Teams Promise But Do Not Deliver*

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1/29/2018

Abstract

Individuals and teams play a hidden-action trust game with pre-play communication. We replicate previous results for individuals but not for teams. While teams make non-binding promises to cooperate at the same rate as individuals, they consistently renege on these promises. Teams first decide on whether they will cooperate or not, frequently promising to cooperate to induce first movers to do so, thereby earning more when reneging.

Key words: trust game, hidden-action, non-binding communication, teams versus individuals

JEL classification: C72, C91, C92, D83

Ohio State University[+], WZB Berlin Social Science Centre and DIW[†], and Nanyang Technological University*. Funding for this research was provided by the National Science Foundation, SES-1630288. We have benefitted from discussions with Katherine Baldiga Coffman, Lucas Coffman, Paul J. Healy, and audience members at the 2016 North American ESA meeting. We thank Liam Bailey, Gus Bradley, Bethany Cady, Anish Ravipati, and Eric Spurlino for their research assistance. An earlier version of this paper was circulated under the title "Team vs. Individual Behavior with Non-Binding Commitments." Opinions, findings, conclusions or recommendations offered here are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Economic transactions are often characterized by imperfectly observable actions. These unobservable actions, and the lack of trust surrounding them, can prevent potentially profitable partnerships from being formed in one-off interactions (Bolton and Dewatripont, 2004). However, non-binding communication can lead to more efficient outcomes, even with unobservable actions, when economic agents are motivated to fulfill their commitments. A large literature with individual decision makers has shown that non-binding communication increases cooperation in one-off transactions of this sort (Charness and Dufwenberg 2006, Vanberg 2008, Ellingsen et al. 2010, Ederer and Stremitzer 2016, Ismayilov and Potters 2016, Schwartz et al. 2014, Bhattacharya and Sengupta 2017). However, much of the time economic interactions are not the result of individual decision-making. In most organizations, promises are made in the name of the larger organization, in which case when individuals make promises they are acting as part of a larger team.

This paper aims to close this gap by comparing individuals and two-person teams in a hidden-action trust game. This is important since if decision making by individuals and teams differs substantially, false inferences may be drawn from experiments using individuals as decision makers, as results may not apply to groups.[1] In addition, employing two-person teams as decision makers allows us to record within-team conversations providing insight into the motivation for meeting (or failing to meet) non-binding commitments.

As the title of the paper indicates, with communication teams make non-binding promises to cooperate at about the same rate as individuals (78% versus 73% for individuals, $p = 0.33$). However, while individuals fulfill these promises 45% of the time, teams do so significantly less often, 26% of the time, not much higher than absent communication (26% versus 21%, $p = 0.35$). Further, while the marginal effect of non-binding promises results in significant increases in cooperation rates for individuals, the marginal effect is essentially zero for teams.

Evidence from within-team conversations shows that, in making commitments, teams first decide whether they want to cooperate or not, and then choose a message to support this decision. When not living up to their commitments, promises are typically designed to induce first movers to trust them in order to earn the higher payoff from reneging, with little argument between

[1] For example, these results for individuals have been used to suggest a more limited need for formal contracts in one-shot transactions than previously thought (Charness and Dufwenberg 2006).

teammates. Most of the time team chats provide little insight into the motivation for fulfilling these promises. But what insight there is indicates teams not wanting to feel "bad" or to "disappoint" the other team.

As note earlier, all hidden action trust games of the sort employed here have used individual subjects. We are aware of two trust games comparing teams to individuals, both of which do not allow communication between agents. Both are "standard" trust games with no hidden action: First movers have a fixed sum of money to distribute between a second mover and themselves. The amount of money sent to the second mover is common knowledge, with the amount doubled or tripled, after which the second mover decides how much to send back. Kugler et al. (2007) compare three-person teams with individuals in this game. The main finding is that teams are less trusting than individuals, as they send less money, but are as trustworthy, giving back the same fraction of the money sent.[2] Song (2008) compares behavior between individuals and group-representatives for three-player teams. She finds that group-representatives are less trusting and less trustworthy than individuals, sending back a smaller percentage of the money sent. Beside the differences in second mover behavior in these two papers, neither looks at the effect of non-binding promises, which is the central issue under study here.

Closer to the present game, in terms of tapping into the same underlying strategic considerations, are simultaneous move, one-shot, prisoner dilemma games comparing teams with individuals with and without communication, reported in the psychology literature (Insko et al., 1993; Schopler et al., 1993). These experiments typically employ open ended, face-to-face communication for a fixed period of time, compared to the limited, anonymous, and one-sided communication in the present experiment.[3] Using financial incentives, communication increases cooperation significantly for individuals but not for teams, quite similar to the results reported here. This will be discussed in more detail below.

The structure of the paper is as follows: Section I outlines the experimental design and procedures. Results comparing individuals and teams with and without communication are reported in Section II. Section III analyzes the team discussions to better understand the basis for

[2] Note that in both cases the average amount returned is *less* than the amount of money sent.
[3] Cooper and Kühn (2014) show that for individuals, unrestricted two-way communication leads to substantially higher cooperation rates than either limited or one-sided communication.

the behavior reported in the team communication treatment. The paper ends with a brief summary of results reported and possible extensions of this line of research.

I. Experimental Design and Procedures

Choices and payoffs, shown in Figure 1, are the same as in Charness and Dufwenberg (2006). As move first, deciding between In or Out. Out is a "safe" action, guaranteeing $5 to both players. A's payoff for In depends on B's choice, with expected earnings greater than $5 if B cooperates (Rolls), and $0 if not. Participants played 5 periods of the same game with perfect stranger matching and no feedback regarding outcomes until the last period.[4] Roles were held constant throughout a session, with one period chosen randomly to determine earnings (along with a $5 show-up fee). At the end of a session, participants learned the payoff they would have received in each of the 5 periods, along with the randomly selected period determining their payoff. Subjects were told that they would not learn whether the chance move was a "Success" or a "Failure", so that As could not attribute a $0 payoff to B choosing Don't Roll.

One treatment used individual decision makers for both A and B Player, to serve as a control against which to evaluate team outcomes. The second used two-person teams who were required to coordinate their actions. Team composition remained the same for all 5 periods.[5] Teammates did not know each other's identity, sitting at separate computer terminals and communicating with each other through a continuously-available chat box. Teams were required to reach agreement on all decisions, with the message protocol structured to allow input from both team members. Each team member received the payoff at the node of the game tree for the one, randomly selected, payoff period. There were no restrictions on the within-team discussions, except to refrain from using profanity and not to identify themselves in any way.[6]

[4] Given the perfect stranger matching protocol, predictions are the same as choosing for a single round.
[5] Teams were referred to as group A or group B in the instructions and on their computer screens so as to minimize rivalrous tendencies.
[6] Chat analysis indicates subjects generally followed these instructions, with the exception of a few subjects disclosing minor identifying characteristics; e.g., their major and class schedule.

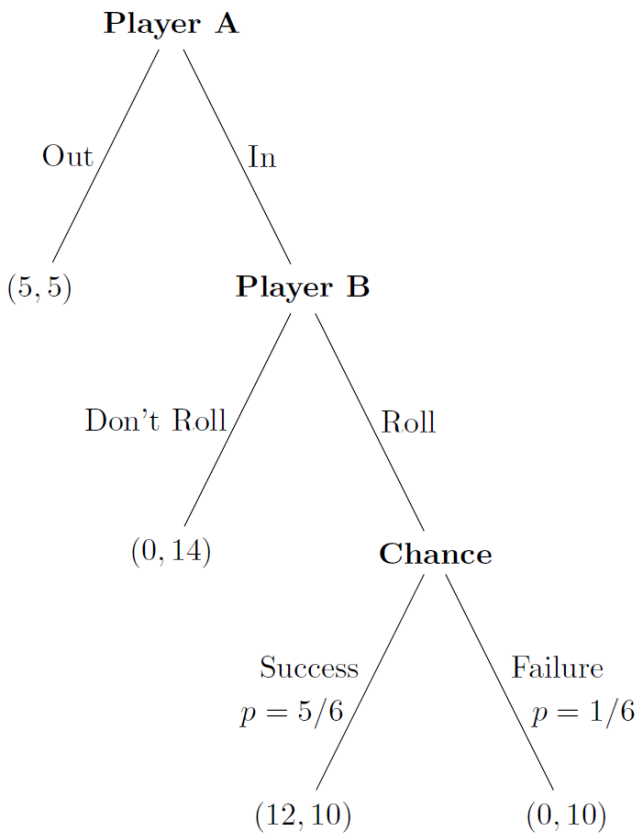

Figure 1: Game Tree: As move first. Bs choose second not knowing As' choices. Chance follows a decision to Roll with the outcome randomly determined. (As' payoffs listed first, Bs' second.)

Each treatment had several sessions with no communication and a similar number with communication---a between-subject design with no overlap between subjects. In the no communication treatments, participants played the game exactly as shown in the game tree. All As decided In or Out, followed by Bs deciding Roll or Don't Roll without seeing As' choice, with the chance move computerized. In the communication treatment, Bs had the opportunity to send a single free-form typed message to the A they were paired with *before* A decided In or Out. After that, decisions proceeded as in the no communication treatment.

In the team communication treatment, Bs had 2 minutes to reach agreement on their message. Neither teams nor individuals were required to send a message and were explicitly told that they could leave the message blank or write "No Message". To give both teammates input into the message content, either member could initially propose a message, with their teammate choosing to accept or reject it. If teammates agreed on the message it was sent after the 2 minutes expired. If they failed to agree on a message within the 2 minute time limit, one member was

randomly selected and given 30 seconds to write a message on behalf of the team (with the chat box turned off).[7] While the B teams decided on what message to send, A teams had 2 minutes to freely chat with each other.

After all B teams had decided on their messages, they were delivered to their respective A team, with As having 1 minute to decide on In or Out. Teammates were required to agree on their decision, and if no agreement was reached, one teammate was randomly selected to make the decision on behalf of the team (with the chat box turned off).[8] While As decided between In or Out, Bs were able to continue their discussions. After all As made their decisions, Bs had 1 minute to reach agreement whether to Roll or Don't Roll (without knowing A's choice). If Bs could not reach agreement, one member of the team was randomly chosen to make that decision (with the chat box turned off).[9]

In the no communication treatment, the message stage was omitted but decision times and disagreement options were the same as in the communication treatment. Procedures were essentially the same for the individual sessions with communication, except individuals were given only 1 minute to write messages.

The experiment was programmed and conducted using z-Tree (Fischbacher, 2007). Subjects were primarily from the undergraduate student population at the Ohio State University, recruited through ORSEE (Greiner, 2004). Sessions lasted under 1 hour, with payments averaging $11.50 per subject in the team sessions and $13 per subject in the individual sessions, including a $5 show-up fee.[10]

There were 4 individual subject sessions without communication with 38 pairs of A and B players, and 4 sessions with communication for a total of 42 pairs of A and B players. The corresponding numbers for the team treatment were 7 sessions for a total of 37 pairs of A and B teams without communication, and 7 sessions with communication for a total of 40 pairs of A and B teams.[11] The statistical analysis is based on decisions at the individual- or team-level and, unless stated otherwise, taking averages of choices over the five periods.

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[7] This happened in 20 out of the 40 first periods. However, within-team conversations indicate that, in most of these cases, teammates had already agreed on the message to send.
[8] This happened in 7 of the 375 decisions, with 5 of these occurring in Period 1.
[9] This happened in 3 out of the 375 decisions.
[10] In the team sessions, each member of the team received the team payoff; e.g., if an A team stayed out, they both would earn $5.00.
[11] With teams and perfect stranger matching, team sessions required 20 subjects. In two of the team sessions without communication 19 subjects showed up so that a single experimenter sat in as the second team member. In these

II Experimental Results

Effects of Communication on Cooperation: The left hand panel of Figure 2 reports the impact of communication on cooperation rates for individuals, with tests for statistical significance reported in the top row of Table 1. In rates increased from 50% to 64% for individuals with communication ($p = 0.06$ based on a two-tailed Wilcoxon rank-sum test statistic).[12] Roll rates increased a bit more, from 26% to 45% ($p < 0.05$). These increases are similar to those reported in CD, although the baseline (no communication) Roll rates are lower here.[13]

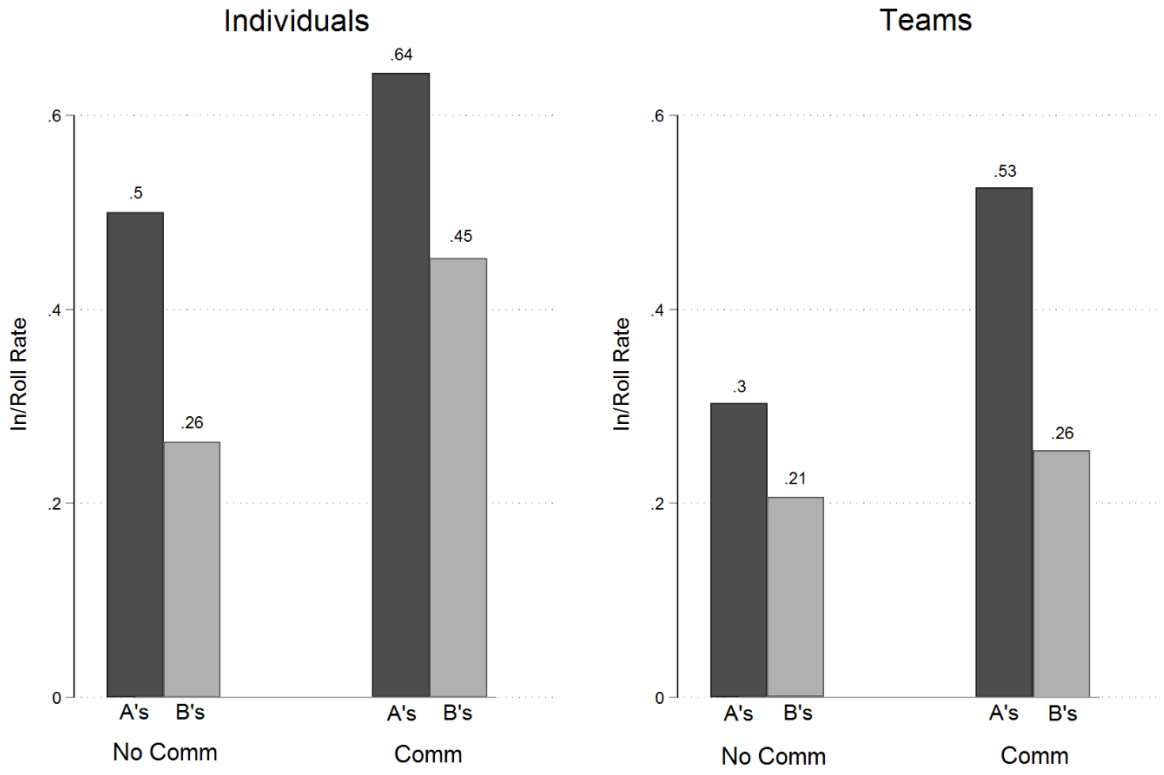

Figure 2: Communication versus No communication: Comparing Teams and Individuals for In and Roll Rates

The impact of communication on cooperation rates for teams is another matter (the second panel of Figure 2, and the second row of Table 1). While communication significantly increased teams' In rates from 30% to 53% ($p < 0.01$), it had no significant impact on Roll rates, an increase

instances, the experimenter told her partner she was the experimenter and would go along with all of her partner's decisions. In both sessions, the experimenter was assigned to an A team. These two A teams are dropped from the analysis.

[12] Two tailed Wilcoxon sign tests will be used unless indicated otherwise.

[13] In CD, the increase in In and Roll rates with communication were 18% and 23% respectively. Baseline (no communication) In and Roll rates were 56% and 44% in CD.

from 21% to 26% (p = 0.35). So whereas communication increased In rates more for teams than for individuals, the increase in Roll rates was substantially less.

Table 1: Tests for Effects of Communication on Promise Keeping

	A's *In* Rate			B's *Roll* Rate		
	With Comm	No Comm	Diff C-NC	With Comm	No Comm	Diff C-NC
Individuals	64%	50%	14%*	45%	26%	19%**
Teams	53%	30%	23%***	26%	21%	5%
Diff Ind – Tm	11%	20%**	---	19%**	5%	

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Unit of observation is at the individual or team level.

Conclusion 1: Communication enhances cooperation rates on the part of first movers (A players) for both teams and individuals and, if anything, more so for teams. Communication increases cooperation rates on the part of second movers (B players) for individuals but has only a small, statistically insignificant increase on Roll rates for teams.

Without communication, teams are significantly less trusting than individuals, consistent with the results reported in Kugler et al. (2007) and Song (2008). However, there are no significant differences in Roll rates, indicating that teams are equally trustworthy. The latter is consistent with the results reported in Kugler et al., but contrary to Song's results. Note that very little is returned in these standard trust games, so that on average first movers would be better off not sending any money. That is, teams and individuals are equally trustworthy in these standard trust games, but on average both are not very trustworthy.[14]

In what follows, the focus is on the effect of communication on As' In rates and how Bs' messages correlate with their decision to Roll or not. In addition, the within-team chats were coded with a view to better understanding As' decisions to choose In and Bs' decisions to Roll.

[14] For both teams and individuals, on average sending all of one's endowment results in an *equal* amount of money being returned so that first movers break even. Sending less than the full endowment does not pay (Kugler et al., 2007; similar results for individuals are reported in Pillutla, Malhotra, and Murnighan, 2003; Sutter and Kocher, 2007).

Messages and Their Impact: Bs' messages were placed in one of four categories: Strong Promise, Weak Promise, Empty Talk, and No Message.[15] To remove experimenter bias, two undergraduate students, neither of whom participated in the experiment, coded the messages after receiving a brief description and examples of each of the categories. A message was classified as a Strong Promise if the sender clearly promised to Roll. A Weak Promise consisted of a less direct statement of intent, or reference to, choosing Roll. Empty Talk were messages unrelated to the game, and No Message was reserved for blank messages or messages where the sender wrote "No Message". Examples of these categories, along with the frequency with which these messages were sent are reported in Table 2 below. The agreement rate between coders was 94%.[16]

Although subjects were free to send whatever message they wished, and the experimenters never mentioned promises, over 50% of the messages consisted of a Strong Promise to Roll for both teams and individuals. Combining Weak and Strong Promises, 73% and 78% of all messages were classified as Promises for individuals and teams, respectively. In what follows, "Promise" refers to Strong and Weak promises combined, with the modifier Strong or Weak used when distinguishing between the two. Table 3 shows In rates conditional on the type of message received along with In rates for the no communication sessions (bottom of Table 3). With communication the largest difference between teams and individuals is with respect to Strong Promises.[17]

Table 2

Message frequencies across treatments

	Individuals	Teams	Examples
	Percentage	Percentage	
Strong Promise	57%	53%	"We will choose ROLL"
Weak Promise	16%	25%	"It would be wise to choose In"
Empty Talk	5%	5%	"Hi!"
No Message	22%	18%	

[15] These categories are based on Houser and Xiao (2010) who reanalyzed the CD data using these four categories.
[16] Disagreements were confined to distinguishing between Strong and Weak Promises.
[17] The average frequency for Strong and Weak Promises combined is 74% for individuals versus 60% for teams (p=0.09).

Table 3
Frequency As' Chose In Conditional on Message Received.

	Individuals	Teams	Difference (Individ-Team)	p-value[a]
Strong Promise	72%	58%	14%	(0.08)
Weak Promise	72%	63%	9%	(0.37)
Empty Talk	22%	10%	12%	(0.48)
No Message	35%	35%	0%	(0.94)
No Communication	50%	30%	20%	(0.02)

[a] p-values are for comparing teams with individuals within each category based on a Wilcoxon rank-sum test using subject averages as the unit of observation.

Table 4 reports the marginal effects of the messages sent on In rates, relative to the no communication sessions. The dependent variable is equal to 1 when first movers chose In (0, otherwise), with separate dummy variables (= 1, 0 otherwise) for each of the four message categories. Standard errors are clustered at the subject or team level. Separate probits are reported for teams and individuals.

Table 4
Marginal Rates for In
(standard errors in parentheses)

VARIABLES	Individuals	Teams
Strong Promise	0.241***	0.283***
	(0.08)	(0.09)
Weak Promise	0.266***	0.292***
	(0.10)	(0.10)
Empty Talk	-0.188	-0.209*
	(0.19)	(0.11)
No Message	-0.135	0.045
	(0.10)	(0.11)
Period	-0.043***	-0.028**
	(0.01)	(0.01)
Observations	400	375

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Error errors are clustered at the individual or team level.

There are relatively strong, positive marginal effects for choosing In following both Strong and Weak Promises for individuals, with no significant differences between the two. The same holds for teams, with essentially no difference in the marginal values compared to individuals. For both teams and individuals the marginal effects of No Message are not significantly different from zero. Empty messages have a negative marginal effect for both teams and individuals, with the former significant at the 10% level.[18] Empty Talk appears to be somewhat suspicious for teams, as the marginal effect is negative and significant at the 10% level.

Conclusion 2: There are strong positive marginal effects on In following both Strong and Weak Promises for both teams and individuals relative to sessions with no communication. These marginal effects are of about the same size for teams and individuals and are not significantly different between the two. Responses to No Message are not significantly different from the no communication sessions.

The period dummies are negative and significant at better than the 5% level for both teams and individuals which, at first blush, seems quite odd. However, the team chats suggest this is a false "end game" effect, most likely resulting from subjects' experience in previous experiments; e.g., "haha maybe we can do in for the first two or three rounds. people tend to be more nice the first several rounds."[19]

Second Movers Actions in Relation to Messages Sent: Table 5 reports the frequency with which B players chose Roll in relation to messages sent. Individuals are far more likely to Roll following a Strong Promise ($p < 0.01$). In contrast, absent communication there are no significant differences in Roll rates between individuals and teams.

[18] When combining Strong and Weak Promises, the coefficient on Promise is 0.247 for individuals ($p < 0.01$) and 0.286 for teams ($p < 0.01$), with Empty Messages not significant in both cases.

[19] The same regressions have been run on different subsets of the data to check if the results are driven by early-round confusion or late-round deterioration of cooperation. Similar results to those reported in Table 4 are observed restricting the analysis to periods 2-5 or 1-4. Quotes from chats are always reported verbatim, hence the poor grammar and spelling at times.

Table 5
Roll Rates Conditional on Message Sent

	Individuals	Teams	Difference (Individ – Team)	p-value[a]
Strong Promise	60%	27%	33%	(< 0.01)
Weak Promise	43%	36%	7%	(0.63)
Empty Talk	37%	14%	23%	(0.18)
No Message	41%	17%	24%	(0.08)
No communication	26%	21%	5%	(0.14)

[a] p-values are for comparing teams with individuals within each category based on a Wilcoxon rank-sum test using subject averages as the unit of observation.

Table 6 reports a probit, similar to the one reported in Table 4, where again, the no communication treatment serves as the reference point. Consistent with the results reported in Table 1 and Figure 2, Strong Promises have a large and statistically significant positive effect on Roll rates for individuals, but not for teams. The marginal effect of Weak Promises is negligible, and not significant in both cases.[20] Once again the period variable is negative so that second movers are subject to this false "end game" effect as well.

Conclusion 3: While individuals are more likely to Roll and cooperate following a promise to do so, the same is not true for teams. Teams are equally willing to make promises, but follow through on them at much lower rates.

There is a strong similarity between the results reported here and results from simultaneous move, one-shot, prisoner dilemma games in the psychology literature (see, for example, Insko et al., 1993 and Wildschut and Insko, 2007 for a survey of this literature). In those experiments there are hidden actions (as choices are made simultaneously) with mutual benefits from cooperation, both with and without communication. Communication also increases joint cooperation by a substantial and significant amount for individuals, but not for teams.[21] The difference in

[20] When combining Strong and Weak Promises, the coefficient on Promise is 0.224 (p=0.01) for Individuals and 0.0767 (p=0.37) for Teams, with Empty Message insignificant in both treatments.
[21] This experiment used financial payoffs and written communication. The standard PD matrix is modified to allow a "withdrawal" option – a perfectly safe payoff intermediate between the cooperative outcome and the "sucker" payoff (a maxi-min option).

cooperation rates between teams and individuals is attributed to the fact that "… groups provide their members with support for acting in a self-benefiting manner, whereas individuals have no such support. Social support is important because it helps to overcome pressure from three norms, equity, equality and reciprocity." (Insko et al., 1993, p. 115).

Table 6
Marginal Roll Rates
(Standard errors in parentheses)

VARIABLES	Individuals	Teams
Strong Promise	0.269***	0.055
	(0.10)	(0.09)
Weak Promise	0.067	0.122
	(0.13)	(0.11)
Empty Talk	0.147	-0.115
	(0.16)	(0.11)
No Message	0.078	-0.025
	(0.12)	(0.10)
Period	-0.052***	-0.036**
	(0.01)	(0.01)
Observations	400	385

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Error errors are clustered at the individual or team level.

Benefits (or the lack thereof) from Choosing In: Cooperation rates are far from the subgame perfect Nash equilibrium (SPNE) prediction (Out, Don't Roll) both with and without communication. A natural question is whether Roll rates were high enough that it paid for As' to deviate from the SPNE. With no communication, the (ex post) expected payoff for In was $2.60 for individuals and $2.10 for teams, so that in both cases it did not pay to choose In. With communication this increased to $5.50 for individuals following a Promise, making In an empirical best response. The expected return for In was $3.20 following a Promise to Roll for teams, less than the return for choosing Out.

III Analysis of Team Chats

Within-team discussions were coded and analyzed to better understand the motivation(s) underlying teams' decisions. Procedures were similar to those used for categorizing messages sent: Two undergraduate students read through and independently coded the team chats after first being instructed on the categories of interest. The coding focuses on the motivation for As choosing In along with Bs' motivation to Roll (or not), as discussed in the hidden action trust literature, along with other, insightful, regularities in the team discussions. Where possible, the same categories were also coded for the no communication team sessions to identify what, if any, differences were at work between the two.

A Teams

Coding categories for As, along with the frequency with which they were coded and agreement rates between the two coders, are reported in Table 7. Two sets of numbers are reported: The percentage of teams coded in a given category at least once, and the percentage of periods coded for a given category.[22] Coders were instructed to base their coding strictly on within team discussions for the period in question.[23] Frequencies are based on either coder coding that category, with agreement rates reported in parentheses. Disagreements were rarely about opposite interpretations of what teams were discussing (e.g., one coding A2, the other coding A3 in Table 7), instead typically resulting from one coder's failure to code a given category while the other one did.[24]

For the category "Discuss Message" this could be in anticipation of the type of message they expected to get, or after the actual message was sent. For example prior to A receiving a message "So, should we just go out every time unless they send us a message saying they swear or something?" "yeah, lets just see based on context". And for example after receiving the message "we roll"; "these are terrible messages to incentivize us to actually choose in and roll." "yeah, you'd think they'd try to be a bit more convincing."

[22] For example, for category A1 93% of teams discussed the message in one or more periods, while the frequency of these discussions at the period level was less, 51% of all periods. That is, teams did not always discuss the message sent.

[23] This was done for two reasons: First, while discussions are correlated across periods within a team, As' choice of In is heavily dependent on the type of message received, which changes from one period to the next. Second, history-dependent coding would require making inferences based on discussions in a past periods, which would have resulted in even more subjective coding.

[24] Coders had opposite interpretations only 2% of the time for A2 versus A3 and 7% for A4 versus A5.

Table 7
Coding Frequencies for First Movers (As)
(Agreement rates in parentheses)

	Coding Category Description	Percentage of Teams		Percentage of Periods	
		Comm	No Comm	Comm	No Comm
A1	Discuss Message	93% (0.86)	NA	51% (0.75)	NA
A2	Reasons should believe a Promise	40% (0.38)	NA	14% (0.25)	NA
A3	Reasons not to believe Promise	55% (0.64)	NA	20% (0.38)	NA
A4	Recognize that In is risky, but willing to take a chance	65% (0.50)	40%** (0.57)	19% (0.29)	12%* (0.43)
A5	Recognize that In is risky, but not willing to take a chance	53% (0.43)	74%* (0.69)	15% (0.33)	20% (0.63)
A6	Mentioned what they would do if B team	33% (0.62)	51%* (0.72)	8% (0.56)	11% (0.55)

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Discussions of Promises typically included a rationale for *why* the team should or should not believe the message sent (codes A2 and A3, respectively).[25] Reasons for believing a Promise commonly emphasized that strongly worded statements of intent were more likely to be upheld. For example, after receiving Strong Promise, "Choose IN and we will choose ROLL - combined payment is highest!" the A team remarks "I like this" "these guys… haha …communists" … "but they could also be the biggest thieves here!... im still in".

Reasons to not believe a Promise often involved wariness regarding *any* message B might send: "I feel like B has the power because of the message because they could say that they will choose roll so we choose in and then totally screw us and choose don't roll …lets go out for the rest of the time."

Trust games are inherently risky given that the trustworthiness of the other team is unknown. We coded for instances where a team discusses their willingness to take a chance, or their desire to play it safe (A4 and A5 respectively). Teams wishing to play it safe typically focused on the guaranteed Out payoff: "lets go out for the rest of the time … cause i feel like i would rather have some payout than chancing it for an extra $7". Teams willing to take a chance

[25] Sometimes reasons were given both for and against believing a Promise within the same period, in which case both were coded for.

focused on the much larger reward for In should the other team choose Roll: "should we choose in then? … I guess this is just a trust thing but I'd rather have the chance to make $12 than $5 I think."

A final category coded for is thinking from the B player's point of view. Coding frequencies for these last three categories (A4-A6) are reported for the no communication team sessions as well. There were minimal differences between the communication and no communication team sessions for these categories at the period level.

Table 8 reports a probit to identify which categories significantly impacted A's decision to choose In, and whether their impact was positive or negative. The dependent variable is 1 for choosing In (0 otherwise). Right hand side variables are dummies for Strong and Weak Promises as well as for Empty Talk, which are all evaluated relative to having received No Message. Two specifications are reported, one with dummies for each of categories A1-A3 included, with the second specification including dummies for all six message categories.[26]

With respect to the first specification: Weak and Strong Promises have essentially the same marginal effect on A players choosing In. Empty talk has negative value $p < 0.05$). Discussions about whether to believe the message or not (codes A2 and A3) have the expected signs and are both significant at the 5% level. The dummy for simply discussing the message (whether a Promise or not) is positive but not significant.

Adding in the additional coding categories has a minimal effect on the Strong and Weak Promise dummies. The dummy for discussing the message (A1) is driven close to zero, with minimal change on the marginal effects of believing the message or not (categories A2 and A3).[27] The dummies for willingness to take a chance or not (codes A4 and A5) have the expected signs, with both significant at the 1% level. With respect to what they would do as B players, A teams who would Roll if *they* were B players are significantly more willing to choose In. This is referred to in the psychology literature as "consensus bias" – assuming that others will act in the same way you would (Ross et al., 1977; Krueger and Clement, 1994). However, for teams who would not

[26] In the regression, these categories are only included in cases where A teams actually received a Promise. So the behavior is in response to the promise they actually received for that period.

[27] The most obvious explanation for category A1 driven down close to zero is that the additional message categories capture much of what the Discuss Message dummy picked up in the previous specification. Coders were allowed to code for multiple categories in each period.

Roll as a B player, the coefficient value although negative is not significant, perhaps because of the other variables in the regression (e.g., willingness to take a chance).

Conclusion 4: In addition to whether or not they received a Promise to Roll, a number of factors clearly impacted decisions to choose In. Key among these were their willingness to take a chance or not, and whether they believed the promise or not, all of which is to be expected. In addition, there was a significant, positive marginal effect for those teams who would have Rolled as a B player, but not for those who would not have rolled.

Table 8
Marginal Rates for In
(standard errors in parentheses)

VARIABLES	Communication	Communication
Strong Promise	0.265**	0.314***
	(0.11)	(0.09)
Weak Promise	0.306**	0.350***
	(0.12)	(0.10)
Empty Talk	-0.230**	-0.246***
	(0.11)	(0.08)
Discuss Message	0.102	0.063
	(0.07)	(0.07)
Believe Promise	0.232**	0.238**
	(0.11)	(0.11)
Not Believe Promise	-0.339***	-0.291***
	(0.10)	(0.09)
Period	-0.033*	-0.04**
	(0.02)	(0.02)
Willing to take a Chance		0.434***
		(0.08)
Unwilling to take a Chance		-0.330***
		(0.10)
Would Roll		0.347***
		(0.10)
Would Not Roll		-0.113
		(0.20)
Observations	200	200

***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level

B Team Chats: Coding focused on Bs' decisions to Roll or not and corresponding decisions to send a Promise. While the literature on why individuals keep their promises focuses on expectation-based guilt aversion (CD) or a desire for consistency between their actions and the message sent (Vanberg, 2008), team discussions never explicitly mentioned either of these two

issues in deciding to Roll or not. Given this, the closest we could come to expectation based guilt aversion or a desire for consistency was to code for "feeling bad" or using terms such as "guilt" or being a "bad person" when sending a Promise. This is captured in category B1 in Table 9, and are not limited to when choosing to Roll (see figure 3 below). In addition we coded for teams justification for choosing Roll or Don't Roll (codes B2 and B3). Again, agreement rates are in parentheses.

Table 9
Codes for B teams
(Agreement rates in parentheses)

	Coding Category Description	**Percentage of Teams**		**Percentage of Periods**	
		Comm	No Comm	Comm	No Comm
B1	Feel bad or guilty	33% (0.92)	19% (0.86)	13% (0.72)	6%** (0.75)
B2	Give a justification for choosing Don't Roll	68% (0.56)	54% (0.75)	19% (0.47)	16% (0.62)
B3	Give a justification for choosing Roll	30% (0.17)	27% (0.90)	7% (0.14)	7% (0.77)

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

A probit similar to the one reported for A's choosing In is reported in Table 10. The dependent variable 1 if the B team chose Roll, 0 otherwise. Right hand side variables included dummies for having sent a Promise (combining Strong and Weak Promises), along with the three coding categories in Table 9, and an interaction term for feeling bad/guilty (B1) with the Promise dummy.[28]

Although the coefficient value for the Promise dummy is positive, it is far from significant at conventional levels. [29] The coefficient value for feeling bad (B1) is negative, but again far from significant, with the Promise*Feeling Bad interaction term quite small and not significant.

[28] Empty Message plus No Message serve as the default category. Including interaction effects between the Promise dummy and categories B2 and B3 have no significant impact, which is not surprising given the nature of codes B2 and B3.

[29] A second specification distinguishing between Strong and Weak Promises yields similar results – no significant effect for either Strong or Weak promises in B teams deciding to Roll or not.

Justifications for choosing to Roll or Don't Roll have the expected signs and are both significant at the 1% level.

Table 10
Factors Underlying B Roll Rates.
(Marginal values with standard errors in parentheses)

	Roll
Promise	0.143
	(0.097)
Feel Bad	-0.170
	(0.13)
Promise * Feel Bad	0.162
	(0.14)
Justify Don't Roll	-0.210***
	(0.061)
Justify Roll	0.506***
	(0.15)
Period	-0.051**
	(0.022)
Constant	-0.555
	(0.43)
Observations	200

***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level

Figure 3 provides further data on the lack of a consistent positive relationship between Promises and feeling "bad/ guilty" when choosing to Roll or not. The height of bars shows the frequency of feeling bad/guilty for each of the categories, with the exact frequencies on top of the bars, and numbers below the observations in each category. As the graph concludes, there is no difference in the frequency of feeling bad/guilt whether a team rolls or not following a promise to do so. In addition, there are somewhat higher frequencies of feeling bad/guilty with following an Empty Message compared to a Promise, whether or not Bs' chose to Roll, though differences are not statistically significant ($p>0.29$).

Finally, teams mention feeling bad more in the communication treatment compared to the no communication treatment. On average, teams mention feeling bad 12.5% of the time with

communication compared to 5.9% without communication (p=0.025).[30] This is indicative of the existence of the moral costs associated with Promises whether choosing to Roll or not. Given the opportunity to communicate, teams are more likely to express feeling bad about their decisions. However, when feeling bad/guilty and choosing not to Roll, these costs are not high enough to Roll; e.g., "does that make me a bad person?" "yeah but me too so whatever… worth the guilt".

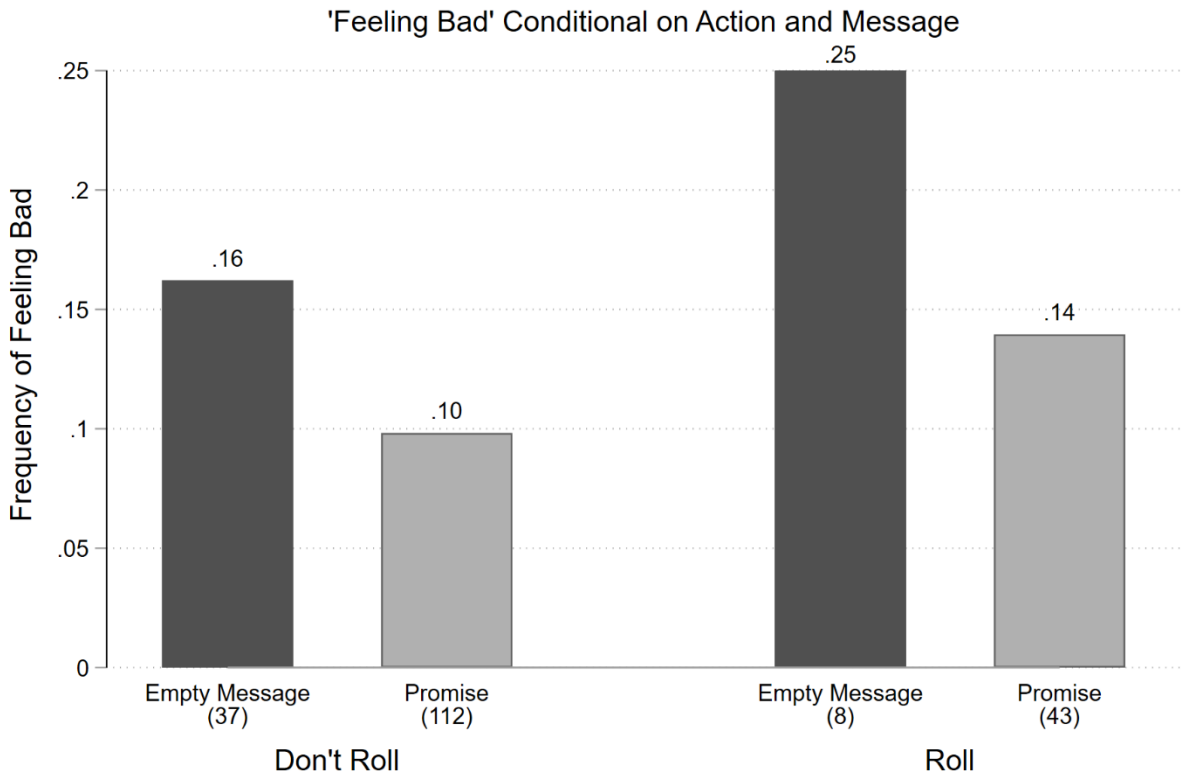

Figure 3: Teams Discussing Guilt/Feeling Bad in relationship to messages sent and actions taken. Number of observations in each cell in parentheses. Exact frequencies at top of bars.

Given the statistical significance of discussions justifying whether to Roll or not, Table 11 provides a sample of team chats coded as justification to Roll or Don't Roll, aimed at providing insight into what underlies decisions to Roll or not. As the Don't Roll sample indicates, the primary justification for choosing Don't Roll is that it makes more money. There is essentially no resistance to this, with the dissolution of moral responsibility often present (see 3 and 5). In choosing to Roll there are a mixture of motives ranging from other regarding preferences (1), to self-regard (see 3

[30] Repeating this calculation at the team level as opposed to the period level the numbers are 32.5% with communication versus 18.9% without (p = .18). However, this has relatively low power given that most teams in both treatments do not express feeling bad/guilty.

- not "feeling slimy"), and feeling "bad" (2) or not wanting to "disappoint" the A group (4). Note that all four of these cases were coded as feeling bad/guilty for the probit in Table 10 and in Figure 3. The justification for this is two-fold: (i) some teams would be classified as expressing other regarding preferences in one trial and feeling bad/guilt in another trial, and (ii) acting against other regarding preferences or self-regard would natural result in feeling bad/guilty.[31]

Team discussions also show that, in most cases, the timing of Bs' decisions in the communication treatment involved first deciding on what action to take and then discussing what message to send. For example, a team that decided not to Roll: "we should definitely not roll" "Hello! I agree" "should we write them a message?" "however, we should tell the other group that (we will Roll) since we have an 80% shot at getting the 12/10 thats what we want (parentheses added)" Teams that decided to Roll did much the same.[32]

This timing is consistent with the idea that a Promise to Roll, followed by a choice of Don't Roll, is explicitly designed to get the other team to choose In in order to get the higher payoff. Further support for this come from agents' beliefs which were collected in later sessions. Beliefs for rounds 4 and 5 were incentivized and elicited at the end of the experiment.[33] Participants were shown the message sent or received in each round and asked to state their beliefs. Team members had 2 minutes to discuss and report a single number representing the team's belief.

[31] Not included here are the many times Bs recognize that As have the short-end of the stick, as this simply involves a recognition of the situation without passing any judgement on it: "Sucks that people in group A might only leave with $5 … What would you think about lying" "suxs to be a". And another time "We got super lucky and rolled B group" ... "yeah group A definitely was unlucky"

[32] For example: "What are your thoughts?" "I think we'd better choose to cooperate" "What should our message say?"

[33] As received $2 for their belief report using a BDM procedure (complete elicitation instructions can be found in the Appendix). Bs' received a $2 bonus if their guess exactly matched As' report.

Table 11: Justifications for Choosing Roll or Don't Roll

Justifications for choosing to Roll (and Rolling):

1. 1153: I think we should actually go with dont roll that way we will make the 14, since we wont be partnered with them anymore and they wont know what we pick. But if we want to be nice to them we could choose roll and just take the 10

2. 1165: As a B group, we should choose dont roll every time
   1165: Right???
   1165: Sup man
   1171: true unless we feel bad for the a group then we might as well roll

3. 961: I say we go ROLL each time
   964: hi i think we should choose DONT ROLL actually, as we will have a higher payoff …
   961: I think it's also super slimy to screw them over after they gave us a chance to earn money. They could just hit "OUT" but instead decided to trust that we would be nicer.
   964: i see. we can try that.

4. 906: What do you think?
   904: I bet they won't in actually...but I prefer to roll
   …
   906: we either get 5 or 14 no matter what if we say don't roll instead of 5 or 10
   904: yes, but I just don't like to disappoint As if they choose to trust us.

Justifications for choosing Don't Roll (and not Rolling)

1. 412: Since we are in the B group, it is in our best interest to select don't roll for every round, but we want our a group to select in
   421: Yea i agree

2. 406: either way if we choose don't roll everytime we either get $5 or $14

3. 420: Go for the same thing (Don't Roll)?
   406: yea … if you're fine with it still
   420: Yea I mean it's more money haha

4. 514: roll?
   509: I say don't roll, we can make more money. That way were gauranteed 5, but can get 14
   514: cool

5. 51: I feel bad being deceptive tho lol (after Promising to Roll and choosing not to)
   68: Yeah same. Next time we could choose roll and tell them to choose in
   51: Sounds good

Table 12 reports these results.[34] Replicating CD's results, for individuals communication increases As' belief that B's will choose Roll, as well as Bs' second-order beliefs that in making a Promise As would be more likely to believe that Bs will Roll. Communication also increases first- and second-order beliefs in teams: As expect Bs to choose Roll with a higher probability (43% vs 22%, $p = 0.056$) with communication than without. Bs' correctly anticipate this effect, reporting higher second-order beliefs with communication than without (58% vs 19%, $p < 0.01$). In addition, there are no significant differences in Bs' second-order beliefs for teams versus individuals with communication (58% versus 63%, $p = 0.5$). In short, B teams not only expect their messages to be meaningful to the A teams, but their expectations are just as high as for B individuals.

Table 12

Tests for Effects of Communication on First and Second Order Beliefs

	A's First Order Beliefs			B's Second Order Beliefs		
	Comm	No Comm	Diff C-NC	Comm	No Comm	Diff C-Nc
Individuals	64%	38%	(<0.01)	63%	29%	(< 0.01)
Teams	43%	22%	(0.06)	58%	19%	(<0.01)
Diff Ind - Tm	(0.05)	(0.03)	---	(0.50)	(0.08)	

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Conclusion 5: Teams promise to Roll at essentially the same rate, regardless of whether they actually Roll or not (84% when Rolling, 75% when not Rolling). Expressions of "guilt" or "feeling bad" occur at low rates, with essentially the same rate regardless of whether teams Roll or Don't Roll. The primary justification for choosing Don't Roll is to make more money. Justifications for choosing to Roll involve feeling bad/guilty. Teams typically decide on their actions first and then whether to Roll or not, with Promises to Roll followed by Don't Roll designed to get A teams to choose In, thereby making more money when they Don't Roll.

IV Summary and Conclusions

This experiment explores the differences between two-person teams and individuals in a one-shot, hidden action trust game with and without communication. The main takeaway is that

[34] Data were collected for 2 team sessions and 1 individual session with communication and for all sessions in the no communication sessions. These were not collected for all sessions as we had hoped that the within team discussions would provide explicit statements to this effect, but this did not materialize.

the large literature on the positive effects of non-binding communication for individuals fails to hold for two-person groups. This result is important since much of the time economic interactions are *not* the result of individual decision-making, but result from group decisions, or individuals acting on behalf of a larger group. As such it's important to determine if the same results hold for groups. For example, the high cooperation rates observed for teams in these games has been used to suggest a more limited need for formal contracts than previously discussed in the economics literature (Charness and Dufwenberg, 2006). While this is consistent with the data for individuals, this experiment shows that it is not likely to be true for teams.

One unanswered question is why do these high cooperation rates hold for individuals but not for groups? The social psychology literature would explain these results based on the strong social norms for individuals to live up to their promises (at least in Western economic culture). In contrast, groups provide their members with support for acting in a self-benefiting manner, whereas individuals have no such support (Insko et al., 1993; Wildschut and Insko, 2007). There is direct support for the second part of this argument, as in the many cases where teams Promise to Roll but do not, the clear motivation is to obtain the higher payoff from inducing first movers to choose In, with little regard for the negative impact on their payoffs. In addition, there is typically support for these suggestions on the part of one's teammate, and rarely argued against.

There is strong outside support for the role of social norms in promoting cooperation for individuals. Ismayalov and Potters (2016) employed a hidden action trust game using the same payoffs as here. As part of their experimental design they have one treatment where Bs can send Promises and a control treatment in which second movers could send messages, but were not allowed to make Promises. Bs' Roll rates were 54% when sending a Promise versus 52% under restricted communication.[35] Kagel (2018) studied a finitely repeated prisoner's dilemma game with the opportunity for unrestricted communication prior to each round of play. Absent communication, with experience, there is essentially no cooperation in the last stage game. However, with communication cooperation rates in the last stage game averaged 43% over the last three super-games with communication versus less than 1% with no communication. These results are indicative of the strong tendency for communication alone to generate cooperation between individuals.

[35] This is conditional on the messages being delivered.

There are a number of interesting questions left unanswered from the present experiment. Why, if teams commonly fail to live up to their Promises, do first movers fail to anticipate this? One explanation from the team chats is that first movers are willing to "take a chance" given the low return for choosing Out compared to In. Would this survive with a larger payoff for Out with comparable risk for choosing In? What happens when comparing teams with individuals in repeated play games where there are multiple equilibria ranging from always defect to high levels of cooperation over time? Will similar differences between teams and individuals be expressed in games with multiple equilibria of this sort? Exploring these issues goes well beyond the scope of the present paper.

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Instructions for the Team Communication treatment. Instructions for other treatments were modified accordingly. Italicized text was read aloud by experimenter with screenshots as a visual aid.

INSTRUCTIONS

Thank you for participating in today's experiment. Please put away your cell phones and listen carefully as we go through the instructions.
This is an experiment in the economics of decision making. The National Science Foundation and the Ohio State University have provided the funds for this research. Feel free to ask questions while we go over the instructions. Please do not speak with any other participants during the experiment and do not take out your cell phones.

GROUP FORMATION

1. In this experiment, you will be asked to make decisions over several rounds. Decisions will be made by two person groups. Your group will consist of you and one other person in the room that you have been randomly paired with. The two of you will be in the SAME group throughout today's session. There are two types of Groups involved in each round – Group "**A**" and Group "**B.**" **A**'s and **B**'s will be randomly matched together in each round (more on this below). The amount of money you will earn depends on the decisions made by your Group and the Group you're matched with.

2. Your assignment as an **A** or **B** group will be determined randomly at the start of the session, and will be the SAME in all rounds.

3. In each round, **A** and **B** Groups will be randomly matched. The computer matches Groups in such a way that no **A** Group will ever be matched with the same **B** Group more than once, and vice versa. The Group you are matched with in the current round is called your "matched group." This means that your matched group will be DIFFERENT in every round.

4. To help each group coordinate their decisions, you will have an on-screen chat box where you can send text back and forth to one another, like an instant messaging system. This chat box is only for you and the other member of your group -- no other participants will be able to see your chat.

   In communicating with each other we request that you follow two simple rules: (1) Be civil to one another and don't use profanity, and (2) Do not identify yourself IN ANY WAY. This chat service is intended for discussion and coordination on decisions and should be used as such.

EXPERIMENT OVERVIEW

5. Group **A** Decision:
   - In each round, **A**'s will see a decision screen indicating whether they want to choose IN or OUT. If Group **A** chooses OUT, they and the **B** Group they have been matched with will receive $5. If **A**'s choose IN, the amount of money that Group **A** and Group **B** will receive depends on what Group **B** chooses. (Note, any payments mentioned will go to EACH member of a group – payments are NOT shared between group members.)

6. Group **B** Decision:
   - **B**'s will see a decision screen where they choose ROLL or DON'T ROLL (referring to the roll of a 6-sided die).
   - If Group **A** has chosen IN and Group **B** chooses DON'T ROLL, Group **B** receives $14 and Group **A** receives $0.
   - If Group **A** has chosen IN and Group **B** chooses ROLL, Group **B** receives $10 and the computer will roll a six-sided die to determine Group **A**'s payoff.
     - If the die comes up 2-6, Group **A** receives $12.
     - If the die comes up 1, Group **A** receives $0
     - Note the computer will be rolling the die – that is using a random number generator to determine which number between 1 and 6 will be drawn. Each number is equally likely to be drawn.
   - If Group **A** has chosen OUT, both Group **A** and Group **B** will receive $5 regardless of whether Group **B** chooses ROLL or DON'T ROLL.
     - When Group **B** makes their choice, they will not know whether Group **A** has chosen IN or OUT (this is referred to as the "strategy" method). However, since Group **B**'s decision is binding only if the **A** they have been matched with has chosen IN, we ask **B**'s to presume, for the purpose of making their decision, that **A** has chosen IN.

Payoffs are summarized in the chart below and will be available on your computer screens for reference throughout the experiment:

	Each member of Group A Receives	Each member of Group B Receives
A chooses OUT	$5	$5
A chooses IN, B chooses DON'T ROLL	$0	$14
A chooses IN, B chooses ROLL, die=1	$0	$10
A chooses IN, B chooses ROLL, die= 2,3,4,5, or 6	$12	$10

7. Prior to Group **A** making their decision on IN or OUT, the **B** Group they have been matched with has the option to send a message to Group **A** via the computer terminal. In these messages, Group **B** is not allowed to identify themselves IN ANY WAY. Other than this restriction, **B** may send anything they wish in this message.

TIMING

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8. The sequence of the experiment will work as follows:

   First, **B** Groups will send a message to the **A** Group they have been matched with.

   After receiving **B**'s message, **A** Groups will decide whether they are IN or OUT.

   After **A**'s decide IN or OUT, **B** Groups will decide ROLL or DON'T ROLL

   Now, we will go over the specifics of how you will make these decisions. While we do this, I will show you what your computer screens will look like in these different stages.

MESSAGE STAGE

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9. **B** Groups will have 2 minutes to decide on whether they want to send a message and, if so, what the message will say. As a Group, the two of you must agree on the content of the message. So in order to do that, either group member can propose a message for the other member to review before sending to your matched **A** Group.

   [Put up message proposing screen] *Both members of the B group will see this screen as they decide on their message. On the top of the screen, you see a reminder that you are a B group. Your Group ID is just a number that identifies your group. If the experimenters ever need to get your attention, we will address you by your Group ID. The top of the screen also reminds you which round it is. There is a timer in the upper right corner which tells you how many seconds are left in the stage. You have 2 minutes to decide on your message, so the timer starts at 120.*

(point to payoffs) This box will remind you of the payoffs. This table is the same as the one you have on your instructions sheet.

(point to chat box) This is the chat box where you can communicate with the other person in your group. To send something, first click your mouse into this darker box at the bottom and then type. You have to click "Enter" on the keyboard for your chat to send. Remember, this chat is only for you and the other member of your group. Members of your matched A group cannot see this chat.

(point to message proposing box) You can propose a message by typing it in this box. You must click this "Propose" button for the message to be sent to the other member in your group for review.
[Put up message accept/reject screen] *If the other member of your group proposes a message, you will see the message here along with these two buttons – "Accept and Send" and "Reject and Rewrite."*

If you are in agreement with the proposed message, click the "accept" button, and it will be sent to your matched **A** Group at the end of the message stage. If you don't agree, you can click "reject" and propose another message. Each group member only gets one opportunity to propose a message. If the group members cannot agree on a message within the 2 minutes, one of the members will be randomly selected and he will have 30 seconds to write a message on behalf of the Group. The chat box will be closed during this 30 second period.

If **B**'s do not want to send any message, just type "No Message" or leave the message space blank.

Note that messages from **B**'s will only be delivered after ALL **B** Groups have written their messages.

While **B**'s decide on their messages, **A**'s will be able to chat with each other.

[Put up A message stage screen] *A groups will see this screen while B groups are deciding on their messages. On the top of the screen, you see a reminder that you are an A group, as well as your Group ID, round number, and timer.*

(point to payoffs) Here is the payoff table. It is the same as in your instructions.

(point to message box) The message from the B group will be displayed in this box once it is sent. For now, it just reminds you that B groups are deciding on their messages.

(point to chat box) Here is your chat box where you can communicate with the other person in you're a group. Remember, you have to click "Enter" on the keyboard for you chat to send.

DECISION STAGES

10. **Group A:**

    Once **A**'s receive a message they will have 1 one more minute to decide between IN or OUT.
    [Put up A decision screen] *This is what A groups will see while they make their decisions. (Point to message box) If you matched B group has sent a message, it will show up here. You can use the chat box to coordinate your decision with the other member of your group, and you input your decision here.*
    (Point to decision box) You will indicate your decision where it says "My Decision." When the other member of your group makes a choice and clicks one of these options, you will see that button fill in under the "Partner's Decision" column. Once you and the other member of you group have clicked on the same decision, your decision will be automatically accepted.
    If you cannot come to agreement during the time allotted, the chat box will close and one member will be randomly chosen to make the decision on behalf of the Group.

    Group B:

11. While **A**'s are deciding on IN or OUT, **B**'s will be able to chat with each other. Once ALL the **A** Groups have made their decisions, **B**'s will have an additional minute to choose whether to ROLL or DON'T ROLL.

    [Put up B decision screen] *This is what B groups will see while they make their decisions. (Point to message box) Whatever message you sent will show up here.*
    Remember, you won't know whether your matched Group A has chosen IN or OUT, but you should make your decision as if they chose IN. You can use the chat box to coordinate your decision with the other member of your group, and you input your decision here. Like the A groups, you and the other member of your group must select the same decision, and then it will be automatically recorded.

    Once you have agreed and clicked on the same decision, your decision will automatically be recorded and your decision is binding. If your Group is unable to come to agreement on the decision within the allotted time period, one member will be randomly chosen to make the decision on behalf of the Group.

FEEDBACK & PAYMENT

12. Once all **B** Groups have made their choices, you will proceed immediately to the next round. You will receive NO feedback regarding the choices made in the previous round.

At the end of the session you will get to see a record of your choices and the payoff you would have received in each round.

13. Your payment will be determined by ONE RANDOMLY SELECTED round. Each round you play is equally likely to be the round selected for payment. This means that you should treat each round as if your decisions in that round will directly determine your payment.

SUMMARY

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1. You will be making decisions in Groups. Your Group consists of you and one other person. You will be paired with the SAME person in your group for the entire experiment.
2. Your role as either Group **A** or Group **B** will be the SAME for the entire experiment.
3. In every round, each Group **A** is matched with a DIFFERENT Group **B** (and vice versa). You will never be matched with the same Group more than once.
4. **B**'s will first have an opportunity to send a message to the **A** Group they have been matched with.
5. After these messages have been delivered, Group **A** will decide IN or OUT.
6. After Group **A** has decided on IN or OUT, Group **B** will decide ROLL or DON'T ROLL.
7. The experiment will consist of 5 separate rounds, and you will not receive any feedback between rounds.
8. One randomly selected round will determine your payment. In addition to these earnings, everyone will receive a $5 show-up fee.

QUESTIONS

1. Suppose you are in Group **A** and your group chooses OUT. Your payoff will depend on the decision made by the Group **B** you have been paired with. (True/False) _____

2. If you are a Group **B** member and your group cannot agree on a message to send to your matched Group **A**, then the computer will randomly select you or your partner to write a message on behalf of your group. (True/False) _____

3. Are **B** Groups required to send a message to their matched **A** Group? (Yes/No) _____

4. Suppose you are in a **B** Group. Even though you do not know the choice of your matched **A** Group, your decision to Roll or Not Roll will be binding if the **A** Group chooses IN. (True/False) _____

5. Suppose you are in Group **A**. You will be matched with the same Group **B** in every round. (True/False) _____

   The other member of your group will be the same person in every round. (True/False) _____

6. Suppose you are in Group **B** and the **A** Group you have been matched with chooses IN. If your Group chooses ROLL, 5 out of 6 times you would earn $_____ and the **A** Group you are matched with would earn $_____. In the remaining 1 out of 6 times, you would earn $_____ and the **A** Group you have been matched with would earn $_____.

7. Suppose you are in a **B** Group and your matched **A** Group has chosen IN. If you choose DON'T ROLL, you will earn $_____ and the **A** Group you have been matched with will earn $_____.

ELICITATION INSTRUCTIONS

Instructions for As:

We want to know how likely you think it is that your matched B group chose ROLL in the round just completed. You will have 2 minutes to discuss with the other member of your group and come to agreement on your report.

To tell us how likely you think it is that the B group chose Roll, you can report any number from 0 to 100. If you report 100, this means that your group thinks the B group chose Roll with 100% chance, or that the B group *definitely did* choose Roll. If you report 0, this means that your group thinks the B group chose Roll with 0% chance, or that the B group *definitely did not* choose Roll. If you report 65, this means that you think there's a 65% chance the B group chose Roll, and so on.

You will enter your report into the box on your screen, and then click the "Check Agreement" button. The computer will then update your input and check it against the input made by the other member of your group. The computer will automatically accept the numbers when they are the same, but will not allow you to move on until you have reached agreement. You must click the "Check Agreement" button after you enter a number.

After this, we will also ask you to report how likely you think it was that your matched group from Round 4 chose Roll. As you are entering your reports, we will remind you of the message B sent to you in Round 4 and Round 5. We will randomly pick one of these two rounds to pay you your bonus payment. You will not be paid for the same round as the computer chooses to pay for your decision.

Payment:

We will pay you a bonus payment based on one of your reports, and the exact way your payment is determined is listed below. The payment scheme might look a little complicated, but it was specifically designed so that you will have the highest expected payment by reporting <u>what you really think</u>. Once you submit your report for the bonus round randomly chosen for payment, the computer will generate a random number between 0 and 100. If the number is smaller than your report, you will be paid $2 if the B group chose Roll and you will be paid $0 if the B group chose Don't Roll. If the random number is larger than your report, you will be paid $2 with probability equal to the random number chosen, and you will be paid $0 otherwise.

For example, let's say that the computer chooses to pay for your report from Round 5, and the computer chooses the random number 72. If your report is any number 0-72, you will be paid $2 if the B group chose Roll and you will be paid $0 if the B group chose Don't Roll. If your report is any number 73-100, the computer will generate another random number. If this second number is less than 72, you will receive $2. If the second number is greater than 72, you will receive $0. Again, this payment ensures that you can't do any better off by reporting a number different from what you really think. So your group should decide how likely you think it is that the B group chose Roll, and then report that number.

Instructions for Bs:

We want to know what you think your matched A group thought about your decisions. In particular, we want to know what you think your matched A group will report as the likelihood that you chose Roll. The A groups that you were matched with in Round 4 and Round 5 will be submitting their reports, and we will ask you to guess what their report is. You will have 2 minutes to come to agreement on your guess of the A group's report from that round. We will remind you of the messages you sent to A in Round 4 and Round 5 as you guess A's report. Again, their report can be any number 0-100, so your guess of their report can be any number 0-100. If you report a small number, that means you think the A Group thought it's not very likely that you would choose Roll. If you report a large number, that means you think the A Group thought it's very likely that you would choose Roll. Like the A groups, you will be paid for your

guess in such a way that you have no incentive to lie. So you should think about how likely you think the A group thought it was that you would choose Roll, and then just report that guess. You will enter your guess into the box on your screen, and click the “Check Agreement” button. The computer will then update your input and check it against the input made by the other member of your group. The computer will automatically accept the numbers when they are the same, but will not allow you to move on until you have reached agreement.

Payment:

You will receive $2 if your guess is correct, and you will receive $0 otherwise. We will randomly pick one of these two rounds to pay you your bonus payment. You will not be paid for the same round as the computer chooses to pay for your decision.

Remaining Time [sec]: 111

You are in Group B	Group ID: B 1	Round 1 of 5

	A payoff	B payoff
A chooses **OUT**	$5	$5
A chooses **IN** , B chooses **DON'T ROLL**	$0	$14
A chooses **IN** , B chooses **ROLL** , die=1	$0	$10
A chooses **IN** , B chooses **ROLL** , die= 2,3,4,5, or 6	$12	$10

Chat Box

Press **ENTER** on the keyboard after you type for chat to be delivered

You: Hey
Partner: Hi

Message

You may propose a message for your partner to review.

Propose

Remaining Time [sec]: 87

You are in Group B	Group ID: B 1	Round 1 of 5

	A payoff	B payoff
A chooses **OUT**	$5	$5
A chooses **IN** , B chooses **DON'T ROLL**	$0	$14
A chooses **IN** , B chooses **ROLL** , die=1	$0	$10
A chooses **IN** , B chooses **ROLL** , die= 2,3,4,5, or 6	$12	$10

Chat Box

Press **ENTER** on the keyboard after you type for chat to be delivered

Partner: Hey
You: Hi

Message

Your partner has proposed the following message:

This is a message from Group B.

- Accept and Send
- Reject and Rewrite

Remaining Time [sec]: 75

You are in Group A	Group ID: A 1	Round 1 of 5

	A payoff	B payoff
A chooses **OUT**	$5	$5
A chooses **IN** , B chooses **DON'T ROLL**	$0	$14
A chooses **IN** , B chooses **ROLL** , die=1	$0	$10
A chooses **IN** , B chooses **ROLL** , die= 2,3,4,5, or 6	$12	$10

Message from Group B:

B Groups are deciding on their messages now.

Chat Box

Press **ENTER** on the keyboard after you type for the message to be delivered

You: Hi

Remaining Time [sec]: 57

You are in Group A	Group ID: A 1	Round 1 of 5

	A payoff	B payoff
A chooses **OUT**	$5	$5
A chooses **IN** , B chooses **DON'T ROLL**	$0	$14
A chooses **IN** , B chooses **ROLL** , die=1	$0	$10
A chooses **IN** , B chooses **ROLL** , die= 2,3,4,5, or 6	$12	$10

Message from Group B:

This is a message from Group B.

Decision

You and your partner must agree on whether to choose "In" or "Out."

My Decision: ○ Out ○ In

Partner's Decision: ○ Out ○ In

Chat Box

Press **ENTER** on the keyboard after you type for the message to be delivered

You: Hi

Remaining Time [sec]: 55

You are in Group B	Group ID: B 1	Round 1 of 5

	A payoff	B payoff
A chooses **OUT**	$5	$5
A chooses **IN** , B chooses **DON'T ROLL**	$0	$14
A chooses **IN** , B chooses **ROLL** , die=1	$0	$10
A chooses **IN** , B chooses **ROLL** , die= 2,3,4,5, or 6	$12	$10

Message sent to Group A:

This is a message from Group B.

Decision

You and your partner must agree on whether to choose "Roll" or "Don't Roll."

My Decision: ○ Don't Roll ○ Roll

Partner's Decision: ○ Don't Roll ○ Roll

Chat Box

Press **ENTER** on the keyboard after you type for the message to be delivered

Partner: Hey
You: Hi