A cognitive dissonance interpretation of the context effect in social preference experiments:

Evidence from a laboratory bribery game

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Abstract

This paper proposes and experimentally tests the hypothesis that cognitive dissonance associated with the context plays a key role in determining people's behavior in social preference experiments. We conduct a laboratory bribery game experiment where the cognitive dissonance levels are controlled using different treatments (familiar-context treatment, unfamiliar-context treatment, and context-free treatment). With the aid of an independent attitude survey, we find that (i) in the unfamiliar-context treatment and the context-free treatment people experience the same cognitive dissonance level and we do not observe different behavior in the lab; (ii) in the familiar-context treatment people experience the most intensive cognitive dissonance level among all treatments and subjects are much less likely to behave unethically. Our results unify the mixed findings from past social preference experiments. Conceivably, our approach that identifies the underlying mechanism through which the experimental context matters can be extended to investigate the context effect in general.

Key words: Context effect; Cognitive Dissonance; Experimental Design; Bribery Game

JEL Code: C9; C7; D9

1. Introduction

Over the past three decades, economists have developed tools that allow us to study people's social preference decision-making via lab experiments[1]. Sample studies include public contribution (Andreoni, 1995; Fehr and Gachter, 2000; Fischbacher et al., 2001), altruism (Andreoni and John, 2002; Carpenter et al., 2008; Forsythe et al., 1994), trust (Berg et al., 1995), reciprocity (Berg et al., 1995; Cox, 2004), and ethical decision-making (Jones, 1995; O'Fallon and Butterfield, 2005; Rest, 1986; Trevino, 1986). In most of the social preference experiments, social norms embedded in the experimental context play a crucial role in determining behavior (Bicchieri and Xiao, 2009; Eckel and Grossman, 1996; Loomes, 1999; Xiao and Houser, 2010). To avoid potential data distortion caused by the connotations of a background story, the mainstream practice in the experimental economics community has been to formulate experiment instructions without a specific context. However, this approach has been criticized because it focuses solely on monetary incentives thus ignoring the importance of values and ethics contained in the context (Bardhan, 2006)[2]. In this paper, we focus on the context effect in social preference games, and suggest a possible channel through which context impacts people's decision. In particular, we first look at the context effect in games targeting on ethical-related behavior (through a bribery game), then we extend our discussion to social preference games in general.

In laboratory social preference research, one commonly used technique to study context effect is to put a decision-maker in a position where he or she must decide whether to engage in economically rational but dishonest practices. From existing studies, mixed findings have been reported. On one hand, many studies (Abbink and Hennig-schmidt, 2006; Armantier and Boly, 2014; Barr and Serneels, 2004; Barr and Serra, 2009; Cooper et al., 1999) have shown that the context has little or no effect on people's behavior in ethical decision-making

[1] Social preference is loosely defined as a concern of tradeoff between one's own payoffs and others' well-being. A decision maker may choose actions to improve or reduce the well-beings of others (Harmon-Jones et al., 2009). A decision maker may either scarify her own payoffs to make others being better-off (e.g., pro-social behavior), or gain payoffs by hurting the others (e.g., unethical behavior). Oftentimes these behaviors deviate from the theoretical optimal choices predicted by game theory (Camerer, 2011; Kagel and Roth, 2016). Social science researchers are often curious about the motivation behind these behaviors.

[2] The debate of context effect on conducting experiments has a long history. Vernon Smith (Smith, 1982, 1976, 1972) proposed an induced value theory that suggests that participants' homegrown preference must be "neutralized" and the experimenter should induce new preferences using monetary reward in the lab. The induced value theory implies that to make participants' homegrown preference negligible, we should eliminate any context in experimental design. On the opposite side, some researchers consider the context as one of the essential factors that determines the external validity and reproducibility of experimental studies. Ignoring the impact of experimental contexts may result in misleading conclusions (e.g., Galizzi and Navarro-Martinez, 2018; Van Bavel et al., 2016). In short, little consensus has been reached on the context effect issue.

experiments. More detailed information of these papers is listed in Table 1[3]. On the opposite side, a considerable amount of evidence has shown that even the slightest change in experimental context can dramatically affect people's decisions. Critical information about those studies is listed in Table 2.[4]

All these attempts from both sides contribute to the heated and ongoing methodological debate on the experiment context effect; yet, a comprehensive interpretation of the underlying reasons for the context effect in social preference experiment is still missing. The key goal of our work, hence, is to incorporate insights gleaned from social psychology into behavioral experiments, and look for a fundamental interpretation.

2. Social norm, Self-concept, and Cognitive dissonance in Different Contexts

Like most social scientists, we believe that behavior must be a function of both the person and the environment. As the well-known Lewin's equation[7] stated: behavior is determined by both personal factors and environmental factors. This idea has shaped the direction of social psychological study for almost a whole century. Applying this insight into the experimental study on social preference, we argue that it is essential to explore the link between the experimental context and the participant's pre-game experience. This link might be the key to understanding the underlying mechanism through which the context affects people's decision in social preference experiments.

Bicchieri and Xiao (2009) suggested that in social preference experiments, norm conformity[8] could be a possible explanation for people's prosocial behavior. In particular, they showed that people's normative expectation (i.e., what other people ought to do) often determines decisions. Yet in most laboratory experiments, we don't know what people's normative expectations are. Those expectations root in the participants' pre-game experiences and are often unobservable to the experimenter. Although individuals are quite

[3] In Cooper et al. (1999), the concrete context was framed as interactions between "manager" and "worker"; In Barr et al. (2004), the concrete context was framed as interactions between "health worker" and "community members"; In Abbink et al. (2006), the concrete context was framed as interactions between a "firm" and a "public officer", i.e., to secure permission to run an industrial plant which produces pollution, the firm can bribe the officer to influence the grant decision; In Barr and Serra (2009), the concrete context was framed as interactions between "public servant" and "citizen"; In Armantier and Boly (2014), the concrete context was framed as interactions between firm manager and employee.

[4] Barr and Serra (2009) is cross-listed in both Table 1 and 2 because their conclusions are different for the bribe and briber participants.

[7] In Lewin's equation, B = F (P, E), where *B* denotes observed behavior, *P* denotes personal factors, and *E* denotes environmental factors.

[8] For a detailed review of the social conformity theory, see Cialdini and Trost (1998).

different in backgrounds, there is one thing in common for most of us — we hold a positive view of ourselves (Seligman and Csikszentmihalyi, 2000). In general, people consider themselves to be "moral, honest, and decent" individuals (Aronson, 1999; Mazar et al., 2008). This positive self-concept prevents people from behaving unethically (Manley et al., 2001). Actions that violate moral obligations or certain social standards invoke an aversive state, as the dishonest practice is inconsistent with the positive self-concept. Such an aversive state is known as cognitive dissonance[9] in social psychology (Aronson, 1992). A key element that determines the intensity of the dissonance is personal involvement—the more attention one devotes to the unethical decision, the greater the dissonance experienced (Elliot and Devine, 1994; Festinger and Aronson, 1960). Recent developments in neural science also find solid evidence to support this idea (Durston et al., 2002; Jarcho et al., 2011). According to Elliot Aronson's seminal work:

> "*...cognitive dissonance theory makes its strongest and clearest predictions when the self-concept of the individual is engaged. That is, … dissonance is greatest and clearest when it involves not just any two cognitions but, rather, a cognition about the self and a piece of our behavior that violates that self-concept*".
>
> —Aronson (1999, p.110)

Returning to the study of experimental economics, an artificial context that is closely related to a participant's pre-game experience orients the participant to associate the hypothetical scenario with her self-concept. Participants will be more engaged in the task and devote more attention to their decisions. Further, in psychology, Cialdini et al., 1990 proposed a focus theory of social norm and showed that only "activated" norms impact people's behavior. Here, we argue that having participants complete experimental tasks in a familiar context is a necessary condition for making the normative expectation salient. Accordingly, the cognitive dissonance evoked by dishonest practices (and their consequences) are magnified by the norm in a familiar interactive environment. Behaviorally, participants are less likely to engage in dishonest practices. On the other side, an experimental context that is distant from pre-game experience leads participants to be unattached to the task. The normative expectation in a remote context is also ambiguous to participants. The lack of personal involvement makes it easier to find external justifications for a dishonest practice. To escape from the aversive state and strive for self-consistency,

[9] The cognitive dissonance theory was first proposed by Festinger (Festinger, 1957). It has been one of the most influential theories in the field of social psychology (Aronson, 1999). See (Harmon-Jones et al., 2009; Harmon-Jones and Harmon-Jones, 2007) for a brief review of the history of the theory.

participants would rationalize their decisions. The reasoning can possibly be: "This is just a game; I would not do that in real life" (although the participant had no similar experience in real life), or "I'm curious about what the consequences are for choosing this; let me try it out."

Similar concepts have been mentioned in some past studies. For example, Barr and Serra (2009) (Barr and Serra, 2009) suggested that people's *intrinsic motivation* plays a vital role in decision-making. Posner and Sunstein (2017) (Posner and Sunstein, 2017) proposed that *moral commitment* must be counted into the cost-benefit analysis. Here, we argue that cognitive dissonance could explain both concepts on a more fundamental level — the fundamental need of striving for self-consistency.

Bicchieri and Xiao (2009) demonstrated that understanding social norm is crucial for predicting altruism behavior in dictator games, as conformity theory asserts that people have incentive to not deviate from the norm. In particular, they found that dictators gave more when they expect the social norm is to do so. We think this finding could be seen as evidence support our cognitive dissonance interpretation. In dictator games, when the expected norm is to be altruistic, a generous decision conforms with the social norm, the same decision also reinforces the positive self-concept. Together, an altruistic participant experience minimum cognitive dissonance. In a more general sense, the motivation for keeping the positive self-concept and avoiding potential cognitive dissonance is also the motivation for most prosocial preference, such as altruism, trust, and fairness, etc. However, it could be interesting to look at cases where the social norm and the positive self-concept work in opposite directions. When self-concept conflicts with the normative expectation, it is potentially beneficial to examine which effect dominant decisions.

Our study explores how the experimental context affects people's decisions in laboratory social preference studies. The intensity of cognitive dissonance evoked by engaging in a dishonest practice is manipulated by the experimental instructions. The same experimental task is presented to the student participants, but with three different instructions. Specifically, we use three treatments, one with familiar-context instruction, one with unfamiliar-context instruction, and one with context-free instruction. In the unfamiliar-context treatment and the context-free treatment, we do not find statistically different outcomes. This result is consistent with findings from past studies. In contrast, we find that the student participants in the familiar-context treatment are much less likely to engage in unethical behavior. In addition, students who engage in unethical behavior in the familiar-context treatment require more monetary compensation to justify their decisions.

3. Administration and Experimental Designs

The experiment was conducted at the school of business in Jianghan University (Wuhan, China) in 2015 the fall semester. In total, 340 students, which consisted of freshmen or sophomores, were randomly invited to participate in the experiment. Among the 340 participants, 250 were randomly selected to play a simple bribery game and followed by a short questionnaire asking about their decisions and reasoning in the game. For the rest of the 90 students, we conducted an independent attitude survey to measure participants' attitude toward unethical behavior in each game context. Informed consent was obtained from all participants. It is very important to note that each participant only participated in either the simple bribery game plus the corresponding questionnaire, or the attitude survey.

To run the bribery game, we conducted 13 sessions with either 10 or 20 participants in each. It took approximately 60 minutes (including check-in and payment processing) to run one session. All the sessions were conducted with computer-based materials, which are developed using z-tree (Fischbacher, 2007). During the experiment, all participants earn "points" (the fictitious experimental currency), and at conclusion, participants are paid in cash privately at the rate: 1 RMB (=0.16 US dollar) for every 100 points they earn. The average earnings were 30 RMB (including 5 RMB show-up fee)[10].

The Laboratory Bribery Game

We use a simple laboratory bribery game to simulate an ethical decision-making scenario in which unethical behavior may occur. All the 250 participants that participated in the bribery game were randomized into 25 groups with ten participants in each. Within a group, 5 participants play as potential bribers (player1 below), the other 5 people play as potential bribees (player2 below). The game has two halves, and each half has 15 periods. The first half identity assignment is random, and a participant only knows his/her identity, not the identities of the other 9 players. All the players play different identities in the second half of the game. In each half, a player1 is paired with a player2 randomly.

At the beginning of each period, each player1 receives 200 points as an initial endowment. Player2 has no endowment. Player1 first decides whether to make a private transfer to the player2 in his or her pair. If the decision is to transfer, the participant must specify a whole integer in the range from 1 to 200 points. Following that decision, player2 decides whether

[10] At Jianghan university, 30RMB is approximately the cost of 5 one-person meal in student dining hall.

to accept or reject the bribe. If accepting it, then the amount offered is deducted from player1's account and added to player2's account. If player2 rejects the bribe, then both players' accounts remain unchanged. Last, player2 decides how to allocate 1000 points. If abiding by the game rules, then each player1 earns 200 points. If violating the game rules, then the player1 in the pair earns 1000 points, and the other player1s earn nothing. After all the allocation decisions have been made, player1 seeks feedback on how many points were received from each player2. Thus, player1 can infer whether or not corrupt activities exist in the group. Since corrupt activities often impose non-trivial negative externalities on other society members, it is reasonable to let the participants know what happens around them.

During the iterations, a pair of participants is identified as a "foul" if any briber from player1 is accepted by player2. By the end of all the 30 periods, a lottery is played out to decide whether to punish the participants who violated the game rules. With a probability of 1%, the punishment occurs: both players' earnings are cleared from their accounts. The extremely low probability reflects that most corrupt activities in reality are difficult to discover. As a matter of fact, many corrupt activities are even unobservable, and the severe penalty we impose represents the consequences arising from discovery of corrupt activities.

To facilitate the analysis, we use Figure 1 to depict the extensive form of the game in each period and T denotes the number of points offered by player1. X and Y denote the possible penalty for player1 and player2.

The equilibria of the game are easy to obtain. On an equilibrium path, a player2 is indifferent between "abide by the rules" and "violate the rules," as the determination of foul is based on the decision regarding whether or not to accept the bribe, rather than the decision regarding point allocation. Accordingly, player2 will play the two alternatives with the same probability (50%). Furthermore, player2's expected payoffs for accepting the bribe is T-Y, which is greater than 0. Therefore, player2 will always accept the bribe being offered. Given that, the expected payoffs of a player1 who offers T points to his or her partner is $(1200-2T-2X)/2$, which is lower than the expected payoffs of offering nothing $(1200/2=600)$. That is, not bribing is the dominant strategy for player1. In equilibrium, player1 does not offer a bribe to player2, and player2 violates the allocation rule with a probability of 50%.

Three treatments are conducted with the same bribery game framework as introduced above. The treatments only vary in the experimental instructions. In the first treatment, the

game is presented as a scholarship allocation scenario in a college[11] (familiar context treatment below). In the second treatment, the game is presented as a competitive bidding scenario among firms (unfamiliar-context treatment below). In the third treatment, the game is presented in an abstract form without any specific scenario or role (context-free treatment below). Table 3 summarizes the roles and terminology for the alternatives in each of the treatments. To avoid potential data distortion caused by suggestive wording[12] , all the alternatives were presented with neutral terminologies in all the treatments. All participants are randomly assigned to one of the three treatments. In total, 100 students participated in the familiar-context treatment, 110 students in the context-free treatment, and 40 students in the unfamiliar-context treatment. Following the bribery game experiment, the participants then finish a short open-ended questionnaire. In the questionnaire, the participants report their decisions in the game, and briefly explain their rationale behind their decisions.

The Attitude Survey

To validate the cognitive dissonance interpretation that we proposed in this paper, we conduct a survey with the rest of the 90 students who are asked to indicate their attitudes on a 7-point Likert scale toward corrupt activities in one of the three contexts (with 30 respondents in each context). The 90 students were randomized into the three different contexts. Our design allows us to obtain measures for attitudes that are not influenced by decisions in the laboratory bribery game. To the best of our knowledge, this is the first bribery game experiment that use an independent survey to measure cognitive dissonance level. The survey results can also represent the normative expectations in each context.

4. Results

Attitudes (normative expectations) toward corrupt activities in each of the contexts

Results from the attitude survey is presented in Figure 2, which shows the distribution of people's attitudes toward unethical behavior in each of the three contexts. Keep in mind that because the respondents of the attitude survey did not participate in the laboratory bribery game, their responses are not influenced by the game. Mean scores toward corrupt activities are 2.793 and 2.414 for player1 and player2. That is, most of the students hold negative views on corrupt activities. These negative attitudes are amplified by the familiar (college)

[11] At the Jianghan University (and perhaps many other colleges in China), the academic advisor is in charge of scholarship allocation.

[12] In the Chinese language and culture, the word "bribery" is often used in an extremely derogatory sense.

context among the student respondents. In terms of attitudes toward player1's bribery, the mean score is 1.57 (Std.dev.=1.30) in the familiar-context survey, 3.85 (Std.dev.=2.05) in the unfamiliar-context survey, and 3.07 (Std.dev.=1.78) in the context-free survey. The t-test result suggests that the mean score in the familiar-context survey is substantially lower than that in the other two surveys ($p<0.001$ for both). The mean attitude score toward player2's corrupt activities is 1.43 (Std.dev.=1.01) in the familiar-context survey, 3.30 (Std.dev=1.98) in the unfamiliar-context survey, and 2.60 (Std.dev.=1.67) in the context-free survey. This result indicates that the students hold the strongest negative attitudes toward player2's corrupt activity in the real-life-context survey (mean comparison tests: $p<0.001$).

Given that survey respondents and laboratory game participants are randomly chosen from the same population, we assume that they also share similar opinions toward corrupt activities. Thus, a student participant in the laboratory game would experience the strongest cognitive dissonance if he or she engages in corrupt activities in a hypothetical scholarship allocation scenario.

Additionally, no evidence suggests that the respondents' attitudes in the unfamiliar-context survey are significantly different than in the context-free survey (mean comparison result: $p=0.1299$ to player1s' corrupt activities, and $p = 0.1535$ to player2s' corrupt activities). We then expect that the students in the bribery game experiment would behave similarly in the unfamiliar-context treatment and the context-free treatment.

Corrupt activities in the laboratory bribery game

In general, the frequency of a player1's bribery attempt is 31.13% in the familiar-context treatment, 39.81% in the unfamiliar-context treatment, and 41.83% in the context-free treatment. Fisher exact test results indicate that the familiar-context treatment has the lowest bribery rate (Fisher exact test $p <0.0001$ in comparison to the unfamiliar-context and $p <0.0001$ in comparison to the context-free treatment). No evidence suggests that the player1's bribery rate in the unfamiliar treatment is significantly different than in the context-free treatment (Fisher exact test $p = 0.4089$). Table 4 summarizes the player1 behavior. In the familiar-context treatment, 36% of individual player1s never tried to bribe their partners; this proportion is 20% in the unfamiliar-context treatment (significantly lower than in the familiar-context treatment; Fisher exact test $p=0.0480$), and 17.27% in the context-free treatment (significantly lower than in the familiar-context treatment; Fisher exact test $p=0.0017$). In the experiment, some of the player1s may have selected the bribery option by mistake (or perhaps to become familiar with the game). Among all player1s in the familiar-context treatment, 43% made bribery attempts no more than 1 time (out of 15

periods); this number is 20% in the unfamiliar-context treatment (significantly lower than in the familiar-context treatment; Fisher exact test p=0.0079), and 25.45% in the context-free treatment (significantly lower than in the familiar-context treatment; Fisher exact test p=0.0055). These observations indicate that the player1s in the familiar-context treatment are much less likely to bribe their partners.

We then compare the outcomes in the unfamiliar-context treatment and the context-free treatment. We do not find any significant differences (proportion of participants who never offer bribe: p=0.8922; proportion of participants who offer a bribe no more than 1 time: p=0.478; proportion of participants who constantly offer a bribe: p =1.0). This result is consistent with past study(Abbink and Hennig-schmidt, 2006).

Table 5 summarizes the frequencies of the player2s' corrupt activities (i.e., violate the rule when allocating resources). The proportion of participants who never violate the rule is 64% in the familiar-context treatment and 17.50% in the unfamiliar-context treatment. These two proportions are significantly different (Fisher exact test p<0.0001). The player2s in the familiar-context treatment are also much more likely to abide by the rules than those in the context-free treatment (Fisher exact test p<0.0001). The proportion of participants who never violate the rule is 17.50% in the unfamiliar-context treatment and 30% in the context-free treatment. Again, the difference is not statistically significant (Fisher exact test p=0.147).

In short, the possibility of engaging in unethical behavior is obviously, in a statistical sense, lowest in the familiar-context treatment, for both the player1s and the player2s. Observations from the bribery game, together with evidence from the attitude survey, suggest that the artificial familiar context amplifies the cognitive dissonance of engaging in dishonest practices, thus preventing the student participants from performing unethical behavior. In addition, in line with past studies, we do not find essential differences in the unfamiliar-context treatment and the context-free treatment.

Upon completion of the bribery game, all the participants are asked to complete an open-ended survey about their decisions and reasoning in the bribery game. According to the survey, 54% of the participants in the familiar-context treatment mentioned the college background. Among them, only 6% engaged in corruption in the experiment.

We also find that the frequency of offering a bribe while playing the briber and the frequency of violating the rules while playing the bribee are positively correlated (correlation = 0.4208, t=6.6839, p<0.0001). This finding indicates that corrupt behavior is likely to be related to certain aspects of individual characteristics (such as personality traits).

Next, we examine the interactions between player1 and player2 in a pair. We find that a reciprocal relationship between the two players is less likely to be established in the familiar-context treatment (Table 6). Specifically, 66% of the time corrupt activity never occurs (i.e., player1 never offers his or her partner a bribe, and player 2 never violates the rules) in the familiar-context treatment. This percentage is 50.83% in the unfamiliar-context treatment (significantly lower than in the familiar-context treatment, Fisher exact test $p < 0.0001$) and 53.20% in the context-free treatment (significantly lower than in the familiar-context treatment, Fisher exact test $p < 0.0001$). Moreover, the player2s in the familiar-context treatment are more likely to reject the bribery from the other person (Table 7). In aggregate, 81.58% of the bribes from the player1 were rejected in the familiar-context treatment. This percentage is 63.35% in the unfamiliar-context treatment (significantly lower than in the familiar-context treatment, Fisher exact test $p<0.0001$) and 77.12% in the context-free treatment (significantly lower than in the familiar-context treatment, Fisher exact test $p=0.075$). In addition, from Table 8, we can see that only 4.16% of the interactions are initiated by player2 in the familiar-context treatment (i.e., player2 violates the game rules without an offer from player1). This proportion is also the lowest among the three treatments. Again, we do not see different results in the unfamiliar-context treatment and the context-free treatment.

To further examine whether the familiar-context is inversely related to the probability of engaging in corruption, we perform several regression analyses. We first use the least squares models to predict player 1's bribery decisions (individual bribery rate) as a function of the context dummies and other controls (regression1 to regression3 in Table 9). Following that, we provide regressions in which player2's violation decisions (individual violation rate) are predicted as a function of the context dummies and the amount of money being offered by player1 with the controls (regressions 4-6 in Table 9). In the data, we observe many participants who never engage in any corrupt activities throughout the whole experiment. Thus, we take player1's bribery decision as a binary variable. That is, if a player1 never bribes his or her partner, it takes the value of 0; otherwise, it takes the value of 1. We then predict this binarized bribery decision as a function of the context dummies and other controls (regressions 1–3 in Table 10). Similarly, we predict the binarized rule violation decision of player2 as a function of the context dummies and other controls (regressions 4-6 in Table 10). As the results suggest, the familiar-context dummy is negatively related to the probability of engaging in corrupt activities. This effect is highly robust to changes in specification. The magnitude of the parameters is much larger in the probit regressions than in the least squares regressions. In addition, we also find that male participants are more likely to engage in corrupt behavior than female participants.

Last, we look at the bargaining between the two players in the repeated game. During the iteration, if a player1's bribery is rejected by a player2, then player1 can try to increase the offer to "buy" the partner. We use the difference between the average offered bribe and the average accepted bribe to capture the difficulty of establishing a reciprocal (yet corrupt) relationship between the two players. According to Table 11, the player1s in the familiar-context treatment have to pay the most money to persuade the player2s to become involved in a dishonest practice. This finding is consistent with the prediction of cognitive dissonance theory in that the student participants in the familiar-context treatment require more monetary compensation (as external justification) to reduce their extremely intense cognitive dissonance. Figure 3 and Figure 4 illustrate the evolution of the player1's bribery decisions (as a binary choice) and the evolution of the player2's rules-violation decisions (as a binary choice). In most of the 30 periods, corrupt activities are less likely to be observed in the familiar-context treatment. Note that the participants change their roles and re-pair with new partners after period 15. Figure 3 and Figure 4 depict the aggregate pattern of the participants' choices.

5. Application of our results

Results from our paper suggest that in social preference experiments, cognitive dissonance associated with the context can be used to explain participant behavior. Based on our results, the experimenters expect to observe behavior change in participants only when the cognitive dissonance levels evoked by dishonest practices are different across treatments. With this insight, let us reconcile the findings from past laboratory social preference research.

Cooper et al. (1999) (Cooper et al., 1999) conducted a ratchet effect experiment in which the authors compared people's decisions in an abstract context and a concrete context. Half of the experimental sessions were conducted with student participants, while the other half were conducted with real-life managers. They reported that among the manager participants, concrete context leads to more strategic interactions and less corrupt decisions. Yet context had no effect on the student participant's decisions. Using the cognitive dissonance theory to interpret the observed result, we argue that since the student participants were neither familiar with the context of the ethical background nor had they any real-life manager experience, the concrete context would not trigger stronger cognitive dissonance of the student participants. Accordingly, the student participants behaved in the same way in both contexts. In contrast, since the manager participants were familiar with the concrete context, they would feel more obligated to follow certain moral rules. Consequently, the manager

participants in the concrete context were more engaged in their decisions, and less likely to behave unethically.

Barr et al. (2004) (Barr and Serneels, 2004) undertook an embezzlement experiment with both abstract and concrete contexts. Their participants were Ethiopian students who had no previous experience in public service (the experimental role). As our cognitive dissonance theory predicts, the abstract context and the concrete context delivered essentially the same result.

Abbink et al. (2006) (Abbink and Hennig-schmidt, 2006) did a bribery game experiment structured as interactions between "firms" and "public officers". Two different instructions were used, one with neutral descriptions and words and the other with suggestive words. The participants were all college students. Again, since the students had no previous experience as public officers, both the concrete context and the abstract context were quite removed from their life experiences. The main finding from this study was that contexts did not change student participants' behavior, and they attribute this finding to the participants' lack of "expertise". A similar bribery game by Barr and Serra (2009) (Barr and Serra, 2009) with University of Oxford student as participants found that when the participant plays as bribee, context has no effect on bribe acceptance; meanwhile, when the participant plays as briber, the context alters the behaviors. The authors attribute these results to "intrinsic motivation". Though the aforementioned "expertise" or "intrinsic motivation" can be a good explanation in their individual cases, our cognitive dissonance theory provides a generic reason for all experiments of this type.

Moreover, Barr and Serra (2009) found that higher negative externalities were associated with less dishonest practices. This finding can be seen as indirect evidence in support of our cognitive dissonance interpretation, given that higher negative externalities may evoke more intense dissonance for the person who behaves unethically.

Alatas et al. (2009) (Alatas et al., 2009) invited real public officers in Indonesian to participate in a bribery game experiment. They found that when the public officer participants played as the bribees, they were less likely to engage in unethical behavior. One interpretation is that when participants play a role that is the same as their real-life identity, they know better the consequences of their decisions. Therefore, familiarity with the experimental role would help prevent unethical behavior from happening. Here, we argue that familiarity with the identity is a special case of familiarity with the context. As discussed earlier, the pre-game experience here is not just limited to participants' real-life identity. Rather, it is an integration of one's real-life role, expertise, knowledge, worldview, and all

factors that contribute to the individual's self-concept. As long as a participant is familiar with the context, she will link the experimental task to her pre-game experiences. Subsequently, the participant will be more sensitive to behavior that violates her self-concept (a positive self-concept for most people).

6. Conclusion and future direction

Social scientists from different fields (economics, psychology, sociology, political science, etc.) apply various approaches to investigate the motivation of dishonest behavior in social preference games, yet interdisciplinary cooperation in this area is surprisingly rare. This lack of communication may result from disagreement on some issues concerning fundamental research methodology.

In economics, it has become standard to present experimental tasks using context-free instructions, even in social preference experiments that emphasize values and ethics embedded in the context. Many past studies have looked at whether variations in the experimental contexts influence people's decisions, with mixed evidence being reported and little insight being provided to explain the underlying mechanism.

In the current study, we propose that in social preference experiments, context affects the participant's behavior through the channel of cognitive dissonance, defined as the aversive state when people engage in a dishonest practice that is inconsistent with their positive self-concept. We show that the experimental context and participants' pre-game experience jointly influence decision making in a systematic and predictable way. Our findings, along with direct evidence from past studies, indicate that a familiar decision-making context leads participants to link the experimental task with their self-concept. Consequently, the familiar context amplifies participants' emotional stress of engaging in dishonest behavior and makes them less likely to behave unethically.

We conduct a simple laboratory bribery game in which the intensities of cognitive dissonance are controlled. Specifically, we carry out three different treatments: a familiar-context treatment (associates with the most intense cognitive dissonance), an unfamiliar-context treatment, and a context-free treatment. We find that corrupt activities are substantially fewer in the familiar-context treatment than in the other two treatments. In addition, we find that the student participants in the familiar-context treatment require more external justification (monetary compensation) to reduce the dissonance evoked by their corrupt activities. Moreover, we replicate the results from past studies: In the

unfamiliar-context treatment and the context-free treatment, we do not find essential differences in the participants' behavior.

We do not think our results should be seen as a whole rejection of the context-free design approach. Instead, the point we are trying to make is that we should always keep our experimental design as simple as possible, but not simpler. In reality, moral obligation and the positive self-concept play a vital role in social preference decision-making; therefore, it is important to simulate these non-monetary payoffs while conducting laboratory experiments. In social preference experiments, we think it is inappropriate to assume that experimental manipulation can be studied apart from the cultural and social contexts that define its meaning. When the social norms associate with the contexts are unclear to participants, we put the controllability and reproducibility of the experiment at risk.

Our research contributes to one of the persistent, but still far from settled questions on experimental methodology: what is the role of experimental context in laboratory studies? Since 1930s, the famous Lewin's equation has captured the insight that behavior is determined by both individual characteristics and environmental factors. However, we still know very little about how these two factors interact with each other and jointly determine behavior outcome. The experiments considered here are intended to be a step in the direction of testing the role of context in social preference experiments. Despite most experimental studies being conducted using context-free instructions, many researchers have argued that such practice impairs the external validity of results generated from laboratory experiments (Loewenstein, 1999; Loomes, 1999), especially when researchers simulate situations that are relevant to real-life problems. To the best of our knowledge, few attempts have been made to verify the above concern. To extend this research, we plan to track each participant in our experiment through his or her entire college career. In addition, we will try to take the participants' personality traits into consideration. Hopefully, we will be able to provide more solid evidence of the impact of context by looking at how people's decisions in the laboratory experiment relate to their everyday decisions.

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Appendix A: Tables

Table1. Evidence that support the opinion that context DOES NOT affect behavior

Study	Basic Setup	Finding	Conclusion
Cooper et al. (1999)	Ratchet effect experiment	Experimental context only has minimal impact on student subjects' behavior	Student subjects do not have "expertise" for the task.
Barr et al. (2003)	Embezzlement experiment	Abstract context and concreate context deliver the same result	The subjects in different treatments have very similar backgrounds.
Abbink et al. (2006)	Bribery game experiment	Even heavy loaded experimental context does not change people's behavior	The subjects will only understand the experimental task by its essential feature.
Barr and Serra (2009)	Bribery game	Varied contexts had no impact on the bribees' behavior	The subjects who played as the "bribree" do not have similar prior experience.
Armantier and Boly (2014)	Bribery game	Framing the bribe as either "bonus" or "penalty" does not change behavior	The "intrinsic motivations" in different treatments are identical.

Table2. Evidence that support the opinion that context DOES affect behavior

Study	Basic Setup	Finding	Conclusion
Eckel and Grossman (1996).	Dictator game	People tend to increase donation when the context infers that a donation goes to a "deserving" recipient.	Context affects how people perceive "fairness".
Cooper et al.(1999).	Ratchet effect experiment	Context affect the manager-subjects' behavior.	Managers have "expertise" for the game. The expertise changes their perceptions of the game.
Laury and Taylor (2008).	Public good game	Laboratory behavior cannot predict subjects' behavior in similar social preference tasks with essential an feature.	People's behavior in the lab may not necessarily reflect their preference.
Capterner et al. (2008).	Dictator game with different subjects	Systematic differences between the choices of students and community members.	Student behavior is not very representative.
Alatas et al. (2009).	Bribery game	public servants are much less likely to involve in dishonest practice.	Public servant subjects have similar real-life experience.
Barr and Serra (2009).	Bribery game	Context affect the briber's behavior.	Their behaviors are driven by "intrinsic motivation".

Table3. The contexts and vocabulary used in the three treatments.

Treatments		**familiar context**	**unfamiliar context**	**context-free**
Earnings		Scholarship	Profits	Points
Player1's role		Student	Tender	Applicant
Player1's alternatives	*alternative1*	make a transfer	make a Transfer	make a Transfer
	alternative2	no contact	no contact	no contact
Player2's role		Advisor	Tenderee	Granter
Playr2's alternative	*alternative1*	abide by the rule	abide by the rule	abide by the rule
	alternative2	violate the rule	violate the rule	violate the rule

Table4. Player1s (potential bribers) in the familiar context treatment have less bribing attempts

Never offer a bribery (attempt=0/15)			No more than one time (attempts <=1/15)			Constantly offer bribery (attempts >= 8/15)		
Familiar context	Unfamiliar context	Context free	Familiar context	Unfamiliar context	Context free	Familiar context	Unfamiliar context	Context free
36/100	8/40	19/110	43/100	8/40	28/110	29/100	15/40	41/110
36.00%	20.00%	17.27%	43.00%	20.00%	25.45%	29.00%	37.50%	37.27%

Table5. Player2s (potential bribees) in the familiar context treatment are less likely to violate the rule

Never violate the rule (attempt=0/15)			No more than one time (attempts <=1/15)			Constantly violate the rule (attempts >= 8/15)		
Familiar context	Unfamiliar context	Context free	Familiar context	Unfamiliar context	Context free	Familiar context	Unfamiliar context	Context free
64/100	7/40	33/110	74/100	9/40	56/110	5/100	4/40	12/110
64.00%	17.50%	30.00%	74.00%	22.50%	50.91%	5.00%	10.00%	10.91%

Table6. Corruption is less likely to happen in the familiar context treatment.

Corruption never happened (no bribery, no violation)		
Familiar context	Unfamiliar context	Context-free
990/1500	305/600	863/1650
66%	50.83%	53.20%

Table7. The familiar context treatment has the higest bribery rejection rate.

The player2 rejected the bribery from the player1		
Familiar context	Unfamiliar context	Context-free
381/467	159/251	507/657
81.58%	63.35%	77.12%

Table8. In the familiar context treatment, interactions initiated by the player2 are rare.

The player2 violate the rule without any bribery from the player1		
Familiar context	Unfamiliar context	Context-free
43/1033	44/349	130/993
4.16%	12.61%	13.09%

Table9. Familiar context dummy negatively predict unethical behavior (OLS regression)

		(1)	(2)	(3)	(4)	(5)	(6)
			Player1			Player2	
dependent variable		bribery rate	bribery rate	bribery rate	violation rate	violation rate	violation rate
model		OLS	OLS	OLS	OLS	OLS	OLS
familiar context (treatment dummy)		-0.098*** (0.039)	not included	-0.094*** (0.042)	-0.110*** (0.022)	not included	-0.086*** (0.026)
unfamiliar contextand and context-free (treatment dummy)	*unfamiliar context*	--	0.016 (0.055)	0.017 (0.054)	--	0.055 (0.035)	0.056 (0.035)
	context-free		--	--		--	--
male		0.225*** (0.048)	0.231*** (0.065)	0.224*** (0.048)	0.086*** (0.033)	0.119** (0.048)	0.086** (0.032)
Constant		0.356*** (0.027)	0.350*** (0.031)	0.351*** (0.031)	0.166*** (0.016)	0.146*** (0.018)	0.152*** (0.012)
Observations		250	150	250	250	150	250
Robust S.D.		YES	YES	YES	YES	YES	YES
R-squred		0.106	0.308	0.106	0.094	0.075	0.103

Table10. Familiar context dummy negatively predict unethical behavior (Probit regression)

		(1)	(2)	(3)	(4)	(5)	(6)
			Player1			Player2	
dependent variable		bribe decision (binary)	bribe decision (binary)	bribe decision (binary)	violation decision (binary)	violation decision (binary)	violation decision (binary)
model		Probit	Probit	Probit	Probit	Probit	Probit
familiar context (treatment dummy)		-0.599*** (0.181)	not included	-0.625*** (0.199)	-1.020*** (0.172)	not included	-0.922*** (0.183)
unfamiliar contextand and context-free (treatment dummy)	unfamiliar context	--	-0.098 (0.268)	-0.096 (0.270)	--	0.408 (0.268)	0.408 (0.269)
	context-free		--	--		--	--
male		0.868*** (0.266)	0.732** (0.372)	0.867*** (0.266)	0.548*** (0.213)	0.473 (0.298)	0.548*** (0.215)
Constant		0.784*** (0.125)	0.827*** (0.148)	0.811 (0.146)	0.522*** (0.116)	0.437*** (0.137)	0.424*** (0.131)
Observations		250	150	250	250	150	250
Robust S.D.		YES	YES	YES	YES	YES	YES
R-squred		0.082	0.033	0.082	0.123	0.030	0.130

Appendix B: Figures

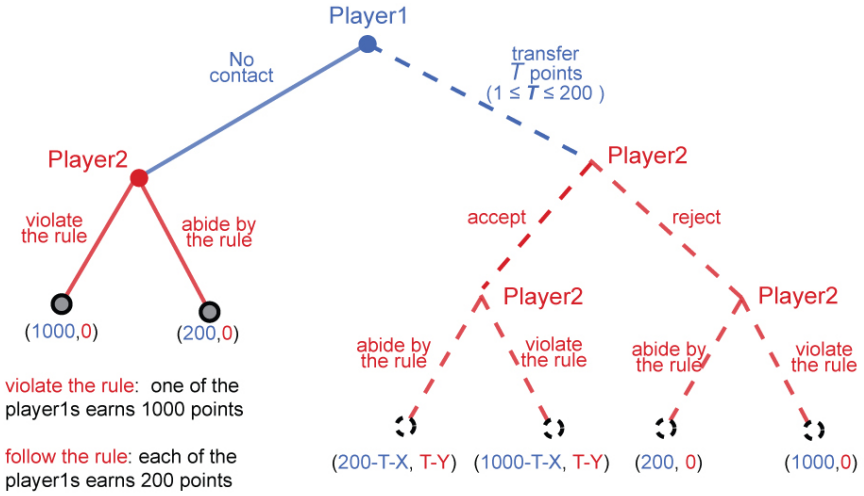


Figure 1. Extensive form of the game

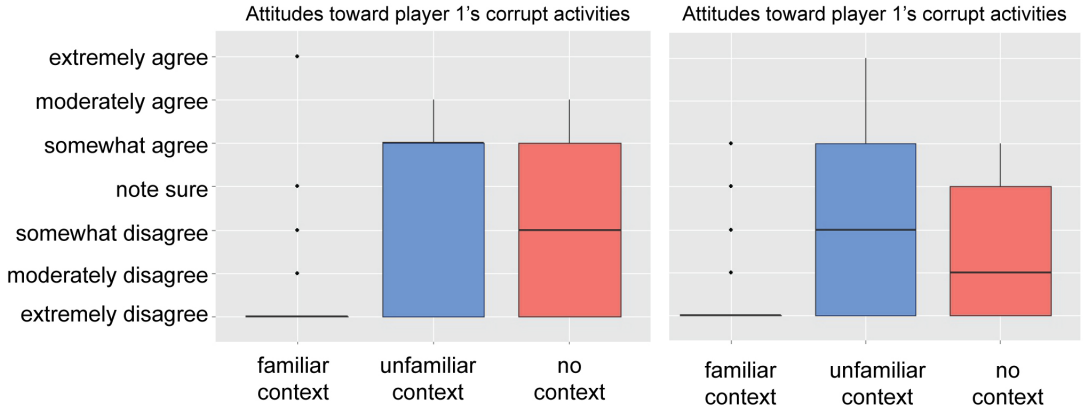


Figure 2. The students hold extremely negative attitudes toward corrupt activities in the familiar context

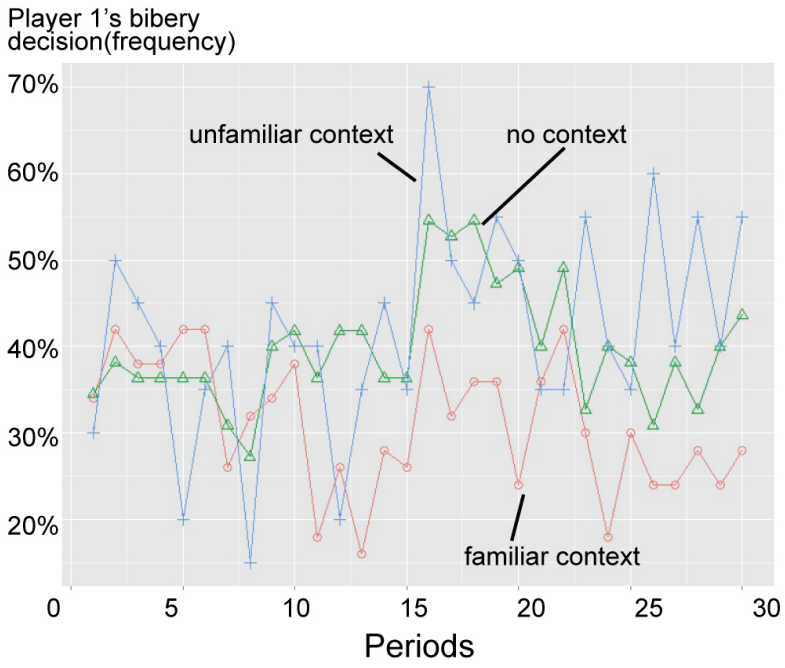


Figure 3. Evolution of player 1's decision

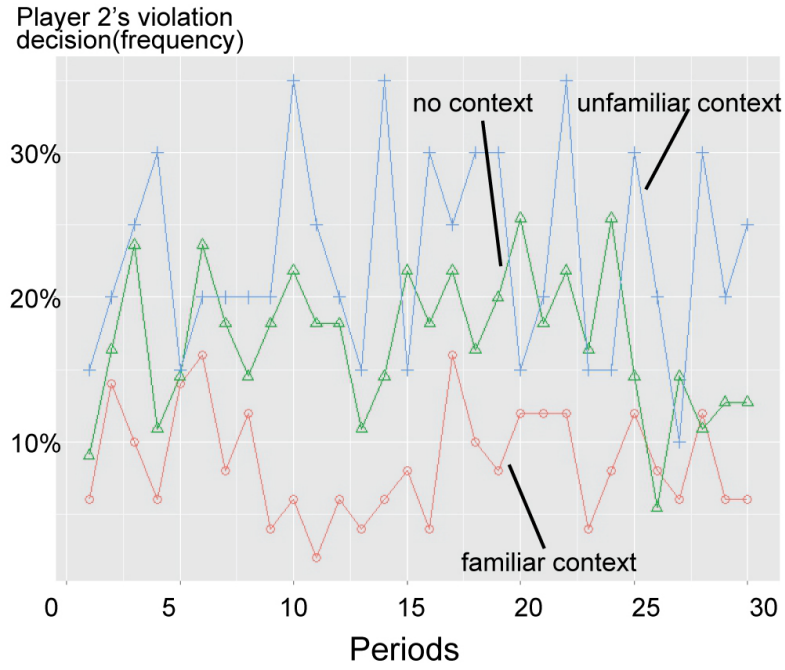


Figure 4. Evolution of player 2's decision

Appendix C: Experimental Instructions and Surveys

Note: all the surveys and instructions here have been translated into English. The original versions in Chinese are available upon request.

Translated attitude survey: familiar context

Please read the following paragraphs, and then response to the questions below.

Imagine a scholarship allocation scenario in a college. In total five students applied the same scholarship. There are 1000 dollars available in the award pool. All the student applicants are equally qualified. **According to the college policy**, the dean shall split the $1000 dollars among the five applicants. That is to say, each of the applicants shall receive an award of $200.

However, prior to the scholarship allocation decision, one of the five students talked to the college dean, sent him a gift that worth $200 (secretly and privately). As return, the dean announced that student as the only person who won the scholarship, distributed all $1000 to her. All other applicants earned nothing. The interaction between the student and the dean will not be discovered by others.

Please select the response that indicates the degree to which you agree or disagree with the STUDENT and the DEAN's activities. There is no right or wrong answer, so try hard to be completely honest in your responses. You can state your opinions accurately as the information you submit will be completely confidential.

For the **STUDENT**:

1	2	3	4	5	6	7
Extremely Disagree	Moderately Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Moderately Agree	Extremely Agree

For the **DEAN**:

1	2	3	4	5	6	7
Extremely Disagree	Moderately Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Moderately Agree	Extremely Agree

You are: Male Female

Translated attitude survey: unfamiliar context

Please read the following paragraphs, and then response to the questions below.

Imagine a public bidding scenario in the electronic construction industry. In total five firms submitted bids for the same project. The project will generate a profit of 1000 *points* (the fictitious currency in this scenario). All the firm applicants are equally qualified. According to the industry regulation, the tenderee shall let the five bidders to cooperate on the project, each of them shall receive a profit of 200 *points* (1/5 of the 1000 *points*).

However, prior to the final decision, one of the five bidders talked to the tenderee, sent him a gift that worth 200 *points* (secretly and privately). As return, the tenderee announced that bidder as the only firm who won the bid. Consequently, the winning bidder earned all the 1000 *points*. All other bidders earned nothing. The interaction between the firm and the tenderee will not be discovered by others.

Please select the response that indicates the degree to which you agree or disagree with the TENDER and the TENDEREE's activities. There is no right or wrong answer, so try hard to be completely honest in your responses. You can state your opinions accurately as the information you submit will be completely confidential.

For the **Tender**:

1	2	3	4	5	6	7
Extremely Disagree	Moderately Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Moderately Agree	Extremely Agree

For the **TENDEREE**:

1	2	3	4	5	6	7
Extremely Disagree	Moderately Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Moderately Agree	Extremely Agree

You are: Male Female

Translated attitude survey: context free

Please read the following paragraphs, and then response to the questions below.

Imagine a game where people allocate *Points* (the fictitious currency in the game). There are five *applicants* and one *granter*. 1000 *points* will be distributed among 5 applicants. All the applicants are equally qualified. According to the game rule, the granter shall split the 1000 *points* among the five applicants. That is to say, each of the applicants shall receive an award of 200 *points* (1/5 of the 1000 *points*).

However, prior to the final decision, one of the five applicants talked to the granter, sent him a gift that worth 200 *points* (secretly and privately). As return, the granter announced that applicant as the only person who won the award. Consequently, that applicant earned all the 1000 *points*. All other applicants earned nothing. The interaction between the applicant and the granter will not be discovered by others.

Please select the response that indicates the degree to which you agree or disagree with the APPLICANT and the GRANTER's activities. There is no right or wrong answer, so try hard to be completely honest in your responses. You can state your opinions accurately as the information you submit will be completely confidential.

For the **APPLICANT**:

1	2	3	4	5	6	7
Extremely Disagree	Moderately Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Moderately Agree	Extremely Agree

For the **GRANTER**:

1	2	3	4	5	6	7
Extremely Disagree	Moderately Disagree	Somewhat Disagree	Not Sure	Somewhat Agree	Moderately Agree	Extremely Agree

You are: Male Female

Translated experimental instruction (familiar context as a sample)

Experiment Instruction

Welcome to the decision-making lab of the Jianghan University of China. The purpose of this experiment is to study how people make decisions in a social interactive situation. If you pay attention and make good decisions, you may earn a considerable amount of money. Just for showing up, you have earned 5RMB. All earnings for today's tasks will be in addition to the 5RMB. You will earn "Points" through the experiment. At the concsion of the experiment, you will be paid 1RMB for every 100 points you earned. The more points you earn the more monetary payment you can get. At the end of the experiment, you will be paid your earnings privately and in cash. You will not be paid if you leave before you conclude the experiment. We guarantee that we will treat your decisions/answers with the utmost confidentiality. For the remainder of this experiment, please refrain from any communication with other participants. Please put away your cell phones.

In the first part of the experiment, we will simulate a scholarship allocation scenario. There are two roles in the experiment:

1. Student (apply for scholarship)
2. Academic advisor (allocate the scholarship)

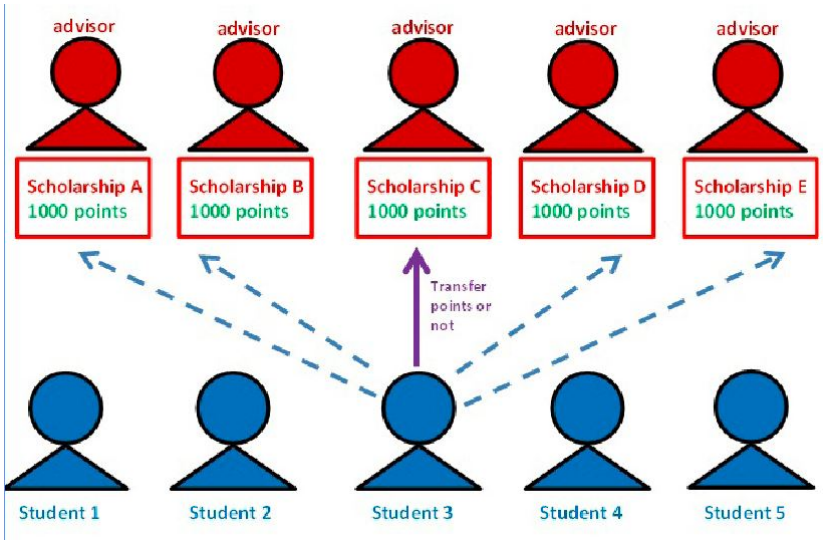
Each participant in the experiment will be randomly assigned with one of the two roles. 10 participants will make up of a group. In each group, there are 5 students and 5 academic advisors. Each student applies for 5 different scholarships (scholarship A to scholarship E). Each academic advisor is in charge of allocating one of the 5 scholarships. In addition, each student will be randomly paired with an academic advisor. Prior to the scholarship allocation decision, the two participants in a pair can interact with each other All the interactions are anonymous. You will never know the identity of the others.

The rules for scholarship allocation:

- Each academic advisor will distribute 1000 Points among the 5 student applicants.
- Each student applicant may face three different outcomes: Full reward (1000 points), partial reward (200 points), and no reward (0 point).
- In addition, we ASSUME all the applicants are the same qualified.
- **According to the college policy**, all the applicants shall receive the same amount of award (partial award, 200 points)
- At the beginning of each round, the student will receive 200 points as initial endowment. The advisor does not have initial endowment.

Introduction to the STUDENTS:

If your role is the STUDENT, then you can imagine that you have applied five different scholarships. Meanwhile, you have the opportunity to contact with one of the academic advisors who are in charge of the scholarship allocation. The first decision you need to make, is whether or not to contact the academic advisor. For example (see the picture below): student3 have applied 5 different scholarships. In addition, she may transfer a certain amount of points (1-200) to the academic advisor who will allocate the rewards of scholarship C, in the hope that to earn the full reward (1000 points). If you decide "do not contact the advisor", then you have no other decisions to make in this round. Please wait for the scholarship allocation outcome.
If you decide to "contact the advisor", then you will make your second decision: transfer a certain amount of points to the advisor. You will specify an integer of the range from 1 to 200 points. After your transfer decision, please wait for the scholarship allocation outcome. When all the scholarships have been allocated, you will see the feedback on how much reward you received from each of the scholarships.

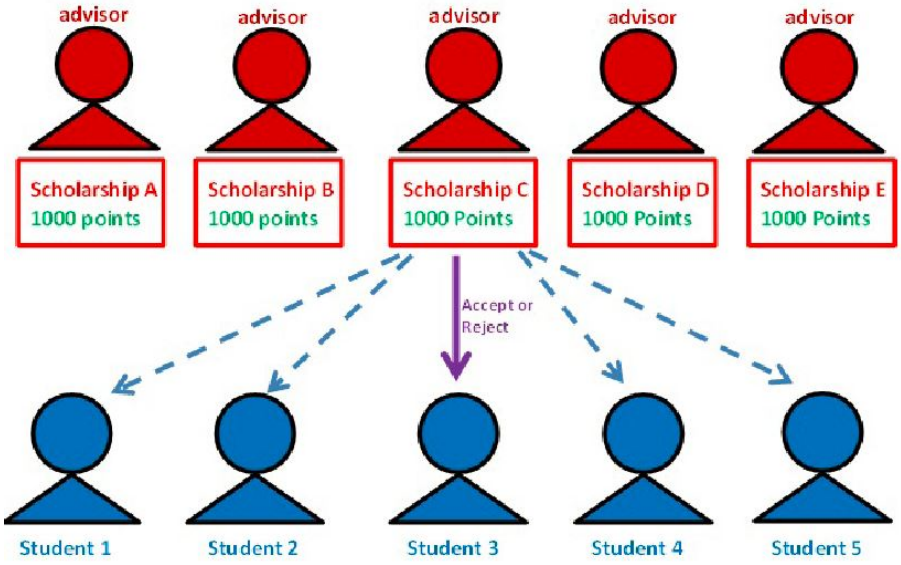


Introduction to the ACADEMIC ADVISOR:

If your role is the ADVISOR, you will allocate 1000 points among 5 student applicants. At the beginning of each round, one of the students may contact with you and transfer some points to you.

Based on the student's decision, you may see one of the two outcomes: (1) the student has contacted me, and have transferred some points to me; or (2) the student has decided not to contact me.
If the student has contacted you, and has transferred some points to you, then you will make a selection between "I accept the transfer" and "I reject the transfer". If you accept the transfer, then the amount of offered will be deducted from the student's account and then added to your account. If you reject the offer, then both you and the student's accounts will remain unchanged. If the student has decided not to contact you, then you will make the allocation decision directly (see examples below).

Next, you will allocate the 1000 points scholarship among the 5 students. Keep in mind that all the students are equally qualified. According to the college policy, you shall split the 1000 points, and allocate 200 points to each student. However, you can also violate the college policy, let the student in your pair earn all the 1000 points, and the other students earn nothing. In short, no matter what decision has been made by the student, you always need to make a selection between two options: (1) abide by the rule, let each student earns 200 points; or (2) violate the rule, let one student earns 1000 points, and the other students earn nothing. After that, the experiment will move to the next round.



Experimental Procedure:
The game will be repeated 30 rounds. From round1 to round 15, you will play the game with a fixed partner. At the end of period 15, all the participants will be assigned to a new role, and then be paired with a new partner to play the game for another 15 periods.

How you will be paid:
At the conclusion of the experiment, four rounds will be randomly selected, two from round1-round15, and the other two from round15 to round30. The randomly selected round will determine your earnings.

Punishment:

During the experiment, a pair of subjects will be identified as "foul" if any offer from the student was accepted by the advisor. By the end of the experiment, a lottery will be played out to decide whether to punish the subjects who are foul. With a probability of 1%, the punishment occurs: both participants' earnings are cleared from their accounts.

In the second part of the experiment, you will complete a short survey independently.

Survey questions after the bribery game:

(1) When you were playing the STUDENT in the experiment, have you ever contacted the advisor?

(2) Why or why not?

(3) When you were playing the ADVISOR in the experiment, have you ever violate the rule when allocating the scholarship?

(4) Why or why not?