The Persistent Power of Promises

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Abstract
A large literature has documented the positive effect of pre-play communication on cooperation, trust, and trustworthiness. However, previous contributions focus on unrealistic settings in which senders are forced to choose their actions immediately after communicating with recipients. Using a hybrid lab and online experiment this paper provides the first evidence for the persistent power of communication. Even when 3 weeks pass between communication and actual choices, communication raises cooperation, trust, and trustworthiness by about 50%. Our results show that the previous body of short-duration laboratory experiments on trust and promises likely translates to longer-term interactions. Thus, in real-world situations, lags between the beginning of the interaction and the time to respond may not substantially alter the trustworthiness of the responder.

Keywords: Trust, promises, persistence, trustworthiness, decay, experiment

JEL codes: A13, C91, D03, C72, D64, K12

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1 Introduction

Trust is the foundation for many social and economic interactions and acts as “an important lubricant of the social system” (Arrow, 1974). In particular, when contractual or reputational incentives are absent, trust between the two parties that either side holds up their end of the bargain becomes particularly important. A string of recent studies offers experimental evidence that promises, even if they come in the form of mere cheap talk, considerably enhance trust and subsequent levels of cooperation in experimental trust and dictator games (Ellingsen and Johannesson, 2004; Charness and Dufwenberg, 2006; Vanberg, 2008; Charness and Dufwenberg, 2011; Ismayilov and Potters, 2016; Ederer and Stremitzer, 2017; Di Bartolomeo et al., 2017; Bhattacharya and Sengupta, 2017).\(^1\)

However, all these studies are limited in one important dimension: time. Outside the lab, trust often has to be repaid later, and promises have to be made good only after some time has passed, but in previous lab experiments hardly any time passes between the promise and the promisee’s choice to deliver on that promise. This paper examines the robustness of experimental findings on the effect of communication on trust, trustworthiness and cooperation given that existing lab studies only analyze at a very short time frame. We document that communication has a surprisingly large effect and that it remains remarkably persistent.

Trust has been extensively studied in laboratory experiments, mostly using the Trust Game (Berg et al., 1995). In this game, an investor has the possibility to send an amount of money to a “trustee.” The amount of money is multiplied so that sending money is socially efficient. The trustee, however, is free to return money to the investor or not, creating a source of moral hazard. The game is seen as a vehicle to study trust (amount sent by investor) and trustworthiness (amount sent back by the trustee). Many studies find that trustees behave, on average, trustworthy: they honor the trust that investors put in them by sending back a substantial part of the money. A recent meta-analysis (Johnson and Mislin, 2011) counted 162 replications of the original game, all showing the same pattern.

This appears to be good news, as it suggests that many real-world problems of hidden information or hidden action can be mitigated through trust and trustworthiness. Better still, pre-play messages by trustees (i.e., promises) tend to increase both average trust and trustworthiness even

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\(^1\)Notable contributions to the broader literature on promise-keeping in political sciences and social psychology include Ostrom et al. (1992), Kerr and Kaufman-Gilliland (1994), Sally (1995), and Bicchieri and Lev-On (2007).
more (Charness and Dufwenberg, 2006; Vanberg, 2008; Ederer and Stremitzer, 2017). Although these messages are non-binding, they seem to sharpen trustees’ sense of obligation or the amount of guilt that is attached to letting the investor down.

However, it is possible that the very short horizon in lab situations overestimates the extent of reciprocity and trustworthiness we may expect in everyday interactions. Casual observation suggests that the more the act of trust, or the promise, recedes into the past, the likelier it is for the promisee to neglect her obligation and to behave opportunistically. For example, a stereotype about politicians is that they promise everything to get elected, but over time conveniently “forget” about these promises. For example, the German post-war chancellor Konrad Adenauer apocryphally said “What do I care about my chitchat from yesterday?”

To investigate how time affects the power of communication (and promises in particular) we use a one-shot, two-person trust game with pre-play communication introduced by Charness and Dufwenberg (2006). The main innovation of our paper is the introduction of delay between the utterance of communication and the decision to act. Trustees in our experiment made their choice either immediately during the laboratory session (as is common in all previous trust game studies), or within 24 hours after leaving the laboratory, or in a 24 hour window 21 days after the laboratory session. This allows us to analyze the differential impact of time of trust, trustworthiness, and cooperation.

Communication significantly raises cooperation, trust, and trustworthiness and these positive effects are not diminished even when 3 weeks pass before the trustee’s actual decision. Thus, we provide the first evidence for the lasting power of communication and promises in particular.

The remainder of the paper proceeds as follows. Section 2 describes our experimental design. Section 3 presents our experimental results. Section 4 offers concluding remarks.

2 Design

We use a one-shot, two-person trust game introduced by Charness and Dufwenberg (2006). Figure 1 shows the game tree. The first mover (“A”) has two options: choosing a safe outside option (“OUT”) with equitable but relatively low outcomes ($15 for each player); or choosing to continue the game (“IN”). If A chooses IN, the second mover (“B”) has two options: one that generates a high outcome
for herself ($42) but no money at all for A (‘DON’T ROLL’); and one where B gets $30, and A’s payoff depends on a lottery (or virtual die roll) with a 5/6 chance of gaining $36 and a 1/6 chance of getting nothing (‘ROLL’). Thus, the selfish decision for B is to choose DON’T ROLL, and A, in choosing IN, has to trust that B chooses ROLL.

Figure 1: Game Tree

Following Charness and Dufwenberg (2006), our first treatment dimension adds a communication stage. Depending on the treatment condition, player B can either write a free-form message to player A before player A makes her decision (COMM) or not (NOCOMM). COMM gives player B the opportunity to affirm that she will choose ROLL. Player A, however, only observes her own outcome. That means she remains uncertain whether player B chose ROLL since even in this case there is a 1/6 chance of her getting nothing.

Player B makes her decision not knowing whether player A has chosen IN or OUT. This allows us to record choices for all second movers, not only those where the first mover chose IN.

Finally, we allow subjects to submit a mixed strategy, with the probability of IN (ROLL) ranging from 0 to 1 in increments of 0.1. Specifically, subjects had a menu of 10 IN/OUT (ROLL/DON’T ROLL) radio buttons, of which the computer will choose one at random to count as the final decision. Subjects made little use of this more nuanced strategy space (see Section 3).

2.1 Delayed Decision

As our primary manipulation, and the critical departure from Charness and Dufwenberg (2006), we introduce a delay into B’s decision. All participants had to complete two short, web-based questionnaire forms, Q1 and Q2, in addition to the laboratory session. They could access Q1 in a 24 hour window 24 hours after leaving the laboratory, and Q2 in a 24 hour window 21 days after the laboratory session. To minimize attrition, we created strong monetary incentives to complete the online part of the study. At the end of the laboratory session, subjects only received their show-up fee, and all the remaining payments only after completing both online questionnaires. Depending on the condition, B chose IN/OUT either while filling out Q1 (EARLY), or while filling out Q2 (LATE). In an additional condition, we moved the first questionnaire at the end of the laboratory session,
so that second movers made their decision while still in the laboratory (IMM). In this condition subjects filled out the same web-based questionnaire they would have seen in the other conditions. Table 1 shows the resulting $2 \times 3$ between-subjects design.

Table 1: Experimental Treatments

<table>
<thead>
<tr>
<th>Mode of Communication</th>
<th>IMM</th>
<th>EARLY</th>
<th>LATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOCOMM</td>
<td>NC-IMM</td>
<td>NC-EARLY</td>
<td>NC-LATE</td>
</tr>
<tr>
<td>COMM</td>
<td>C-IMM</td>
<td>C-EARLY</td>
<td>C-LATE</td>
</tr>
</tbody>
</table>

2.2 Additional Measures

We elicited subjects’ first-order beliefs about how many times the person with whom they were matched would choose ROLL. We call these responses FOB1. To avoid hedging we did not provide monetary incentives. In addition, we asked each player A about the aggregate percentage of ROLL decisions and each player B about the aggregate percentage of IN decisions. We call these responses FOB2. We incentivized FOB2 with a bonus of $5 if the guess fell within 10 percentage points of the actual value.

We also elicited player B’s second-order beliefs about the matched player A’s first-order beliefs. We call these second-order beliefs SOB. At the end of Q2, we also elicited first-order beliefs about the other delay condition. That is, at the end of the study, we revealed the existence of the EARLY (LATE) condition to those subjects participating in the LATE (IMM/EARLY) condition and asked As about Bs (or As) about the aggregate percentage of IN (or ROLL) decisions in the other delay condition. We term these responses FOB-O.

In the COMM condition, after making their ROLL/DON’T ROLL decision, B also had to re-write the message to A (RECALL). With this measure we wanted to test whether message recollection systematically changes over time. We did not provide monetary incentives for precision.

Finally, we presented subjects with two multiple-price lists (MPLs), as measures of risk preference (MPL-R) and time preference (MPL-T). The MPL-R task asked for subjects’ certainty equivalent for a 50-50 lottery between $15 and $0, the MPL-T task asked for their preference between a fixed $10 early payment and a late payment that varied between $10 and $15.
2.3 Online Experiment

To replicate our laboratory findings with a larger set of subjects, we also conducted an online experiment on mTurk. In the online study, the IMM and EARLY delay conditions are identical: after the “lab” part, subjects see a link to Q1, so that they can complete this questionnaire immediately, as in the lab version of the IMM condition. However, Q1 remains available for 24h after completion of the “lab” part, as in the lab version of the EARLY condition.

To further simplify the online design, we eliminated mixed strategies, so that subjects only made one IN/OUT (ROLL/DON’T ROLL) decision.

2.4 Procedures

We conducted 40 experimental sessions with a total of 354 student subjects at the University of Zurich and at Yale University. Subjects were assigned to visually isolated computer terminals. Beside each terminal they found paper instructions. Questions were answered individually at the subjects’ seats. Subjects interacted with another randomly chosen participant in the session. All subjects were paid after 21 days with Amazon gift vouchers. The experiment was programmed and conducted with the software z-Tree (Fischbacher, 2007).

3 Results

We first study the behavior of trustees in our 6 treatment conditions. Figure 2a shows the number of times a trustee chose ROLL. When there is no communication trustees choose to roll on average between 38% to 35% of the time while this number increased to around 58% to 55% of the time when communication was possible. Thus, as expected communication greatly and significantly increases cooperation by trustees. This result mimics the findings of previous contributions studying trust games with pre-play communication in experimental settings. However, while the time delay between communication and the roll decision reduces roll rates, this decline is small and not statistically different. Moreover, communication uniformly raises roll rates in all treatments by about 20 percentage points. This suggests that communication enhances cooperation and trustworthiness, possibly through increasing trust.
Indeed, Figures 2b, 2c, and 2d show that communication consistently raises first- and second-order beliefs. Although there is more variation in the positive effect of communication on first- and second-order beliefs than for roll rates, the magnitudes are quite similar. On average, communication raises beliefs by about 20 percentage points.

A similar picture emerges from regression analysis as shown in Table 2. Communication raises
roll rates and beliefs by about 20 percentage points with no discernible differences in the effect across the 3 delay conditions. The only exception are second-order beliefs in the early delay condition where the positive effect of communication is significantly weaker.

Table 2: Trustee Behavior

<table>
<thead>
<tr>
<th></th>
<th>Rolls</th>
<th>FOB1</th>
<th>FOB2</th>
<th>SOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>-0.078</td>
<td>-0.806</td>
<td>-11.054*</td>
<td>-0.159</td>
</tr>
<tr>
<td></td>
<td>(0.731)</td>
<td>(0.549)</td>
<td>(5.519)</td>
<td>(0.616)</td>
</tr>
<tr>
<td>Late</td>
<td>-0.272</td>
<td>-0.568</td>
<td>-4.231</td>
<td>-0.250</td>
</tr>
<tr>
<td></td>
<td>(0.664)</td>
<td>(0.583)</td>
<td>(3.367)</td>
<td>(0.704)</td>
</tr>
<tr>
<td>Communication</td>
<td>1.935***</td>
<td>2.059***</td>
<td>16.344***</td>
<td>2.631***</td>
</tr>
<tr>
<td></td>
<td>(0.657)</td>
<td>(0.594)</td>
<td>(4.543)</td>
<td>(0.745)</td>
</tr>
<tr>
<td>Early × Communication</td>
<td>-0.075</td>
<td>-0.937</td>
<td>7.569</td>
<td>-1.404*</td>
</tr>
<tr>
<td></td>
<td>(1.243)</td>
<td>(0.990)</td>
<td>(7.506)</td>
<td>(0.790)</td>
</tr>
<tr>
<td>Late × Communication</td>
<td>-0.038</td>
<td>0.342</td>
<td>1.352</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>(0.918)</td>
<td>(0.907)</td>
<td>(6.113)</td>
<td>(0.921)</td>
</tr>
<tr>
<td>Constant</td>
<td>3.772***</td>
<td>5.000***</td>
<td>44.070***</td>
<td>4.386***</td>
</tr>
<tr>
<td></td>
<td>(0.286)</td>
<td>(0.404)</td>
<td>(3.133)</td>
<td>(0.598)</td>
</tr>
</tbody>
</table>

adj. R-squared | 0.032 | 0.076 | 0.091 | 0.114 |
N              | 353   | 249   | 353   | 186   |
Clusters       | 40    | 36    | 40    | 32    |

*p<0.10, **p<0.05, ***p<0.01

We now turn our attention to the analysis of investor behavior and beliefs. Figure 3b shows that investors are significantly more trusting when communication is possible. In the treatments with communication investors increase their IN choices by roughly 20 percentage points, that is, a very large increase in trust by almost 50%. This effect is once again almost uniform across the different delay treatments. Similarly, our measures for first-order beliefs FOB1 and FOB2 are significantly higher in the communication treatments. Thus, our results suggest that communication increases trust even over time horizons as long as 3 weeks.

Table 3 documents the large and persistent effect of communication on trust. Investors have higher expectations about the roll rates of trustees and therefore behave more trustingly when communication is allowed. There is no evidence that greater delay diminishes the positive effect of communication.

Taken together our results suggest a surprisingly persistent effect of communication. Even when trustees make their decisions outside of the lab and as long as 3 weeks after they communicated...
with investors, they still behave much more generously towards them than when communication is impossible. Anticipating such behavior of trustees, investors exhibit significantly more trust and choose to opt in at much larger rates.

Table 3: Investor Behavior

<table>
<thead>
<tr>
<th></th>
<th>Ins</th>
<th>FOB1</th>
<th>FOB2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>-0.806</td>
<td>0.119</td>
<td>0.963</td>
</tr>
<tr>
<td></td>
<td>(0.558)</td>
<td>(0.742)</td>
<td>(5.927)</td>
</tr>
<tr>
<td>Late</td>
<td>-0.177</td>
<td>0.453</td>
<td>2.378</td>
</tr>
<tr>
<td></td>
<td>(0.516)</td>
<td>(0.521)</td>
<td>(3.769)</td>
</tr>
<tr>
<td>Communication</td>
<td>1.862***</td>
<td>2.089***</td>
<td>14.158***</td>
</tr>
<tr>
<td></td>
<td>(0.662)</td>
<td>(0.574)</td>
<td>(4.262)</td>
</tr>
<tr>
<td>Early × Communication</td>
<td>0.784</td>
<td>0.244</td>
<td>-7.248</td>
</tr>
<tr>
<td></td>
<td>(1.206)</td>
<td>(0.958)</td>
<td>(7.390)</td>
</tr>
<tr>
<td>Late × Communication</td>
<td>-0.098</td>
<td>0.411</td>
<td>3.811</td>
</tr>
<tr>
<td></td>
<td>(1.021)</td>
<td>(0.700)</td>
<td>(4.866)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.000***</td>
<td>3.547***</td>
<td>34.860***</td>
</tr>
<tr>
<td></td>
<td>(0.473)</td>
<td>(0.407)</td>
<td>(3.293)</td>
</tr>
</tbody>
</table>

adj. R-squared 0.055 0.116 0.056
N 353 261 354
Clusters 40 36 40

* p<0.10, ** p<0.05, *** p<0.01

Figure 3: In Decisions; 1st-order beliefs about partner; 1st-order beliefs about population
4 Conclusion

A large literature beginning with Charness and Dufwenberg (2006) has documented the positive effect of pre-play communication on cooperation, trust, and trustworthiness in experimental games. However, there are potentially serious doubts about the external validity of these studies because they force trustees to their actions immediately after communicating with investors. By contrast, many real-world instances of promises involve a significant delay between the communicating the promise and delivering on it. In fact, one of the primary roles of promises is to facilitate production and exchange over time.

Using a hybrid lab and online experiment we provided the first evidence for the persistent power of communication over time. In our trust experiment, trustees chose how much to return to investors either immediately in the lab, in a 24 hour window after they left the lab, or 3 weeks after they left the lab. Even when 3 weeks passed between the communication stage and actual choices, communication raised cooperation, trust, and trustworthiness by about 50% and this positive effect is as large as when choices immediately follow communication.

The surprisingly large and persistent effect of communication naturally raises a number of additional questions about the role of communication. For example, at what point does the persistence of communication diminish? What institutional arrangements could enhance potentially decaying trust over time? We leave these and other interesting questions for future research.
References


