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The application of Signalling Theory to health-related trust problems: The example of herbal clinics in Ghana and Tanzania

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ABSTRACT

In contexts where healthcare regulation is weak and levels of uncertainty high, how do patients decide whom and what to trust? In this paper, we explore the potential for using Signalling Theory (ST, a form of Behavioural Game Theory) to investigate health-related trust problems under conditions of uncertainty, using the empirical example of 'herbal clinics' in Ghana and Tanzania. Qualitative, ethnographic fieldwork was conducted over an eight-month period (2015–2016) in eight herbal clinics in Ghana and ten in Tanzania, including semi-structured interviews with herbalists (N = 18) and patients (N = 68), plus detailed ethnographic observations and twenty additional key informant interviews. The data were used to explore four ST-derived predictions, relating to herbalists' strategic communication ('signalling') of their trustworthiness to patients, and patients' interpretation of those signals. Signalling Theory is shown to provide a useful analytical framework, allowing us to go beyond the *primary trust problem* addressed by other researchers – cataloguing observable indicators of trustworthiness – and providing tools for tackling the trickier *secondary trust problem*, where the trustworthiness of those indicators must be ascertained. Signalling Theory also enables a basis for comparative work between different empirical contexts that share the underlying condition of uncertainty.

1. Introduction

1.1. Healthcare and the problem of trust

Across low/middle-income countries (LMICs), a combination of weak health systems and high demand leads many people to resort to a poorly-regulated 'informal' sector with substantial uncertainty about the quality of treatments on offer. Patients are thus faced with the problem of whom and what to *trust*. Trust usually implies *vulnerability*, since the truster has to depend on, but can never be certain about, another's motives, intentions and future actions (Baier, 1994; Gilson et al., 2005). With healthcare, the stakes are particularly high: individuals' health can be severely compromised by taking harmful products, while poor quality or ineffective treatment can be equally dangerous when it delays effective care and/or undermines trust in healthcare more generally (Blair et al., 2017).

The role of trust in healthcare has received significant research attention in recent years. Most work has focussed on doctor-patient relationships in 'Western' settings (e.g. Brown, 2009; Calnan and Rowe, 2008; Barrett et al., 2007; Mechanic and Meyer, 2000; Meyer, 2015), but research has increasingly included resource-poor contexts, where inadequate service provision and financial barriers may severely constrain choice (e.g. Birungi, 1998; Gilson et al., 2005; Russell, 2005; Ozawa and Walker, 2011; Tibandebage and Mackintish, 2005; Ackatia-Armah et al., 2016; Rodriguez, 2016). These studies have identified various inter-personal factors (honesty, sincerity, empathy, evidence of competence, etc.) and institutional factors (trust in medical training, general trust in public institutions, etc.) that interact to promote trust and influence treatment-seeking decisions.

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However, this literature suffers two important limitations. First, it assumes that it is *intrinsically* a good thing for patients to trust practitioners, as the basis for effective care. Thus, papers often conclude with recommendations that health professionals hone their listening/communication skills, etc. to foster patient trust (e.g. Ackatia-Armah et al., 2016; Gilson, 2003; Mechanic and Meyer, 2000). This is fine if the practitioner really *is* trustworthy but, in the highly unregulated informal sector present in many LMICs, this cannot necessarily be assumed. If behaviours that engender trust can be taught and learned, it follows that they can also be *mimicked*. This leads to the second shortcoming: current literature tends to be limited to *describing* and *classifying* qualities associated with trustworthiness (competence, integrity, empathy, etc.) and, sometimes, the observable indicators of those qualities (making eye contact, smiling, listening, etc.). However, given the risk of fakery, how can patients determine which indicators can be trusted?

In this paper, we propose that **Signalling Theory** – a variant of Behavioural Game Theory – might provide a valuable tool for enabling a deeper and more theoretically-informed analysis of health-related trust problems. Signalling Theory, whose origins lie in economics (Akerlof, 1970; Spence, 1973: Podolny, 2005) and evolutionary biology (Zahavi and Zahavi, 1997), has more recently been used by biological anthropologists (Bliege Bird and Smith, 2005; Sosis and Alcorta, 2003) and sociologists (Bacharach and Gambetta, 2003; Gambetta and Hamill, 2005; Gambetta, 2009; Hamill, 2011) to understand how communication works under conditions of uncertainty. However, Game Theory has rarely been applied to healthcare (see Tarrant et al., 2010; for a notable exception) and, to our knowledge, Signalling Theory has never been used for this purpose. Below, we outline, and then apply, the principles of Signalling Theory to a scenario where uncertainty is particularly high: 'herbal clinics' in Ghana and Tanzania. Our aim is twofold: to address an empirical question – how, under conditions of uncertainty and informational asymmetry, patients come to trust/distrust herbalists and their medicines – and to assess the potential contribution of Signalling Theory to the study of health-related trust problems more widely.

We use the terms '*trust*' and '*trustworthiness*' here in a very specific way. When we say that a patient 'trusts' a practitioner or medicine, we mean that they trust *enough* to accept a specific treatment at a particular moment; not necessarily that they trust the practitioner/medicine more generally. Neither do we assume that trust is the *only* factor driving treatment-seeking decisions, especially in populations facing serious resource constraints, as we discuss below.

1.2. Signalling Theory

Signalling theory (ST) addresses the problem of how individuals communicate unobservable properties like trustworthiness to one another in contexts of uncertainty and asymmetrical information. Because trustworthiness (like honesty or courage) cannot be directly observed, we have to discern it through associated behaviour or 'signals'. The **primary trust problem** is to ascertain an individual's trustworthiness by looking for observable indicators of that 'property'. However, as noted above, some people – 'mimics' – may display the same signals, in order to dupe someone else to their advantage. The **secondary trust problem** is thus to determine whether the signals of trustworthiness can themselves be trusted.

To distinguish between genuinely trustworthy individuals and 'mimics', the receiver (the one 'reading' the signals) must try to evaluate the cost of signal production (resources, time, etc.) relative to expected pay-offs for the signaller. ST distinguishes three categories of signals according to their discriminatory power. **Pooling signals** can be displayed easily and cheaply by genuine and dishonest signallers alike (for example, smiling) so cannot distinguish effectively between the two. **Semi-sorting signals** carry greater costs for dishonest signallers, who are therefore less likely to display them than honest ones. Semi-sorting signals thus convey more information about trustworthiness, although they may still be faked by an imposter who anticipates a sufficient pay-off to justify the investment. Fully **discriminating signals** distinguish reliably between honest and dishonest signallers because they would be beyond the latter's capacity to mimic, given the expected pay-off (Spence, 1973; Gambetta, 2009). Gambetta and Hamill (2005) have noted that, in 'real life', the situation is usually better represented by *continuum* of signals that convey varying degrees of imperfect information, operating both singly and in clusters.

Although ST predicts that signalling strategies everywhere draw on a similar underlying logic, the signals themselves will be *context-specific*. A behaviour that signals trustworthiness in one context may signify something different (or nothing at all) in another. A signal's discriminatory power also varies over *time*, as once-discriminating practices become easier to mimic and are more widely adopted. Actors therefore need relevant, up-to-date knowledge regarding the costs and pay-offs of signals used in a particular context (Gambetta and Hamill, 2005:14). Trustworthiness is also *situation*-specific: you may trust a healer to prescribe appropriate medicine but not to look after your children, or to treat a headache but not cancer.

1.3. Applying Signalling Theory to the case of 'herbal clinics' in Ghana and Tanzania

Herbal clinics have become an increasingly prominent feature of Africa's therapeutic landscapes, especially in urban areas. Operated usually by men, they claim to combine the best of 'indigenous' healing with 'modern', 'scientific' approaches, positioning themselves strategically within highly-competitive markets. Herbal clinics in contemporary Ghana and Tanzania range from large, upmarket, 'high-tech' establishments to basic, single-room structures (see Marsland, 2007, Hsu, 2002; McMillen, 2004; Langwick, 2010 re Tanzania, and Hampshire and Owusu, 2013; Tsey, 1997; Twumasi and Warren, 1986; re Ghana). Nonetheless, 'herbal clinics' share some common features which form the basis of our working definition: a fixed premises; operated by a practitioner claiming expertise in 'traditional' herbal medicine; producing and selling manufactured, plant-derived capsules, powders, ointments and/or bottled medicines.

Formal regulation of herbal medicine remains limited in both countries, despite numerous efforts. Since 1992, all herbal products sold in Ghana require approval by the Food and Drugs Authority (FDA), which tests products for acute toxicity (although not efficacy or chronic toxicity, as we discuss below), while practitioners must be licensed by the statutory Traditional Medicine Practice Council. However, off the record, regulators complained that they lack the capacity to operate effectively beyond the capital city; most herbal medicines remain unapproved and inspections are reportedly intermittent. Regulation in Tanzania is, as one Government official put it, "*way behind Ghana.*" The recently-established Traditional and Alternative Health Practice Council recently began the mammoth task of registering all 'traditional healers' in the country, while plans to license herbal medicines have yet to be operationalised.

In the absence of effective regulation, objective evidence about the quality and effectiveness of herbal products is limited, but we can infer substantial variation. Recent in-vivo and in-vitro studies in Ghana (e.g. Amoah et al., 2015; Komlaga et al., 2016; Wilmost et al., 2017) and Tanzania (e.g. Nondo et al., 2016) have detected varying levels of antimicrobial activity and efficacy in commonly-