda conducted a study involving 38 pregnant women who were in New York at the time of the September 11 terror attack. In this study, she measured the mothers' basal cortisol levels and the cortisol levels of their babies at one year of age. Of these women, the ones who developed PTSD had low basal cortisol levels and so did their babies (Paul, 2010).

This study piques interest in the question, would offspring of low cortisol mothers also have low cortisol had they not experienced stress in utero? Was the stressful environment the trigger for altered cortisol levels or were these levels genetically determined? Perhaps this is a topic for future research.

Implications for Counselors

We do know that although illness can be genetically predisposed, environment also plays a role. Counselors can have some influence on the environment. Humans are resilient so environmental stressors do not always impact people in injurious ways. For example, studies show that children can endure chronic adversity and adapt resiliently when they have a positive relationship with an adult (Masten, Best, & Garmezy, 1990). Counseling can mitigate internal environmental adversity. The brain is plastic, proving that a new environment can create new neuropathways. Experience can actually change the structure of the brain. This is what occurs in the process of counseling. The following

chapter will detail how the way we experience the environment changes the brain and ultimately mental and physical health through the science of epigenetics.

Chapter 4: Epigenetics, the Mechanism of Resilience

You may be familiar with the concept of gene modification. Corn has been genetically modified, via the process of gene splicing, to contain a pesticide-like substance that causes corn crops to be more resistant to insects that would otherwise destroy the crop. In order to meet consumer demand, salmon have been genetically modified to grow faster. In these instances, geneticists used a process much like grafting to affect the genes. Much to anglers' dismay, male bass fish in the Potomac River have been found with male and female traits. Field and Stream.com (2010) reported that chemicals mimicking natural hormones present in the water are the cause of this genetic modification.

Genes in corn and fish can be modified but what about genes in humans? This review has illuminated the phenomenon of resilience. How resilient are people? What is the mechanism behind resilience? Until recently, science held to the axiom that the presence of a specific gene determines our destiny, postulating for example, that some people are “hardwired” for resilience while others are not. Scientists have discovered that there are certain environmental factors that “turn on” or “turn off” genes. This is the science of epigenetics – no splicing or grafting necessary!

Epigenetics is a Greek word with the prefix, “epi” meaning “on top of” or “above”, so “epigenetics” means “on top of the gene” or “above the gene”. Epigenetics relates to whether or not a gene becomes active. This is known as “gene expression”.

Bruce Lipton (2008) defined epigenetics as the effect environmental influences, including nutrition, stress, and emotions, have in modifying genes. Genetic expression has been described using a metaphorical light switch (Lipton, 2008). Just as a room

containing a light switch will remain dark unless someone flips the switch on, so a gene is only activated when triggered by the environment. A gene must be expressed, or turned on, to activate (Lipton, 2008). Similarly, Earnest Rossi commented, “our genes are switched on and off in response to our conscious efforts to cope with outer stresses as well as to our inner hopes, wishes, fantasies, and dreams” (Rossi, 2002, p. xvi).

Over the years, science has taught that DNA was sovereign. This ideology taught that the diseases to which one would succumb are predetermined by DNA. Until now, one could not explain why it is that identical twins with the same genetic predisposition realized different health outcomes. For some, genes associated with cancer were activated, for others, these genes remained inactive.

William Horton (2005) reported on a study finding that the genetic expression of three-year-old monozygotic twins was almost identical whereas when examined again when the twins were 50 years of age, genetic expression in cells of the mouth, intra-abdominal fat, and muscle was different. This common phenomenon is referred to as “epigenetic drift” (Horton, 2005). Another study examined sets of twins in which one of the twins developed an autoimmune disease. Researchers suggested that the effect of the environment including lifestyle differences might affect key genes involved in immune function. This genetic alteration contributes to the differential onset of the disease in twins. (Javierre, et al., 2009).

As exemplified in these twin studies, sometimes genes are expressed, or turned on, and sometimes genes are turned off. The encouraging news is that genes cannot turn themselves on or off! Proteins, in response to the environment, flip the switch (Lipton, 2008). Thinking back to the light switch metaphor, the way a person perceives and

processes life events provides the environment that can turn on light switches, cause them to remain turned off, or turn off light switches that have once been turned on.

In Chapter Two, we reviewed the impact of emotional stress upon the body. Studies have shown that stress actually alters genes. For example, *Biological Psychology* reported a study comparing people's genes before and after a stressful experience. This was done by comparing medical students' gene expression to their anxiety scores on the State-Trait Anxiety Inventory (STAI) taken both nine months prior to the medical licensing examination and taken again two months prior to the examination. STAI scores nine months prior to the examination were within normal ranges. Results on the second anxiety test taken two months prior to the exam showed that anxiety was significantly elevated. Gene expression patterns were more normal nine months prior to the exam. When assessed at the two-month period, 24 genes were found to have changed significantly (Kawai, et al., 2007). These genes that changed, or turned on, are associated with inflammation and immune response and also regulation of cell growth, transformation, and malignancy.

In what ways are genes altered? Exposure to stress can change the endocrine system's homeostatic regulation and immune functioning further reducing the ability to adapt to new stressors such as infection or cancer (Kiank, et al., 2008). It is imperative that acutely stressful situations are psychologically processed appropriately because the brain cannot discern between actual stress and stress that emanates from re-playing a traumatic event that has been obdurately seared into the mind (Lipton, 2008).

Mind-body healing can remedy the effects of stress. In 2008, Benson, in a Harvard-based study found that people with nine or more years experience in mind-body

techniques, such as meditation and relaxation, changed their genes. In those who practiced mindfulness, 2,209 of the 54,000 genes were being expressed differently, as compared to those in the control group. These 2,209 genes expressed themselves in ways associated with salubrity in those who practiced mindfulness. For those who did not practice mindfulness, these same genes expressed themselves in ways associated with stress and disease, including immune system functioning and inflammation (Benson & Proctor, 2010).

Seeing these results, Benson wondered whether mind-body training could impact the control group's genes, so for eight weeks he trained the control group in mind-body techniques, including meditation focusing on breathing, progressive relaxation, and visualization, before studying their genetic response. In the eight-week duration of training between the first and second test, 1,561 genes changed expression in healthful manifestations. By the way, the probability of the same genes being involved accidentally in both groups in both experiments was less than one in 10 billion (Benson & Proctor, 2010).

The meaning we assign to the beliefs we assimilate into our being is also critically important to genetic expression and ultimately to mental and physical health.

Counseling for a Hopeful Future

There are many ways in which counseling interventions can affect mental and physical outcomes. Brain researchers Gerd Kempermann and Frederick Gage are hopeful that science will provide a way to regenerate damaged neural networks and treatment will involve adaptations of environmental or cognitive stimuli as well as changes in physical activity (Kemperman, & Gage, 1999). Louis Cozolino similarly stated, "We can think in

terms of stimulating new neurons, helping existing neurons to grow and branch out and connect, and also having existing neural systems connect with each other in new and creative ways that support mental health” (Buczynski, 2011, p. 5). He continued his discussion regarding the influence counseling has on the brain by describing counselors as “amygdala whisperers” (Buczynski, 2011, p. 14).

How does counseling work to change the brain? Kandel (1998) suggested long-term behavioral change that occurs through counseling changes gene expression, altering the strength of synaptic connections. Also, these changes alter the anatomical pattern of interconnections between brain nerve cells (Kandel, 1998). In other words, counseling changes brain structure.

A diagnosis of hope, founded in a person’s intrinsic resilience and camaraderie with fellow sojourners can affect healing. According to Nobel Prize winner, Eric Kandel, M.D., “Social influences will be biologically incorporated in the altered expressions of specific genes in specific nerve cells of specific areas of the brain” (Kandel, 1998, p. 457). In reflecting upon this, Dawson Church, Ph.D. mused,

When the doctor of the future tears a page off her prescription pad and hands it to a patient, the prescription might well be – instead of, or in addition to, a drug – a particular therapeutic belief or thought, a positive feeling, a gene-enhancing physical exercise, an act of altruism, a day of gratitude, or membership in a social club (Church, 2009, p. 30).

Psychologist, Robert Emmons wrote an entire book on gratitude. In his book, *Thanks! How Practicing Gratitude Can Make You Happier*, Emmons (2007) posited that

people who practice gratitude on a regular basis benefit not only in their interpersonal lives but also in their physical and emotional health.

Emmons reported, “Adults who keep gratitude journals on a regular basis exercise more regularly, reported fewer illness symptoms, feel better about their lives as a whole and are more optimistic about the future” (Emmons, 2007, p. 11). According to Emmons, people who are grateful experience higher levels of positive emotions such as “joy, enthusiasm, love, happiness, and optimism” (Emmons, 2007, p. 11).

These people are also better able to cope with life stressors and recover faster from illness. The happiness that gratitude yields has been shown to bolster the immune system and even lengthen one’s life (Emmons, 2007). This is not surprising, as we know that in response to emotions, chemicals congruent with one’s emotional state, are sent coursing through the blood so that bodily organs can be fed and respond appropriately to meet the condition of the emotional state.

Imagine every bodily organ receiving a message of love, joy, enthusiasm, happiness, and optimism! With this knowledge, counselors can suggest journaling incidents of gratefulness as an intervention to sooth a harried soul and encourage a hopeless heart.

Myers and Myers reported four traits associated with happy people: They like themselves, feel in control of their lives, are optimistic, and are extroverted (Myers & Myers, 1997). In affording clients unconditional positive regard, a counselor can aid clients along the journey toward liking self and feeling in control.

Myers and Myers also found that religiously active people also reported to be happier (Myers & Myers, 1997). Religiously active people often join with other like-

minded individuals in common interests and pursuits. Many religious traditions foster environments of encouragement. Coming from a Christian perspective, for example, Thessalonians 5:11 (New Living Translation), admonished, “So encourage each other and build each other up just as you are already doing.” People are encouraged to support one another with kind words in Proverbs 12:25 (New International Version). “Anxiety weighs down a heart but a kind word cheers it up.” Counselors work with people of all faiths and are sensitive to each client’s perspective and as such, can tap into the client’s sources of faith and hope.

Counselors can encourage clients to seek informal environments of social support such as churches, book clubs, athletic clubs and the like. Even local volunteer opportunities can be places of support.

One study on the effects of social support on inpatients with major depressive disorder showed that impairment was remediated by a weekend leave in which the patients spent time with family and friends in a supportive environment (Sayal, Checkley, Rees, et al., 2002).

Social emotional support can be offered via group counseling. In group counseling, members have an opportunity to try new ways of being and discover creative ways to work toward common goals. For example, I run psycho-educational groups for people who feel depressed and in my estimation, the relationships formed in those groups outweigh the value of the psycho-educational information dispensed. C. S. Lewis, in his book, *The Four Loves*, summed up the experience of many in the groups I run. “Friendship, I have said, is born at that moment when one person says to another, ‘What! You too? I thought I was the only one’” (Lewis, 1960, p. 78). The realization that a

person is not alone in the sea of distress and that together with other sojourners can form a raft of solidarity yields healing friendships.

Therapeutic Approaches

Research has shown that a therapeutic relationship consisting of empathy and warmth is associated with positive client outcomes (Lambert & Barley, 2001). To establish a therapeutic relationship, the counselor must first honor the client's perspective. This can be accomplished by basing interventions in a person-centered approach, couched in unconditional positive regard.

People come to counseling because they have tried every avenue only to discover dead ends. They have not yet found a way to cope effectively. They see that their chosen coping strategies are working imperfectly. The downside of the coping mechanism is starting to outweigh the upside but considering change on their own when they cannot yet see a way out is too ominous. They are stuck. People seek counseling when they are at the edge of chaos.

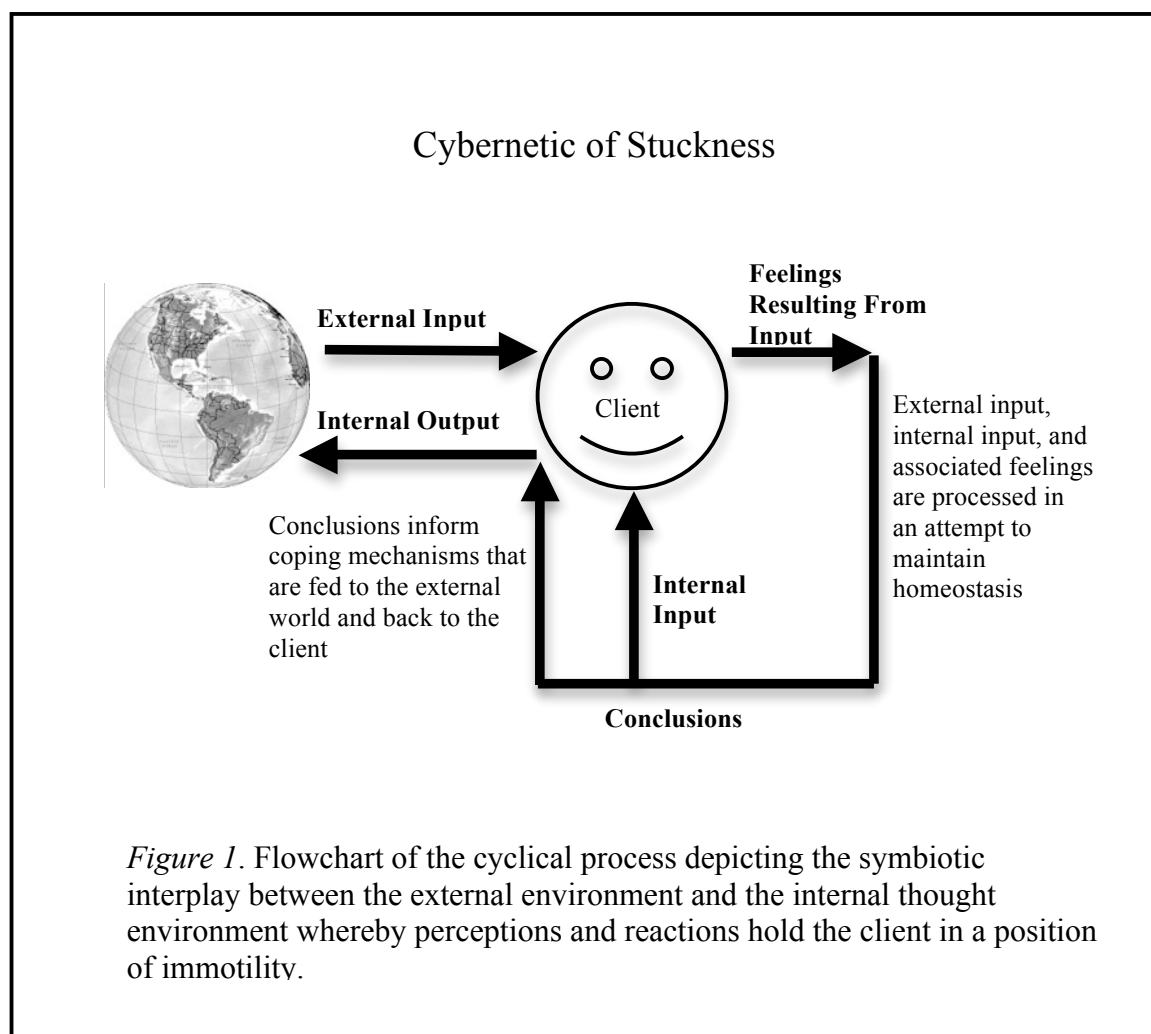
Borrowing the concept of cybernetics from Gregory Bateson (Bateson, 1972), and applying this to counseling, there are two types of input: the client's external environment and the client's internal environment. The external environment is all that goes on around the client. This includes happenings related to the client and those completely unrelated. The internal environment consists of feelings about the external environment. These feelings and this processed communiqué get fed back as input that changes the client. The client processes and responds to both sources of input in an attempt to maintain homeostasis, making conclusions about her world and self. The "output" is the client's resultant conclusions that are fed back to the client and the client's

world as “input.” his input response further endorsed by the client’s conclusions. The cycle continues . . . In the client’s world, the client’s reactions (conclusions) along with the external environment’s reactions to the client help to construct the client’s reality. This is explains self-fulfilling prophesies, for example. When a client comes to counseling, the client may be unaware of how responses to the environment influence the environment’s behavior. The client may not be aware that the environment can be changed. The client feels trapped in a first-order change, repeating the cybernetic, coping as best possible. It is this immotility that is the seed of stress and ultimately discouragement. This seed is fed in a self-sustaining way by remaining in its current

environment. See the chart in Figure 1.

I created the chart in Figure 1 to demonstrate the tenuous interplay between the external environment, consisting of other people, and the individual's internal thought environment. The cycle above can reinforce patterns into the subconscious. Daniel Amen stated that each cell in your body is impacted by each thought you have (1998). One is reminded of the Proverb, "For as he thinks within himself, so is he." Proverbs 23:7 (NASB). The way we think is indeed tied to our physical state.

From a psychodynamic perspective, Lipton stated that the subconscious mind is much more powerful than the conscious mind and when the conscious mind is in conflict



with the “programs” of the subconscious mind, the subconscious mind wins (Lipton, 2008). This tension between the subconscious and the conscious mind causes stress that can manifest itself in the body if not effectively brought to our awareness. Bringing the subconscious to light is the goal in a psychodynamic counseling approach.

A cognitive behavioral perspective would suggest that we challenge troubling and unhelpful thoughts. Counselors work to directly challenge the unhelpful thoughts as such and admonish the client to take action that is incongruent with the unhelpful thoughts. With consistent action in new ways, the brain develops new neuropathways, adopting new thinking that eventually leads to new more helpful coping methods. This is known as cognitive restructuring.

A person-centered approach uses unconditional positive regard to validate the client’s thoughts and feelings, giving these formerly buried thoughts and feelings permission to enter the room. In acknowledging these thoughts and feelings, they paradoxically recede from importance when longer helpful.

What is “unconditional positive regard”? Carl Rogers, founder of the human potential movement says that in creating an environment ripe for change, the counselor must demonstrate acceptance or caring. Rogers uses the word, “prizing” (Rogers, 1980, p. 116). “Prizing” is a beautifully reverent word. *The Free Dictionary* defines it as, “worth striving for” and uses the words, “highly desirable” in the definition (Farlax, 2011). Merriam-Webster uses the words, “to value highly” and “esteem” (Merriam-Webster, 2011). Imagine after sojourning in indescribable adversity, coming in brokenness to a counselor and for the first time, experiencing feelings of value and esteem, even feeling as someone worthy of another’s striving! Rogers describes the ideal

relationship between client and counselor, “The first element could be called genuineness, a realness, or congruence. The more the therapist is himself or herself in the relationship, putting up no professional front or personal façade, the greater is the likelihood that the client will change and grow in a constructive manner” (Rogers, 1980, p. 115). Authentically relating yields a supportive environment that is conducive to healing.

Rather than painting happy faces and affirming that the emotional and physical maladies will heal, in processing, person-centered counselors work with clients first by listening, understanding and validating this tension (Presbury, Echterling, & McKee, 2008), then on illuminating the thought patterns that support unhelpful subconscious “programs”. This works to bring the subconscious and conscious minds into alignment. An authentic relationship consisting of listening, understanding, and validation is the new seed planted in the fertile field of hope. Consider the joy and fulfillment that results from an authentic relationship! Daniel Amen said, “Every time you have a good thought, a happy thought, a hopeful thought, or a kind thought, your brain releases chemicals that make your body feel good and cool your deep limbic system” (Amen, 1998, p. 57).

Epigenetics is a very hopeful science that celebrates resilience in suggesting that our genes do not determine our destiny (Lipton, 2008). Lipton reported on an early lesson he learned from his mentor and pioneer in stem cell cloning, Irv Konigsberg, “He told me that when the cultured cells you are studying are ailing, you look first to the cell’s environment, not to the cell itself, for the cause” (Lipton, 2008, p. 19).

Implications for Counselors

Looking to the environment for both the cause and the cure is a philosophy that is parallel to a person-centered approach to counseling. For many clients, the environment they experienced was hostile and now the counselor provides a new environment of unconditional positive regard, while using corrective emotional experiences to gently deconstruct previous coping methods. The former coping mechanisms fade away as they are just no longer applicable in the new environment.

A resilience-focused counseling environment founded in person-centered philosophy has implications in healing not only the mind and emotions but the body too.

Chapter Five: Conclusion

When we understand that the body responds positively to the genuine expression of a good thought and emotion, we can see how thoroughly life changing a counselor's work can be. Imagine the calming release that comes when a person feels as though they have finally been heard. Consider the relief and satisfaction resulting from feeling understood.

A person who has received the pronouncement, "Your coping mechanisms are maladaptive," sinks further into a despondent hole with the obedient mind and body following suit. If the person knew how to respond to life's adversities in a better way, a better response would have been employed. The resilient client is not exhibiting maladaptive behaviors but rather is exhibiting coping skills.

Imagine, instead, a client's response when a person-centered counselor validates the coping mechanisms by understanding how they are being used for survival and inquires as to the perceived benefits of these coping mechanisms as opposed to preaching about their deleterious effects. This type of validation yields a sense of optimism about one's ability to face the future. The brain causes the body to respond to the calming release, satisfaction, and relief that occur in the framework of authentic relationship. Effective counseling has the potential to positively impact mind, emotion, and body – that's whole health!

The new epigenetic science has exciting implications for the field of counseling. Feinstein and Church (2010) reported that successful counseling interventions changed gene expression. Researchers have found specific biological markers of psychopathology that are associated with gene expression. These markers are: exaggerated limbic system

responses to harmless stimuli, memory and learning distortions, parasympathetic and sympathetic nervous system imbalances, elevated levels of stress hormones such as cortisol, and impaired immune system functioning (Feinstein & Church, 2010).

We have already discussed the pernicious impact of stress on genes and ultimately, physical health. Recent research demonstrated that with effective counseling, measurable biological improvements can be made that impact physical health. (Feinstein & Church, 2010). Through counseling, new neuropathways are created as people learn new ways of being. Corrective emotional experiences affect gene expression by modulation of the neuroplastic synaptic connections in the brain (Feinstein & Church).

Recent evidence through the science of epigenetics offers hope as it gives credence to the resilient human body and mind. Imagine influencing the brain to send healthy messages through the blood to the body. Healing thoughts, effectively processed, can positively affect genes. To be effectively processed, these positive healing thoughts must be in harmony with subconscious programming (Lipton, 2008). This is where the work of the therapist becomes germane. A counselor can help bring the subconscious thoughts to consciousness, opening the way for the client to choose to accept or reject these thoughts. Through counseling, thought patterns that have been unhelpful in the past can be deconstructed and new ways of being can be envisioned. (Presbury, Echterling, & McKee, 2008). These new ways of being can enhance health.

The current medical model focuses upon fixing what is “wrong.” Sometimes people can get so encumbered by what is wrong that they neglect what is working - the things that are healthfully serving them (Church, 2009). According to Dawson Church, this new model of wellness focuses first on what’s already working in clients’ lives and

then on what their potentials are, all the while treating the issues that trouble them. (2009).

Counselors can join with physicians by providing a thorough, holistic approach to wellness in giving voice to a patient who is encumbered by life's circumstances, while honoring that patient's resilient potential.

Person-Centered Counseling for Whole Health

How does the body disinvite disease, or turn off the light switch? People are mentally and physically healed when they are ministered to in their totality. The body and mind can no longer be treated independently. The science of epigenetics has profound ramifications for all in the healing professions including physicians and counselors as well as the insurance companies who reimburse these professionals.

In clearing the path to the light switch, through the dynamic interpersonal process between counselor and client, the client can experience new possibilities through which life events can be perceived as the counselor provides corrective emotional responses and authentic uses of immediacy. In an environment of unconditional positive regard, the client in moves from a sense of loss of control that is often associated with stress, to a self-efficacious base from which the life is now viewed within control, thus reducing stress.

A Call to Action

Now that we have the data, what are we to do?

Interdisciplinary Collaboration for Whole Health. The first important implication for this call to action is greater interdisciplinary collaboration for whole health. Physicians and counselors can partner for improved patient outcomes. Improved

physical and psychological health for the individual as physicians and counselors dissolve boundaries between their professions, allowing the individual to be treated holistically, fostering mental and physical health. Examples have been cited in this review.

Research in cellular biology has shown that only about five percent of diseases are genetically determined. The remaining 95 percent are environmentally based (Lipton, 2008). Counseling has a positive effect on environmentally based illnesses via the mechanism of gene expression (Feinstein & Church, 2010, Emmons, 2007). This suggests that in many cases, we do not have to be hopeless victims.

Lowered Healthcare Costs for the Individual. Counseling is less expensive than invasive medical procedures. It is difficult to put a cost on all the diseases and conditions related to inflammation, endocrine function and immune conditions that are associated with stress induced maladaptive gene expression. Consider heart disease. Although there are genetically linked predisposing factors for heart disease, stress has been identified as a significant contributing factor (Pashkow, 1999). According to cardio vascular surgeon, Denton Stam, (M.D. Stam, personal communication, March 12, 2011) a coronary artery bypass graft surgery (CABG) costs about \$35,000.

Of the possible factors leading to heart disease, does it not make sense to provide help for the factors within human control? Although the average amount of counseling sessions is twelve, even one year of weekly counseling sessions aimed at stress reduction at a rate of \$100 per hour would only cost 15% of the price of a CABG surgery.

Individuals can avoid costly and invasive medical procedures resultant from unhealthful

gene expression in favor of counseling which encourages gene expression in health-promoting ways.

Lowered Healthcare Costs for the Nation. Health and health care is both an individual concern and a national concern. As counselors and medical professionals adopt a resilience-based epigenetic approach to whole health, cost savings impact the nation.

Despite the fact that only about 5% of diseases are genetic, or beyond our control, the United States Health and Human Services Department predicts that the health share of GDP will continue an upward trend, reaching 19.3% of GDP by 2019 (U.S. Department of Health and Human Services, 2011). This gloomy forecast shadowed against the recent hopeful psychological and biological scientific findings prompts further action in the direction of integrated whole health.

Counseling: A Proactive Intervention. Insurance funds that would otherwise be spent on costly medical procedures for a few can be proactively spent on counseling for many. Insurance companies can note that integrative holistic treatment involving early counseling intervention in a physician - counselor partnership could possibly eliminate a future need for more costly medical procedures, eventuating in lowered insurance costs. Perhaps implications of these findings will afford changes in insurance policies, appropriating more funds for counseling.

Final Thought

Bruce Lipton stated that our DNA, passed down through generations is not our destiny (Lipton, 2008). In fact, “environmental influences, including nutrition, stress, and emotions can modify those genes” (Lipton, 2008, p. 37). The fact that our thoughts and

emotions can transform our genes is as hopeful as the sun emerging over the mountains
dawning the new day!

References

- AbdelMalik, P., Husted, J., Chow, E. W. C., & Bassett, A. S. (2003). Childhood head injury and expression of schizophrenia in multiply affected families. *Archives of General Psychiatry*, *60*, 232-236.
- Amen, D. (1998). *Change your brain: Change your life*. New York, NY: Three Rivers Press.
- American Psychological Association. (2011). *Stress: The different kinds of stress*. Retrieved from <http://www.apa.org/helpcenter/stress-kinds.aspx>
- Barker, D. J. (2004). The developmental origins of adult disease. *Journal of the American College of Nutrition*, *23*, 588-595.
- Barbier, O., Jacquillet, G., Tauc, M., Cougnon, M., & Poujeol, P. (2005). Effect of heavy metals on, and handling by, the kidney. *Nephron Physiology*, *99*, 105-110.
doi:10.1159/000083981
- Bateson, G. (1972). *Steps to an ecology of mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. Chicago, IL: University of Chicago Press.
- Benson, H., & Proctor, W. (2010). *Relaxation revolution: Enhancing your personal health through the science and genetics of mind body healing*. New York, NY: Scribner.
- Berkman, L. F. (1995). The role of social relations in health promotion. *Psychosomatic Medicine*, *57*, 245-254.
- Binder, E., B., Bradley, R.G., Liu, W., Epstein, M.P., Deveau, T.C., Mercer, K.B., & Ressler, K. J. (2008). Association of FKBP5 polymorphisms and childhood abuse

- with risk of posttraumatic stress disorder symptoms in adults. *Journal of the American Medical Association*, 299, 1291-1305.
- Buczynski, R. (Producer). (2011, March 17). *Why all practitioners are neuroscientists: with Louis Cozolino, PhD and Ruth Buczynski, PhD* [Audio podcast]. Retrieved from <http://www.nicabm.com/brainexchange/>
- Caldji, C., Diorio, J., Anisman, H., & Meaney, M. J. (2004). Maternal behavior regulates benzodiazepine/GABAA receptor subunit expression in brain regions associated with fear in BALB/c and C57BL/6 mice. *Neuropsychopharmacology*, 29(7), 1344-1352.
- Choudary, P. V., Molnar, M., Evans, S. J., Tomita, H., Li, J. Z., Vawter, M. P., Myers, R. M., . . . Jones, E. G. (2005). Altered cortical glutamatergic and GABAergic signal transmission with glial involvement in depression. *Proceedings of the National Academy of Sciences of the United States of America*, 102, 15653–15658.
- Church, D. (2009). *The genie in your genes: Epigenetic medicine and the new biology of intention*. Santa Rosa, CA: Energy Psychology Press.
- CNS Productions (Producer). (1999). *Roots of Addiction* [VHS]. Available from <http://www.cos.edu>
- Cohen, A. (Producer). (2009, August 26). Super nutrient gal [Audio podcast]. Retrieved from <http://series.supernutrientgal.com/wowguests>
- Cozolino, L. (2002). *The neuroscience of psychotherapy: Building and rebuilding the human brain*. New York: W.W. Norton and Company.
- Emmons, R. A. (2007). *Thanks: How practicing gratitude can make you feel happier*. New York, NY: Houghton Mifflin.

- Evans, S. J., Choudary, P. V., Neal, C. R., Li, J. Z., Vawter, M. P., Tomita, H., . . . Akil, H. (2004). Dysregulation of the fibroblast growth factor system in major depression. *Proceedings from the National Academy of Sciences of the United States of America*. 101,15506–15511.
- Feinstein, D., & Church, D. (2010). Modulating gene expression through psychotherapy: The contribution of noninvasive somatic interventions. *Review of General Psychology*, 14(4), 283-295.
- Frank, L. (2000). A theory of schizophrenia, viruses, and pregnancy. *Genome News Network*. Retrieved from http://www.genomenewsnetwork.org/articles/12_00/Schizophrenia_virus_pregnancy.shtml
- Gern, J. E. (2010). The urban environment and childhood asthma study. *The Journal of Allergy and Clinical Immunology*, 125(3), 545-549, doi: 10.1016/j.jaci.2010.01.037
- Heuser I, Yassouridis A, & Holsboer F. (1994). The combined dexamethasone/CRH test: a refined laboratory test for psychiatric disorders. *Journal of Psychiatric Research*, 28, 341–356.
- Horton, W. (2005). Epigenetics and twins: The effect of time. *Growth, Genetics, and Hormones*. 21(4). Retrieved from <http://www.gghjournal.com/volume21/4/ab13.cfm>
- Javierre, B. M., Fernandez, A. F., Richter, J., Al-Shahrour, F., Martin-Subero, J. I., Rodriguez-Ubreva, J., . . . Ballestar, E. (2009). Changes in the pattern of DNA methylation associate with twin discordance in systemic lupus erythematosus. *Genome Research*, 20(2), 170-179. doi: [10.1101/gr.100289.109](https://doi.org/10.1101/gr.100289.109)

- Kandel, E. (1998). A new intellectual framework for psychiatry? *American Journal of Psychiatry*, 155, 457-469.
- Kemperman, G., & Gage, F. (1999). New nerve cells for the adult brain. *Scientific American*, 280, 48-55.
- Kawai, T., Kyoko, M., Masuda, K., Nishida, K., Shikishima, M., Ohta, . . . & Rokutan, K. (2007). Gene expression signature in peripheral blood cells from medical students exposed to chronic psychological stress. *Biological Psychology*, 76(3), 147-155. doi:10.1016/j.biopsycho.2007.07.008
- Kendler, K., Walters, E., Neale, M., Kessler, R., Heath, A., & Eaves, L. (1995). The structure of the genetic and environmental risk factors for six major psychiatric disorders in women, Phobia, generalized anxiety disorder, panic disorder, bulimia, major depression, and alcoholism. *Archives of General Psychiatry*, 52(5), 374-383.
- Kiank, C., Depke, M., Fusch, G., Domanska, G., Geffers, R., Voelker, U. & Schuett, C. (2008). Hypermetabolic syndrome as a consequence of chronic psychological stress in mice. *Brain, Behavior, and Immunity/Abstracts*, 22, 20-21.
doi:10.1016/j.bbi.2008.04.069
- Lambert, M.J., Barley, D.E., (2001). Research summary on the therapeutic relationship and psychotherapy outcome. *Psychotherapy: Theory, Research, Practice, Training*, 38(4), 357-361. doi:10.1037/0033-3204.38.4.357
- Lazarus, R. S. (1993). Coping theory and research: Past, present and future. *Psychosomatic Medicine*, 55, 234-247.
- Lewis, C. S. (1960). *The four loves*. Orlando, FL: Harcourt Brace.

- Lipton, B. (2008). *The biology of belief: Unleashing the power of consciousness, matter, and miracles*. Carlsbad, CA: Hay House.
- Massachusetts General Hospital (2011, January 21). Mindfulness meditation training changes brain structure in eight weeks. *ScienceDaily*. Retrieved from <http://www.sciencedaily.com/releases/2011/01/110121144007.htm>
- Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology*, 2(04), 425-444. doi:10.1017/S0954579400005812
- Masten, A. S., Coatsworth, J. D., Neemann, J., Gest, S. D., Tellegen, A., & Garmezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development*, 66,1635-1659.
- Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy, N., & Ramirez, M. (1999). Adaptation in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology*. 11(1), 143-69.
- Murphy B. E. (1991). Steroids and depression. *Journal of Steroid Biochemistry and Molecular Biology*, 38, 537–559.
- Myers, David & Myers Diener (1997). The pursuit of happiness. *Scientific American*, Mysteries of the Mind, [Special Issue]. 7(1), 1.
- Ozbay, F., Fitterling, H., Charney, D., & Southwick, S. (2008). Social support and resilience to stress across the life span, A neurobiologic framework. *Current Psychiatry Reporteds*, 10(4), 304-310. doi:10.1007/s11920-008-0049-7
- Patel, P. D., Lopez, J. F., Lyons, D. M., Burke, S., Wallace, M., & Schatzberg, A. F.

- (2000). Glucocorticoid and mineralocorticoid receptor mRNA expression in squirrel monkey brain. *Journal of Psychiatric Research*, 34, 383–392.
- Paul, A. M. (2010). *Origins: How the nine months before birth shape the rest of our lives*. New York, NY: Free Press.
- Phillips, D. I. (2006). External influences on the fetus and their long-term consequences. *Lupus*, 15, 794-80.
- Plomin, R., & Asbury, K. (2005) Nature and nurture, environmental influences on behavior. *Annals of the American Academy of Political and Social Science*, 600, 86-98.
- Plotsky P. M., Owens M. J. & Nemeroff, C. B. Psychoneuroendocrinology of depression. Hypothalamic-pituitary-adrenal axis. *Psychiatric Clinics of North America*, 21, 293–307.
- Presbury, J., Echterling, L. G., & McKee, J. (2008). *Beyond brief counseling and therapy, An integrated approach*. Upper Saddle River, NJ: Pearson Education.
- Prizing (tr.v.). In the free dictionary by Farlex (2011). Retrieved from <http://www.thefreedictionary.com/prizing>
- Prizing. (v.). In Merriam-Webster's online dictionary (2011). Retrieved from <http://www.merriam-webster.com/dictionary/prizing>
- Rogers, C. (1980). *A way of being*. New York, NY: Houghton Mifflin.
- Rossi, E. (2002). *The psychobiology of gene expression: Neuroscience and neurogenesis in hypnosis and the healing arts*. New York, NY: W. W. Norton.
- Rubin, R. T., Poland, R. E., Lesser, I. M., Winston, R. A., Blodgett, A. L. (1987). Neuroendocrine aspects of primary endogenous depression. I: Cortisol secretory

- dynamics in patients and matched controls. *Archives of General Psychiatry*, 44, 328–336.
- Sayal, K., Checkley, S., Rees, M., Jacobs, C., Harris, T., Papadopoulos, A., & Poon, L. (2002). Effects of social support during weekend leave on cortisol and depression ratings, A pilot study. *Journal of Affect Disorders*, 71(1-3), 153-157.
- Soderland, P., Lovekar, D., Weiner, D. E., Brooks, D. R., & Kaufman, J. S. (2010). Chronic kidney disease associated with environmental toxins and exposures. *Advances in chronic kidney disease*, 17(3), 254-264. doi:10.1053/j.ackd.2010.03.011
- Study says 80 percent of male Potomac smallmouth are hermaphrodites. (2010, April 21). Field and Stream, Field Notes. Retrieved from <http://www.fieldandstream.com/blogs/where-fish-bass/2010/04/study-says-80-percent-male-potomac-smallmouth-are-basically-hermaphrod>
- Sullivan, P. F., Neale, M. C., & Kendler, K.S. (2000). Genetic epidemiology of major depression: Review and meta-analysis. *American Journal of Psychiatry*, 157, 1552-1562.
- Thomas, L. D. K, Hodgson, S., Nieuwenhuijsen, M., & Jarup, L. (2008). Early kidney damage in a population exposed to cadmium and other heavy metals. *Environmental Health Perspectives*, 117(2), 181-184. doi: 10.1289/ehp.11641
- Tsuang, M. (2000). Schizophrenia, genes and environment. *Biological Psychiatry*, 47(3), 210-220.

- Turkez, H., Geyikoglu, F., Tatar, A., Keles, S., Kaplan, I. (2010). The effects of some boron compounds against heavy metal toxicity in human blood. *Experimental and Toxicologic Pathology*, In Press, corrected proof. doi: 10.1016/j.etp.2010.06.011.
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2005). Genomics and disease. *Health Marketing*. Retrieved from http://www.cdc.gov/healthmarketing/entertainment_education/tips/genomics.htm
- U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services. *National Healthcare Expenditure Data, NHE Fact Sheet*. Retrieved from http://www.cms.gov/NationalHealthExpendData/25_NHE_Fact_Sheet.asp - [TopOfPage](#)
- U.S. Department of Health and Human Services, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism. (2006). *Alcohol Alert* (NIH Publication No. 67). Retrieved from <http://pubs.niaaa.nih.gov/publications/aa67/aa67.htm>
- Van Os, J., & McGuffin, P. (2003). Can the social environment cause schizophrenia? *British Journal of Psychiatry*, 182, 291-292.
- van Zyl-Knab, C. (2011, February). *Introduction to Motivational Interviewing*. Seminar conducted at James Madison University, Harrisonburg, VA.
- Webster, M. J., Knable, M. B., O'Grady, J., Orthmann, J., Weickert, C. S. (2002). Regional specificity of brain glucocorticoid receptor mRNA alterations in subjects with schizophrenia and mood disorders. *Molecular Psychiatry*, 7, 985-994.
- Yapko, M. D. (1995). *Essentials of hypnosis*. New York, NY: Routledge.
- Zimmer, C. (2010). The brain: Switches that can turn mental illness on and off. *Discover*. *Mind and brain: Genes and health*. Retrieved from

http://discovermagazine.com/2010/jun/15-brain-switches-that-can-turn-mental-illness-on-off/article_view?b_start:int=1&-C=