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Do liars believe? Beliefs and other-regarding preferences in sender–receiver games

Roman M. Sheremeta, Timothy W. Shields*

Argyros School of Business and Economics, Chapman University, One University Drive, Orange, CA 92866, USA

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ABSTRACT

We examine subjects' behavior in sender–receiver games where there are gains from trade and alignment of interests in one of the two states. We elicit subjects' beliefs, risk and other-regarding preferences. Our design also allows us to examine the behavior of subjects in both roles, to determine whether the behavior in one role is the best response to the subject's own behavior in the other role. The results of the experiment indicate that, when acting as senders, the majority of subjects adopt deceptive strategies by sending favorable message when the true state of the nature is unfavorable. When acting as receivers, the majority of subjects invest conditional upon receiving a favorable message. The investing behavior of receivers cannot be explained by risk preferences or as a best response to subject's own behavior in the sender's role. However, it can be rationalized by accounting for elicited beliefs and other-regarding preferences. Finally, the honest behavior of some senders can be explained by other-regarding preferences. Thus, we that find liars do believe, and that individuals who care about the payoffs of others tend to be honest.

1. Introduction

> "It is hard to believe that a man is telling the truth when you know that you would lie if you were in his place." (H.L. Mencken)

We depend upon financial analysts to determine when to buy or sell securities, upon attorneys' assessments in deciding to pursue legal action, upon salespeople for product information, and upon doctors to undergo medical procedures. These experts hold private information that is not necessarily contractible or verifiable. Additionally, they have incentives to sway our behavior. Analysts receive commissions from transactions, attorneys from billed hours, salespeople from sales commissions, and doctors bill for procedures performed. While there are numerous examples of deception (Michaely and Womack, 1999; Franco et al., 2007), people have developed behaviors such as honesty and trust to facilitate the aforementioned interactions.

A sender–receiver game (Crawford and Sobel, 1982) is a prototype of an environment that captures many real-life interactions in which an informed agent (sender) has an incentive to misreport information to an uninformed agent (receiver)

* Corresponding author. Tel.: +1 714 289 2092.
E-mail address: shields@chapman.edu (T.W. Shields).

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due to a possible conflict of interests. This type of environment has been well studied in the lab. Blume et al. (1998), Forsythe et al. (1999), Dickhaut et al. (2003) and Cai and Wang (2006), all find that, when there is some misalignment of interests, senders convey more information than theory predicts and receivers rely upon senders' messages more than predicted. Similar behavior is documented in sender–receiver games where there is never alignment of interests. Gneezy (2005), Sanchez-Pages and Vorsatz (2007) and Hurkens and Kartik (2009) argue that the two main reasons why senders convey more information than predicted are that subjects have other-regarding preferences for distributions and/or they are averse to lying.[1] However, without a proper control for beliefs and elicitation of other-regarding preferences it is impossible to distinguish between these alternative explanations.

We examine behavior in the sender–receiver game where there are gains to trade and alignment of subjects' interests in one of the two states. Thus, our game models the setting where there are conflicts of interest, but still some potential for cooperation. In order to tease out the determinants of behavior we measure subjects' beliefs about the behavior of others, risk and other-regarding preferences. By examining subjects' beliefs of others, not only we can identify if senders intend to deceive others with messages sent, but can also identify whether receivers infer information content from senders' messages. Furthermore, our design also allows us to examine the behavior of subjects in both roles to determine whether the behavior in one role is the best response to the subject's own behavior in the other role.

The results of the experiment indicate that, when acting as senders, the majority of subjects (60%) adopt deceptive strategies by sending favorable message when the true state of the nature is unfavorable. When acting as receivers, the majority of subjects (67%) invest conditional upon receiving a favorable message. The investing behavior of receivers cannot be explained by risk preferences or as a best response to the subject's own behavior in the sender's role. However, it can be rationalized by accounting for elicited beliefs about the behavior of others and other-regarding preferences. Despite the appeal of Mencken's quoted prescription, we find that subjects believe that others are telling the truth, although these same subjects tend to lie. Rather than characterizing subjects who deceive yet believe (invest) "as if they believe they are the only once capable of dishonesty" (Forsythe et al., 1999 pp. 509), we find the majority of receivers believe there are enough honest senders to warrant investment. In aggregate the beliefs are not unfounded. Finally, the honest behavior of some senders can be explained by other-regarding preferences, while the other honest senders appear to be averse to lying. Thus, we find that liars do believe, and that individuals who care about the payoffs of others tend to be honest.

2. Game, experimental design and procedures

2.1. Sender–receiver game

The experimental design is based on a sender–receiver game. The game proceeds as follows. In the first stage, the sender receives a private perfect signal $\theta^* \in \{A,B\}$ about the true state of nature. It is public knowledge that the state of the nature is likely to be favorable with probability $p(A)$ and unfavorable with probability $p(B)$. In the second stage, the sender releases a public message $\theta \in \{A,B\}$ regarding the state, after receiving a private signal θ^*. After receiving the message θ, the receiver can invest his cash endowment η, in which case he receives $\pi(\theta^*) \in \{\pi_A,\pi_B\}$. The investment pays $\pi_B < \eta$ when θ^* is B, and $\pi_A > \eta$ when θ^* is A. If the receiver decides not to invest he retains his endowment. The sender earns compensation $\lambda > 0$ if the receiver decides to invest, or else receives nothing. After the receiver makes his decision, the true state of nature θ^* is revealed and both players receive their payoffs based on the state and depending on the investment decision of the receiver.

Since it is always in sender's interest to persuade receiver to invest, sender has an incentive to deceive a trusting receiver by sending message A when the true state of nature is B. Anticipating deception, the receiver ignores the message sent and invests only if $p(A)\pi_A + p(B)\pi_B \geq \eta$. Examining only pure strategies, it is trivial to prove truthful reporting cannot be sustained as an equilibrium. Alternatively, imagine the conditions needed for a mixed reporting strategy: the sender must be indifferent from reporting that the state is A or B. This dictates the receiver must have the same investing strategy for both messages received. Therefore, the equilibrium investment strategy is to always or never invest and the equilibrium reporting strategy is to destroy information content such that the receiver is indifferent between messages received.

2.2. Experimental parameters

In the experiment, we set parameters such that a risk-neutral receiver should not invest. Specifically, we assume that the state of the nature is equally likely to be either favorable or unfavorable, i.e., $p(A) = p(B) = 0.5$. We also set the receiver's endowment $\eta = \$10$, the favorable state-based payoff $\pi_A = \$18$, the unfavorable state-based payoff $\pi_B = 0$, and the sender's compensation $\lambda = \$13$. Given these parameters, the receiver's expected payoff from investment, given that the sender's message contains no information, is \$9 ($0.5 \times \$18 + 0.5 \times \$0$). On the other hand, the receiver's outside payment

[1] Charness and Dufwenberg (2006) cite guilt aversion as explanation why senders (trustees in a trust game) reveal private information, where the trustee first sends a non-binding message, and then takes an action after observing the investment level. In our design, the sender can transmit a message, but only the receiver takes an action.