

Eliciting Guilt Sensitivity to Predict the Real-World Behavior

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Abstract

This study tests guilt aversion by experimentally eliciting guilt sensitivity of villagers in Bangladesh and evaluating its impact on the real-world behavior. In the trust game with a hidden action, the villagers are asked about their reciprocal behavior for seven potential opponents with different levels of trusting belief. The guilt sensitivity is elicited from the threshold belief to switch from selfish to reciprocal behavior. I find robust supporting evidence for guilt aversion but not for pure altruism or trustworthiness; guilt averse villagers can borrow from and repay to community members after a disaster. Individuals also suffer from property crime less in villages with a higher guilt sensitivity neighborhood. However, the guilt sensitivity is uncorrelated with contribution to community events. A potential reason for the insignificant effect is also discussed.

Keywords: Guilt aversion; social preference; experiment

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1. Introduction

Social preference has long been recognized as a vital underpinning of human society since Smith (1759). This argument has been tested in the literature with the recent development of economic experiments; altruism, cooperativeness, and trustworthiness have positive effects on the living standard, labor market outcomes, creditworthiness, and common resource management in the real-world settings (Barr and Serneels 2009; Bouma et al. 2008; Carpenter and Seki 2011; Carter and Castillo 2011; Fehr and Leibbrandt 2011; Karlan 2005; Kosfeld and Rustagi 2015, Sawada et al. 2013). However, it is not well known to what extent guilt aversion explains the real-world behavior.

The goal of this study is to test the validity of guilt aversion in the real world, by developing a unique experimental approach to elicit the guilt sensitivity parameter. I elicit the sensitivity by conducting a trust game with hidden action, which is frequently used in the literature pertaining to guilt aversion (Charness and Dufwenberg, 2006; Vanberg, 2008; Charness and Dufwenberg, 2010; Ellingsen, et al., 2010; Charness and Dufwenberg, 2011; Kawagoe and Narita, 2014). Then I combine the experimental result with the survey data collected from the subject households to examine the association between the sensitivity and the real-world behavior. To the best of my knowledge, this study is the first study to elicit guilt sensitivity and to test guilt aversion in the real-world setting.

2. Experimental Design and Results

2.1. Procedure and Participants

The study site is Satkhira district in southwestern Bangladesh. In this district 288 households from 16 rural villages were randomly sampled. 279 of the 288 sampled households participated in both household survey in December 2010 and economic experiment in August 2011. A total of 36 subjects from two villages were invited per day and were randomly allocated to two experiment rooms, so that each room includes nine subjects from each village.

2.2. Trust Game with Hidden Action

In order to elicit the guilt sensitivity at the individual level, I conduct a trust game with a hidden action. This game is commonly used in the guilt aversion literature (Charness and Dufwenberg, 2006; Vanberg, 2008; Charness and Dufwenberg, 2010; Ellingsen et al., 2010; Charness and Dufwenberg, 2011; Kawagoe and Narita, 2014).

In this game each subject is paired with a randomly chosen anonymous opponent in the other experiment room. They are assigned as Player A and Player B. This game has three stages. In the first stage, Player A chooses *In* or *Out*. If he/she chooses *Out*, the game is over, and both subjects receive BDT 100 each. If *In* is chosen, the game proceeds to the second stage, where Player B either chooses *Roll the die* or *Don't roll*. If Player B does not roll the die, he/she earns BDT 280, while the paired Player A receives BDT 0. If Player B decides to roll the die, it goes to the third stage, where Player B's payoff is BDT 200, regardless of the face of the die. However, Player A's payoff depends on the face of the die. Player A receives nothing if the face shows 1 and BDT 240 otherwise.

This study applies the strategy method; after all the subjects make decisions in the role of Player A, they make decisions as Player B. All the subjects are asked four questions. First, as a Player A, they are asked to choose *In* or *Out*. Second, they are also asked how many out of the 18 subjects in the other room will roll the die if he/she chooses *In*. Recall that the subjects are told that they are paired with one of the 18 subjects. Therefore, this question elicits the first-order belief about Player B's trustworthiness. Third, as a Player B this time, all the subjects decide whether they roll the die or not, conditional on Player A choosing *In*. This question is used to elicit the subjects' trustworthiness. Finally, the experimenters explain that there are seven potential Player As, and they exhibit different levels of belief about *Roll the die*: 0%, 16.7%, 33.3%, 50%, 66.7%, 83.3%, and 100%. The subjects are asked their decision for each potential opponent. For example, the subjects are explained as follows: *Player A expects that 6 of the 18 participants in this room will roll the die. Then, which option will you choose?*

2.3. Elicitation Method

The guilt sensitivity is elicited from the behavioral patterns in the last question in the role of Player B. If Player B does not roll the die even though the paired Player A trusts him/her to do so, it lets Player A down. According to guilt aversion of Charness and Dufwenberg (2006), this causes Player B to feel

disutility of guilt. The level of disutility depends on to what extent Player B believes his/her choice lets Player A down.

To explain this argument more clearly, suppose ρ^A represents Player A's belief about *Roll the die*, conditional on Player A choosing *In*. Since the expected material payoff for Player A is BDT 200 when Player B rolls the die, Player A expects BDT $200\rho^A$ when choosing *In*. However, if Player B chooses *Don't roll*, Player A yields nothing. Thus, if Player B does not roll the die, his/her choice will let Player A down by BDT $200\rho^A$. However, since ρ^A is unobservable for Player B, he/she does not know exactly by how much his/her choice lets Player A down. Hence, he/she makes decisions based on his/her expectation about ρ^A , which is denoted by ρ^B . In other words, ρ^A and ρ^B are the first- and second-order belief about *Roll the die*, respectively. This causes Player B to achieve a utility as much as BDT $280-200\rho^B g$ by choosing not to roll the die, where g represents the guilt sensitivity parameter. If it exceeds the utility obtained from rolling the die (BDT 200), Player B will not roll the die. This implies that Player B rolls the die if and only if $\rho^B g > 0.4$. Therefore, subjects with a certain level of guilt sensitivity should switch their choice from *Don't roll* to *Roll the die* as ρ^B increases. The switching point varies depending on their guilt sensitivity.

Furthermore, this experimental design has a preferable feature. Since ρ^B is endogenous for Player B, it suffers from (false) consensus effects if ρ^B is used to analyze Player B's behavior. However, since this study provides Player B with the information on Player A's first-order belief, this procedure assures that the first and second order beliefs coincide, i.e., $\rho^A = \rho^B = \rho$, reducing the scope for such effects.

By exploiting the experimental design, I compute four indicators of guilt sensitivity. The first is the indicator assuming the linear guilt disutility, where Player B's utility from not rolling the die is characterized by $280-200\rho g$. This utility function is consistent with Charness and Dufwenberg (2006) and other studies, and therefore useful as a benchmark. Yet, the anticipated payoff for Player A when choosing *In* becomes lower than that when choosing *Out*, if $\rho < 0.5$. Such a low belief might not be credible for Player B, causing the elicited guilt sensitivity to be inaccurate. Therefore, I use the questions with $\rho \geq 0.5$ and compute the second sensitivity variable, which takes unity if the subject always rolls the die in this range, and zero otherwise. This is equivalent to the indicator that takes unity if the first indicator is equal to or greater than one. The third indicator assumes the quadratic guilt disutility, i.e., $280-(200\rho)^2 g$, implying that the marginal disutility of guilt increases with the level of letting Player A down. Finally, the last indicator assumes the logarithmic disutility, i.e., $280-\log(200\rho)g$, considering the opposite tendency from the third indicator (decreasing marginal disutility).

Three points should be remarked regarding the experimental result. First, more than 40% of subjects switch their behavior from the self-interested to trustworthy manner at the 50% or 67% of belief. Second, 26.5% of subjects chose *Roll the die* even when Player A's belief is zero. This cannot be explained simply by guilt aversion, because the net gain from choosing *Don't roll* is positive regardless of guilt sensitivity. Rather, this is consistent with pure altruism and trustworthiness, implying that the indicator of guilt sensitivity partially captures them. The econometric analysis in Section 3 addresses this concern by controlling for the indicators of pure altruism and trustworthiness. Third, 11 subjects (3.9%) switched their answers to the opposite or switched multiple times. These observations are not used in the empirical analyses.

3. Guilt Sensitivity to Predict the Real-World Behavior

First, we examine the impact of guilt sensitivity on the credit accessibility and creditworthiness. In developing countries like Bangladesh, access to formal credit and insurance is limited. Therefore, villagers rely on borrowing from informal sources, such as friends and relatives, to smooth consumption. Since such informal lenders do not charge interest rates and the formal scheme to enforce repayment does not exist, the borrower's social preference plays a critical role in whether he/she repays, and therefore whether he/she can borrow. This argument leads to the following testable hypotheses; those with higher guilt sensitivity are (1) more likely to be able to borrow from informal sources, (2) more likely to repay the informal loans, and (3) less likely to bind the credit constraint.

Second, guilt sensitive individuals should be less likely to commit crimes. Yet, in practice, it is difficult to collect data on crimes committed by the survey respondents, as they might not report their true crime experience. Therefore, I examine the determinants of victimization by following

Barslund et al. (2007) and Gaviria and Pagés (2002). Exploiting the fact that 64% of crime incidences in Bangladesh occur between peers in the same community (Faruk and Khatun 2008), I test whether individuals residing in more guilt averse neighborhoods are less likely to be victims of crime. I assume that the criminals reside in the same community as the victim. The validity of this assumption in the study area is discussed by Shoji (2017).

Finally, I examine the role of guilt in the contribution to community events, such as the household's average hours per month to participate in the community work, and household expenditure for ceremonies per month. Guilt averse individuals may contribute more to the community, so that they do not let the other community members down.

The estimation results show that the villagers' guilt sensitivity has significant causal effects on their real-world behavior, whereas pure altruism or trustworthiness does not; guilt averse individuals can borrow from and repay to informal sources, such as neighbors and relatives, after a disaster, and are less likely to bind the credit constraint. This is in line with the finding of Karlan (2005). The risk of crime victimization is also lower in the villages with guilt averse neighbors. In contrast, intriguingly the guilt aversion does not predict the behavioral patterns regarding the contribution to community events.

4. Discussion and Conclusions

Guilt aversion has been tested in many studies, and they showed mixed results. By exploiting a new experimental approach and the data on real-world behavior, this study provides supporting evidence for guilt aversion. It has shown that those with higher guilt sensitivity can borrow from informal sources and repay the informal loans. Individuals also suffer from property crime less in villages with a higher guilt sensitivity neighborhood. In contrast, it appears that the elicited guilt sensitivity does not explain the contribution to community events.

Why does guilt aversion not facilitate contribution to the community events? Although it is difficult to rigorously test it with my data, a likely explanation is that an individual's contribution to community events is beneficial for multiple villagers, while loan repayment and theft are bilateral transactions. Therefore, the attitude to guilt in such a setting may not be well manipulated via a two-payer game. It may rather be suitable to elicit the sensitivity from a public goods game to predict the contribution to community events. In order to draw conclusions regarding this question, further studies examining different outcomes and different elicitation methods are required.

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