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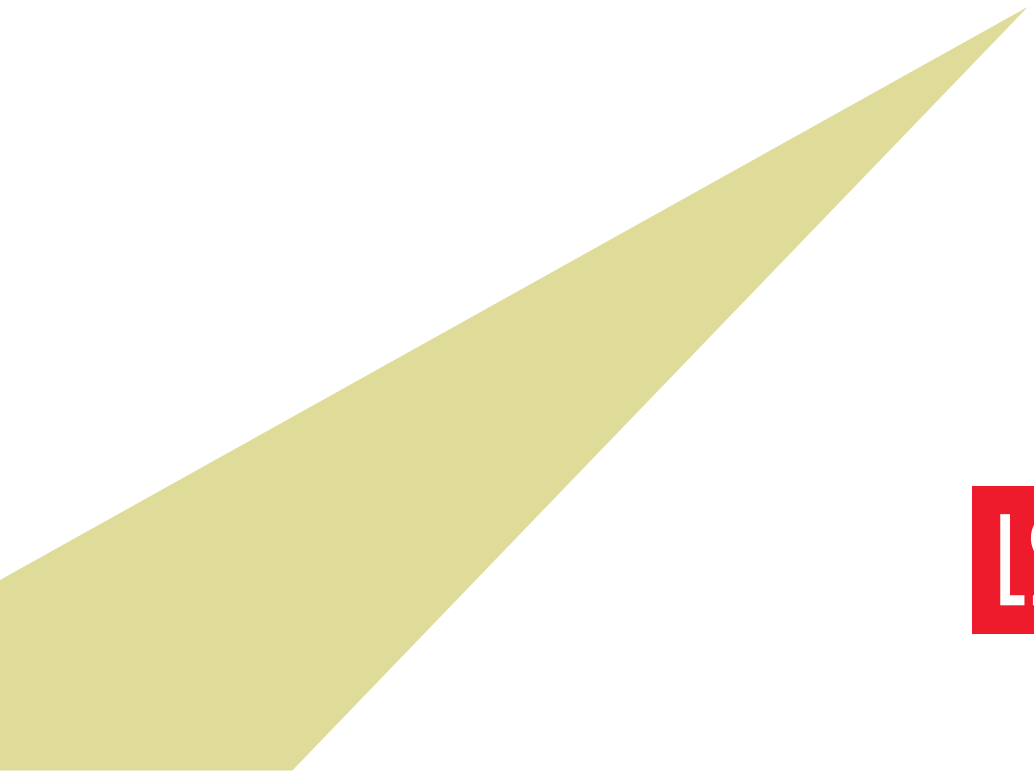

The hedonic placebo effect of traditional medicines

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Abstract

To date, the scientific evidence on traditional medicines is scant and under-developed, yet, paradoxically individuals continue to use it and claim high satisfaction levels. What can explain this effect? Using self-collected data from Ghana we argue that variations in satisfaction across individuals can be attributed to the hedonic placebo effect gained from using traditional medicines, in which processes involved with its consumption are as important, if not more important, than measures of self-reported health outcome. Findings suggest that individuals' health seeking behaviour should be evaluated using procedural, as well as outcome, utility.

Keywords: process utility, procedural utility, traditional medicine use, medicines, Ghana.

Contents

6.1 Introduction

Traditional medicines and healers[1] (TM/H) play a very important role within healthcare systems of many developing countries (World Health Organization, 2002). A large proportion of sub Saharan Africa continues to utilise this form of care for a variety of reasons, despite the fact that most medicines consumed are not scientifically tested or approved. This has led to a division within both policy and research arenas, between those who claim traditional medicines to be a substitute for people who fail to accept, access, afford or find available modern medicines, and those who argue that traditional medicines can never be replaced by modern medicines given its special nature. This paper shows that these divergent views might partially be reconciled if we take into account the utility ('subjective well-being') people gain from the processes involved in the consumption of TM/H. We term this the 'hedonic placebo effect'[2], through which people who decide to act by sourcing traditional medication are more likely to feel satisfied to have done something, even after controlling for the utility from self-reported health outcomes. In the case of untested, unregistered and unregulated traditional medicines, this concept rings even truer: taking action, in and of itself, appears to have some value, in addition to (somewhat indeterminate) health benefits.

This method of analysing satisfaction is a clear departure from conventional studies in two ways: firstly, instead of focusing on satisfaction derived from outcomes (level of outcome utility, OU), emphasis is placed on the utility gained from the process. This follows closely the work of Frey and colleagues (B. S. Frey, Benz, & Stutzer, 2004; B. S. Frey & Stutzer, 2005) who measure and coin the term 'procedural utility'[3] (henceforth PU). The process in question here is whether, in addition to consuming herbal medication, an individual has undertaken other rituals or healing processes such as prayers, incantations, meditation, massage, touch therapies, religious activities, body-mind therapy or folk therapy. Such processes are argued to be an important aspect of utility for sick individuals, and shown to

[1] Defined as herbal medicines, animal parts and/or minerals and non-medication therapies including spiritual therapies (WHO 2002:1)

[2] the 'placebo effect' term is borrowed from medical literature. Under the placebo effect, inert substances have psychological effects, inducing individuals to report that they feel better or relived of symptoms. We are grateful to an anonymous reviewer for suggesting the 'hedonic placebo effect' term as applied here.

[3] Frey et al are among the first to quantify, though not conceptualise: the idea of procedural justice is old, harking back to (Bentham, 1789)

be evidence of the quality of care provided by healers. To the authors' knowledge this is the first study to have quantified traditional medicines in this manner. Secondly, the study takes advantage of outcome measures, as measured by five dimensions on health, as outcome utility controls. Previous studies exploring satisfaction with traditional medicines have merely asked for satisfaction rates without quantifying health dimensions, making it difficult to differentiate between sources of satisfaction. Adopting these methods allows for the analysis of traditional medicines and healers from a previously unexplored angle.

Data collected from households in two regions of Ghana are used to elucidate these points. Using satisfaction with life as a proxy for utility from utilisation, individuals attain higher levels of subjective well-being if rituals or healing processes have been carried out. This process utility is directly measured against outcome utility, through which we can determine some evidence of a hedonic placebo effect. Even after controlling for severity of illness, financial capabilities, societal environment and locational characteristics (collectively termed 'control variables'), the significance of PU pertains. Results also remain largely robust to sensitivity checks in which different outcome and satisfaction measures are tested. The study has important policy implications for the measurement and analysis of satisfaction, and the need for PU to be taken into account when founding medicines policies, which are currently based on proving TM's scientific merit rather than recognising that individuals gain utility from the processes involved in its consumption (Ministry of Health, 2007; World Health Organization, 2002).

The following section provides the background to traditional medicines utilisation and the concept of PU, including examples to illustrate. The application of PU to traditional medicines utilisation is provided within. Section III outlines the empirical framework, which includes the statistical model and data description. Results are discussed in section IV, alongside an array of robustness checks. Discussions and policy implications are presented in section V before the paper concludes.

6.2 Background

The literature has previously explored possible reasons for the continued use of traditional medicines and healers. Among the more prominent are explanations linked with better

accessibility, acceptability, affordability and availability over modern medicines (Anyinam, 1987; World Health Organization, 2002). The acceptability component is particularly interesting as it presents the view that illness is conceptualised according to health beliefs, opening up the possibility that causes and cures may differ from that offered by modern medicines. Indeed, the anthropological literature is awash with explanations to support this view (Evans-Pritchard, 1937; Kleinman, 1980; Rivers, 1924; Twumasi, 1979).

Healers and medicines are sometimes purposively chosen for particular conditions for which skills and/or medicines are effective at relieving symptoms– if not to totally cure. Examples of this include herbal remedies for malaria (Willcox & Bodeker, 2004), HIV (Mills, Cooper, & Kanfer, 2005) and low back pain (Gagnier, van Tulder, Berman, & Bombardier, 2007). Indeed, two extremely common pharmaceutical products, quinine and artemisinin, originate from indigenous medical systems (Muthaura, Keriko, Derese, Yenesew, & Rukunga, 2011), serving to illustrate the biomedical properties of some plants. Yet, for the most part, biomedical evidence on the efficacy of traditional medicines is patchy, with a significant body of literature pointing out the dangerous effects of traditional medicines and healers (Dada, Yinusa, & Giwa, 2011; Liu, 2007; Smyth, Martin, & Cairns, 1995). As such, to date, literature fails to capture completely why people continue to use traditional medicines when most remedies are not scientifically proven effective.

Studies on satisfaction from utilisation also give rise to mixed evidence. One report analysing satisfaction with health providers in Ghana, as measured by 'percentage of patients who report being satisfied with the services received at last visit' indicates that traditional healer attendees were most satisfied (65%), followed by private sector patients (56% for private doctor, 51% private facility) whilst public facilities were rated less highly (49% public hospital or clinic) and mission hospitals fared the worst (39%) (Center for Pharmaceutical Management, 2003, p. 43). On the other hand, Peltzer et al (2008) shows non-herb users have slightly higher levels of satisfaction than herb users, a finding reflected by Stekelenburg et al (2005) who report an 89% satisfaction rate after hospital treatment versus 74% after utilisation of TH. Ezeome and Anarado (2007) report that in Nigeria, 68.3% of complementary and alternative medicine users were disappointed, with over 21% of users reporting various unwanted effects. However, levels of satisfaction from

TM/H use are not necessarily related to perceived or actual effectiveness. A study in Pakistan shows 84% of patients using TM/H were satisfied or very satisfied, but only 57% thought treatment was effective (Tovey, Broom, Chatwin, Hafeez, & Ahmad, 2005, p. 246). Further, compared to medical specialists who scored 96% for satisfaction and 94% for effectiveness, TM/H fares badly for outcome. Overall, such studies give rise to divergent satisfaction rates because they are measuring different aspects of satisfaction and are thus unable to separate between utility gained owing to health outcomes and utility gained from the quality of care of healers.

This paradox of the users' 1) inability to qualify and quantify scientifically the merits of herbal medicine and healers; and yet 2) still reporting persistent use alongside varied satisfaction rates, highlights the need to look for sources of utility other than from aspects related to outcome. Procedural utility is here offered as a possible tool of analysis.

Within economics, procedural utility has been tested by the likes of Bruno Frey for whom not merely the 'ends', but 'means' - the 'how' as well as the 'what' - are valuable in their own right. This is in contrast to the positivistic movement of the 1930s in which only tangible outcomes were all that mattered in explaining well-being. Frey et al (2004) put forward three ways in which PU differs from 'traditional' utility: firstly, at the core of PU is its hedonic nature, in which 'utility is understood as wellbeing, pleasure and pain, positive and negative affect or life satisfaction' (B. S. Frey, et al., 2004, p. 379). As such, the existing work on the economics of subjective well-being (Easterlin, 1973; Layard, 2006; Oswald, 1997; Stevenson & Wolfers, 2008) is very much in line with PU in that this body of literature equates subjective well-being with utility. Secondly, people have a sense of 'reflexive consciousness' so care about how they are perceived and in turn, how they perceive others. In essence this means that assessments are endogenous to an individual's utility function (A. Frey & Stutzer, 2001). Thirdly, PU incorporates a non-instrumental aspect, whereby utility is additionally amassed from how people are treated (with respect, or with equal rights, for example). This is in sharp contrast to traditional utility measurement which takes into account solely instrumental values. These three dimensions amalgamate to define PU as 'the hedonic well-being people gain from the quality of treatment in institutionalized processes as it contributes to a positive sense of self' (A.

Frey, Benz, & Stutzer, 2002, p. 4). Examples from the fields of politics and economics are given in Benz and Stutzer (2004); Benz and Frey (2008); Stutzer and Frey (2006) and Lind and Tyler (1988).

It follows that theories from cognitive behavioural theory/social psychology are central to understanding how people derive utility, but what are the intrinsic motives serving these needs? In self-determination theory, Deci and Ryan (2000) put forward three motives: autonomy, relatedness and competence. Autonomy ('rule by self') refers to the value an individual attaches to be 'psychologically free': an individual appreciates the ability to express his own feelings and wants, to pursue personal interests but all the while maintaining social support[4]. Relatedness describes the need of individuals to feel wanted and connected, 'feeling loved and cared for'. Utility is accrued from social connections and overt ability to 'fit in' with society. Thus, individuals conforming to the social norm are likely to feel higher levels of relatedness particularly in societies with strong localised communities or where societies are closely integrated. Competence is the intrinsic motivation gained through positive affirmation of oneself by others, such as encouragement or supportive feedback. Deci and Ryan (2000, p. 231) state that the satisfaction of these three needs are; 'essential for the healthy development and well-being of all individuals regardless of culture'. These three motives may therefore be seen as the underlying traits of PU, because individuals inherently try to fulfil these needs and, in line, gain utility from the extent to which they have been satisfied.

PU and traditional medicines

TM/H users experience peace of mind, emotional and spiritual well-being through rituals and healing processes carried out, over and beyond possible health benefits. This is akin to the placebo effect in biomedicine, which shows psychological benefits (positive thinking and instilling hope and expectation) from taking inert substances, whilst others show neurological effects such as the release of endorphins (natural pain killers in brain) or dopamine ('fight or flight' reaction) contributing significantly to well-being (Benson & Friedman, 1996; de la Fuente-Fernandez et al., 2001; Wampold, Minami, Tierney, Baskin, &

[4] Thus, autonomy does not mean independence per se, as it relies on social backing and endorsement

Bhati, 2005). In the mid twentieth century Beecher (1955) evaluated from 15 studies an average 35% of medical effectiveness of drugs were due to placebo and another, more recent study, found that even when patients showed signs of improvements in health even when told the pill was placebo ('honest placebo') (Kaptchuk et al., 2010).

Moerman (1983) similarly evaluates 31 studies on ulcer treatment to find up to 90% of drug effectiveness can be accredited to placebo, but that only half this is due to active substances while the remaining half is to 'general medical effectiveness'. General medical effectiveness can arise from a 'practitioner effect', or good quality patient-practitioner interactions, which induces individuals to place symbolic and psychological values to medicine and healing. Thus, having an understanding and empathic healer is as important –if not more important - in the process of health seeking (D. E. Moerman, 1979; Price, 1984; van der Geest, Whyte, & Hardon, 1996). This is corroborated in a study that reveals, even having controlled for baseline quality of life scores and heterogeneous variables across sites, individuals taking medication for HIV/AIDS from traditional healers report higher quality of life than those who sought drugs at a western medical infrastructure. The authors suggest that healers are better able to 'provide psychosocial support and a familiar cultural context for health care' (Taylor, Dolezal, Tross, & Holmes, 2008, p. 555).

However, the placebo concept itself is not without criticism. Kienle and Kiene (1997) argue that a range of factors can explain why individuals feel better for having used inert substances. Among these, spontaneous improvement, fluctuation of symptoms, additional treatment and neurotic or psychotic misjudgement are put forward as biological explanations, whilst statistical and methodological issues are also raised in the form of irrelevant response variables, answers of politeness and conditioned answers. Although these ideas fall outside the scope of this study, placebo effects –both biological and psychological in nature - are a possible source of utility especially for TM/TH use which remains largely clinically untested.

A key reason for the continued utilisation of TM is the healers' culturally sensitive approaches to treatment, often referred to as more 'holistic' in nature (van der Geest, 1997). Frequently healers are personally invested and involved, willing to spend much

time and effort to understand all aspects of an individual's life and not merely acting as an agent in the identification of illness or disease. This is clearly indicative of genuine concern and care. Such reasons also likely explain the popularity of TM as a backup option, used when other treatments have proved ineffective or deficient (Sato, forthcoming). In such cases, palliative care and sympathy is more likely to be forthcoming from healers who have extensive knowledge of the patient and are socially invested in them. The character of interaction between the healer and patient is notable and varied. Some examples of healer care beyond provision of herbal products include religious and non-religious acts such as: prayers, incantations, bloodletting, animal sacrifice, divination, speaking in tongues and in the case of spiritual illness, standing as an intermediary between the individual and spirit (Rivers, 1924; Stekelenburg, et al., 2005; Tabi, Powell, & Hodnicki, 2006). Additionally, some plants must be prepared specially by healers to make the herbs effective, even when the actual substance remains unchanged (see Kareru et al (2007)). For example, Yoruba practitioners in Nigeria must sing to their medicines before administration (from van der Geest, et al., 1996) and further, medicines are useless without faith and belief that they will work (Tabi, et al., 2006). All these processes contribute to increasing an individual's faith in the healing power of medicinal products.

The nature of interaction between patient and healer extends to mode of payment. Healers are known to provide different payment contracts based on ability to pay (Hausmann Muela, Mushi, & Ribera, 2000) and outcomes (Leonard & Zivin, 2005), as they are able to exploit the informal networks within which they work: societies in which mutual accountability is high are amenable to traditional medicines/healer use and further, such arrangements are shown to be economically rational. Whether due to culture or payment flexibility, the upshot is identical: when individuals use traditional medicine and healers, some utility is gained from certain processes involved in its consumption that would otherwise not pertain from modern systems. Rather than utility from health outcomes per se, there is some value specific to the process of utilising traditional medicines.

The above discussion suggests that intrinsic concerns and procedural utility therefore arising are of greater concern over outcome utility and a testable hypothesis can be formulated:

The utility derived from utilising TM/H with rituals leads to greater levels of satisfaction than without, because individuals recognise procedural utility. Such procedural utility pertains even when controlling for outcome utility, giving rise to a hedonic placebo effect.

6.3 Empirical strategy

1. Data

Data are sourced from household questionnaires undertaken by research assistants in late 2010 in two regions of Ghana, Greater Accra (GA) and Upper West (UW). A standardised sampling methodology, approved and frequently used by the World Health Organisation, was used. In each region, two districts are selected (district capitals plus the least populous), from which references points are chosen. Using each reference as the centre, three clusters ('radii') are mapped according to distance, and household clusters are targeted for interviews. Researchers travel in random directions within radius clusters, and choose households common to the area and in line with other specified criteria. A representative household is then labelled as the starting point, and subsequent households are interviewed so long as they were: at least five apart; similar to the representative household; private, not public buildings; and in separate compounds. Researchers must return at least once to empty or busy households and obtain information from an appropriate respondent. Prior to actual data collection, ethical approval was sought from relevant institutions and a pilot questionnaire run. This allowed for effective translations and training of research assistants.

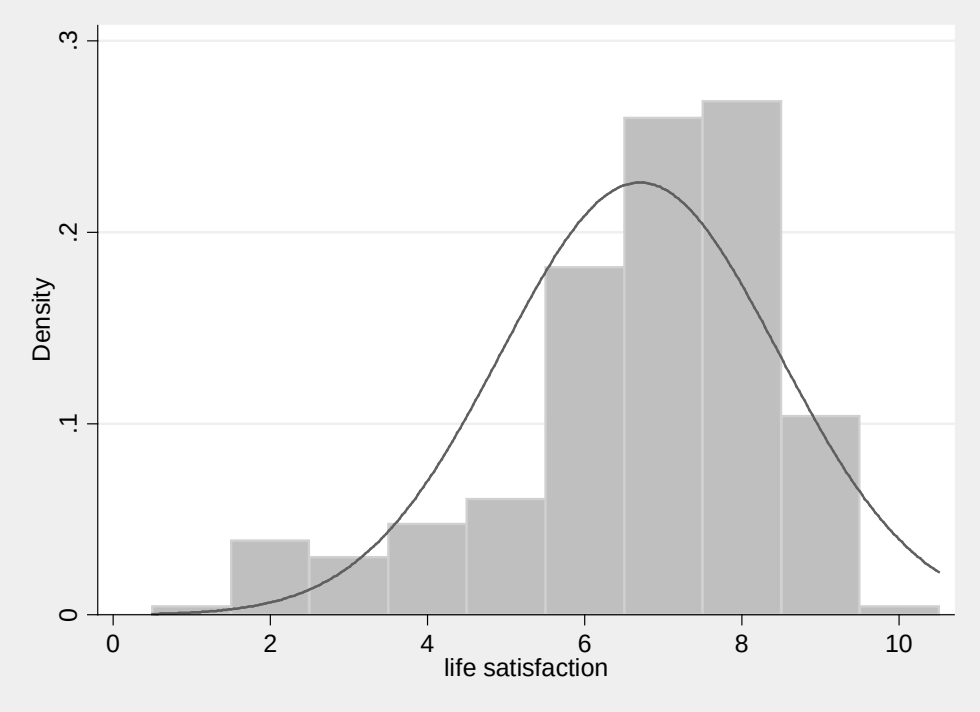
In sum, information on 4713 from 772 households was collected, using 16 reference points. For the purposes of this paper, relevant data include health needs, sociodemographic information, sources and nature of treatment, and various dimensions of self-reported satisfaction.

The measurement of utility using self-reported satisfaction is increasingly accepted in economic literature (Ferrer-i-Carbonell & Gowdy, 2007; Kahneman, Wakker, & Sarin, 1997). Life satisfaction is measured for all users of traditional medicines and/or healers by asking respondents the following question: 'using a scale of 0 to 10, where 0 indicates absolute dissatisfaction and 10 indicates absolute satisfaction, please indicate (*first name*)'s overall level of satisfaction with life after utilizing TM/H'. Respondents were aided by a horizontal visual representation of the scale, but more importantly, the question was thoroughly explained by a trained research assistant to entice accurate answers from respondents, and internal validation was checked through the use of multiple alternative and not dissimilar questions.[5] The answer was then taken to be a proxy for utility (subjective well-being).

A histogram of the main dependent variable, life satisfaction, is plotted in figure 1. On the full scale, satisfaction levels of 8, 7 and 6 are the most commonly stated numbers. The distribution is therefore skewed to the left, as the normal curve depicts. The mean life satisfaction is 6.7.

[5] For example, 1) 'how satisfied was (*first name*) with the outcome? With answers ranging from very satisfied to very dissatisfied and 2) please indicate (*first name*)'s overall level of satisfaction with health after utilizing the TM/H. A very high correlation between all three answers were achieved, indicating that asking the same question in different ways did not yield dissimilar results.

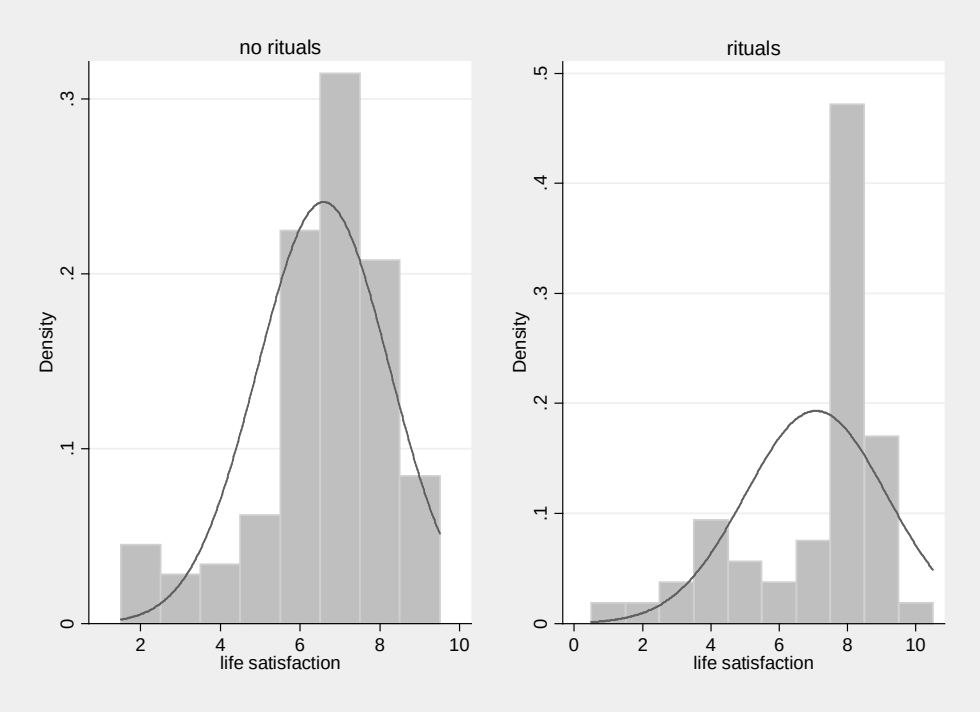
Figure 1 - life satisfaction after TM/H utilisation



An additional measure of satisfaction, change in life satisfaction (the difference between life after and life prior utilisation) is used as a robustness check. Scores are grouped into 5 categories (negative or no change, change of 1 or 2 points, change of 3 or 4 points, change of 5 or 6 points and change of 7 or more points).

The main independent procedural variable is termed 'ritual', denoted 1 if the respondent answered, given need, 'yes' to the question: 'did you/the TH carry out any rituals or healing processes?' (acupuncture, meditation, incantations, massage, touch therapies, religious activities, body-mind therapy, folk therapy). Slightly fewer people had rituals carried out (26%) than not (74%). Overall, those who have rituals show greater levels of subjective well-being, stating an average score of 7.08 as opposed to 6.59 for those without rituals. Histograms reflecting satisfaction scores for individuals with and without rituals are presented in Figure 2.

Figure 2 - life satisfaction according to rituals



The main independent outcome variables of interest are obtained from indicators collectively referred to as EQ5D, which enquires about 5 dimensions of health: mobility, self-care , usual activities, pain/discomfort and anxiety/depression on three possible levels – none (level 1), some (level 2) and severe (level 3) – before and after utilisation. For the purposes of this study, one indicator for the main model plus two additional indicators are derived to test for robustness: firstly, whether the individual felt better following utilisation, per dimension, where 0 indicates no change or individual got worse (e.g. individual stated level 2 before and level 2 after, or individual stated level 1 before but level 3 after) and 1 indicates that the individual felt better (e.g. individual stated level 2 before, and level 1 after). The second indicator states the absolute level of problem, where 0 indicates no problems at all (level 1) and 1 indicates some or severe problems (levels 2 or 3). These variables are termed 'mobility_abso'; 'selfcare_abso'; 'activity_abso'; 'pain_abso'; and 'anxiety_abso'. The third indicator is an attempt to arrive at a single utility score combining these five dimensions. As there are 3 possible choices per dimension, an individual can be assigned a corresponding score based on a 'tariff' (see (Szende, Oppe,

Devlin, & EuroQol Group., 2007)) where 0 indicates a state 'as death' and 1 shows full health. Although considerable debate surrounds the specificity and appropriateness of using pre-assigned value sets for differing populations (Parkin, Rice, & Devlin, 2010), it is used here only as an additional robustness check and should therefore not be overly scrutinized. There are no existing value sets for Ghana, so Zimbabwe's is borrowed to be indicative of sub Saharan value sets. In Zimbabwe's tariff, a 33333 problem set (i.e. individual has severe problems in every dimension) corresponds to a utility score of -0.145 and 11111 is assigned the value 1. The distribution of raw scores can be found within the summary table in appendix one.

A brief outline of remaining control variables is given here, with fuller descriptions and explanations to be found in appendix one. A dummy variable 'severity' is included as a proxy for self-assessed *health*. An individual is classed according to self-rated severity of illness (denoted 1 if he/she believed the symptoms to be very serious; 2 serious; 3 not serious or not serious at all) and type of illness (chronic or not). Two measures of *financial capability* are additionally included; log equivalised income, calculated using a formula taking into account number of children and adults in the household, and a dummy to indicate whether the individual holds health insurance. With a mean of 0.6, the majority did indeed hold national health insurance. Indicators of *societal environment* are also added: 'culture' indicates an index of cultural attitudes and beliefs towards TM/H[6], whilst 'community group' asks whether anyone in the household belongs to a community group (0 no 1 yes) in order to assess the level of social interaction. Other *socio-demographic* variables include: sex (0 male 1 female); highest level of education completed or currently attaining ('education_cat'; 0 none, 1 primary, 2 junior, 3 senior+); occupation ('occupation'; 1 farmer, 2 office worker, 3 own business owner or 4 unemployed); religion ('religion': 1 Christian, 2 Muslim, 3 other or 4 none), the age group within which the individual falls ('ageg': 1: 0-11; 2:12-17; 3:18-34; 4: 35-54; 5: 55+), whether the individual is married ('married' 0 no 1 yes) and the relationship to the head of the household ('head_cat': 1 head; 2:spouse; 3:child; 4:other). Finally, two *locational dummies* are incorporated into the

[6] Individuals were asked to rate their level of agreement about certain attitudes and beliefs related to TM/H and this was made into an index using principal components analysis. Higher values indicate more negative cultural attitudes towards TM/H.

model: 'urban', denoted 1 if the household is located in one of two district capitals and 0 otherwise and lastly, a regional dummy Upper West, omitting Greater Accra.

2. Model

We use an ordered probit specification that allows for multiple, ordered dependent variables assuming a normal distribution (Greene, 2003; Jones, 2007). This is appropriate when outcomes can be viably classed in a natural order. Life satisfaction is scaled between zero and ten, with zero representing 'absolute dissatisfaction' and are measured on an ordinal scale, used to express an underlying latent variable y*, where y* infers the individual's 'true satisfaction'. This implies that ordinal interpersonal comparability is assumed, whereby someone who answers 8 is happier than someone answering 4, but not necessarily twice so (Ferrer-i-Carbonell & Gowdy, 2007). Threshold values (τ_i) represent cut-off points where an individual moves from belonging in one satisfaction level to another. Where the lowest (highest) possible value of the threshold is minus (plus) infinity, and a constant term is suppressed[7], it is possible to model an eleven (0-10 inclusive[8]) category ordered probit thus:

$$P(y_i = 0|x_i) = \phi(\tau_0 - x_i\beta)$$

$$P(y_i = 1|x_i) = \phi(\tau_1 - x_i\beta) - \phi(\tau_0 - x_i\beta)$$

$$P(y_i = 2|x_i) = \phi(\tau_2 - x_i\beta) - \phi(\tau_1 - x_i\beta)$$

$$P(y_i = 3|x_i) = \phi(\tau_4 - x_i\beta) - \phi(\tau_3 - x_i\beta)$$ .... For every y_i until

$$P(y_i = 10|x_i) = 1 - \phi(\tau_9 - x_i\beta)$$

Where βs and τs are to be estimated with robust standard errors, clustered by radius to account for sampling methodology and ϕ represents the probit link function and estimation is by maximum log likelihood. Coefficients have a qualitative interpretation only: a positive coefficient indicates an individual will display higher latent satisfaction and

[7] Alternatively the first threshold could be set to zero
[8] Although no zero values were actually observed

is therefore more likely to report higher levels of satisfaction whereas a negative coefficient implies the opposite. To quantify magnitudes, marginal effects for any level of outcome can be calculated, with regressors set at mean values. Specifically, a one unit increase in the variable (or being in the category as opposed to the omitted counterpart(s) if it is a dummy variable) is associated with changes - in percentage point terms – of achieving a certain level of satisfaction. Additionally, the change in probability for any given points of a regressor can be derived and plotted. For example, it is possible to calculate the change in probability of attaining all outcome levels when an individual hypothetically moves from not having rituals or healing processes (rituals=0) to having some (rituals=1).

6.4 Results

The descriptive data reveals that individuals who were treated with rituals display higher levels of satisfaction than those who were treated without rituals. In this section, ordered probit models with and without control variables are presented. Here, only marginal effects for reaching satisfaction level 8[9] are reported.

Table 1 - Effects of procedural utility

	(1) I	(2) II	(3) GA	(4) UW
Rituals	0.083**	0.105**	0.187[a]	0.164***
	(0.025)	(0.034)	(0.101)	(0.047)
Illness characteristics				
Mild severity		-0.027	0.232	-0.117*
		(0.065)	(0.235)	(0.059)
Low severity		0.033	0.156	-0.059
		(0.113)	(0.270)	(0.105)
Chronic		0.018	0.043	0.0003
		(0.051)	(0.086)	(0.033)
Financial capability				
Insurance		-0.039	-0.143	-0.079**
		(0.039)	(0.161)	(0.025)
Income		0.033	0.019	0.020
		(0.026)	(0.030)	(0.028)
Societal environment				

[9] Level eight was chosen as representative of high satisfaction, as there were very few observations for levels 9 and 10

Culture	-0.009	-0.178*	0.065*
	(0.017)	(0.072)	(0.027)
Communitygroup	0.067	0.142	0.088***
	(0.043)	(0.119)	(0.018)
Sociodemographic characteristics			
Female	-0.005	0.125*	-0.051***
	(0.039)	(0.061)	(0.015)
Education_primary	0.072*	0.086	0.093
	(0.029)	(0.068)	(0.057)
Education_junior	0.039	0.138	0.036
	(0.050)	(0.138)	(0.041)
Education_senior+	-0.010	0.226***	-0.012
	(0.054)	(0.024)	(0.155)
Occupation_office	0.059	-0.204***	0.066***
	(0.071)	(0.037)	(0.018)
Occupation_business	0.070	-0.302**	0.135***
	(0.093)	(0.115)	(0.023)
Occupation_unemp	0.025	-0.116	0.016
	(0.039)	(0.102)	(0.088)
Religion_Muslim	-0.068	-0.276***	-0.021
	(0.063)	(0.071)	(0.115)
Religion_other	0.035	-0.057	0.103***
	(0.073)	(0.122)	(0.023)
Religion_none	0.025	-0.221***	0.079
	(0.055)	(0.050)	(0.085)
Age__12-17	0.084	-0.167*	0.089*
	(0.060)	(0.084)	(0.041)
Age_18-34	-0.002	-0.352***	-0.134
	(0.094)	(0.065)	(0.153)
Age_35-54	0.029	-0.450***	-0.034
	(0.135)	(0.104)	(0.218)
Age_55+	-0.011	-0.394***	-0.072
	(0.106)	(0.095)	(0.180)
Married	-0.017	-0.264	0.072
	(0.067)	(0.165)	(0.049)
Spouse	0.033	0.357***	-0.014
	(0.028)	(0.090)	(0.055)
Child	0.004	-0.198	0.052***
	(0.030)	(0.186)	(0.005)
Other_relation	-0.012	0.089	-0.064[a]
	(0.023)	(0.213)	(0.037)
Locational characteristics			
Urban	0.033	0.272***	0.087

		(0.043)	(0.043)	(0.076)
Upper West region		0.141*		
		(0.062)		
Chi2(dof)	10.02 (1)	0.837 (2)	9.404 (2)	0.767 (2)
r2	0.009	0.050	0.225	0.099
N	231	189	70	119

Marginal effects for satisfaction level 8 are presented;
Robust Standard errors in parentheses;
[a] p<0.1, * p<0.05, ** p<0.01, *** p<0.001

Results confirm the positive value of rituals and healing processes on life satisfaction. The first column in table I displays the baseline ordered probit in which only the variable 'rituals' is regressed. The positive and significant coefficient indicates satisfaction increases when individuals have utilised TM/H with rituals. Individuals with rituals are associated with an 8 percentage point higher likelihood of achieving satisfaction 8 than individuals without rituals. This can be taken as the first sign of the possible effects of procedural utility.

Controls are then included to test whether other non-procedural variables override the effect of procedural factors (column 2). Even including controls, the rituals have strong and positive effects on subjective well-being. However, the significance of other variables appear over-ridden by the regional dummy and as such, it is informative to split the sample according to region.

Columns 3 and 4 present results for Greater Accra and Upper West respectively. Even when analysing results by region and including all controls, the effect of rituals still hold. Size effects appear larger for Greater Accra, though greater statistical significance arises from Upper West. Both regions show that by undertaking rituals, the proportion of people indicating satisfaction level 8 increases by between 16-18% percentage points. These regions also display differences in the relative importance of other indicators of satisfaction. For example, the signs on severity of illness are positive and insignificant for Greater Accra but negative for Upper West. Belonging in a community group in Upper West has significantly positive effects on achieving high satisfaction, possibly because individuals feel supported by those living within the same social circles. This latter result

serves to validate that to a certain extent, those with higher social capital reach higher levels of satisfaction which is consistent with social capital theory (Helliwell & Putnam, 2000).

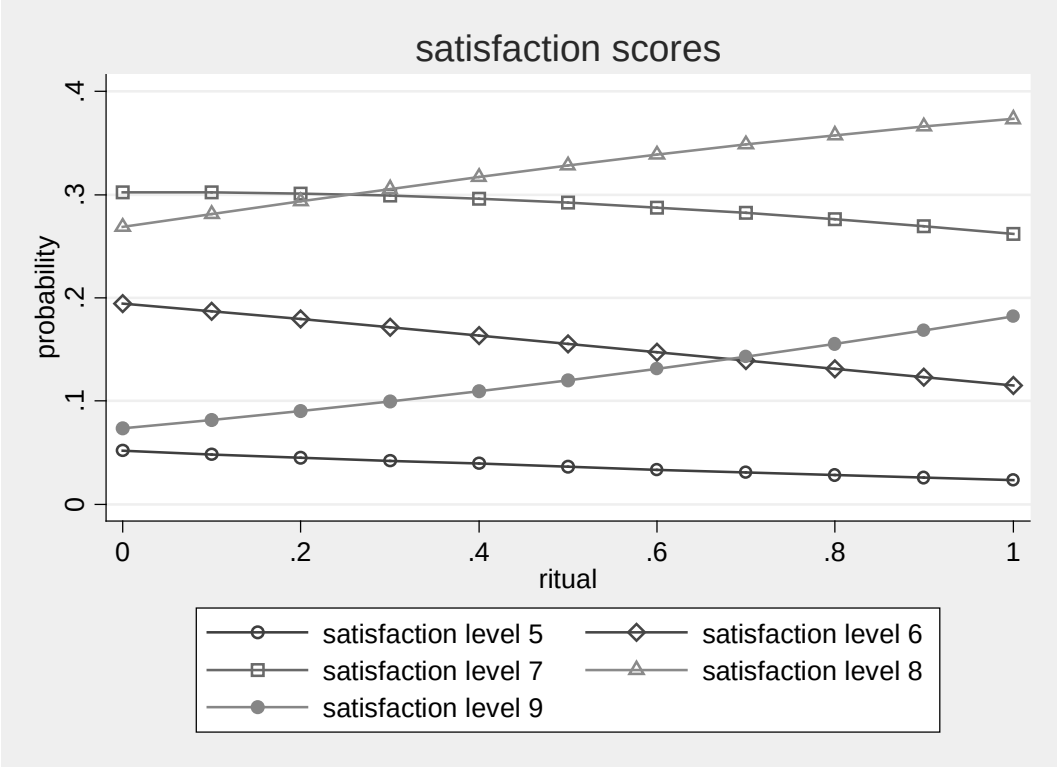
Whilst in Greater Accra, there appear to be no significant effects of insurance on satisfaction, in Upper West there are significantly negative effects. The sign on the insurance coefficient suggests that individuals with insurance are less likely to achieve satisfaction level 8 than those without. Although this is counterintuitive, it must be borne in mind that the indicator distinguishes between insurance holders and non-holders only, rather than whether they have utilised insurance for their illnesses. Further, many individuals expressed dissatisfaction from high registration costs and yearly payable premia to keep a validated card, users of TM/H (and therefore those who could reveal satisfaction levels) would not have been able to use insurance for traditional care, thus effectively nullifying its worth and in fact, are burdened with an extra outlay in ensuring its validity. Previous research also indicates that health insurance coverage does not ensure high satisfaction levels with a health system (Blendon, Leitman, Morrison, & Donelan, 1990).

The significance of the community variable in Upper West is a sign of subjective well-being resulting from greater interconnectedness, interaction and interdependence. This concurs with a study from the USA which suggests that – controlling for demographics and health needs - individuals with a positive sense of community are less likely to report problems with health care costs, choice, access and satisfaction (Ahern, Hendryx, & Siddharthan, 1996). Other important variables include the role of cultural attitudes and beliefs, with individuals in Greater Accra showing that having negative attitudes is associated with less likelihood of achieving level 8 satisfaction, whereas people in Upper West have less likelihood of being in category 8 if they hold negative attitudes towards TM/H. These differences may be due to the particular level of satisfaction chosen (i.e. people in Upper West maybe less likely to report level 8, but more likely to report another level instead). Socio-demographic indicators such as gender, level of education, occupation, religious

affiliation, age and relationship to the head of the household are additional important indicators of satisfaction.

Ordered probit estimations can be graphed by calculating the changes in probability for purposively chosen satisfaction levels between individuals with rituals versus those without, given the full range of control variables. In figure 3, the probabilities of attaining satisfaction levels 5, 6, 7, 8 and 9 are plotted for every 10 percentage point increment between ritual=0 (no ritual) and ritual=1 (ritual). For example, when an individual does not have a ritual, the probability of attaining satisfaction level 8 is calculated as 0.269. As the individual veers towards having a ritual, the probability of attaining this level of satisfaction rises, to reach 0.373 where ritual=1. The difference in these two probabilities, 0.105, is the resulting marginal effect for satisfaction level 8 in column two, table 1. On lower probability levels (satisfaction levels 5, 6 and 7), decreasing trends (negative differences) are plotted. All corresponding changes in probability used to construct the graph are given in appendix two.

Figure 3- change in probability from no rituals to rituals, selected satisfaction scores



1. Direct test: procedural versus outcome utility

A direct test of procedural versus outcome utility is possible if outcome indicators are included in regressions. Table 2 sees the addition of five variables directly measuring the health effects of TM/H utilisation and thus capture outcome utility. These five variables indicate changes in utility accrued to individuals who report improvements in mobility, self-care, daily activities, pain and anxiety. If it is the case that these outcomes are of greater importance than processes, the marginal effect on variable 'ritual' would be rendered insignificant or reduced, and the coefficient on the outcome variables would prove significant. Results are given for the full sample (column 1) and by region (columns 2 and 3) [10] and show that even with outcome variables included, carrying out rituals has large marginal effects: an individual who uses TM/H with rituals are 11.2 percentage points more likely to be on satisfaction level 8 than someone without (versus 10.5

[10] Henceforth, only shorter tables (without displaying controls) are presented. Full tables are available upon request

percentage points without outcome variables in model one). Regional sub samples also confirm positive effects (23.3 and 15.6 percentage points for Greater Accra and Upper West, respectively) of PU, despite controlling for outcome utility.

The marginal effects on the outcome variables for the full sample suggest three dimensions to be of particular importance: activity, pain and anxiety. Specifically, an individual who states improvements in activity, pain and anxiety is expected to raise their likelihood of reaching level 8 satisfaction by 21.9, 17.9 and 16.7 percentage points respectively. Mobility and self-care have smaller but still significant effects on satisfaction. In Greater Accra, the effect of procedural utility seems to override outcome utility, except in the case of pain. In Upper West, improvements in activity have a particularly sizeable and significant effect on satisfaction (29.2 percentage points). The corresponding graph for changes in probability associated with satisfaction once controlled for outcome utility, for the full sample, is given in appendix 3.

Table 2 - direct test of PU vs OU

	(1) OU	(2) OU_GA	(3) OU_UW
Rituals	0.112***	0.233[a]	0.156***
	(0.021)	(0.141)	(0.021)
Outcome measurements			
Mobility	0.035***	-0.040	0.124[a]
	(0.010)	(0.049)	(0.064)
Selfcare	-0.103***	0.004	-0.202***
	(0.026)	(0.068)	(0.025)
Activity	0.219***	0.181	0.292***
	(0.019)	(0.140)	(0.088)
Pain	0.179[a]	0.143*	0.206
	(0.103)	(0.065)	(0.187)
Anxiety	0.167***	0.063	0.236**
	(0.045)	(0.123)	(0.089)
Financial capabilities	*Yes*	*Yes*	*Yes*
Societal Environment	*Yes*	*Yes*	*Yes*
Sociodemographics	*Yes*	*Yes*	*Yes*
Locational dummies			

	Yes	*Yes*	*Yes*
Region	0.061		
	(0.051)		
Chi2 (dof)	0.866 (2)	4.404 (2)	2.118 (2)
R2	0.143	0.272	0.187
N	189	70	119

Marginal effects for satisfaction level 8 are presented;
Robust Standard errors in parentheses;
[a] p<0.1, * p<0.05, ** p<0.01, *** p<0.001
Standard controls are included but not presented

2. Robustness checks

Results are checked using a variety of sensitivity analyses. The most important of these is the test for sample selection (Heckman, 1979). Given that only satisfaction scores for users of TM/H are ascertained, inferences about the population of non-users cannot be made directly. If there are systematic differences between users and non-users, there exists a problem of identification and consequent 'selection bias' (Heckman, 1979). In such cases it is possible instead to estimate the probability of utilisation conditional on explanatory variables, and then estimate the expected satisfaction scores conditional on use. This is known as the two step procedure for sample selection, in which the first step is to estimate a probit model for utilisation by identifying an 'exclusion restriction' – where an explanatory variable is chosen for being associated with TM/H utilisation but not satisfaction directly. An inverse mills ratio (IMR) is then calculated and added as an extra variable in the second stage regression and significant IMR is seen to be indicative of sample selection problems. One possible candidate for this explanatory variable is an indicator measuring the presence more than one herbalist within an hour's walk[11], the rationale being, having more herbalists within the locality is likely to increase access probability and hence utilisation, but satisfaction with the particular healer used or processes involved in consumption does not necessarily change because extra practitioners are available. This variable is tested for significant and insignificant relationships with utilisation and satisfaction respectively. In practice, finding an appropriate variable fulfilling such identification restrictions is difficult and it is common to find sample

[11] How many of the following types of traditional medical practitioners/THs do you have within one hours' walk (<1) from your home? (of which non spiritual herbalist was one category): 0,1,2,3,4,5+.

selection models in which the same set of regressors are used for both steps (Jones, 2007). Here, in addition to presence of extra herbalists, all variables from the first step regression are included in the second stage. In tables three and four, sample selection models for regressions without and with outcomes, respectively, for full samples and regional sub-samples, are given. The first row of table three shows marginal effects of achieving life satisfaction 8 in the sample selection models is comparable to the original estimates. Sample selection is not of concern (as indicated by insignificant inverse mills) for the full sample and Upper West, but results for Greater Accra should be interpreted with care given its significance. Even when outcomes utilities are accounted for (table four), rituals appear significant and sizeable. Sample selection appears problematic for regional, but not full, samples. Overall, the general finding that rituals are associated with attainment of higher satisfaction levels, holds.

Table 3 - Sample selection models

	1	2	3	4	5	6
	ssm	ssm_GA	ssm_UW	ssmOU	ssmOU_GA	ssmOU_UW
Rituals	0.106**	0.266	0.165***	0.113***	0.284*	0.157***
	(0.033)	(0.105)	(0.048)	(0.017)	(0.137)	(0.020)
Outcome measurements						
Mobility				0.032***	-0.043	0.132*
				(0.004)	(0.050)	(0.067)
Self care				-0.103***	0.005	-0.203***
				(0.027)	(0.066)	(0.026)
Activity				0.219***	0.170	0.288**
				(0.019)	(0.139)	(0.095)
Pain				0.181[a]	0.137[a]	0.204
				(0.102)	(0.071)	(0.188)
Anxiety				0.167***	0.073	0.239**
				(0.048)	(0.148)	(0.089)
Financial capabilities						
	yes	*yes*	*yes*	*yes*	*yes*	*yes*
Societal environment						
	yes	*yes*	*yes*	*yes*	*yes*	*yes*
Sociodemographics						
	yes	*yes*	*yes*	*yes*	*yes*	*yes*

Locational dummies						
	yes	*yes*	*yes*	*yes*	*yes*	*yes*
Region	0.152*			0.071		
	(0.065)			(0.059)		
invmills	0.080	0.661**	-0.0151	0.07	0.460*	-0.102***
	(0.185)	(0.246)	(0.139)	-0.172	-0.188	-0.024
chi2 (df)	0.232 (2)	5.418 (2)	0.652 (2)	1.428 (2)	2.199 (2)	1.797 (2)
r2	0.050	0.241	0.099	0.143	0.281	0.187
n	189	70	119	189	70	119

Marginal effects for satisfactino level 8 are presented
Robust standard errors in parentheses
a p<0.1,*p<0.05, ** p<0.01, *** p<0.001
standard controls are included but not presented

Additional robustness tests are carried out using alternative outcome variable measurements (absolute level of each EQ5D (Table 4); derived utility scores from value sets (Table 5 columns 1-3) and both value sets plus positive changes in each EQ5D (Table 5 columns 4-6); and an alternative dimension of satisfaction, namely changes in satisfaction prior and after utilisation, grouped into 5 categories (Table 6). All alternatives are aligned with original results, indicating that procedural utility is to be gained through rituals. Further, from using outcome utility as controls, it is possible to conclude that there are hedonic placebo effects from the consumption of TM/H.

Table 4 - absolute levels of satisfaction

	(1)	(2)	(3)
	absolute	absolute_GA	absolute_UW
Rituals	0.096***	0.332[a]	0.154*
	(0.026)	(0.192)	(0.065)
Outcome measurements			
Mobility_abso	-0.042	0.199	-0.086
	(0.072)	(0.256)	(0.094)
Selfcare_abso	-0.044	-0.202**	-0.040
	(0.028)	(0.063)	(0.188)

Activity_abso	-0.201***	-0.139	-0.317**
	(0.047)	(0.096)	(0.101)
Pain_abso	-0.060	-0.145	0.015
	(0.061)	(0.141)	(0.069)
Anxiety_abso	-0.156[a]	-0.178**	-0.142
	(0.085)	(0.067)	(0.100)
Financial capabilities			
	Yes	*Yes*	*Yes*
Societal Environment			
	Yes	*Yes*	*Yes*
Sociodemographics			
	Yes	*Yes*	*Yes*
Locational dummies			
	Yes	*Yes*	*Yes*
Region	0.127		
	(0.092)		
Chi2 (dof)	0.013 (2)	3.580 (2)	0.067 (2)
r2_p	0.137	0.308	0.187
N	189	70	119

Marginal effects for satisfaction level 8 are presented;
Robust Standard errors in parentheses;
[a] p<0.1, * p<0.05, ** p<0.01, *** p<0.001
Standard controls are included but not presented

Table 5 - EQ5D utility scores

	(1) score	(2) score_GA	(3) score_UW	(4) scoreOU	(5) scoreOU_GA	(6) scoreOU_UW
Rituals	0.091**	0.268[a]	0.149**	0.097***	0.300[a]	0.138***
	(0.030)	(0.156)	(0.057)	(0.018)	(0.181)	(0.030)
Outcome measurements						
EQ5D_score	0.837**	0.945*	0.960*	0.596*	0.902**	0.722[a]
	(0.324)	(0.482)	(0.413)	(0.268)	(0.298)	(0.421)
Mobility				0.030	-0.057	0.117
				(0.030)	(0.046)	(0.093)
Selfcare				-0.083***	0.069	-0.181***
				(0.023)	(0.057)	(0.022)
Activity				0.182***	0.138	0.236[a]
				(0.024)	(0.131)	(0.124)
Pain				0.092	-0.086	0.113
				(0.075)	(0.144)	(0.135)
Anxiety				0.092**	0.010	0.127
				(0.031)	(0.064)	(0.093)
Financial capabilities	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Societal Environment	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Sociodemographics	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Locational dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Region	0.099			0.059		
	(0.062)			(0.050)		
Chi2 (dof)	23.010 (2)	1.654 (2)	13.140 (2)	18.140 (2)	4.803 (2)	4.871 (2)
R2	0.146	0.304	0.194	0.174	0.320	0.222
N	189	70	119	189	70	119

Marginal effects for satisfaction level 8 are presented; Robust Standard errors in parentheses; Standard controls are included but not presented [a] p<0.1, * p<0.05, ** p<0.01, *** p<0.001.

Table 6 - change in life satisfaction

	(1) changelife	(2) changelifeGA	(3) changelifeUW	(4) changelifeOU	(5) changelifeGA	(6) changelifeUW
Rituals	-0.121***	-0.182***	-0.152*	-0.146**	-0.422**	-0.118*
	(0.015)	(0.026)	(0.065)	(0.047)	(0.153)	(0.053)
Outcome measurements						
Mobility				-0.032	-0.043*	-0.029
				(0.017)	(0.021)	(0.036)
Selfcare				0.029	0.019	0.054
				(0.074)	(0.033)	(0.083)
Activity				-0.111[a]	-0.041	-0.133
				(0.060)	(0.041)	(0.107)
Pain				-0.063	0.021	-0.065
				(0.062)	(0.019)	(0.099)
Anxiety				-0.086**	-0.062[a]	-0.080*
				(0.031)	(0.037)	(0.036)
Financial capabilities	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Societal Environment	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Sociodemographics	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Locational dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Region	-0.090*			-0.070		
	(0.041)			(0.047)		
Chi2 (dof)	0.063 (2)	0.819 (2)	0.385 (2)	0.380 (2)	0.644 (2)	0.367 (2)
R2	0.068	0.094	0.109	0.185	0.249	0.216
N	189	70	119	189	70	119

Marginal effects for satisfaction level 2 are presented; Robust Standard errors in parentheses; Standard controls are included but not presented [a] p<0.1, * p<0.05, ** p<0.01, *** p<0.001.

3. Caveats

Questions on satisfaction are inevitably open to subjectivity as its measurement is the result of the interplay between personal preferences, expectations and actual care experienced (Donabedian, 1988; Schommer & Kucukarslan, 1997; Ware, Davies-Avery, & Stewart, 1978) [for review see (Sitzia & Wood, 1997)]. For example, Jackson et al (2001) find unmet expectations as a strong predictor of dissatisfaction among walk-in patients to a clinic in USA, indicating that satisfaction is driven by the extent to which expectations have been fulfilled, which may in turn be culturally embedded[12]. To the extent that respondents were answering on behalf of household members, satisfaction levels may be inaccurate if people are not able to empathize with the individual in question. To mitigate this, where possible, the individual in question was called upon. Further, the timing of questioning also appears important. Jackson's study finds on average individuals stating higher levels of satisfaction 3 months after care was sought than immediately after the visit because whilst satisfaction immediately after the visit reflects merely the advice or solution received from the physician, by 3 months satisfaction scores more likely reflect the symptomatic impact of the solutions offered. In this study, satisfaction was measured for acute illnesses in the past two weeks, and chronic illness experiences within the last month preceding the survey to counteract recall bias. Satisfaction was also measured in multiple ways (verbally, numerically and worded differently) to check for internal consistency, with open ended questions to comprehend opinions fully. Additionally, to counter social desirability bias (reluctance to express dissatisfaction) interviewers were trained to make clear to the respondent that all answers were confidential and anonymous. The questionnaire was also designed to ask for overall satisfaction measures before health outcome measures so satisfaction scores were not driven by the ordering of questions.

When sample selection modes are run, the nature of the instrument gives rise to slightly different estimates. Unfortunately, with limited data, it is not possible to find alternative, perhaps more appropriate, instruments. This also restricts the possibility of testing for

[12] For example, it is not unusual for people in developing countries to have to supply their own injections, bedding and food for hospital visits, so expectations for hospitals to supply these items might be fairly low, leading to high satisfaction rates where they are provided.

omitted variable bias and endogeneity. To the extent that this paper is the first to measure procedural utility in the utilisation of traditional health systems, it would be useful to incorporate other instruments within questionnaires in order that testing for these dimensions is possible in the future.

6.5 Discussion

This paper has shown that individuals value procedures involved in consuming traditional medicines in and of themselves. Procedures were proxied by a dummy variable indicating whether an individual carried out healing processes such as rituals, incantations and prayers in conjunction with taking medications. Procedural utility is accrued as a result of rituals irrespective of outcome measures such as improvements in mobility, ability to self-care, activity, pain and anxiety, and thus support the existence of hedonic placebo effects. In this respect, the paper presents a paradox, in which scientific evidence on traditional medicines is scant and under-developed, yet, individuals continue to use it and claim high satisfaction levels. By using the idea of PU, these two opposing views can be reconciled, as it suggests that individuals like to do something rather than nothing in response to symptoms, even if there is no clear impact on health outcomes.

In order to understand further the mechanisms behind why procedural utility is gained when utilising traditional medicines, some discussion of the nature of healing processes vis-à-vis modern medicines is required. There are two broad explanations, one at the individual level and another at the societal level. On the individual level, it is widely acknowledged that the patient-healer relationship is unique and quite apart from the doctor-patient relationship seen within the modern system. Healers are known to provide a more holistic experience through psychological, in addition to physical or biological, care (Busia, 2005; DeJong, 1991; Hevi, 1989; van der Geest, 1997), thus creating a therapeutic relationship with individuals and allowing for more in-depth interaction. In this respect, traditional forms of care provide a relationship of equals, in which patients play an active role rather than the 'expert-patient' relationship seen in modern facilities. Evidence of this has been found in developed countries by users of complementary and alternative medicines, who have stated their appreciation for therapeutic processes, irrespective of treatment efficacy, by increasing energy, facilitating coping mechanisms, enhancing self-

awareness (Cartwright & Torr, 2005) and self-control (Furnham & Bhagrath, 1993). O'Callaghan and Jordan (2003) show that values and dissatisfaction with doctor-patient relationships, rather than discontent with biomedical outcomes, drive individuals to seek care from alternative sources. Differences in mode and nature of payment 'contracts' in the two systems can even be attributed to interaction effects (Leonard & Zivin, 2005). Arguably, this increased involvement creates a sense of control and is itself a source of procedural utility, especially when illnesses are not curable or psychosomatic (Abbo, 2011; Anyinam, 1987).

Procedural utility is also partly accrued owing to divergent explanatory frameworks between traditional and modern systems. Whilst modern systems largely practice medicine based on scientific understanding, traditional medicines allow for a broader concept of illness and efficacy. Chi argues 'the efficacy of medicine is dependent on what people are looking for, and how to evaluate them' (Chi, 1994, p. 317). For example, modern medicines are perceived to work faster than Chinese medicines, but the latter are thought to be more effective in treating the 'root cause' of diseases and are culturally valued. People fear side effects of modern pharmaceuticals, preferring more 'natural' forms of cure. Further, individuals believed Chinese medicines equated a more holistic, patient oriented treatment than modern medicines which is based on a scientific paradigm: 'most TMs are an integral part of their socio-cultural environments, which also developed their own world views and philosophies. Such world views and philosophies are inseparable from their medical systems, which defines the meaning of health and illness' (317). Van der Geest et al (1996, p. 167) similarly write that the effects of any medication are 'social, cultural, psychological, and even metaphysical' such that medicines possess social and symbolic characteristics, and the 'charm is in their concreteness…in them healing is objectified' (van der Geest & Whyte, 1991, p. 345). This is likely to be the same view for users of TM/H, for whom the charm is likely to be in the processes involved in the consumption of herbal preparations, rather than the product itself, and TM has the capacity to carry meanings as well as perceived biomedical powers. Efficacy, then, might be considered a cultural construction and the 'total drug effect' depends also on nonchemical attributes such as beliefs and expectations and quality of patient-practitioner interaction.

As such, causes of illness stem not only from individual, but also sociocultural and social-psychological, factors (Astin, 1998; Kleinman, 1980; Mechanic, 1986). Thus, topics of discussion during consultation may or may not be related to the individual's illness and frequently include counselling with or about family and societal relations (Kale, 1995). The surrounding environment and relations are vital to an individual's health decisions and outcomes, in what Lash (2000) and Mackian (2004) call 'reflexive communities': health decisions are not merely the result of one's own information and knowledge about illness, but is a reflection of the individual's emotional and practical concerns in the context of societal constructions and interactions. In this sense, the structure of networks and type of advice relayed are also crucial to health seeking behaviour (Berkanovic, Telesky, & Reeder, 1981). Thus, the satisfaction arising from utilising traditional medicines can also be seen as a way of behaviour which conforms to society's rules (copying the most prevalent behaviour), pertaining to 'pro social behaviour' (Torgler, Frey, & Wilson, 2009). Given TM/H's social dimensions, conforming to societal values and following cultural norms can also be driving a positive sense of community which in turn affects utility. This also reflects the deep embeddedness of TM/H within society. After all, the label itself reflects many hundreds – if not thousands – of years of existence and use: in times before pharmaceutical companies and science laboratories, populations were entirely reliant on herbal remedies to cure ailments (Busia, 2005) and in Ghana today, the utilisation of TM/H is perfectly in line with societal norms and traditions[13] such that even the recognition of the 'correct' plants rests solely on local information obtained through generations of 'learning by doing' and hearsay.

In this respect, PU may be seen as the product of individual and societal benefits. Individuals who hold a strong sense of self efficacy[14] in socially valued pursuits mix ideas from society (e.g. cultural value systems) with one's own judgement and experiences (Oettingen, 1995) and are able to translate this into higher levels well-being (Bandura,

[13] The flip side of not following social norms is internal sanctions (guilt, remorse) or social sanctioning (alienation) (Torgler, et al., 2009)

[14] Bandura (1995, p. 2) defines self-efficacy as 'beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations'.

1995). An individual's social surroundings are central to strengthening self-efficacy: individuals have more self-belief when they see similar others experiencing success and are socially persuaded of positive effects by others around them. Bandura argues that participation and representation in community structures and norms alone empowers individuals and promotes health. Individuals learn actions by observing and interacting with others in society and are rewarded with positive reinforcement, which may account for a part of the satisfaction gained. This is also in line with literature looking at how identity, defined as 'a person's sense of self', impacts economic outcomes and further, that defecting from one's identity can lead to negative utility (Akerlof & Kranton, 2000).

The policy implications of this paper are threefold. Firstly, there is a distinct need to recognise procedural utility within the traditional medicines system. To date, TM is evaluated solely through outcome utility in the form of scientific evidence from randomised control trials. Yet, individuals clearly continue to consume TM/H because of the positive experiences associated with utilisation, whether through interactions with healers or conforming to societal norms. By distinguishing between 'care' and 'cure', and paying closer attention to PU, it would be possible to evaluate closer intermediate processes, including dimensions such as increased involvement, control, sense of purpose and mutual respect, all of which are valuable in their own right. If care components were determined to be important, this has knock-on consequences for health care management and the organisation of the health system as a whole. The consideration of PU thus gives ammunition to proponents of TM/H policymakers who have long argued that TM/H is appreciated for holistic reasons even if the science behind TM is still in its infancy.

Secondly, the paper calls for an alternative approach to the measurement and quantification of satisfaction. Within modern medicines, it has become standard practice to use objective measures to evaluate patient satisfaction through the use of questionnaires and relevant instruments (Coulter, 2006) but this has not extended fully to developing countries and certainly not for traditional medicines use. This is partly because studies of healer-patient interactions have largely remained in the domain of anthropology or sociology rather than health economics. Yet, this is a severe shortcoming in that it is not

yet possible to determine how to improve provider performance, or which aspects of care matter most to patients. If questionnaires allowed for objective feedback to questions about healing processes and other related practices actually carried out by healers and then measured this against satisfaction levels, specific elements could be pinpointed as providing high levels of utility.

Thirdly, in areas where access to pharmaceutical medicines is impeded, the significance of utility gained from traditional medicines utilisation is appealing. This is not to nullify the provision of public and formal systems - users of these systems may well attain even higher outcome and procedural utility than TM/H users, but it does suggest that the preservation, safeguarding and documentation of TM, especially in more culturally accepted areas, is essential (WHO is currently proposing a global database starting with some developed countries) because individuals are still able to gain utility from traditional medicine in health care deficient areas. Relatedly, even if modern medicines were more widely available, people may not necessarily switch to these sources if they do not gain as much satisfaction from the processes involved. In this respect, it would be important to integrate the most procedural utility enhancing aspects from TM/H with modern medicines to induce the highest possible levels of satisfaction.

6.6 Conclusion

This paper has argued that rituals and related healing processes involved in the utilisation of traditional medicines are an important source of procedural utility. Through rituals, individuals gain control over their illnesses and can exploit a unique patient-healer relationship. They also increase subjective well-being by conforming to social norms and acting out pro-social behaviour. These results hold even when controlling for self-reported outcome measures, which suggests the existence of a hedonic placebo effect. Key results are checked using sample selection models in addition to alternative measures of satisfaction and outcome utility. Future research looking at different types of healing processes and intermediary processes, such as increased control or management of illness,

involvement or other measures of patient-healer interaction would allow for more in-depth analysis of the exact sources of PU.

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Appendix 1 - Summary table of variables

	description	coding	Full sample mean	sd	N
Satisfaction variables					
lifeafter	life satisfaction after TM/H utilisation	0-10. 0 absolute dissatisfaction, 10 absolute satisfaction	6.701299	1.764862	231
changelifegrouped	change in life satisfaction before and after utilisation	0-4. 0 negative or no change; 1 : 1/2 point change; 2: 3/4 point; 3: 5/6 point change; 4: 7/8/9 point change	2.212121	1.022797	231
Process variable					
rituals	whether individual experienced rituals or other healing processes	0=no; 1= yes	0.229437	0.421384	231
Outcome variables					
mobility	whether individual felt better in mobility dimension following utilisation	0= no, got worse or saw no change; 1=yes, got better	0.606061	0.489683	231
selfcare	whether individual felt better in selfcare dimension following utilisation	0= no, got worse or saw no change; 1=yes, got better	0.601732	0.490604	231
activity	whether individual felt better in activity dimension following utilisation	0= no, got worse or saw no change; 1=yes, got better	0.670996	0.470872	231
pain	whether individual felt better in pain dimension following utilisation	0= no, got worse or saw no change; 1=yes, got better	0.796537	0.403448	231
anxiety	whether individual felt better in anxiety dimension following utilisation	0= no, got worse or saw no change; 1=yes, got better	0.647826	0.47869	230
mobilityabso	level of mobility	0= no problems at all; 1=some or severe problems	0.147186	0.355061	231
selfcareabso	level of selfcare	0= no problems at all; 1=some or severe problems	0.160173	0.367563	231

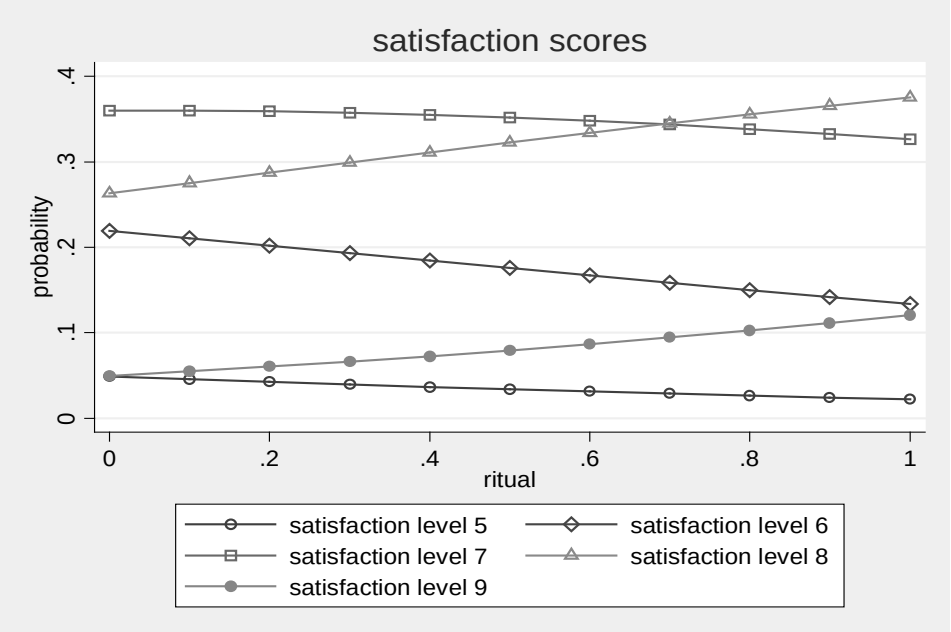
activityabso	level of activity	0= no problems at all; 1=some or severe problems	0.220779	0.415673	231
painabso	level of pain	0= no problems at all; 1=some or severe problems	0.34632	0.47683	231
anxietyabso	level of anxiety	0= no problems at all; 1=some or severe problems	0.291304	0.455354	230
score	EQ5D utility score following utilisation	range -0.145 to 1, where 1 is full health and 0 is death, negative is worse than death	0.858057	0.221337	230
CONTROL VARIABLES					
Disease characteristics					
Chronic	whether illness was chronic	0=no; 1= yes	6.521072	1.354331	215
Severity	perceived severity of illness	1: very serious; 2: serious; 3: not serious	1.848485	0.727405	231
Financial capability					
insurance	whether individual has health insurance	0=no; 1=yes	0.597403	0.491486	231
income (x)	log equivalised income		3.933266	1.049867	202
Societal environment					
culture	index of cultural attitudes towards traditional medicines/healers	positive score increasing with dislike or negativity towards TM/H	6.521072	1.354331	215
communitygroup	whether anyone in household belongs to a community group	0=no; 1=yes	0.285714	0.452735	231
Sociodemographic characteristics					
sex	gender	0=male; 1=female	0.606061	0.489683	231
education_cat	highest level education completed or currently attaining	0=none; 1=basic primary; 2=junior; 3=junior+; 4=other	1.069565	1.103561	230
occupation	occupational group	1=farmer/fisherman; 2=office worker; 3=own business; 4=unemployed	2.774892	1.241133	231
religious_group	religious group	1=Christian; 2=Muslim; 3=other; 4=none	1.458874	0.821873	231
ageg	age group	1= 0-11; 2=12-17; 3=18-34; 4=34-55; 5=55+	3.46875	1.355575	224

married	whether individual is married	0=no; 1=yes	0.4329	0.496553	231
head_cat	relationship to head of household	1=head; 2=spouse; 3=child 4=other	2.367965	1.110666	231
Locational characteristics					
region	region dummy	0=Greater Accra; 1=Upper West	0.450217	0.498596	231
urban	urban dummy	0=no; 1=yes	0.601732	0.490604	231

Appendix 2 - Changes in probability of obtaining different satisfaction levels

Satisfaction	ritual=0	ritual=1	Difference	confidence interval for difference
Pr(y=1x):	0.0006	0.0039	-0.0033	[-0.0112, 0.0046]
Pr(y=2x):	0.0075	0.029	-0.0215	[-0.0523, 0.0094]
Pr(y=3x):	0.0095	0.0284	-0.019	[-0.0409, 0.0029]
Pr(y=4x):	0.0181	0.0461	-0.028	[-0.0428, -0.0131]
Pr(y=5x):	0.0237	0.0518	-0.0281	[-0.0495, -0.0068]
Pr(y=6x):	0.1151	0.1947	-0.0796	[-0.1104, -0.0488]
Pr(y=7x):	0.2621	0.3022	-0.0402	[-0.0413, -0.0390]
Pr(y=8x):	0.3731	0.2686	0.1045	[0.0619, 0.1471]
Pr(y=9x):	0.1822	0.0736	0.1086	[0.0985, 0.1187]
Pr(y=10x):	0.008	0.0015	0.0065	[-0.0125, 0.0255]

Appendix 3 – changes in probability, with OU



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