

Is Talk Cheap in High Stake Trust Games? An Experimental Analysis of Decentralized Cooperation

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[Working Paper]

Abstract

Trusting strangers when the stakes are high can be a risky endeavor. The mere perception of strategically deceptive behavior to misrepresent private information can lead to a breakdown in cooperation. Bluffing, or making promises that are not carried through, weakens an actor's reputation for honesty and makes future diplomatic efforts less effective (Sartori 2005). We conducted trust game experiments in which subjects can exchange proposals and interact with each other before making decisions. We investigate whether face-to-face interactions, provide assurance of intent even when formal enforcement is unavailable. We show that costless communication is effective in realistic contexts where the stakes are high and the shadow of the future is finite. Our research is one of only a few papers that investigate the effects of face-to-face communication on trust and offers the possibility of developing a theoretical and practical understanding of how cheap talk determines bargaining outcomes.

President Kennedy promised Soviet Premier Nikita Khrushchev that he would remove American nuclear missiles from Turkey if the Soviets first removed their missiles from Cuba. His promise to withdraw U.S. missiles in Turkey is widely believed to have convinced Khrushchev to withdraw his missiles from Cuba. However, in traditional models of crisis bargaining (Fearon 1995), costless communication is deemed ineffective because actors have an incentive to not tell the truth. These bargaining models assume that costless promises will have little or no influence on those receiving the message (Fearon 1994 1995; Schultz 1998). While costly signals are undoubtedly important, much communication can be transmitted through *cheap talk*. In the context of games of incomplete information, the term *cheap talk* refers to direct and costless communication among players (Crawford and Sobel 1982). Communication is

important in building cooperation, especially when it signals intent (Goffman 1971). However, Pilisuk et al. (1967) have shown that simply providing opportunities for communication between the players does not necessarily increase cooperation, because these opportunities can be used to deceive. The literature on the consequences of deception in bargaining is sparse, focusing primarily on Nash bargaining with asymmetric information (Roth and Murnighan 1982 1983; Schweitzer and Croson 1999). Hence, the fact that actors cannot directly observe each other's willingness to cooperate creates one of the central dilemmas in bargaining.

There have been few experiments with pre-play communication in trust games. Putterman et al. (2009) permitted participants in trust games to engage in pre-play communication that could end with binding contracts. They found that most subjects forewent the contracts despite their modest cost, and that the lion's share of mutually beneficial exchanges took place without binding contracts. Ben-Ner et al. (2010) conducted small stakes trust game experiments in which subjects could sometimes exchange proposals either in numerical form, or using chat messages followed by exchange of numerical proposals. The authors found that chat enhances the likelihood that trustors and trustees will adhere to non-binding agreements they make— an express verbal pre-play agreement increased sending by trustors. Their participants were not informed in advance of the exact number of interactions, nor did they know what condition would follow the initial one, hence, there were no end game effects. However, these studies demonstrate that pre-play costless communication induces substantially more cooperation than lack thereof.

Ben-Ner et al. (2011) contend that behavioral economists offer alternatives to conventional economic theory: (a) people often display trust and trustworthiness in real-life

interactions resembling trust games, and large numbers have done so in past experimental trust games¹: (b) communication is found helpful in engendering cooperation, (c) reciprocity is often observed, (d) most people have a preference for keeping their word, (e) there exist individual differences that generate a distribution of types in terms of money-maximizing vs. other preferences (Kurzban and Houser 2001; Fischbacher et al. 2001), and (f) individuals choose their actions to maximize their utility subject to beliefs about partners' types, which may be influenced by information about partner characteristics or past actions.² Research has shown that human beings routinely help strangers at costs to themselves (Zak et al. 2007). The neuropeptide oxytocin (OT) has been shown to rise in blood samples when individuals are intentionally shown trust via monetary transfers. Those with higher OT levels showed increased monetary sacrifice to the stranger who had trusted them (Zak et al. 2005). Money sent by the first mover is commonly used to measure his trust that the trustee will return his money. Money returned by the second mover is used to measure his trustworthiness. We expect the trustors and the trustees to interpret the non-binding promise as an agreement, which they feel some degree of commitment to adhere.³

Hypothesis (H1)- During the interactions, the majority of participants will make a promise to transfer some or all of their endowment to an interaction partner and the majority who receive a transfer will keep their promise.

Hypothesis (H2a)- In all sessions, participants (FM) who make a non-binding promise will transfer a larger sum to their interaction partner than those who do not make a promise.

Hypothesis (H2b)- In all sessions, participants (SM) who make a non-binding promise will transfer a larger sum to their interaction partner than those who do not make a promise.

Hypothesis (H3)- In all sessions, participants who make a non-binding promise will earn a larger sum in all sessions.

Hypothesis (H4)- Participants who honor a non-binding promise will earn a larger sum in all sessions.

A likely mechanism supporting our hypotheses is that communication increases credibility and decreases cognitive efforts thereby increasing cooperation; there is no reason for

¹. See Camerer (2003) and the symposium in Journal of Economic Behavior and Organization, vol. 55, no. 4, 2004.

². Although neither theoretical nor experimental behavioral economics provide as specific a set of predictions as does conventional theory, they do supply observations that permit characterization of trusting and trustworthiness (Ben-Ner et al. 2011).

³. The hypotheses generated by standard and behavioral economics disagree on most predictions (Ben-Ner et al. 2011).

this not to hold even when the stakes are high. We expect the participants to interpret the non-binding promise as an agreement, which they feel some degree of commitment to adhere. If our hypotheses are supported, our findings may produce insights into bargaining where explicit contracts are not possible such as in conflict resolution scenarios where initial trust building gestures are essential to reach peaceful resolutions even when the shadow of the future is finite.

Experimental Design

The experiment was conducted at Center for Neuroeconomics Studies (CNS) at Claremont Graduate University (CGU). We recruited 168 participants, mostly non-student adults, ages 25 to 50 years ($M= 32$, $SD= 7.15$). The reported income of the participants was on average \$15,001 - \$25,000 per year. 39% of the participants had a 4-year college degree (Bachelors) and 32% had more advanced degrees (Masters, PhD). 57% of the participants were male. Only 14.17% of the participants were unemployed. 31.25% had full employment, 24.17% were full time students, and 30.42% had part time employment. A group of four participated in two experimental sessions. Participants initially earned a financial endowment (\$120) and a group of four participated in a set of 2-minutes face-to-face interactions. Participants were given the opportunity to make a promise regarding their planned economic decisions during their interactions. A survey was given at the end of each session to determine whether the participant made a promise as either FM and/or SM to the interaction partner and whether the participant believed her or she kept the promise.

The participants played the trust game twice in each session. The trust game aims at measuring senders' willingness to trust a receiver. In the original trust game designed by Berg et al. (1995), the trustor is given a sum of money. In the first move, the trustor must decide how much, if any, to send to a trustee. Any money sent to the trustee is then tripled. The trustee

makes the second move, deciding how much money to return to the trustor. Under the assumption of selfish preferences and rational choice theory, the only sub-game perfect Nash equilibrium is for the trustor to send no money to the trustee, using backward induction to infer that the trustee will never return any money. In our study, the participants made both first mover (FM) and second mover (SM) decisions in multiple dyads. Their decisions were revealed to the interacting partners before the end of each session. The decision tree in Figure 1 shows all possible choices for FM and SM, and all possible monetary payoffs. The resulting payoffs are shown in brackets, with FM on top and SM below. Each participant makes a total of two decisions in the trust game per session. One of the decisions is selected by die roll for payoff at the end of each session. In total, participants could earn as little as \$50 or as much as \$1010. Participants also received \$50 show-up fee for each of the two sessions.

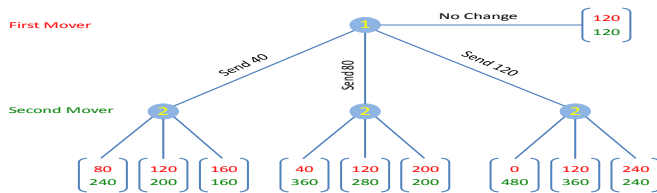


Figure 1- The amounts in the decision tree are set so that a salient reward is paid to the participants.

Results

Initial self-report analysis of the survey data provided the following: 63% of the participants made a promise in session 1 whereas 72% of the participants did so in session 2. Overall, 18.20% of the participants transferred \$0, 11.08% transferred \$40 12.03% transferred \$80 and 58.70% transferred a total of \$120 to their respective interaction partners. We divided the participants in the following groups: those who made a promise (promise-group), those who

did not (no-promise-group), those who honored their promise (promise-honored) and those who did not (promise-not honored). We conducted t tests, using both behavioral and self-report data, to see whether there are significant differences between those who made a non-binding promise to send money to an interaction partners after face-to-face communication and those who did not.

The amount transferred by the participants, as FM to the partner in the trust game among those who made a promise and those who did not, is statistically significant in session 1. The mean monetary transfer under the promise condition was 93.99, with a standard deviation of 2.16. The mean monetary transfer under the no-promise condition was 67.43, with a standard deviation of 3.30. This difference was statistically significant, $t(630) = 6.97, p < .001$. In other words, whether or not the person made a promise affects her monetary transfer in session 1. This indicates FMs in the promise-group have a significantly higher mean on the amount transferred to an interaction partner. In session 2, the mean monetary transfer under the promise condition was 93.85, with a standard deviation of 2.15. The mean monetary transfer under the no-promise condition was 62.25, with a standard deviation of 4.00. This difference was also statistically significant, $t(568) = 7.41, p < .001$. In other words, whether or not the person made a promise affects her monetary transfer as FM in session 2 as well.

As SM, we found no statistically significant difference between the participants who made a promise ($M = 88.48, SD = 2.35$) and those who did not ($M = 86.06, SD = 3.34, t(572) = 0.57, (p = 0.56)$) in session 1. In other words, whether or not the person made a promise did not affect her monetary transfer as SM in session 1. In session 2, the mean monetary transfer as SM under the promise condition was 92.52, with a standard deviation of 2.29. The mean monetary transfer under the no-promise condition was 76, with a standard deviation of 3.94. This difference was

statistically significant, $t(528) = 3.73, p < .001$. In other words, whether or not the person made a promise affects her monetary transfer as SM in session 2.

The mean monetary payoff under the promise condition was 189.75, with a standard deviation of 6.92. The mean monetary payoff under the no-promise condition was 162.12, with a standard deviation of 7.34. This difference was statistically significant, $t(630) = 2.56, p < 0.01$. The result indicates that those in the promise-group earned a higher payoff than those who did not make a non-binding promise. Even in session 2, whether or not the person made a promise affected her monetary payoff. In session 2, the mean monetary payoff under the promise condition was 188.87, with a standard deviation of 6.68. The mean monetary payoff under the no-promise condition was 163, with a standard deviation of 9.25. This difference was statistically significant, $t(568) = 2.12, p < 0.03$.

In session 1, the mean monetary payoff under the honored-promise condition was 179.79, with a standard deviation of 6.78. The mean monetary payoff under the no-promise condition was 188.31, with a standard deviation of 9.72. This difference was not statistically significant, $t(572) = -0.70, p = 0.47$. In other words, whether or not the person kept her promise did not affect her monetary payoff at the end of the session 1. However, whether or not the person honored her promise did affect her monetary payoff at the end of the session 2. The mean monetary payoff under the honored-promise condition was 191.15, with a standard deviation of 6.93. The mean monetary payoff under the no-promise condition was 160.53, with a standard deviation of 9.66. This difference was statistically significant, $t(528) = 2.42, p < 0.01$. In result, participants who honored their promise had higher monetary payoff at the end of the session 2.

Conclusion

Initial self-report analysis of the survey data confirmed that the majority of participants will make a promise to transfer some or all of their endowment to an interaction partner and the majority who receive a transfer will keep their promise. Interestingly 59% of the participants transferred the full amount allocated to them (\$120) to their respective interaction partners as the FM in the trust games. We conducted t tests, using both behavioral and self-report data, to see whether there are significant differences between those who made a non-binding promise to send money to an interaction partners after face-to-face communication and those who did not. We confirm our hypothesis that in all sessions, participants (FM) who made a non-binding promise would transfer a larger sum to their interaction partner than those who did not make a promise. However, we found that, participants (SM) who made a non-binding promise transferred a larger sum to their interaction partner in session 2 only. In session 1, we found no significant difference between the two groups. The reason for this finding could be that by session 2 reputations have been established and participants deem the non-binding promise as an agreement with someone they have previously interacted with. Furthermore, our results indicate that those in the promise-group earned a higher payoff than those who did not make a non-binding a promise in all sessions, confirming our third hypothesis. Our final hypothesis was only partially confirmed. The results indicated whether or not the person kept her promise did not affect her monetary payoff at the end of the session 1. On the other hand, whether or not the person honored her promise did affect her monetary payoff at the end of the session 2. Hence, participants who honored their promise had higher monetary payoff at the end of the session 2. Established reputations may have facilitated cooperation producing higher payoffs for those who honored their promises at the end of session 2.

We conducted trust game experiments in which subjects can exchange proposals and interact with each other before making decisions. We showed that costless communication is effective in realistic contexts where the stakes are high (average earning in our study is approximately \$500) and the shadow of the future is finite. We interpret the act of honoring the final promise as abiding by the non-binding agreement between dyads after costless communication. At this stage, a defection cannot be punished in the future rounds and the game is officially over. In our experiment, participants had the opportunity to interact face-to-face, make non-binding agreements and build their reputation. The non-binding agreement holds even at the final stage of the high stake game when defection could offer lucrative monetary gains for a potential defector. Trust reduces the need for formal contracts, which are costly to write, monitor, and enforce (Hill 1995; Barney 1994) and is extremely valuable in conflict resolution. Costless communication to size up character can increase trust, decrease transaction costs and increase cooperation- even when the stakes are high. Our results suggest that cheap talk influences bargaining positively than would otherwise be expected by current theoretical models. New models that incorporate these findings can augment our understanding of the impact of costless communication on the dynamics of bargaining and negotiation. Our analysis here suggests that face-to-face interactions to size up type can build trust. Furthermore, the non-binding agreements within the context of cheap talk can maintain cooperation even at the final stage of a finite game. This work provides insights into high stake bargaining interactions - particularly in the area of conflict resolution- where building and maintaining trust are essential to achieve win-win outcomes. Our future work will study the small portion of the participants who chose non-cooperative tactics or deception as their primary strategy, which will further add valuable insights into bargaining dynamics.

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