The Hedonic Procedural Effect of Traditional Medicines

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Abstract The objective of this paper is to understand whether variations in satisfaction across individuals can be attributed to the hedonic procedural effect of using traditional medicines, in which processes involved with its consumption are as important, if not more important, than measures of self reported health outcome. The study involved rolling out structured household questionnaires in late 2010 in Ghana. The key variables used in analysis include: life satisfaction to proxy utility, a binary variable indicating whether the individual used an accompanying procedure, and EQ5D health outcome measures, alongside control variables. Findings suggest that individuals who used accompanying procedures are more likely to report higher levels of utility than individuals who did not, even after controlling for health outcomes and socioeconomic indicators. The study shows 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

1 Introduction

Traditional medicines and healers\(^1\) TM/H play a very important role within healthcare systems of many developing countries (WHO 2002). A large proportion of sub Saharan

\(^1\) Defined as herbal medicines, animal parts and/or minerals and non medication therapies including spiritual therapies (WHO 2002:1).
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 TM to be a substitute for people who fail to accept, access, afford or find available modern medicines, and those who argue that TM 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 procedural effect’, through which people who decide to act by sourcing TM are more likely to feel satisfied to have done something, even after controlling for the utility from self reported health outcomes.

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 (Frey et al. 2004; Frey and Stutzer 2005) who measure and coin the term ‘procedural utility’ (henceforth PU). The process in question here is whether, in addition to consuming herbal medication, an individual has undertaken other accompanying procedures 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, and shown to be evidence of the quality of care provided by healers. To the authors’ knowledge this is the first study to have quantified TM 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 TM 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 TM/H from a previously unexplored angle.

The following section provides the background to TM/H utilisation and the concept of PU, including examples. The application of PU to TM utilisation is provided within. Section 3 outlines the empirical framework, which includes the statistical model. Results are discussed in Sect. 4, alongside an array of robustness checks. Discussions and policy implications are presented in Sect. 5 before the paper concludes.

2 Background

The literature has previously explored possible reasons for the continued use of TM/H. 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 (Twumasi 1979; Kleinman 1980; Evans-Pritchard 1937; Rivers 1924).

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 and Bodeker 2004), HIV (Mills et al. 2005) and low back pain (Gagnier et al. 2007). Indeed, two extremely common pharmaceutical products, quinine and artemisinin, originate from indigenous medical

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2 The idea of procedural justice is old, harking back to Bentham (1789).
systems (Muthaura et al. 2011), serving to illustrate the biomedical properties of some plants. Yet, for the most part, biomedical evidence on the efficacy of TM is patchy, with a significant body of literature pointing out the dangerous effects of TM/H (Liu 2007; Dada et al. 2011, Smyth et al. 1995).

Studies on satisfaction from utilisation also give rise to mixed evidence. One report analysing satisfaction with health providers in Ghana, as measured by ‘% of patients who report being satisfied with the services received at last visit’ indicates that TH 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). On the other hand, Peltzer et al. (2008) show non-herb users have slightly higher levels of satisfaction than herb users, a finding reflected by Stekelenburg (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 TM 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 et al. 2005). Further, TM/H fare badly for outcome compared to medical specialists who scored 96 % for satisfaction and 94 % for effectiveness. 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 TM/H; 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. PU is here offered as a possible tool of analysis.

2.1 PU

Within economics, PU 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. Frey et al. (2004) put forward three ways in which PU differs from ‘traditional’ outcome 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’ (Frey et al. 2004). As such, existing works on the economics of subjective well being (Layard 2006; Oswald 1997; Easterlin 1973; Stevenson and Wolfers 2008) are 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 (Frey and 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). 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’ (Frey et al. 2004). 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).3

3 It follows that theories from cognitive behavioural theory/social psychology are central to understanding how people derive utility.
2.2 PU and Traditional Medicines

TM/H users experience peace of mind, emotional and spiritual well-being through healing processes carried out, over and beyond possible health benefits. In biomedicines, it is known that psychological benefits (positive thinking and instilling hope and expectation) can be derived 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 (Wampold et al. 2005; de la Fuente-Fernandez et al. 2001; Benson and Friedman 1996).4

Procedural utility can arise from good quality patient-practitioner interactions, which induce individuals to place symbolic and psychological values on medicine and healing. Sometimes, having an understanding and empathic healer is as important—if not more important—in the process of health seeking (van der Geest et al. 1996; Price 1984; Moerman 1979). Writing of the ‘meaning response’ of modern medicines, Moerman and Jonas (2002) say; ‘most elements of medicines are meaningful, even if practitioners do not intend them to be so … both diagnosis and prognosis can be important forms of treatment’. This is corroborated in a study that reveals, even having controlled for baseline quality of life scores and heterogeneous variables, individuals taking medication for HIV/AIDS from healers report higher quality of life than those who sought drugs at a western medical infrastructure because healers are better able to ‘provide psychosocial support and a familiar cultural context for health care’ (Taylor et al. 2008), supporting the possibility of a procedural effect through the ‘special interaction between patient and healthcare provider associated with the treatment ritual’ (Hrobjartsson and Gotzsche 2010).5 Such reasons also likely explain the popularity of TM as a backup option, used when other treatments have proved ineffective or deficient (Sato 2012a, b). Some examples of healer care beyond provision of herbal products include religious and non-religious acts such as: prayers, incantations, blood letting, animal sacrifice, divination, speaking in tongues and in the case of spiritual illness, standing as an intermediary between the individual and spirit (Tabi et al. 2006; Stekelenburg 2005; Rivers 1924).

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

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

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4 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 patients showed signs of improvements in health even when told the pill was placebo (‘honest placebo’) (Kaptchuk et al. 2010). Moerman (1983) similarly finds 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’.

5 However, the placebo concept itself is not without criticism. In a systematic review, Hrobjartsson and Gotzsche (2010) do not find placebo interventions to have clinical effects in general, although some patient reported outcomes such as pain and nausea are positively affected through placebo. 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.
3 Empirical Strategy

3.1 Data Collection

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 applied. 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. 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 assigned, 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. Within the household a representative is chosen to answer the questionnaire. This person fulfills at least three of the following: main health care decision maker; most knowledgeable about health of household members, expenditures or health care utilisation of others in the household; designated care giver for sick household members. 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.

3.2 Data Description

In sum, information on 4,713 individuals from 772 households was collected, using 16 reference points. 741 individuals had acute (within the past 2 weeks) or chronic (care sought within the last month) medicine needs, of which 231 episodes were attended to using TM (by self or healers).

The measurement of utility using self-reported satisfaction is increasingly accepted in economic literature (Ferrer-i-Carbonell and Gowdy 2007; Kahneman et al. 1997). Life satisfaction is measured for all users of TM and/or healers by asking respondents the following question: ‘using a scale of 0–10, 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 and internal validation was checked through the use of multiple alternative and not dissimilar questions. The answer was then taken to be a proxy for utility (subjective well-being).

The main independent procedural variable is termed ‘procedure’, denoted 1 if the respondent answered, given need, ‘yes’ to the question: ‘did you/the TH carry out any rituals or healing processes?’ (including acupuncture, meditation, cantations, massage, touch therapies, religious activities, body-mind therapy, folk therapy etc.).

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

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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.
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. Briefly, the remaining control variables include dimensions on illness, financial capability, societal environment socio-demographics and locational variables. A fuller outline and statistical summary are found in Appendix 1.

3.3 Model

An ordered probit specification is appropriate when outcomes can be viably classed in a natural order (Greene 2003; Jones 2007). Life satisfaction is measured on an ordinal scale, and used to express an underlying latent variable \( y^* \), which 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 and Gowdy 2007). Regression results are presented as marginal effects, which indicate the change in share of individuals belonging to the stated satisfaction level given changes in independent variables. For example, if the marginal effect on procedures for satisfaction level 8 is 0.1, this implies that having a procedure (as opposed to none) increases the likelihood of stating satisfaction level 8 by 10 percentage points. Further statistical exposition is given in Appendix 2.

4 Results

4.1 Descriptive Data

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

Of those who used TM/H, 26 % had procedures carried out, while 74 % did not. Overall, those who have procedures show greater levels of subjective well-being, stating an average score of 7.08 as opposed to 6.59 for those without. Histograms reflecting satisfaction scores for individuals with and without procedures are presented in Fig. 2.
4.2 Ordered Probit

Ordered probit results confirm the positive value of procedures and healing processes on life satisfaction. The first column in Table 1 displays the baseline ordered probit in which only the variable ‘procedure’ is regressed. Only marginal effects for reaching satisfaction level 8 are reported in the main text. The positive and significant coefficient indicates satisfaction increases when individuals have utilised TM/H with procedures. Individuals with procedures are associated with an 8.3 percentage point higher likelihood of achieving satisfaction 8 than individuals without procedures.

Controls are then included to test whether other non-procedural variables override the effect of procedural factors (column 2). The sample size of regressions decreases to 189 where missing observations on other variables apply. Even including controls, procedures 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 GA and UW respectively. Even when analysing results by region and including all controls, the effect of procedures still hold. Size effects appear larger for GA, though greater statistical significance arises from UW. Both regions show that by undertaking procedures, the likelihood of indicating satisfaction level 8 increases by between 16.4 and 18.8 percentage points. These regions also display differences in the relative importance of other indicators of satisfaction. For example, the signs

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7 Level eight was chosen as representative of high satisfaction, as there were very few observations for levels 9 and 10.
## Table 1  Effects of procedural utility

|                                | I       | II      | III     | IV      |
|--------------------------------|---------|---------|---------|---------|
| Procedure                      | 0.083***| 0.105***| 0.187*  | 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**       |         |         |         |         |
| Culture                        | −0.009  | −0.178**| 0.065** |         |
|                                | (0.017) | (0.072) | (0.027) |         |
| Community group                | 0.067   | 0.142   | 0.088***|         |
|                                | (0.043) | (0.119) | (0.018) |         |
| **Socio-demographic 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_none                | 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  |         |
on severity of illness are positive and insignificant for GA but negative for UW. Belonging to a community group in UW has significantly positive effects on achieving high satisfaction, possibly because individuals feel supported by those living within the same social circles. This concurs with a study from America 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 et al. 1996).

While in GA, there appear to be no significant effects of insurance on satisfaction, in UW 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 with high registration costs and yearly payable premia to keep a validated card. Users of TM/H would not have been able to use insurance for TC, thus effectively nullifying its worth. Previous research also indicates that health insurance coverage does not ensure high satisfaction levels with a health system (Blendon et al. 1990).

Marginal effects for level 4 outcome (for full sample, and split by region), are also presented in Appendix 3 by way of analysis of lower levels of satisfaction. The coefficient

|   | I   | II  | III | IV  |
|---|-----|-----|-----|-----|
|   | (0.094) | (0.135) | (0.153) | (0.065) | (0.104) | (0.181) | (0.109) | (0.218) |
| Age_35–54 | 0.029 | -0.450*** | -0.034 | 0.394*** | -0.072 | (0.106) | (0.095) | (0.180) |
| Age_55+ | -0.011 | -0.034 | -0.072 | 0.017 | -0.264 | 0.072 | (0.067) | (0.165) | (0.049) |
| Married | 0.033 | 0.357*** | -0.014 | 0.028 | 0.090 | (0.055) | (0.030) | (0.186) | (0.005) |
| Spouse | 0.004 | 0.198 | 0.052*** | 0.012 | 0.089 | -0.064* | (0.023) | (0.213) | (0.037) |
| Child | 0.017 | 0.264 | 0.072 | -0.011 | -0.264 | 0.072 | (0.067) | (0.165) | (0.049) |
| Other_relation | 0.033 | 0.357*** | -0.014 | 0.028 | 0.090 | (0.055) | (0.030) | (0.186) | (0.005) |

**Locational characteristics**

|   | I   | II  | III | IV  |
|---|-----|-----|-----|-----|
| Urban | 0.033 | 0.272*** | 0.087 | (0.043) | (0.043) | (0.076) |
| Upper West region | 0.141** | (0.062) |
| Log Likelihood | -421.807 | -323.251 | -94.600 | -188.508 |
| R2 | 0.099 | 0.050 | 0.225 | 0.099 |
| N | 231 | 189 | 70 | 119 |

Marginal effects for satisfaction level 8 are presented

Robust SE in parentheses

*** Significant at 1 %; ** 5 %; * 10 %
on the ‘procedure’ variable in the full sample is significantly negative, indicating that those who have procedures are less likely to attain life satisfaction score 4. This corroborates our finding that procedures are associated with higher levels of satisfaction.

4.3 Direct Test: Procedural Versus Outcome Utility

A direct test of PU versus OU 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. If it is the case that these health outcomes are of greater importance than processes, the marginal effect on the variable ‘procedure’ 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) and show that even with outcome variables included, carrying out procedures has large marginal effects: an individual who uses TM/H with procedures is 11.2 percentage points more likely to be on satisfaction level 8 than someone without (versus 10.5 percentage points without outcome variables in model two, Table 1). Regional sub samples also confirm positive effects of PU (23.3 and 15.6 percentage points for GA and UW, respectively), despite controlling for OU.

The marginal effects on the outcome variables for the full sample suggest three dimensions are particularly important: activity, pain and anxiety. Specifically, an individual who states improvements in activity, pain and anxiety is expected to raise their

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**Table 2** Direct test of PU versus OU

|                  | I OU | II OU_GA | III OU_UW |
|------------------|------|----------|-----------|
| Rituals          | 0.112*** | 0.233*   | 0.156***  |
|                  | (0.021)  | (0.141)  | (0.021)   |
| **Outcome measures** |      |          |           |
| Mobility         | 0.035*** | −0.04    | 0.124*    |
|                  | (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*   | 0.143**  | 0.206     |
|                  | (0.103)  | (0.065)  | (0.187)   |
| Anxiety          | 0.167*** | 0.063    | 0.236***  |
|                  | (0.045)  | (0.123)  | (0.089)   |
| **Illness characteristics** | Yes | Yes | Yes |
| **Financial capabilities** | Yes | Yes | Yes |
| **Societal environment** | Yes | Yes | Yes |
| **Socio-demographics** | Yes | Yes | Yes |
| **Locational dummies** | Yes | Yes | Yes |
| Log Likelihood   | −291.725 | −88.848  | −170.085  |
| R2               | 0.143    | 0.272    | 0.187     |
| N                | 189      | 70       | 119       |

Marginal effects for satisfaction level 8 are presented
Robust SE in parentheses
Standard controls are included but not presented
*** Significant at 1 %; ** 5 %; * 10 %

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8 Only shorter tables (without displaying controls) are presented henceforth.
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 GA, the effect of PU seems to override OU, except in the case of pain. In UW, improvements in activity have a particularly sizeable and significant effect on satisfaction (29.2 percentage points).

4.4 Robustness Checks

Additional robustness tests are carried out using alternative outcome variable measurements, including the absolute level of each EQ5D; derived utility scores from value sets and both value sets plus positive changes in each EQ5D. All alternatives are aligned with original results, namely that PU is gained through procedures over and above any effects on health: thus, there is some evidence of hedonic placebo effects from the consumption of TM/H. To check for reporting bias, two separate regressions have been run (presented in Appendix 4). The first limits the sample to those who are responding for their own (hence no proxy results), while the second uses this characteristic as a control, and further adds whether proxy respondents were male or female. Results show that in the sample responding for their own, the procedure coefficient is no longer significant. This may be explained by the small number of observations available for testing, especially as in the second regression using this variable as a control, procedure is highly positively significant. Further, the proxyfemale coefficient is highly significant, suggesting that if the proxy was female, life satisfaction is likely to be much higher than if they were male. Additional analysis by gender, respondent and relationship of respondent to the user is therefore necessary to explore reporting bias issues.

4.5 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; Ware et al. 1978; Schommer and Kucukarslan 1997) (for review see Sitzia and Wood 1997). For example, Jackson et al. (2001) find unmet expectations to be a strong predictor of dissatisfaction among walk-in patients to a clinic in USA, indicating that satisfaction is driven by whether expectations have been fulfilled, which may in turn be culturally embedded.

To the extent that respondents were answering on behalf of household members, responses may be inaccurate (as the robustness checks showed). Data limitations do not allow a more thorough exploration of caregiver/questionnaire respondent (‘proxy’) versus patient evaluations (‘own’). It has been previously found that their views can diverge because proxies are not necessarily able to fully analyse the feelings and problems of the person who carries the illness (Binger et al. 1969). For example, Binger et al. (1969) argue that each child has a unique perspective on, and valuation of, his or her health status, and may learn to conceal their true emotions from parents and carers. Some psychometric literature therefore supports the direct elicitation of values from children for accuracy (Eiser et al. 2001).

The functioning of carers and other family members are also directly influenced by the patient, which impacts answers to questions related to quality of life. Farnik et al. (2010) show that parents of children with chronic illnesses report impaired health related quality of life, particularly those related to emotional concerns and impacts on role functioning. Parents were particularly unhappy about not being able to give time and attention to other
family members, negative impacts on work related activities, as well as daily household activities.

However, proxies may be useful when answering on behalf of children or the severely sick who lack the cognitive and linguistic skills necessary to complete preference-based measures. Some studies support the view that proxies accurately answer questions related to observable behaviours such as physical functioning and symptoms, but less so for social or emotional impairments (Petrou 2003). In an asthma study, Stelmach et al. (2012) find a strong correlation between changes in quality of life of parents and changes in quality of life in children, suggesting that proxies can provide accurate answers.

In this study, to mitigate these effects, where possible, the individual in question was called upon. Satisfaction was also measured in multiple ways (verbally, numerically and worded differently) to check for internal consistency. To counter interviewer demand effects and social desirability bias (reluctance to express dissatisfaction), interviewers were trained to emphasise the importance of accurate and truthful answers and make clear 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.

Having said this, all this highlights the importance of using a tool which accurately captures quality of life. The potential divergence in measures between proxies and patients encourages the development and use of a validated instrument, particularly by age. While the EQ5D attempts to overcome this limitation by using age-neutral dimensions (for example, the ‘usual activities’ captures multiple dimensions such as work, school, leisure), it is suggested that bespoke descriptions of health states or scenarios according to the population of interest, are required. This is the case in much of the psychometric literature; for example, Farnik’s et al. (2010) ‘Quality of Life in a Child’s Chronic Disease Questionnaire’ is addressed to parents of children with a chronic disease, while the Paediatric Asthma Caregiver’s Quality of Life Questionnaire looks at quality of life in parents whose child has asthma (Stelmach et al. 2012).

The paper has used oprobit to model life satisfaction. Oprobit assumes the relative difference between satisfaction scores are unknown—thus oprobit does not assume that the space between scores (‘cuts’) is of the same distance. In this study, the spacing between cuts is uneven, most likely explained by the fact that many people stated high satisfaction scores. This is a common phenomenon (Peel et al. 1998), but one that requires further investigation.

The available data limits this paper in three other dimensions. Firstly, a nationally representative sample would have allowed us to speak of Ghana as a whole. Secondly, it was not possible to find appropriate instruments to test for sample selection and omitted variable bias. If there are systematic differences between users and non-users, there exists a problem of identification and consequent ‘selection bias’ (Heckman 1979). Only satisfaction scores for users of TM/H are ascertained, such that inferences about the population of non-users cannot be made directly, nor can falsification tests by made (i.e. analysis of satisfaction levels between users and non users).

Thirdly, literature also shows that physical health is influenced by psychological states, both directly and indirectly, such that reverse causality cannot be dismissed. Ample evidence shows that positive psychological well-being is associated with reduced mortality in both healthy populations (Veenhoven 2008) as well as disease populations (Chida and Steptoe 2008; Chida et al. 2009; Keyes et al. 2010). Positive attributes such as emotional well-being, positive mood, joy, happiness, vigor and energy and traits such as life satisfaction, hopefulness, optimism and sense of humour have been shown to reduce mental
illness, cardiovascular, renal failure and HIV mortality. Contributory indirect factors include better health behaviour, being more perceptive of illness and heightened effective coping mechanisms. Chida et al. (2009) also identify factors such as religiosity/spirituality and church attendance as having a ‘protective’ effect on healthy populations, independent of socioeconomic status, negative affect and social support. Similarly, Veenhoven (2008) argues that chronic unhappiness can slow down body functioning, which leads to higher blood pressure and lower immune response. Similar findings are reflected in Howell et al. (2007) and Cohen et al. (1995), who argue that well-being directly strengthens immune functioning and pain tolerance, and is associated with both short term and long term health outcomes. With more extensive data, it would be advantageous to disentangle such effects and further consider physical well-being and psychological well-being within an overarching concept of health.

It is also the case that individuals may have been using formal health care in addition to TM/H. However, previous research (Sato 2012a, b) has shown that most traditional medicine users are using it as a last resort, or at least, as a second or third ‘choice’. As such, for the majority of individuals, the decision to use TM followed the decision to visit doctors/physicians and it might be assumed that traditional care was being used when modern medicines had failed to produce desired results or outcomes, rather than complementarily (Sato 2012b) (thus effects related to formal health care use may be reduced when estimating the impact of the healing dummy).

To the extent that this paper is the first to measure PU 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.

5 Discussion

This paper has shown that individuals value procedures involved in consuming TM in and of themselves. PU is accrued as a result of accompanying procedures, irrespective of outcome measures and thus findings support the existence of hedonic procedural effects. 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 (Hevi 1989; Busia 2005; Dejong 1991; van der Geest 1997). 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 and Torr 2005) and self control (Furnham and 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 and Zivin 2005).

PU is also partly accrued owing to explanatory frameworks. Chi argues ‘the efficacy of medicine is dependent on what people are looking for, and how to evaluate them’ (Chi 1994). Van der Geest et al. (1996) 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 and Whyte 1991). Efficacy, then, might be considered a cultural construction and the ‘total drug effect’ depends also on nonchemical attributes such as beliefs, expectations and quality of patient-practitioner interaction. Another important dimension is whether individuals have adapted to healing. If individuals think of TM/H as the cultural norm (and have ‘adapted’ this as part of their daily lives), effects on life satisfaction may be underestimated: embeddedness of culture is an important aspect that remains little understood and merits further discussion within the realm of health seeking behaviour.

The policy implications emanating from this paper are threefold. Firstly, there is a distinct need to recognise PU within the TM 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. 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. 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.

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 TM 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, a further debate can be framed around welfarist versus extra-welfarist points of view (Brouwer et al. 2008). Welfarism aims to maximise utility across all individuals, and has often been criticised for focusing on efficiency (Hauck et al. 2004). From the point of view of welfarists, social institutions such as TM/H are not good or valuable in and of themselves but only for their consequences (specifically, their effect upon health outcomes) (Mooney 2001). On the other hand, extra-welfarists advocate that the most relevant characteristic in evaluating alternative policies is health outcomes, and need for health care—rather than individual demand—is the guiding principle upon which to allocate resources (Gyrd-Hansen 2005; Hauck et al. 2004). Accordingly, Ng (2004, pp. 258–259) suggests:

‘we want to consume products that satisfy our preferences, so going from the analysis of products to the analysis of preferences is going a layer deeper, but what we want ultimately is happiness or true welfare…not just preference satisfaction…Ultimately it is the degree of happiness that counts, more so than preference’.
Thus, an extra-welfarist approach, when evaluating modern and traditional systems, would better accommodate the complex attributes of TM/H. If policymakers recognised that TM/H has intrinsic, as well as instrumental, value, policy priorities would lie more in understanding the social aspects of health and well-being, rather than directly comparing health outcomes.

6 Conclusion

This paper has argued that accompanying procedures and related healing processes involved in the utilisation of TM/H is an important source of PU. Through procedures, 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 procedural effect. Future research using longitudinal data looking at healing processes for non-medical reasons, 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.

Appendix 1: Control Variables Included in Analysis and Summary Statistics

A dummy variable ‘severity’ indicates an individual’s self assessed 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), while the ‘chronic’ dummy indicates 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. Indicators of societal environment are also added: ‘culture’ indicates an index of cultural attitudes and beliefs towards TM/H\(^9\), whilst ‘community group’ asks whether anyone in the household belongs to a community group (0 no 1 yes) 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), age group (‘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 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.

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\(^9\) 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.
| Question | Self reported or not/retrospective or measured | Description | Coding | Full sample |
|----------|-----------------------------------------------|-------------|--------|-------------|
|          |                                               |             |        |             |
| **Satisfaction variables** |                                               |             |        |             |
| Lifeafter | '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 utilising the TM/H' | Self reported or household head reported/retrospective | Life satisfaction after TM/H utilisation | 0–10. 0 absolute dissatisfaction, 10 absolute satisfaction | 6.701299 | 1.764862 | 231 |
| **Process variable** |                                               |             |        |             |
| Procedure | 'Did you/the TH carry out any rituals or healing processes? (acupuncture, meditation, cantations, massage, touch therapies, religious activities, body-mind therapy, folk therapy etc.)' | Self reported or household head reported/retrospective | Whether individual experienced rituals or other healing processes | 0 = no; 1 = yes | 0.229437 | 0.421384 | 231 |
| **Outcome variables** |                                               |             |        |             |
| Mobility | Please indicate (first name)'s state of health before and after treatment in the following five dimensions: mobility; self-care; usual activities; pain/discomfort and anxiety/depression | Self reported or household head reported/retrospective | 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 | As above | Self reported or household head reported/retrospective | 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 | As above | Self reported or household head reported/retrospective | 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 |
| Question         | Self reported or not/retrospective | Description                                                                 | Coding                                                                 | Full sample |
|------------------|-----------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------|-------------|
|                  |                                   |                                                                           | 0 = no, got worse or saw no change; 1 = yes, got better                | Mean        |
| Pain             | As above                          | Self reported or household head reported/retrospective                    | Whether individual felt better in pain dimension following utilisation | 0.796537    |
|                  |                                   |                                                                           |                                                                       | SD          |
|                  |                                   |                                                                           |                                                                       | N           |
| Anxiety          | As above                          | Self reported or household head reported/retrospective                    | Whether individual felt better in anxiety dimension following utilisation | 0.647826    |
|                  |                                   |                                                                           |                                                                       | SD          |
|                  |                                   |                                                                           |                                                                       | N           |

Control variables

**Disease characteristics**

Chronic ‘Has anyone in this household ever been told by a doctor or other health care provider that they have a chronic disease? A chronic disease is an illness that will not go away or takes a long time to go away, even when treated’

Self assessed severity ‘How serious do you think this illness was?’

**Financial capability**

Insurance Does (first name) have health insurance?
| Question                        | Self reported or not/retrospective or measured | Description                        | Coding                      | Full sample |
|--------------------------------|-----------------------------------------------|------------------------------------|-----------------------------|-------------|
| Income (x)                     | Self reported or household head reported/retrospective | Log equivalised income            |                             | 3.933266    |
| Societal environment           |                                               |                                    |                             | 1.049867    |
| Culture                        | Self reported or household head reported/measured | Index of cultural attitudes towards traditional medicines/healers | Positive score increasing with dislike or negativity towards TM/H | 6.521072    |
| Community group                | Self reported or household head reported/measured | Whether anyone in household belongs to a community group | 0 = no; 1 = yes | 0.285714    |
| Sociodemographic characteristics|                                               |                                    |                             |             |
| Sex                            | Self reported or household head reported/measured | Gender                            | 0 = male; 1 = female        | 0.606061    |
| Education_cat                  | Self reported or household head reported/measured | Highest level education completed or currently attaining | 0 = none; 1 = basic primary; 2 = junior; 3 = junior++; 4 = other | 1.069565    |
| Occupation                     | Self reported or household head reported/measured | Occupational group                | 1 = farmer/fisherman; 2 = office worker; 3 = own business; 4 = unemployed | 2.774892    |

*Please state the amount your household spent in total last month. Please include all food, rent, school fees, health expenditures etc.*

*Please state whether any household members belong to the following groups: local church/place of worship; local sports team; money lending schemes; Any other community or political groups/affiliations*
| Question                  | Self reported or not/retrospective or measured | Description                      | Coding                                                                 | Full sample |
|---------------------------|-------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------|-------------|
| Religious group           | ‘Please state the religion of every member of the household’ | Religious group                  | 1 = Christian; 2 = Muslim; 3 = other; 4 = none                        | 1.458874    |
| Ageg                      | ‘Please state the age of every member of the household’ | Age group                         | 1 = 0–11; 2 = 12–17; 3 = 18–34; 4 = 34–55; 5 = 55+                   | 3.46875     |
| Married                   | ‘Please state the marital status of every member of the household’ | Whether individual is married    | 0 = no; 1 = yes                                                       | 0.4329      |
| Head_cat                  | ‘Please state the relationship to the head of every member of the household’ | Relationship to head of household | 1 = head; 2 = spouse; 3 = child 4 = other                             | 2.367965    |

**Locational characteristics**

| Region                    | Measured                                        | Region dummy                      | 0 = Greater Accra; 1 = Upper West                                     | 0.450217    |
| Urban                     | Whether major city within region                 | Urban dummy                       | 0 = no; 1 = yes                                                       | 0.601732    |
Appendix 2: Statistical Exposition of Ordered Probit Model

In an ordered probit model, threshold values ($\tau_i$) 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, it is possible to model an eleven (0–10 inclusive) category ordered probit thus:

$$P(y_i = 0|x_i) = \phi(\tau_0 - x_i\beta)$$
$$P(y_i = 1|x_i) = \phi(\tau_1 - x_i\beta) - \phi(\tau_0 - x_i\beta)$$
$$P(y_i = 2|x_i) = \phi(\tau_2 - x_i\beta) - \phi(\tau_1 - x_i\beta)$$

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

where $\beta$s and $\tau$s are to be estimated with robust standard errors, clustered by radius to account for sampling methodology and $\phi$ represents the probit link function and estimation is by maximum log likelihood. A positive coefficient indicates an individual will display higher latent satisfaction and 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 are calculated, with regressors set at mean values.

Appendix 3

See Table 3.

| Procedure         | I OU  | II OU_GA | III OU_UW |
|-------------------|-------|----------|-----------|
| Mobility          | -0.008* (0.004) | 0.012** (0.005) | -0.025* (0.013) |
| Selfcare          | 0.021* (0.013)  | -0.001 (0.021)  | 0.034 (0.020) |
| Activity          | -0.062* (0.026) | -0.072*** (0.012) | -0.079 (0.076) |
| Pain              | -0.052** (0.021) | -0.067* (0.038) | -0.051 (0.041) |
| Anxiety           | -0.043** (0.019) | -0.021 (0.023)  | -0.059 (0.037) |
| Illness characteristics | Yes    | Yes      | Yes      |
| Financial capabilities | Yes    | Yes      | Yes      |
| Societal environment | Yes    | Yes      | Yes      |
| Socio-demographics | Yes    | Yes      | Yes      |
| Locational dummies | Yes    | Yes      | Yes      |
| Log Likelihood    | -291.725 | -88.848 | -170.085 |
| R2                | 0.143  | 0.272  | 0.187  |
| N                 | 189    | 70  | 119   |

Marginal effects for satisfaction level 4 are presented
Robust SE in parentheses
Standard controls are included but not presented

*** Significant at 1 %; ** 5 %; * 10 %
Appendix 4

See Table 4.

|                      | I OU_own responders | II Proxy and response controls |
|----------------------|---------------------|--------------------------------|
| Procedure            | 0.033 (0.043)       | 0.121*** (0.022)               |
| Mobility             | 0.016 (0.025)       | 0.029** (0.011)                |
| Selfcare             | 0.022 (0.039)       | −0.011** (0.031)               |
| Activity             | 0.073 (0.044)       | 0.219*** (0.025)               |
| Pain                 | 0.063** (0.023)     | 0.185** (0.090)                |
| Anxiety              | 0.01 (0.013)        | 0.172*** (0.036)               |
| Illness characteristics | Yes                 | Yes                            |
| Financial capabilities | Yes               | Yes                            |
| Societal Environment  | Yes                 | Yes                            |
| Socio-demographics   | Yes                 | Yes                            |
| Locational dummies   | Yes                 | Yes                            |
| Own                  | NA                  | 0.008 (0.022)                  |
| Proxymale            | NA                  | 0.036 (0.088)                  |
| Proxyfemale          | NA                  | 0.097*** (0.011)               |
| Log Likelihood       | −110.069            | −290.402                       |
| R2                   | 0.203               | 0.147                          |
| N                    | 78                  | 189                            |

Marginal effects for satisfaction level 8 are presented
Robust SE in parentheses
Standard controls are included but not presented
*** Significant at 1 %; ** 5 %; * 10 %

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