Fishy Gifts: Bribing with Shame and Guilt

David Ong*

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Abstract

The following model shows how in the context of belief preferences, in particular shame and guilt aversion, implied or expressed beliefs about unobservable actions can simultaneously induce and sort for behavior that fulfill those beliefs. It is motivated by the $250 billion prescription drug industry, which spent $19 billion per year on marketing to US doctors, mostly on 'gifts', and often, as at Yale, with no monitoring for reciprocation. In one revealing incident, a drug firm representative closed her presentation to Yale medical residents by handing out $150 reference books and remarking, "One hand washes the other." By the next day, half the books were returned. I show in a one shot psychological trust game with asymmetric information how the belief in reciprocation implied by a gift from a profit maximizer can sometimes induce reciprocation, or if not, then screen for non-reciprocation. In those cases when a gift will not screen, an announcement of the belief can extend this induction/screening effect by refining the pooling equilibrium. I discuss implications for current policies in medicine, as well as, how the implied belief of practices like pro bono work in some expert professions may screen for trustworthiness, and how scandals that change such beliefs can sort in untrustworthy individuals.

JEL Codes: C72, D82, D86, H51, H75, I11, I18, M31, M37

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1 Introduction[1]

Medical professionals, health policy makers, and the public have become increasingly concerned at the coincidence of:

*Peking University HSBC School of Business Shenzhen, China, dvdong@gmail.com

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1) rising expenditure on prescription drugs: $64 billion in 1995, $151 billion in 2001 and $252 billion in 2006 [Herper and Kang, 2006] (with an estimated one-quarter of this increase resulting from a shift to the prescribing of more expensive drugs [Dana and Loewenstein, 2003])

2) extraordinary profitability of drug firms not commensurate with innovation: 76% were deemed only "moderately more efficacious" by the US Food and Drug Administration [Dana and Loewenstein, 2003], and

3) large expenditures on marketing to doctors: $18,000-$29,000 [Brennan et. al., 2006] per doctor per year – mostly on 'gifts': free samples, expensive dinners, pens, watches, trips...

There has been much speculation about what is actually happening as well as suggestive evidence that these gifts are intended to and do exert undue influence on the prescribing of doctors (See Appendix B: Background on Pharmaceutical Industry Gift Giving for more details). However, the evidence has largely been indirect, circumstantial, and theoretically problematic, with the main problem being how to explain contracting and enforcement when gifts are generally given without a statement of even the expectation of reciprocation, and for which reciprocation had been traditionally been unmonitorable.

To develop a possible model, I focus on a strange yet revealing incident that occurred at Yale–New Haven Hospital several years ago. There, after the pharmaceutical firm representative (Drug Rep) closed her presentation to Yale medical residents (lowly paid doctors in training) by handing out medical reference books worth $150, she unexpectedly remarked, that "one hand washes the other" (from now on referred to as "insinuation"). By the next day, half the books were returned[2]. Crucial for any model is the fact that Yale–New Haven Hospital, like many other hospitals, does not release prescribing data to any firms[3]. Unobservability of reciprocation means that repeated game incentives to enforce an implicit contract cannot explain the incident. Neither can social concerns as in [Benabou and Tirole, (2006)] be a motive since reciprocation here is unobservable, nor self-image concerns since the message "one hand washes the other" reveals nothing about the doctor's type, yet nonetheless influenced his behavior. Unobservability is the key problem in the modeling of bribing of experts who exercise subjective judgments for the sake of others – fiduciaries like judges, credit raters, managers, accountants, bureaucrats, politicians, student loan officers, and professors who choose text books for courses.

This paper's analysis of the Yale incident contributes to several literatures[4]. I outline

[2]Reported by a former Yale Medical resident Melinda L. Randall. Since 2009, 32 drug firms have attempted a self-imposed ban on gift giving. How well this ban has worked is unknown. In any case, many items like reference books are exempt.

[3]Private communication with the Director of Pharmacy Services at Yale-New Haven Hospital.

[4]Though there are published admissions of former and current drug reps use of psychological incentives

the contributions first and discuss alternative models next. First, this paper offers a possible explanation of a long standing marketing practice among drug firms of giving gifts to doctors even when they could not monitor them for reciprocating prescriptions. Second, it contributes to the corruption and gift giving literatures by showing how a gift with nothing said can induce reciprocation through the implied beliefs of the giver and the guilt aversion of the recipient. I show how the shame of accepting of a possible bribe, rather than being an impediment to bribing, can screen for reciprocation inducing guilt by cutting costs through rejections from those who would not reciprocate. Third, where gift alone doesn't work, I show how under some shame and guilt sensitivity conditions, the signal (insinuation that gift is a bribe – "One hand washes the other") can extend the screening effect, when doctors are smart enough to forward induct. This also demonstrates how a collective reputation (see [Tirole (1996)]) can be endogenously induced by an announcement of beliefs, where those who would not fulfill that belief self-select out of the group. Fourth, I also show how current policies to deter reciprocation can aid such screening. I outline some other applications immediately below.

1.0.1 Intuitions of the Model and Results

I will develop the model and outline the results by ruling out simpler alternative models. Again, due to unmonitorability, any model of the Yale incident would have to be one shot. But, in a game where the Drug Rep (she) can give a gift, or not, and the Doctor (he) has a choice of making reciprocating prescriptions at some cost, or not, the Doctor would not reciprocate and hence, the Drug Rep would not give. Even if we were to make this a standard psychological game, where the Doctor felt **guilt**[5] (modelled as the product of guilt sensitivity and the Doctor's belief about the Drug Rep's belief in reciprocation) from disappointing the expectation of the Drug Rep for reciprocation, that would not explain the announcement and its effect – returned books. Similarly, "kindness" as in [Rabin, 1993], could be a motive for reciprocation, but not for rejection. Nor would the mere introduction of **shame**[6] **(**modelled as the product of shame sensitivity and the second order expectation for reciprocation**)** from the expectation of doing something bad, as also developed in [Tadelis, 2008] be an adequate explanation. Tadelis showed that the threat of merely being observed can deter a bad action.

to induced doctors to reciprocate (see [Fugh-Berman and Ahari, 2007], for example), to my knowledge, such descriptions have not been formally analyzed. In any case, I am not aware of any descriptions of events similar to the Yale incident.

[5] See [Battigalli and Dufwenberg, 2008] for a general model of guilt, and [Charness and Dufwenberg, 2006] and [Fong et. al., 2007],[Reuben et. al, 2009] for experimental evidence that guilt can induce reciprocation.

[6] Shame is distinct from guilt or even "blame from guilt" as in [Battigalli and Dufwenberg, 2007] because it need not involve disappointment of expectations. Rather, one is ashamed *because* of what others expect one to do, or has seen us do.

But here, the subsequent prescribing of the doctors was not observable. Unlike [Benabou and Tirole, (2006)] where preferences for reciprocation are fixed constants, here they arise from equilibrium expressions of beliefs. There is a kind of "crowding in" behavior in so far as gifts are necessary for reciprocation, but the main contribution of this paper is to model reciprocation and rejection behavior from the mere expression of beliefs about unobservable behavior, i.e., from a self-fulfilling belief. That does not seem to be with the purview of [Benabou and Tirole, (2006)].

To explain the announcement and rejection, I introduce the possibility of shame from being observed (by patients, say) in accepting a possible bribe and interact shame and guilt in the context of double sided asymmetric information. There are now two types of Drug Reps h and l. l only benefits from reciprocation and thus, her expectation for reciprocation can be inferred from her giving. The altruistic h type of Drug Rep[7], which may only exist in the mind of the Doctor, suffers a cost from giving with insinuation, which makes it less preferred than mere giving. There are two types of Doctors, a highly shame averse type (H) and a not so highly shame averse type (L). The sequence of play is as follows. Nature moves to choose the types of Drug Reps and Doctors facing each other. The Drug Rep can then: 1) give a gift, 2) give and insinuate, and 3) not give, where 2) is more costly for the h Drug Rep. Each type of Doctor observes the Drug Rep's choice and updates his beliefs on the type of Drug Rep he faces. The Doctor then chooses to accept or reject given the shame of acceptance and anticipated cost of reciprocation or non-reciprocation. Observers update their beliefs on which type of Doctor is accepting. Each type of Doctor chooses to reciprocate or not given his guilt.

Due to asymmetric information about the Drug Rep's type, the Doctor's guilt now depends upon his belief that he is facing the bribing Drug Rep *and* his belief that the bribing Drug Rep is expecting reciprocation from *his type*[8]. Due to unobservability of the shameful act, reciprocation, an otherwise innocuous act, acceptance, is shameful for *everyone* when *anyone* reciprocates. Formally, the shame of acceptance is now the product of each type of Doctor's shame sensitivity and the *type weighted* average of *beliefs about beliefs* about the rates of reciprocation of *all types* of Doctors who accept. In other words, shame is here modelled as a function of ex ante beliefs, while guilt is modelled as a function of ex post be-

[7] As reported in the Yale incident and as shown in surveys [Kaiser Foundation Survey, 2001], a significant portion did not suspect that drug firms are out to influence their prescribing with gifts. Drug firms promotional material try to confirm this impression. See their websites (e.g., www.pfizer.com). Hospitals, including Yale, have instructional interventions for doctors to explain how drug firms may be trying to influence them.

[8] This sensitivity to type based expectations would predict the results in [Vanberg, 2008.], where responders in a trust game fulfilled only their own promises and not those of prior responders with whom they had been switched. It would also be consistent with the result in [Charness and Dufwenberg, 2009], where generic promises chosen by proposers had no trustworthiness enhancing effects.

liefs[9]. Equilibrium behavior then becomes driven by the interplay between, shame, a 'public bad'[10] among all types who accept, and guilt, a 'private bad' for each who disappoints an expectation for reciprocation from his type. Thus, in a partial pooling equilibrium, where both types of Doctors are accepting, but only H is reciprocating, only the H type can feel guilt in deviating to not reciprocate. However, though L is not reciprocating (and hence, not expected to) he will nonetheless feel the same shame as H at acceptance, because the Patient cannot tell them apart. In other words, shame is a function of the ex-ante belief of reciprocation (because the Patient does not know which type of Doctor is accepting) and guilt is a function of the ex-post belief (because each type of Doctor knows what is expected of him in equilibrium). Thus, in a pooling equilibrium, shame is a public bad among all who accept, but guilt is a private bad for each who does not reciprocate, *when he is expected to reciprocate*. It is the interaction between these two bads that drives the behavior of the Doctors, and ultimately, the behavior of the Drug Rep. In view of these results, the announcement of the expectation of reciprocation in the Yale incident, increased the expectation of reciprocation, and therefore, the guilt at non-reciprocation. That increased reciprocation, which increased the ex-ante expectation of reciprocation, which in turn increased the shame of acceptance and hence, *decreased* acceptance. Thus, the Drug Rep's announcement increased the rate of reciprocation per acceptance while it decreased acceptance. Hence, such a strategy's effect on costs could have been profit maximizing, if the Drug Rep got the parameters right[11].

1.0.2 Intuitions about Equilibria

The model is predictive given the correlation between shame and guilt sensitivities of the Doctors present. The most interesting cases are partial pooling equilibrium when both types of Doctors accept but only one is reciprocating, i.e., the other is free-riding. One such case is when there is strongly negative correlation between shame and guilt sensitivities (Equilibrium 3). In this case, H, the type who is *most* sensitive to shame, and hence, *most* likely to reject, is *least* sensitive to guilt and hence, *least likely to reciprocate*. Then a gift alone can screen for non-reciprocation. This would explain the normal practice of drug firm representatives, where gifts are given but nothing is said. To induce this H to reject,

[9] This is consistent with the psychological and economics literature. See [Tadelis, 2008] and [Tangney, Dearing, 2002].

[10] See [Ong, 2008a] for experimental evidence that shame an be externalized to others who have committed no wrong. This is in marked contrast to guilt, which the results in [Vanberg, 2008.] suggests cannot be imposed upon others who haven't committed themselves through a promise.

[11] This particular Drug Rep was subsequently banned from returning to Yale-New Haven Hospital, a drastic move that may be difficult to justify if the administration thought the impression of increased reciprocation was completely incredible. This trade-off between directness and indirectness may also explain why cash gifts are generally not used with doctors. They are too direct. Observers infer (perhaps incorrectly) that everyone who would accept would reciprocate. *Because of that*, no one would accept.

the Drug Rep can merely buy a cheaper gift before the game begins (Equilibrium 2). In contrast, when there is not strong negative correlation, a gift alone cannot screen for non-reciprocation. For example, with positive correlation, L, the type who is the *least* sensitive to shame, and hence, *least* likely to reject, is the *least* sensitive to guilt, and hence, *least likely to reciprocate* (Equilibrium $3H$)[12]. A gift rejected by L would also be rejected by H, the type who *is most likely to reciprocate*. In some of these cases, the Drug Rep can increase the guilt of L enough by insinuating to cause him to also reciprocate (Equilibrium 4)[13]. If instead H had been free-riding, as can be the case when there is weakly negative correlation (Equilibrium $3L$), the Drug Rep can in *some* of these cases get rid of H by insinuating (Equilibrium 6). Furthermore, even if H had been reciprocating (Equilibrium $\bar{3}H$), if the shame externality of L reciprocating would force a trade-off between either H accepting or L accepting, the Drug Rep could still choose L over H (Equilibrium $5L$). This case where profit maximization involves and announcement and rejection would explain the stylized facts of the Yale incident. I show using the Intuitive Criterion that insinuation works as an equilibrium refinement of the partial pooling equilibrium, causing separation. Assuming that the Drug Rep insinuated rationally in the Yale incident, my results show that those who kept the gift and said that they would not have reciprocated were in fact lying. Those who had rejected the gift were lying only if Equilibrium 4 applied.

In the policy section, I show that:

1. Bans on gifts imply off-equilibrium beliefs that shame all doctors, even those who would not have accepted. This helps to explain why bans, the most obvious solution, has been used only in a handful of hospitals.

2. Perversely, gift registries and educational interventions can *help* the Drug Rep screen for reciprocation because they act like insinuation.

3. Hypothetical off-equilibrium beliefs about what others believed Doctor would have done–reciprocate–even if incorrect, can give rise to "non-credible shame", which would keep that the Doctor from accepting the gift. (Details in Appendix D which is available on request.)

[12]The numbers to denote these equilibria will be followed by the letter of the reciprocating type. For example, in "Equilibrium $3H$" both are accepting but only H is reciprocating. In contrast, in "Equilibrium 3", all types who accept are reciprocating.

[13]Equilibria a) $3H$ and 4, b) $3L$ and 6, c) $\bar{3}H$ and $5L$ are pairs of equilibria for the same parameter ranges of shame and guilt sensitivities. The Drug Rep can move from the first to the second of the pair if she insinuates. I show that she will insinuate if doing so would increase her profits and if she believes that the Doctor can forward induct, i.e., are rational enough to reason through an equilibrium refinement.

1.0.3 Other Applications

Beyond the $252 billion US prescription drug market, the $89 billion student loan industry also employed gifts to market loan products to financial aid councilors. See [New America Foundation, 2009] for a large listing of articles on the topic. Preliminary research indicates that, like drug firms, loan firms could not monitor for reciprocation in the form of recommendations of their products to students, and may also have relied upon psychological factors like guilt and shame to target gifts to get reciprocation. Guilt and shame may have important unobservable influence on the subjective judgments of credit rating and accounting agencies when their consulting arms get lucrative contracts. Here, whether the consulting contract was given due to a reciprocation motive is unobserved. Reciprocation for bribes in elections with secret ballots are also unobservable. After voters accept the bribe, they can still vote however they like. In this case, shame modulated by insinuation may also be used there to screen for reciprocation. In China, where there are severe penalties for bribing officials, bribes are made in sealed envelopes of cash that are left on the table, often unmentioned and unacknowledged. However, should the desired outcome come about, whether it was reciprocation by the official or not is generally not observable. In this case as well, the official may pass the bribe back from shame. Similarly, in America, a large campaign contribution may *coincidentally* be followed by desired legislative efforts. Whether such efforts are forms of reciprocation remains a secret. Again, the contribution could be refused due to the shame inducing beliefs of acceptance.

A scandal in a fiduciary field can change expectations just like insinuation did in the Yale incident. In [Ong, 2008a], I show how the shame from a scandal may sort out those who are most trustworthy from a fiduciary field, as Enron may have done in accounting. That raises the question of how expert professions might select for trustworthy people and hence, conserve the trust they need to function. This is addressed in follow up work [Ong, 2008b] which argues that pro bono work among doctors, which amounted to $12 billion in 2001, may help screen out people who would cheat on their patients, and hence damage the reputation of all doctors.

The model is in section 2. I define the equilibrium concept in section 3.1, develop aspects of equilibria in section 3.2 and list propositions proved in section 3.3. Proofs are in Appendix C, which is available upon request.

2 The Model

2.1 Game Structure

The model can be summarized as a standard trust game with two types of proposers (Drug Rep/she[14]) $\theta_1 \in \{l, h\}$ facing two types of responders (Doctors/he) $\theta_2 \in \{H, L\}$, with observable acceptance a but unobservable reciprocation r. Drug Reps also have two ways of giving g_1 and g_2 with g_1 standing for giving and g_2 standing for giving and insinuating. Here H stands for highly shame averse and L stands for not so highly shame averse.

The sequence of play is:

1. Nature moves first to choose pairs of Drug Reps and Doctors; the l Drug Rep with probability p_1 and L Doctor with probability p_2.

2. Each type of Drug Rep may give a gift g_1 or give and insinuate g_2 or not give [15].

3. Each type of Doctor may accept a or not accept $\neg a$.

4. If he accepts, he may reciprocate r or not reciprocate $\neg r$, unobserved by the Drug Rep (and Patient).

The game tree is in Appendix A.

I look at parameter ranges in which the 'not give' is dominated, so that it can be omitted, since nothing interesting happens if the Drug Rep does not want to give. To avoid introducing further notation in an already complicated model, I will let action letters a and r also stand for mixed behavioral strategies in those few places where they are needed, e.g., when they determine equilibrium beliefs. My analysis is otherwise limited to pure strategy equilibria.

2.2 Doctor's Payoff and Information

v =value of the gift. e =cost of reciprocation. $v > e > 0$. For each type of Doctor $\theta_2 \in \{H, L\}$:

- γ_{θ_2} =guilt sensitivity where $\gamma_{\theta_2} > 0$.
- σ_{θ_2} =shame sensitivity where $\sigma_{\theta_2} > 0$ and $\sigma_H > \sigma_L > 0$.

[14] Drug Reps are usually very attractive and personable women, often drawn from the ranks of former cheerleaders.

[15] I only look at the situations where the Proposer wants to give in at least one of the two ways. To avoid clutter, I omit notation of not giving.

- The presence of a passive observer (the Patient) is reflected in the Doctor's heightened shame sensitivity.

$I \in \mathcal{I}$ is information set of the Drug Rep after Doctor accepts, modelling the Drug Rep's uncertainty as to which type of Doctor accepted and whether that type is reciprocating or not. There are four such information sets, one for each combination of Drug Rep and her actions: $\mathcal{I} = \{I_{lg_2}, I_{lg_1}, I_{hg_2}, I_{hg_1}\}$. Each of those information sets contain four possible histories, which differ only as to whether a certain type of Doctor reciprocated or not.

Let:

- μ_1 =updated belief that the Drug Rep is the l type given that she gives, gives and insinuates or does not give.

- μ_2 =updated belief that the Doctor is the L type given observed acceptance. In equilibrium, $\mu_2 = \frac{p_2 a_L}{p_2 a_L + (1-p_2) a_H}$: the prior weighted ratio of the rate of acceptance of the L type to acceptances by either types.

Since the Doctor has preferences over Drug Rep's beliefs, in equilibrium, he will, in a sense to be defined in the equilibrium concept below in section 3, have *beliefs in his utility function.* $\bar{\rho}(I)$ and $\rho_{\theta_2}(I)$ should be interpreted as payoff parameters when in utility functions and beliefs otherwise. They are equal in equilibrium.

- $\bar{\rho}(I)$ =Doctor's belief about the observer's belief about the rate of reciprocation of whoever is accepting at $I \in \mathcal{I}$. Hence, $\bar{\rho}(I) = 1$ would be the second order belief that "whoever accepts reciprocates."

- $\rho_{\theta_2}(I)$ =Doctor θ_2's belief of observers' belief about θ_2's rate of reciprocation after acceptance. Hence, $\rho_{\theta_2}(I) = 1$ would be the θ_2's second order belief that "if I accept, I would be expected to reciprocate."

In equilibrium, the average rate of reciprocation conditional on acceptance $\bar{\rho}(I)$ is the μ_2 weighted average of *beliefs about the rate of reciprocation* $\rho_{\theta_2}(I)$ of each type θ_2 conditional on acceptance. The conditional beliefs are used here because I assume that Doctors care about the beliefs of Drug Reps only if they accept.

$$\bar{\rho}(I) = \rho_L(I) \cdot \mu_2 + \rho_H(I) \cdot (1 - \mu_2) \tag{1}$$

The support of $\rho_{\theta_2}(I)$ is represented by dashed 'belief support sets' in the tree in Appendix A. The standard information sets which enclose the belief support sets represent the

uncertainty of an observer who knows neither which type is accepting, nor whether they are reciprocating.

Payoff of Doctor after:

1. non-acceptance: 0.
2. accepting and reciprocating: $v - e - \sigma_{\theta_2}\bar{\rho}(I)$.
3. accepting and not reciprocating: $v - \mu_1\gamma_{\theta_2}\rho_{\theta_2}(I) - \sigma_{\theta_2}\bar{\rho}(I)$.

2.3 Drug Rep's Payoff

Though I do provide justifications for how I model the Drug Rep, the Drug Rep's actions should be regarded as providing the framework for the main focus of the paper – the analysis of how shame and guilt can be used to manipulate the behavior of the Doctor. What the reader should take away is that

1. The l Drug Rep must anticipate reciprocation whenever she gives in equilibrium.
2. Upon observing g_2, the Doctor should believe that they are facing l, since g_2 is dominated for h but not for l [16].

More specifically, I assume that the insinuation is free for the l Drug Rep and she cares only about material payoffs. Hence, her payoffs from insinuating or not depends only upon the Doctor's consequent acceptance and rate of reciprocation. (There are many ways to model the above assumptions. I outline somewhat cumbersome way below.) Acceptance increases costs by k and reciprocation increases revenue by R. Let $\boldsymbol{g}_2 \in \{0,1\}$ be the rate of insinuation for the Drug Rep and $\mathbf{r}_{\boldsymbol{g}_2}$ be the rate of reciprocation for the Doctor. The profits for the l Drug Rep is then:

$$\pi_l\left(\boldsymbol{g}_2, \mathbf{r}_{\boldsymbol{g}_2}\right) = \left(\mathbf{r}_{\boldsymbol{g}_2} \cdot R + \left(1 - \mathbf{r}_{\boldsymbol{g}_2}\right) \cdot 0 - k\right) = \left(\mathbf{r}_{\boldsymbol{g}_2} R - k\right) \tag{2}$$

Since the l Drug Rep is not sure about which type of Doctor she is facing, she chooses $\boldsymbol{g}_2$ to maximize her expected payoffs:

$$\max_{\boldsymbol{g}_2} E\left(\pi_l\left(\boldsymbol{g}_2, \mathbf{r}_{\boldsymbol{g}_2}\right)\right) = \max_{\boldsymbol{g}_2} \left\{\mu_2\left(\mathbf{r}_{L\boldsymbol{g}_2} R - k\right) + (1-\mu_2)\left(\mathbf{r}_{H\boldsymbol{g}_2} R - k\right)\right\} \tag{3}$$

[16] A casual perusal of drug firm websites will show that drug firm promotion portray drug firms as altruistic, or the least, not just profit maximizing. As late as 2001, 40% of doctors did not realize that drug firms monitored their prescribing patterns [Kaiser Foundation Survey, 2001]. According to [Madhavan et. al., 1997], "physicians *slightly agreed* that pharmaceutical companies give gifts to physicians to influence their prescribing." Hospitals like Yale New Haven Hospital have educational interventions that basically tell doctors that drug firms are very likely trying to affect their prescribing through gifts. Again, see [Fugh-Berman and Ahari, 2007] for more details on the psychological/relationship tactics used by drug firms to influence doctors.

Clearly, the l Drug Rep will only give if she is making non-negative profits. This requires that, if either type of Doctor accepts, at least one reciprocates; fixing a choice of either $\boldsymbol{g}_2 = \mathbf{1}$ or $\neg \boldsymbol{g}_2 = \mathbf{1}$, if $\mathbf{r}_L = 1$ or $\mathbf{r}_H = 1$, the Drug Rep earns positive profits.

$$R\left(p_2\left(\mathbf{r}_L\right) + \left(1 - p_2\right)\left(\mathbf{r}_H\right)\right) > k \tag{4}$$

3 Equilibrium Analysis

I adapt here the notion of psychological sequential equilibrium (PSE) concept introduced by [Battigalli and Dufwenberg, 2008]. As in a standard perfect Bayesian equilibrium, in each subgame, players are best responding to their beliefs and beliefs are consistent with equilibrium actions of all players including nature's moves, according to Bayes rule. However, here the Doctor's payoffs also depend upon his beliefs about the beliefs of the Drug Rep. In a PSE, beliefs about beliefs are also correct. Hence, in equilibrium, each type of Drug Rep chooses to give g_1 or insinuate and give g_2, or not give, given her belief μ_2 of facing L and expected rates of reciprocation after acceptance. Each type of Doctor decides on acceptance or non-acceptance given his shame aversion $\sigma_{\theta_2}\bar{\rho}$, the value of the gift v and his anticipated consequent guilt, should he not reciprocate, or his cost of reciprocation e, should he reciprocate. After acceptance, each type of Doctor would choose to reciprocate r or not, given his guilt aversion $\gamma_{\theta_2}\rho_{\theta_2}$, his cost of reciprocating e, and his belief about the Drug Rep's expectation of type θ_2's reciprocation rate ρ_{θ_2}. Consistency between beliefs and actions requires that

$$\rho_{\theta_2}\left(I\right) = \mathbf{r}_{\theta_2}\left(I\right), \forall I \in \mathcal{I}, \forall \theta_2 \in \{H, L\} \tag{5}$$

3.1 Aspects of Equilibria

For convenience and to avoid needless repetition, I define some aspects of equilibria.

The Doctor needs to rank four pure strategies $(r, a), (r, \neg a), (\neg r, a)$ and $(\neg r, \neg a)$. Let these rankings be represented in the following short hand:

$$\begin{aligned}
&(r \succeq \neg r) := (r, a) \succeq (\neg r, a) \\
&(\neg r \succeq \neg a) := (\neg r, a) \succeq (r, \neg a) \text{ and } (\neg r, a) \succeq (\neg r, \neg a) \\
&(r \succeq \neg a) := (r, a) \succeq (r, \neg a) \text{ and } (r, a) \succeq (\neg r, \neg a)
\end{aligned} \tag{6}$$

the conditions for which I will derive in the following.

The $(r \succeq^{\neg} a)$ **Condition:** At each information set $I \in \mathcal{I}$ for each type $\theta_2 \in \{H, L\}$, reciprocate is better than not accept iff:

$$v - e - \sigma_{\theta_2} \bar{\rho}(I) \geq 0$$

The $(^{\neg} r \succeq^{\neg} a)$ **Condition:** At each information set $I \in \mathcal{I}$ for each type $\theta_2 \in \{H, L\}$, not reciprocate is better than not accept iff:

$$v - \mu_1 \gamma_{\theta_2} \rho_{\theta_2}(I) - \sigma_{\theta_2} \bar{\rho}(I) \geq 0$$

The $(r \succeq^{\neg} r)$ **Condition:** At each information set $I \in \mathcal{I}$ for each type $\theta_2 \in \{H, L\}$, reciprocate is better than not reciprocate iff:

$$v - e - \sigma_{\theta_2} \bar{\rho}(I) \geq v - \sigma_{\theta_2} \bar{\rho}(I) - \mu_1 \gamma_{\theta_2} \rho_{\theta_2}(I)$$

$$\mu_1 \gamma_{\theta_2} \rho_{\theta_2}(I) \geq e$$

The $(r \succeq^{\neg} r, r \succeq^{\neg} a)$ **Condition:** At each information set $I \in \mathcal{I}$ for each type $\theta_2 \in \{H, L\}$, accept and reciprocate is best iff:

$$v - e \geq \sigma_{\theta_2} \bar{\rho}(I) \text{ and } \mu_1 \gamma_{\theta_2} \rho_{\theta_2}(I) \geq e$$

The $(a \succeq^{\neg} a)$ **Condition:** At each information set $I \in \mathcal{I}$, for each type $\theta_2 \in \{H, L\}$, accept is better than reject iff:

$$\max\left\{v - e - \sigma_{\theta_2} \bar{\rho}(I), v - \mu_1 \gamma_{\theta_2} \rho_{\theta_2}(I) - \sigma_{\theta_2} \bar{\rho}(I)\right\} \geq 0$$

$$\min\left\{e, \mu_1 \gamma_{\theta_2} \rho_{\theta_2}(I)\right\} < v - \sigma_{\theta_2} \bar{\rho}(I)$$

3.2 Characterization of Equilibria

In the following, equilibrium will be abbreviated to "Eq.". Since, I only need distinguish beliefs that are after insinuation g_2 and those that are after non-insinuation g_1, I will only write beliefs as a function of g_2 or g_1 (e.g., write $\rho_{\theta_2}(g_2)$ for $\rho_{\theta_2}(I_{\theta_1 g_2}), I_{\theta_1 g_2} \in \mathcal{I}$, $\theta_1 \in \Theta_1, \theta_2 \in \Theta_2$). In equilibria 1-3, the Drug Reps pool to g_1. In equilibria 4-6, the l Drug Rep separates to g_2. To avoid repetition, I state only what each type of Doctor does in the following proposition.

3.2.1 No Insinuation Equilibria

To shorten my proofs, I characterize off-equilibrium beliefs, which are all the same, in the following lemma, which apply to all propositions that follow. Since beliefs on the equilibrium path are true and can be substituted away with their corresponding actions, they too are omitted in the propositions.

Lemma 1 *For a fixed action of the l Drug Rep* $s_1 \in \{g_2, g_1\}$, *both Doctors will accept and not reciprocate*

$$\left(\left(\mathbf{a}_H\left(s_1\right)=1,\mathbf{r}_H\left(s_1\right)=0\right),\left(\mathbf{a}_L\left(s_1\right)=1,\mathbf{r}_L\left(s_1\right)=0\right)\right) \tag{7}$$

when $\rho_H\left(s_1\right)=\rho_L\left(s_1\right)=0$. *The l Drug Rep's payoff will be* $-k$.

Proposition 2 (Eq. 1) *There exist equilibria in which both types of Doctors accept and reciprocate iff*

$$v-e \geq \sigma_{\theta_2} \text{ and } p_1\gamma_{\theta_2} \geq e, \forall \theta_2 \in \{H, L\} \tag{8}$$

$$\rho_H\left(g_1\right)=\rho_L\left(g_1\right)=1 \tag{9}$$

Proposition 3 (Eq. 2) *There exist equilibria in which the L type of Doctor accepts and reciprocates and the H type does not accept iff*

$$\rho_L\left(g_1\right)=1, \bar{\rho}\left(g_1\right)=1, v-e \geq \sigma_L \text{ and } p_1\gamma_L \geq e \tag{10}$$

$$\rho_H\left(g_2\right)=0 \text{ and } \rho_L\left(g_2\right)=0 \tag{11}$$

and

$$\left\{\begin{array}{ll} a) & \rho_H\left(g_1\right)=1, v-p_1\gamma_H<\sigma_H \text{ and } p_1\gamma_H<e \\ & \text{or} \\ b) & \rho_H\left(g_1\right)=0, \sigma_H>v \text{ and } p_1\gamma_H<e \end{array}\right\} \tag{12}$$

Proposition 4 (Eq. 3L) *There exist equilibria in which both types of Doctors accept but only L reciprocates iff*

$$v-e \geq \sigma_L p_2 \text{ and } p_1\gamma_L \geq e \tag{13}$$

$$0 \leq v-\sigma_H p_2 \text{ and } p_1\gamma_H<e \tag{14}$$

$$\rho_H\left(g_1\right)=0, \rho_L\left(g_1\right)=1, \bar{\rho}\left(g_1\right)=p_2 \tag{15}$$

$$\rho_L\left(g_2\right)=\rho_H\left(g_2\right)=0 \tag{16}$$

Proposition 5 (Eq. 3H) *There exist equilibria in which both types of Doctors accept but only H reciprocates iff*

$$v-e \geq \sigma_H\left(1-p_2\right) \text{ and } p_1\gamma_H \geq e \tag{17}$$

$$0 \leq v - \sigma_L (1 - p_2) \text{ and } p_1 \gamma_L < e \tag{18}$$

$$\rho_H (g_1) = 1, \rho_L (g_1) = 0, \bar{\rho} (g_1) = (1 - p_2) \tag{19}$$

$$\rho_H (g_2) = \rho_L (g_2) = 0 \tag{20}$$

Corollary 6 (Eq. $\bar{\mathbf{3}}H$) *Consider Eq. 3H. If $v - e < \sigma_H$, then H only accepted if L also accepted and but did not reciprocate.*

3.2.2 Insinuation Equilibria

In the following equilibrium, the l Drug Rep separates from the h Drug Rep by insinuating g_2.

Proposition 7 (Eq. 4) *There exist equilibria in which the L type of Doctor accepts and reciprocates and the H type does not accept iff*

$$\rho_L (g_2) = 1, \bar{\rho} (g_2) = 1, v - e \geq \sigma_L \text{ and } \gamma_L \geq e \tag{21}$$

$$\rho_H (g_1) = \rho_L (g_1) = 0 \tag{22}$$

and

$$\left\{ \begin{array}{ll} a) & \rho_H (g_2) = 1, \sigma_H > v - e \text{ and } \gamma_H \geq e \\ & \text{or} \\ b) & \rho_H (g_2) = 0, \sigma_H > v \text{ and } \gamma_H \geq e \end{array} \right\} \tag{23}$$

Proposition 8 (Eq. $\mathbf{5}L$) *There exist equilibria in which the L type of Doctor accepts and reciprocates and the H type does not accept. More specifically iff*

$$\rho_L (g_2) = 1, \bar{\rho} (g_2) = 1, v - e \geq \sigma_L \text{ and } \gamma_L \geq e \tag{24}$$

$$\rho_H (g_1) = 0 \text{ and } \rho_L (g_1) = 0 \tag{25}$$

and

$$\left\{ \begin{array}{ll} a) & \rho_H (g_2) = 1, v - \gamma_H < \sigma_H \text{ and } \gamma_H < e \\ & \text{or} \\ b) & \rho_H (g_2) = 0, \sigma_H > v \text{ and } \gamma_H < e \end{array} \right\} \tag{26}$$

Proposition 9 (Eq. 6) *There exist equilibria in which both types of Doctors accept and reciprocate. More specifically iff*

$$v - e \geq \sigma_{\theta_2} \text{ and } \gamma_{\theta_2} \geq e, \forall \theta_2 \in \{H, L\} \tag{27}$$

$$\rho_H(g_1) = \rho_L(g_1) = 1 \tag{28}$$

Proposition 10 *Suppose that either Eq. 4 or Eq. 3H can hold. If the not highly shame averse type L are numerous enough*

$$p_2 > \frac{k}{(R+k)} \tag{29}$$

the Drug Rep would prefer the outcome in Eq. 4. Then, Eq. 3H can be eliminated with the Intuitive Criterion.

Proposition 11 *Eq. 3L can be eliminated with the Intuitive Criterion. Eq. 5L would hold instead.*

3.3 Graphical Analysis of Equilibria

An equilibrium will be a pair of points on the shame and guilt plain $(\sigma, \gamma) \in R^2_+$ below. Though in fact, we need a graph for each type of Doctor $\theta_2 \in \{H, L\}$, if we assume that priors on Doctors' types are symmetric,i.e., $p_2 = \frac{1}{2}$, we can use one graph, say for type H, to represent best response regions for both types, when both are expected to reciprocate. When one is not expected to reciprocate, then the best response graph for that one has a vertical boundary at infinity. In that case I only show the graph of the one that is reciprocating. Even for the type who is expected to reciprocate, the boundary is "one sided"; it only exists for decreasing guilt sensitivity. For increasing guilt sensitivity, if the Doctor had not been expected to reciprocate, no degree of guilt sensitivity will make him want to reciprocate. (These graphs are a little strange and tricky to draw. I ask for the readers patience.) Now, I will indicate how the boundaries of these best response regions for figures 1-5 below were determined.

3.3.1 Horizontal Boundary for $H : (r \succeq \neg r)$

The horizontal axis is divided up by the 'reciprocate is better than not reciprocate' or $(r \succeq \neg r)$ condition : $\mu_1 \gamma_H \rho_H \geq e$, in which $\mu_1(g_1) = p_1$ in a pooling equilibrium (figure 2) and $\mu_1(g_2) = 1$ and $\mu_1(g_1) = 0$ in a separating equilibrium (figure 3). Since, $\rho_H \in \{0, 1\}$, when $(r \succeq \neg r)$ is rewritten as $\gamma_H \geq \frac{e}{\mu_1 \rho_H}$, the horizontal boundaries for $\gamma_H \in \left\{0, e, \frac{e}{p_1}, \infty\right\}$.

3.3.2 Vertical Boundary for $H : (r \succeq \neg a)$

The vertical boundary to the right of $(r \succeq \neg r)$ boundary is divided by the 'reciprocate is better than not accept' or $(r \succeq \neg a)$ condition: $v - e \geq \sigma_H \bar{\rho}$, in which $\bar{\rho} = 1 - p_2$ when both are

accepting but only H is reciprocating (see figure 1), or $\bar{\rho} = 1$, when only the reciprocating type accepts (figure 2). (If both were accepting and only L was reciprocating then, the dividing line would be where $\bar{\rho} = p_2$.) Hence, when $(r \succeq \neg a)$ is rewritten $\frac{v-e}{\bar{\rho}} \geq \sigma_H$: the vertical boundaries for $\sigma_H \in \left\{\frac{v-e}{1}, \frac{v-e}{1-p_2}\right\}$.

3.3.3 Diagonal Boundary for $H : (\neg r \succeq \neg a)$

The diagonal is divided by the 'not reciprocate is better than not accept' or $(\neg r \succeq \neg a)$ condition for $H : v - \mu_1\gamma_H\rho_H - \sigma_H\bar{\rho} \geq 0$[17]. This condition, which can be more conveniently written as $\frac{v-\mu_1\gamma_H\rho_H}{\bar{\rho}} \geq \sigma_H$ only matters when not reciprocating is better than reciprocating $(\neg r \succeq r) : \mu_1\gamma_H\rho_H < e$ and H has not accepted, i.e., H is in region $\neg a$. There are two possibilities: H accepts or not.

- Should H have accepted and not reciprocated, consistency between beliefs and actions would require that $\rho_H = \mathbf{r}_H = 0$. Thus, from the perspective of the H Doctor who has accepted and not reciprocated, the shame σ_H boundary for accepting would be defined by $\frac{v}{\bar{\rho}} \geq \sigma_H$ in which $\bar{\rho} = p_2$. (Not shown in any figure.)
- Should H not have accepted, then beliefs about H's rate of reciprocation *had he accepted* are not constrained $\rho_H \in \{0, 1\}$. Recall from 1 that

$$\bar{\rho} = \rho_L \cdot \mu_2 + \rho_H \cdot (1 - \mu_2)$$

  - Suppose that H believes that had he accepted, he would have been expected to reciprocate, then $\rho_H = 1$ and $\frac{v-\mu_1\gamma_H}{\bar{\rho}} \geq \sigma_H$, in which $\bar{\rho} = 1 \cdot 1 + 0 \cdot 1 = 1$.
  - If on the other hand, H believes that had he accepted, he would not have been expected to reciprocate, then $\rho_H = 0$ and $\frac{v}{\bar{\rho}} \geq \sigma_H$, in which $\bar{\rho} = 1 \cdot 1 + 0 \cdot 0 = 1$.

Hence, when $(\neg r \succeq \neg a)$ is rewritten as $\frac{v-\mu_1\gamma_H\rho_H}{\bar{\rho}} \geq \sigma_H$, the possible diagonal boundaries are $(\sigma_H, \gamma_H) \in \left\{(\sigma_H, \gamma_H) : \sigma_H = \frac{v}{p_2} \text{ or } v - \mu_1\gamma_H - \sigma_H = 0\right\}$.

The diagonal for L is comparable except that $\bar{\rho} = 1 - p_2$ when both accept and H reciprocates, but L does not reciprocate. See figure 2.

If both H and L have high enough guilt sensitivity to reciprocate, then the Drug Rep only has to choose a gift v that will cause them to accept. This is the situation in Eq. 1 (not figured). If however, one type is not sensitive enough to guilt, and guilt and shame are

[17] If H is considering $\neg r \succeq \neg a$ then, by the positive profit condition 4 and consistency 5, L must be accepting and reciprocating: $\rho_L = \mathbf{r}_L = 1$.

negatively correlated, the Drug Rep can choose a gift that only the less shame sensitive type would accept. This is the situation Eq. 2 in figure 1.

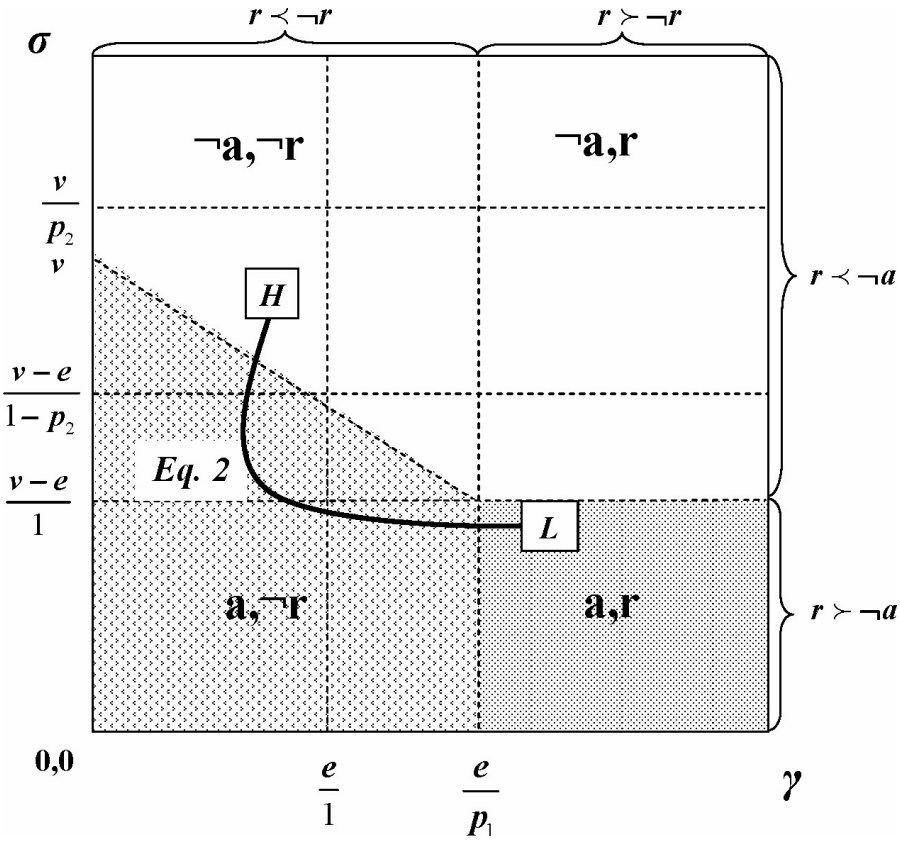


Figure 1: Only L accepts and reciprocates.

However, if guilt and shame are positively correlated, we may have the situation in Eq. $3H$ in figure 2.

3.3.4 Screening With Shame Spillovers

In Eq. $3H$, the highly shame averse Doctor H, who has high shame and guilt sensitivity, is accepting and reciprocating, while L, who has lower shame and guilt sensitivity, is accepting but not reciprocating. In Eq. 4, the same H has not accepted, while L has accepted and reciprocated. Eq. $3H$ has the L type of Doctor in region $\neg r$ and H in region r. Eq. 4 has this same L in region r and H in region $\neg a$. The bribing Drug Rep l, by separating with an insinuation, increases guilt causing the L Doctor with guilt range $e \leq \gamma_L \leq \frac{e}{p_1}$ and shame range $0 \leq \sigma_L \leq v - e$ (figure 2) to accept and reciprocate.

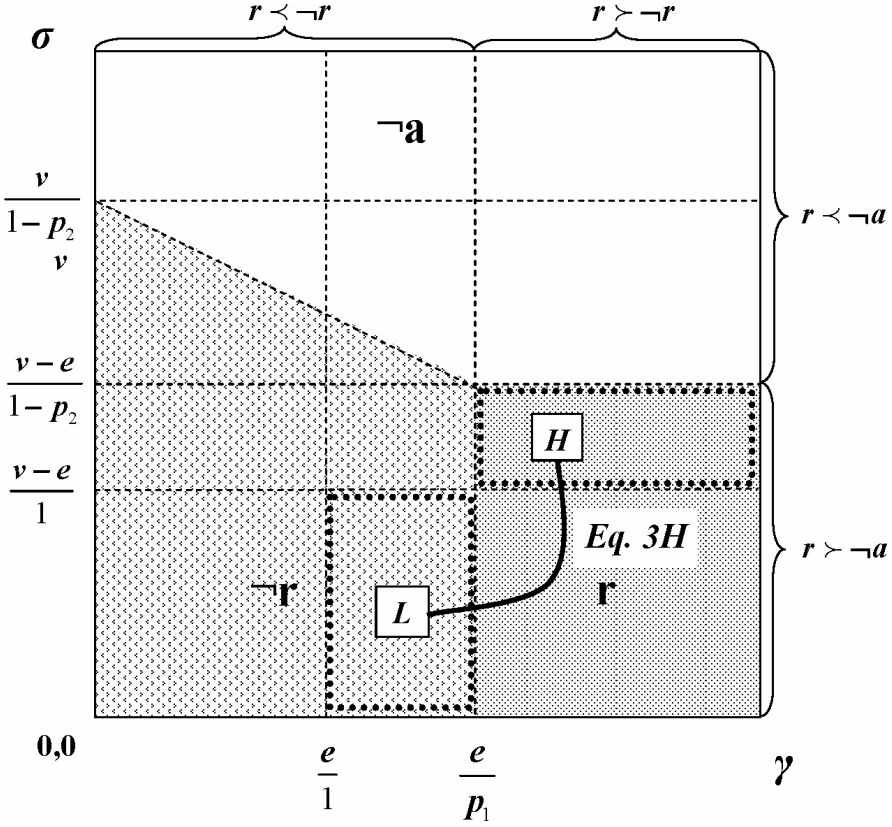


Figure 2: Both accept. Only H reciprocates.

When they do so, they exert a negative externality for their paired type in the guilt range $\frac{e}{p_1} \leq \gamma_H$ and shame range $1 - e \leq \sigma_H \leq \frac{v-e}{1-p_2}$ that causes H to not accept (figure 3). The solid arrow in figure 3 indicates the *necessary* marginal increase in the r region which occurs when insinuation separates: $\mu_1(g_1) = p_1 \rightarrow \mu_1(g_2) = 1$. The dotted arrows indicate the *possible* changes in the boundaries after an insinuation, driven by changes in the value of $\bar{\rho} = p_2 \rightarrow \bar{\rho} = 1$.

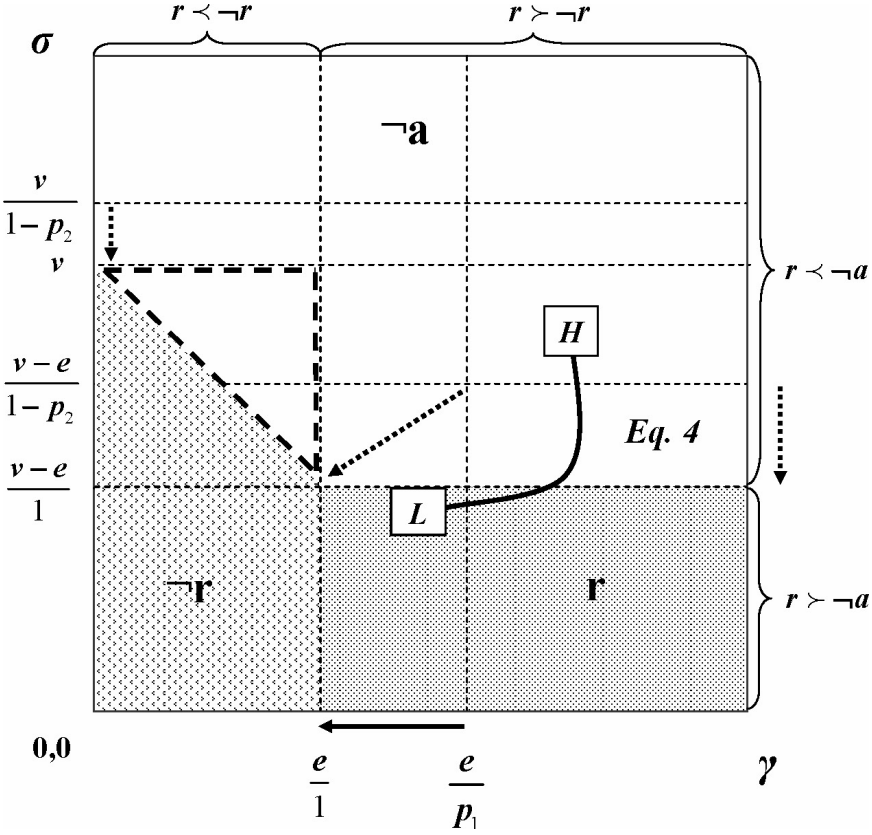


Figure 3: Insinuation. Only L reciprocates.

Eq. $3H$ was maintained by the Drug Rep's belief that, should there be an insinuation, the Doctor will infer he is facing the h Drug Rep and hence accept and not reciprocate. Proposition 7 establishes that if the L type is great enough of the proportion of the Doctor population, the non-insinuation equilibria Eq. $3H$ will fail the Intuitive Criterion. Upon observing insinuation, Doctors can infer that they are facing the l Drug Rep, since insinuate is dominated for h. When L is a greater proportion of Doctors, the L Doctor's best response of reciprocate would be sufficient to make the l Drug Rep deviate to reciprocate. The prediction for this set of parameters would then be, the Drug Rep will insinuate. She will lose the prescriptions of the highly shame averse type but gain the prescriptions of the not highly shame averse type. This is what the Drug Rep in the Yale incident could have been trying to achieve with her insinuation.

When there is negative correlation between guilt and shame, as in Eq. $3L$, insinuation can cause the non-reciprocating type H to not accept, as in Eq. $5L$ of figure 4. When there is positive correlation, as in Eq. $3H$, insinuation can cause the non-reciprocating type to reciprocate, as in Eq. 6 of figure 4.

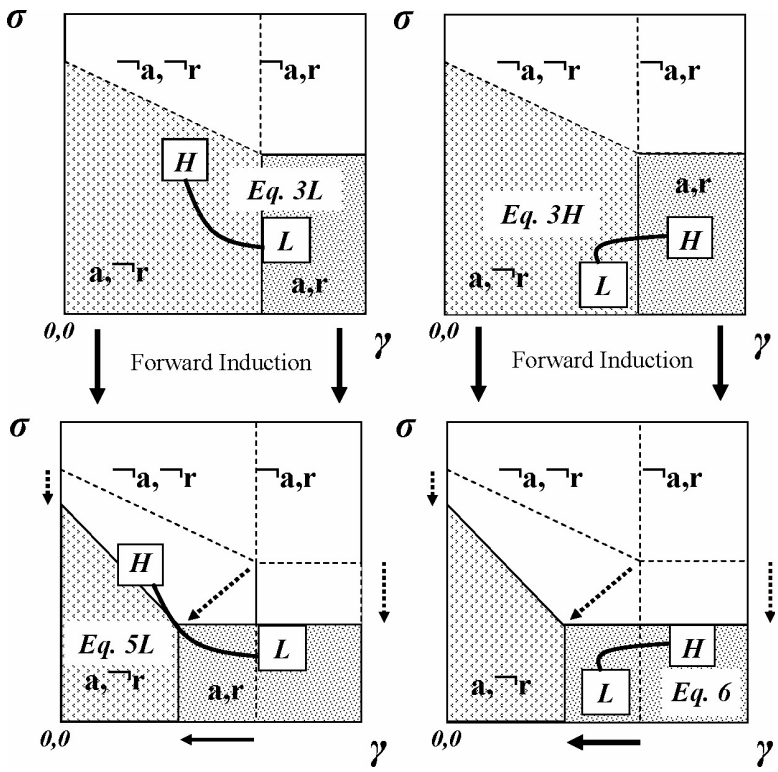


Figure 4: Free-rider rejects (left) or reciprocates (right).

4 Discussion

4.1 Policy Implications

4.1.1 Bans

At first, it may seem surprising that only a handful of medical schools out of thousands use the most obvious solution: ban drug rep to doctor gift giving[18]. However, the rational for the reluctance to ban can be seen in my model by. We can convert the drug firm's revenues from bribing:

$$R\left(p_2\left(\mathbf{r}_L\right)+\left(1-p_2\right)\left(\mathbf{r}_H\right)\right)>0$$

into a social utility constraint that must also be met for the gift giving to be permitted by some social planner,

$$u-S\left(p_2\left(\mathbf{r}_L\right)+\left(1-p_2\right)\left(\mathbf{r}_H\right)\right)\geq 0$$

[18]Harris, Gardiner, "Group Urges Ban on Medical Giveaways." New York Times, April 28, 2008, describes a recent effort to increase bans in medical schools.

in which u is the social utility achieved by permitting gifts and S is the sensitivity to distorted prescribing. Suppose that the regulator bans. Given a ban, doctors could infer that the regulator believed that the rate of reciprocation *would have* made the ban worthwhile:

$$u - S\bar{\rho} < 0$$

where

$$\bar{\rho}(I) = \rho_L(I) \cdot \mu_2 + \rho_H(I) \cdot (1 - \mu_2) \tag{30}$$

In other words, the regulator must have believed that the aggregate rate of reciprocation would have been too high, if it had not banned. But, unlike Eq. 2 where shame could be avoided by rejecting, when the regulator bans, all doctors suffer shame through the implied $\bar{\rho}$; all doctors would have suffered from the belief that they would have reciprocated enough to warrant a ban. A persistent and unavoidable insult[19] to the integrity of their profession might deter entry of qualified people into a specific hospital, or in the health care industry in general [20].

4.1.2 Gift Registries

Gift registries, which record all gifts over a certain amount (e.g., $50), have been legislated in a number of states[21] [Ross et. al., 2007]. If preferences over beliefs are monotonic on the number of people who have them, then gift registries amount to increasing σ, the sensitivity to shame. Increasing σ amounts to decreasing v via a gift ceiling.

4.1.3 Educational Interventions

An initial study demonstrated that education as to the 'true' motives of firms and the social costs of accepting gifts can indeed cut acceptance [Randall et. al., 2005]. If an educational interventions did this by increasing σ for all guilt sensitivity types, it would have the same effect as a ceiling on gift value. If on the other hand an educational intervention increased doctors' belief of facing the bribing Drug Rep, that would have the same effect as the Drug Rep always insinuating and hence, increasing $\mu_1(g_1) = p_1$ to $\mu_1(g_2) = 1$, with the difference

[19] $\sigma\bar{\rho}$ can also include the effects of pecuniary punishments for acceptance contingent upon beliefs about subsequent intended actions, if $\hat{\rho} = \bar{\rho} + fines$ or if fines are a function of $\bar{\rho}$, $\hat{\sigma} = (\sigma + fines)$. Both $\hat{\sigma} > \sigma$ and $\frac{v-e}{\bar{\rho}} > \frac{v-e}{\hat{\rho}}$ implies that the acceptance regions in all figures would shrink, reducing the effectiveness of gifts.

[20] Nearly 60 percent of doctors had considered getting out of medicine because of low morale (Williams, Alex, "The Falling-Down Professions," New York Times, January 6, 2008).

[21] Medina, Jennifer, "Drug Lobbying Kills Gift Disclosure Bill," New York Times, June 29, 2006.

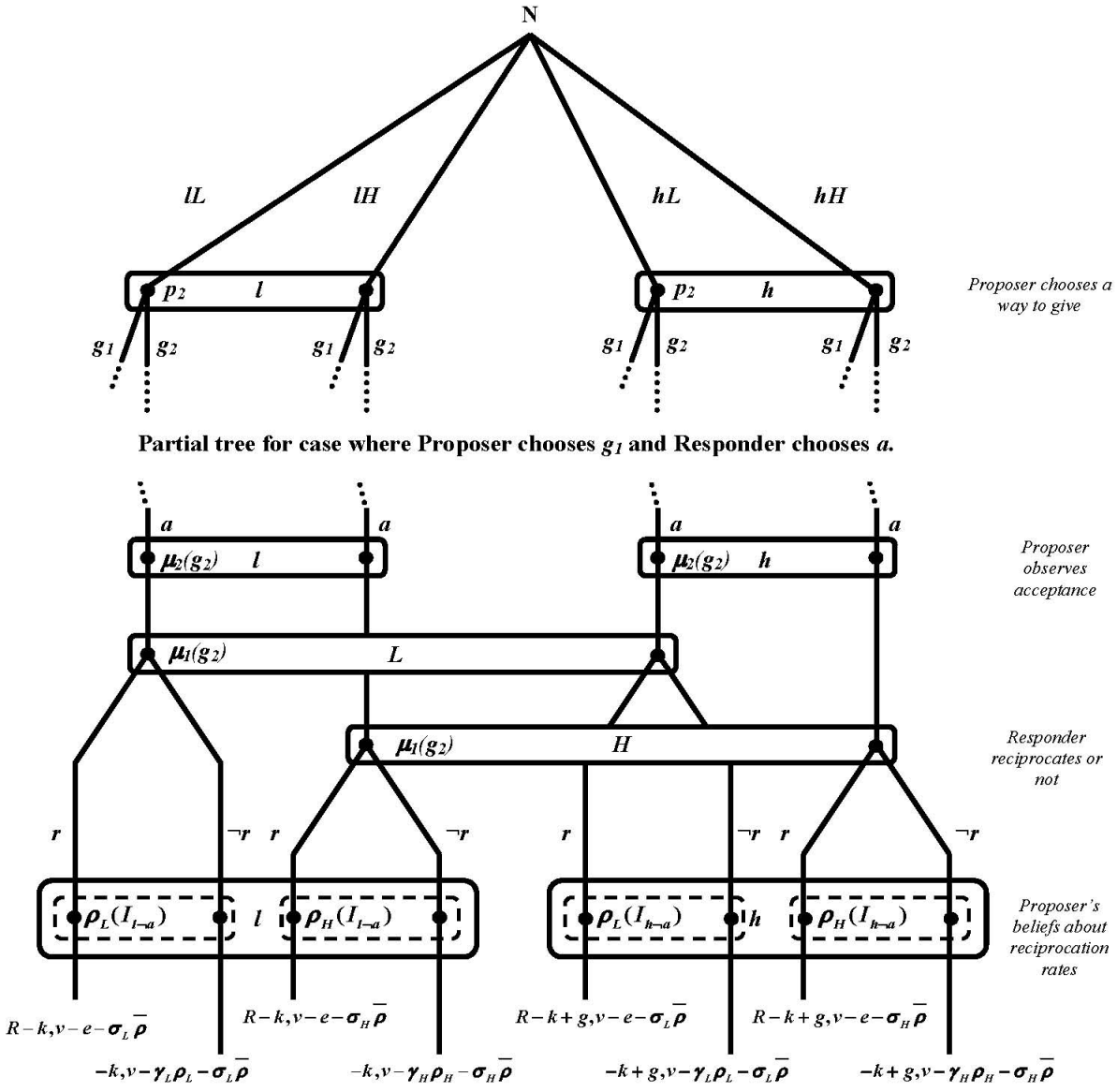
that it could save the firm representative from having to reveal her motive, and risking the imposition of restricted access to doctors. As shown in Proposition 10 and 11, that could result in *more* influenced prescriptions by making it more profitable. Counterintutively, regulators could try to decrease the prior belief on the l type of Drug Rep $\mu_1 = p_1 \to 0$, e.g., by promoting the idea that all firms are actually non-bribing. If that worked, guilt in non-reciprocation would go down, which would eventually result in less giving with a bribing intention.

Veiled offers suggest that the firm believes that ambiguity is essential for a profit maximizing trade-off between acceptance and reciprocation. If so, policy makers may be able to disrupt the illicit exchange by disambiguating the beliefs of receivers. If Doctors uniformly believed that nothing was expected of their type, i.e., $\rho_{\theta_2} \to 0, \forall \theta_2 \in \{H, L\}$, then the region for acceptance will expand as it's upper bound $\frac{v-e}{\bar{\rho}} \to \infty$, at the same time that the region for not reciprocating r, whose lower bound is defined by $\frac{e}{\mu_1 \rho_{\theta_2}} \to \infty$. Contrariwise, should the situation be described by Eq. $\bar{3}H$, in which $\bar{\rho} = 1 - p_2$ and both types of doctors accept, but only $\neg H$ type reciprocates, it could be best for policy makers to try to convince everyone that all types of doctors are in fact reciprocating so as to increase $\bar{\rho} \to 1$ to prompt rejection from a majority of doctors.

5 Conclusion

Doctors are experts. Expertise opens the client to expert relationship to exploitation by third parties. The client cannot tell if the expert is acting in their best interest for the same reason that the client needs the expert's help. Hence, clients need to trust the experts they go to. Hence also, experts must be averse to the appearance of betraying their client's trust and therefore, anything approaching explicit contracting to betray that trust. Gifts are a way for third parties to camouflage such contracting. However, third parties face an incentive problem similar to that which they may try to exploit; Expertise also makes the experts actions unobservable to the third party. Contracts on those actions are therefore unenforceable – by the usual means. Third parties need to trust their experts even to betray the trust of others.

6 Appendix A



7 Appendix B: Background on Pharmaceutical Industry Gift Giving

Medical professionals, health policy makers, and the general public have become increasingly concerned about the effects of pharmaceutical company gifts to doctors in the face of costs that have risen disproportionately to measures of efficacy. These gifts range from free drug

samples to items unrelated to the products manufactured by the company, such as expensive dinners, exotic vacation packages only tangentially related to short conferences or even large payments for very undemanding "consulting work". Gifts constitute a significant part of the $19 billion[Brennan et. al., 2006][22] spent on marketing to 650,000 prescribing US doctors – including the salaries of 85,000 pharmaceutical firm representatives who visit an average of 10 doctors per day. At the same time, patient spending on prescription medications has more than doubled between 1995-2001 from $64 billion to $154.5 billion in 2001, with an estimated one-quarter of this increase resulting from a shift among medical professionals to the prescribing of more expensive drugs [Dana and Loewenstein, 2003]. This figure is on its way to double again and totaled $252 billion in 2006 [Herper and Kang, 2006].

Increased costs could be due to better medicine. In 2000, the average price of these "new" drugs was nearly twice the average price of existing drugs prescribed for the same symptoms. But, according to [Dana and Loewenstein, 2003], the US Food and Drug Administration judged 76% of all approved new drugs between 1989 to 2000 to be only moderately more efficacious than existing treatments, many being a modification of an older product with the same ingredients. Not surprisingly, pharmaceutical firms are among the most profitable[23] [Fortune 500, 2001-2005]. PhRMA, the drug industry trade group, claims that this extraordinary profitability is due to extraordinary risks taken, as indicated by their posted R&D expenditures. Drug firms have been highly secretive about the specifics of their R&D spending data. One study argued that marketing dwarfs R&D spending by three fold [Public Citizen, 2001].

Doctors rarely acknowledge the influence of promotions on their prescribing. A number of studies, however, have established a positive relationship between prescription drug promotion and sales. There is also a consensus in the literature that doctors who report relying more on advertisements prescribe more heavily, more expensively, less generically, less appropriately and often adopt new drugs more quickly, leading to more side effects [Norris et. al., 2005]. The bias in self assessment as to the effects of promotion is illustrated dramatically in one study in which, after returning from all-expenses paid trips to educational symposia in resort locations, doctors reported that their prescribing would not be increased. Their tracked subsequent prescribing, however, attested to a significant increase [Orlowski

[22] Half is spent on free samples, which according to [Adair and Holmgren, 2005] shift doctor prescriptions habit by 10%. Doctors are also less critical of the appropriateness of a drug when giving out free samples [Morgan et. al., 2006]. As pointed out by a psychiatry blogger, firms may be feeding doctors' desire to be heroes in the eyes of their patients with free samples [Carlat, 2007]. Other initial evidence that free samples do have a significant impact on prescribing are in [Chew et. al., 2000].

[23] "From 1995 to 2002, pharmaceutical manufacturers were the nation's most profitable industry. They ranked 3rd in 2003 and 2004, 5th in 2005, and in 2006 they ranked 2nd, with profits (return on revenues) of 19.6% compared to 6.3% for all Fortune 500 firms."[Kaiser Foundation, 2007]

and Wateska, 1992].

What exactly these gifts do is a topic of much debate. Drug firms have been monitoring physician prescribing imperfectly since 1950 through various sampling techniques[Greene, 2007]. Beginning in the 1990s, they were able to purchase physician level data. One major data provider to pharmaceutical firms, IMS Health, collects information on 70% of all prescriptions filled in community pharmacies [Steinbrook, 2006] and had revenues over $2.7 billion in 2007. Since 2005, the AMA has received $44 million/year from licensing physician data (the AMA Masterfile) which contains physician profiles for 900,000 physicians that can be used with pharmacy prescriptions data to construct physician prescribing profiles [Greene, 2007]. However, even as late as 2001, four in 10 physicians did not realize that drug industry representatives had information about their prescribing practices[Kaiser Foundation Survey, 2001].

Drug firms claim that gifts are incidental to their motive to persuade and are used merely to improve doctor attitude towards information presented to them[24]. Doctors themselves admit that gifts increase the likelihood of their attendance at drug firm presentations. In one survey however, 67% of faculty and 77% of residents believed accepting gifts could influence prescribing, especially if gifts greater than $100 were involved [Madhavan et. al., 1997]. In another, 61% of physicians thought that their prescribing would be unaffected by expensive gifts like textbooks, but only 16% thought their colleagues would be similarly unaffected [Steinman et. al., 2001] [25]. (From now on, this will be referred to as the "61/16 survey.") Furthermore, doctors' assessment as to whether they are affected by gifts negatively correlates with the amount and frequency of gifts they accept [Wazana, 2000].

There has been little or no state or federal sanctions of the amount or type of gifts that a doctor can accept. The American Medical Association and PhRMA have both formally *recommended* that doctors not accept gifts outside of textbooks with retail value greater than $100 and no more than *eight* at a time[26]. Most doctors are not aware of even these guidelines and enforcement is unheard of. Perhaps under the pressure of public uproar and the threat of regulation, many pharmaceutical firms adopted a similar code for themselves in 2002, and apparently to some effect. A new code going into effect in January 2009 prohibits distribution of noneducational items to health care professionals including small gifts, such as pens, note pads, mugs, and similar "reminder items" with company or product logos on

[24] A record $875 million fine against one firm for kickbacks and lavish gifts to get doctors to prescribe more of its drugs shows that what drug firms provide is not always just information [Raw, 2002]. Note, that crucially, the advertising and bribing motives for gifts are not mutually exclusive.

[25] The discrepancy between influence on self and influence on most other physicians is corroborated by [Madhavan et. al., 1997].

[26] The AMA has been criticized for conflict of interest for accepting $600,000 from drug firms to formulate and promote this policy.

them, even if they are practice-related[Hosansky (2008)]. However, according to [Steinbrook (2009)], compliance of verification is encouraged, but not required and the many exceptions based upon terms such as "occasional" and "modest" are open to interpretation. Whether these rules will have a real effect is still to be seen.

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