

Conditional trust: sex, race and facial expressions in a trust game.

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We report the results of a series of laboratory experiments that focus on a two-person, sequential trust game. Two persons at different locations are paired for a single play of the game. Participants also complete two risk-assessment instruments: a survey and a decision task. The treatments involve the manipulation of the information available to the subjects about their counterparts. In one treatment, subjects are told the sex of their counterpart along with answers to several preference questions (what is your favorite color?, etc.) In the other, each subject sees a photograph of his/her counterpart. Our two-site design means that we can control the information subjects have about their counterparts without compromising anonymity or deceiving the participants. We conjecture that people are strategic actors whose trusting behavior is conditional on the decision context, including the characteristics of a partner, and we are able to test the effect of observable characteristics on trust and reciprocity. In a second component of the experiment, the photographs are rated by a separate set of subjects using survey items that ask subjects to choose between descriptive word pairs. These items scale into three factors that measure trustworthiness/reliability; friendliness/cooperativeness, and mood. Trusting behavior is significantly related to risk attitudes, friendliness/cooperativeness, race and sex. Reciprocity is related to the trustworthiness of the recipient.

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Introduction.

Economic theory is primarily concerned with interactions among anonymous agents. However, in reality, people pay attention to the characteristics of others when making strategic decisions. People engage in favoritism, nepotism, stereotyping and discrimination, and their interactions are strongly contingent on their observations of others. In this study, we provide subjects with controlled information about their counterparts, and observe the effect of particular characteristics on their behavior in a simple one-shot trust game.

We report the results of a two-phase experiment in which subjects interact with a counterpart at another location. Separate locations guarantee anonymity and preclude post-experiment interaction. However, our setup allows us to selectively reveal information about the players to each other. This setup is relevant for inferring the outcome of initial interactions between strangers, where agents can observe each other but are unlikely to interact in the future.

Motivation.

A persistent finding runs through research on bargaining behavior. Individuals like to meet with their counterparts when negotiating a deal. Diplomats like to meet with their opponents when building a treaty. People feel that they can do better in consummating a deal once they have met with their counterpart. It appears that a face-to-face meeting allows people to get a read on one another in order to assess whether they are trustworthy, whether they may be cooperative or whether they may be hiding their true intention. From the standpoint of game theory, observing one's counterpart should be little more than cheap talk. After all, in a one-shot, sequential game in which one actor first makes a trusting move, any claims made by (or inferred about) the second mover will not be credible. The second mover can always renege on any promise, without penalty to himself. This problem is especially acute for individuals who are strangers and are unlikely ever to interact again (thus removing any need for building a reputation).

Despite the fact that any promises can only be considered as cheap talk, there is a substantial amount of trust among strangers. In many situations there is a substantial potential gain to trust and reciprocity, and therefore a reason to attempt a successful transaction. In this context, the ability to read the intentions of others, especially strangers, is a potentially valuable skill.

The role of intentions in economic behavior has not been ignored by economists. Rabin (1993) develops a model where utility depends not only on actions but also on intentions. However, he makes no effort to model the inference of intentions, but assumes agents know each others' intentions. Several experimental papers examine the ability of agents to infer or signal intentions. The results of Frank, et al., (1993), would seem to indicate that people are able to read the intention to cooperate. (Also see Smith, 1998; Burnham, McCabe and Smith, 2000). The claim here is that there are credible characteristics or signals that can be read by others.

Another theoretical track examines the importance of "inequality aversion" in motivating behavior in bargaining games. Bolton and Ockenfels (2000) and Fehr and Schmidt (1999) develop similar models of inequality aversion. Implicit in both papers is the possibility that

aversion to inequality is contingent on the characteristics of the players (such as wealth, for example), but both approaches stop short of modeling this dependence. In experimental studies, there is substantial heterogeneity among subjects in the degree of inequality aversion. It seems clear that most individuals are concerned about how they fare with respect to their counterparts, but their willingness to accept lower payoff may depend on the relative status of the counterpart. A given individual might care differently about inequality depending on the counterpart. To model the within-subject and across-subject heterogeneity one might need to know the relative status or economic differences and in order to calibrate inequality aversion in a particular game. This might involve understanding the past history of interactions and knowing the reputation of the counterpart, but might also involve the initial judgments of the players.

In studies where subjects appear to read the intentions of another, it is not clear what people read. They might try to draw some inference about the emotional state of their counterpart or they might infer something about the individual based on the population from which the counterpart was drawn. In the first case, looking at an individual's face or body language may give substantial insight into the emotional state of the counterpart and this might translate to a credible signal. In the second case, knowing that one's counterpart is a Caucasian female who is also a student may enable the decision maker to calibrate the likely responses based on prior experience with similar individuals. In either case this requires additional information about the counterpart beyond the payoffs to the game. What is common to these approaches is that people often make a quick decision about others based on some type of signal that can be clearly read and interpreted. That signal must be embedded in some characteristic of the counterpart. What markers are easily observed in a counterpart? Certainly the sex, the race/ethnicity or the emotional state of the counterpart can be observed. Moreover, each of those markers may signal something about the expected behavior of the counterpart. The sex of one's counterpart is certainly important (see Scharleman et al., 2001 and Chaudhuri and Gangadharan, 2002).

Racial or ethnic markers are often used as a way of distinguishing people as belonging to an in-group and an out-group. The minimal group paradigm used by social psychologists shows that it is easy to build differences between groups. Something as simple as assigning individuals to one of two groups that differ only in their color (or giving half the individuals gold stars) can result in substantial differences in cooperative behavior. However, there are many different dimensions across which individuals can distinguish themselves in natural settings. The salience of one's own group, the ease with which groups can be differentiated and the perceived threat of the out-group all strengthen the degree to which in-group and out-group distinctions will be made. (see the survey by Brewer and Brown, 1999). Racial and ethnic markers are very powerful signals for group identity.

Because people over-attribute behavior to type rather than to the situation, it is very easy to rely on stereotyping (Ross and Nesbitt, 1991). Combined with the in-group/out-group tendencies noted above, this leads to hypotheses that people are less likely to trust outsiders, especially when those outsiders are easily identified.

In order to understand the emotional state of an individual, the face may be very important (Ekman, 1982; Fridlund, 1994). People pay enormous attention to faces and people usually

argue that it is important to engage in face-to-face interaction. A huge portion of the brain is devoted to identifying faces and interpreting facial expressions. Infants pay attention (Johnson et al. 1991). As noted, people may use the face as an important cue concerning emotion. Smiles invite trust (Scharlemann et al., 2002). Cues about genetic relatedness (phenotypic similarities in facial structure) also trigger more trusting (but not trustworthy) behavior (DeBruine, 2002).

In this paper we examine two related hypotheses.

Hypothesis 1: People read the emotional state of their counterparts, and condition their decisions on those readings. We hypothesize that subjects infer the happiness/friendliness of their counterparts, and connect those readings with expectations about whether a counterpart is likely to reciprocate trust.

Hypothesis 2: People observe the sex, race and ethnicity of their counterparts, and condition their decisions on those observations. Two possibilities arise. First, subjects may infer status differences, and second, subjects may infer ingroup/outgroup memberships. Both may affect the perceived likelihood that trust will be reciprocated

Research Design.

Phase 1:

The first phase of the experiment tested the behavior of subjects in a simple trust game. The experiment included two main components: a trust game and an assessment of risk attitudes. Subjects first completed a survey designed to measure attitudes toward risk, Zuckerman Sensation-Seeking Scale (SSS), form V (Zuckerman, 1994). Subjects earned 10 experimental laboratory dollars for completing the survey (the exchange rate was 2 lab dollars for each US dollar). For the second part of the experiment, subjects were randomly paired with another individual at a different site. One site was LSHTA experimental lab at Virginia Tech in Blacksburg, Virginia; the other was the Behavioral Research Lab at Rice University in Houston, TX. The subject was randomly assigned to be either the first or second mover in a one-shot trust game with the assigned counterpart. In this trust game, a variation on Berg, Dickhaut and McCabe (1996), first movers could keep their \$10 or pass the \$10 to their counterpart. If a subject kept the money, then this part of the experiment was finished. Otherwise the amount was doubled and the counterpart then decided among 9 different allocations of the \$20, ranging from (\$0, \$20) to (\$20, \$0) in \$2.50 increments. This game differs from BDM in three ways. First, our first movers made an all-or-nothing decision, while the BDM subjects chose to send \$0-\$10 in increments of \$1. Second, in our experiment the amount sent was doubled, while in theirs the amount sent was tripled. Finally, our decision was framed as a “loan”, while theirs used neutral language.

After observing the characteristics of their counterpart, both first movers and second movers are asked to predict the actions of their counterparts. First movers record their prediction after their own decision has been made but before finding out the counterpart’s move. Second movers record their predictions while awaiting the first-mover’s decision.

After the trust game decisions were completed, subjects finished the risk-assessment element of the experiment by making a series of risky decisions. The risky decision task replicates the risk instrument designed by Holt and Laury (2002), in a computerized

environment. Subjects face a series of paired lottery choices as explained below. One of the decisions is then chosen at random and played out for payment. Finally, subjects respond to a questionnaire that collects demographic data and measures their attitudes toward trust and altruism.

The survey risk measure: The Zuckerman SSS form V is a forty-question survey instrument designed to elicit subject preferences for seeking out novel and stimulating activities, attitudes, and values and further exploring them (See Appendix 1). The survey asks subjects to choose their preferred alternative from a pair of statements about risky activities. For example, in one item the choices are: a) Skiing down a high mountain slope is a good way to end up on crutches; b) I think I would enjoy the sensations of skiing very fast down a high mountain slope. The survey is comprised of four subfactors measuring different aspects of sensation seeking. The Disinhibition (DIS) factor measures nonconformity with standards of acceptable social behavior. This type of sensation is achieved by drinking, gambling, and sex. The Boredom Susceptibility (BS) measures aversion to routine in one's life and intolerance of boring people. The Thrill and Adventure Seeking (TAS) factor measures preference for the thrills inherent in risky activities such as parachute jumping. Finally, the Experience Seeking (ES) factor addresses the preference for mentally arousing activities and a non-conforming lifestyle. This scale has been shown in previous studies to be related to risky behavior in a variety of situations (see Zuckerman, 1994, for examples). Eckel and Grossman (2002a, b) compare the scale with subjects' decisions in an environment with financial stakes and find only a very weak relationship. We include this instrument to determine whether individuals' self-reported preferences over hypothetical risky alternatives is consistent with their choice about whether to "risk" lending money to a stranger.

The Trust Game. In the second part of the experiment subjects participated in a trust game. The first mover chooses whether to send \$10 to a counterpart. If sent, the \$10 is doubled. The second mover then decides how much to return (if any) to the sender. This game differed from the original "investment game" examined by Berg, Dickhaut and McCabe (1996) (BDM) in several respects. Instead of a decision to keep or send any portion of a \$10 allocation, our first-mover's decision is framed as a choice of whether to make a loan of \$10 experimental dollars to a counterpart. If the loan is made, the \$10 is "invested" and doubled, while BDM triple the amount sent. The second mover then determines the allocation of the resulting \$20 in fixed increments. At one extreme the second mover could take all \$20 and return \$0 to the first mover. Or the second mover could take \$17.50 and return \$2.50. The remaining allocations changed in increments of \$2.50, with the final option to take \$0 and give the first mover \$20. In BDM, subjects make decisions in \$1 increments. Finally, our experiment is computerized, while theirs is hand-run. While this game has many equilibria, the single subgame perfect equilibrium is for the first mover to decide to not make the loan, with second mover receiving nothing. Previous results from variations on this game indicate that a large fraction of subjects trust, and trust is just reciprocated on average. (Berg, et al.; Glaeser et al; Croson and Buchan; Scharleman, et al.)

We also collected data on subjects' expectations of each others' decisions. Regardless of whether the loan was made, the first mover was asked to predict the second mover's choice. Likewise, before being informed of whether the loan was offered, the second mover was asked to predict what the first mover intended to do. Once both subjects finished their tasks, the outcome was revealed. Subjects were then asked to type a brief answer to the question, "We are very

interested in what you thought about the decision problem that you just completed. In the space below please tell us what kind of situation this problem reminds you of.”

The Risky Decision. In the third part of the experiment replicates the experiment in Holt and Laury (2001). Subjects faced a set of choices between two risky lotteries. The decision sheet is replicated in Table 1.

Table 1
Options for Holt/Laury Financial Risk Instrument

Please Choose Option A or Option B for EACH Decision Below

Keep in mind that as you move down the table the chances of the higher payoff for the decision in each column increases.

	Option A	Your Choice A	Option B	Your Choice B
Decision 1	\$2.00 if Card is 1 \$1.60 if Card is 2-10	A: <input type="radio"/>	\$3.85 if Card is 1 \$0.10 if Card is 2-10	B: <input type="radio"/>
Decision 2	\$2.00 if Card is 1-2 \$1.60 if Card is 3-10	A: <input type="radio"/>	\$3.85 if Card is 1-2 \$0.10 if Card is 3-10	B: <input type="radio"/>
Decision 3	\$2.00 if Card is 1-3 \$1.60 if Card is 4-10	A: <input type="radio"/>	\$3.85 if Card is 1-3 \$0.10 if Card is 4-10	B: <input type="radio"/>
Decision 4	\$2.00 if Card is 1-4 \$1.60 if Card is 5-10	A: <input type="radio"/>	\$3.85 if Card is 1-4 \$0.10 if Card is 5-10	B: <input type="radio"/>
Decision 5	\$2.00 if Card is 1-5 \$1.60 if Card is 6-10	A: <input type="radio"/>	\$3.85 if Card is 1-5 \$0.10 if Card is 6-10	B: <input type="radio"/>
Decision 6	\$2.00 if Card is 1-6 \$1.60 if Card is 7-10	A: <input type="radio"/>	\$3.85 if Card is 1-6 \$0.10 if Card is 7-10	B: <input type="radio"/>
Decision 7	\$2.00 if Card is 1-7 \$1.60 if Card is 8-10	A: <input type="radio"/>	\$3.85 if Card is 1-7 \$0.10 if Card is 8-10	B: <input type="radio"/>
Decision 8	\$2.00 if Card is 1-8 \$1.60 if Card is 9-10	A: <input type="radio"/>	\$3.85 if Card is 1-8 \$0.10 if Card is 9-10	B: <input type="radio"/>
Decision 9	\$2.00 if Card is 1-9 \$1.60 if Card is 10	A: <input type="radio"/>	\$3.85 if Card is 1-9 \$0.10 if Card is 10	B: <input type="radio"/>
Decision 10	\$2.00 if Card is 1-10	A: <input type="radio"/>	\$3.85 if Card is 1-10	B: <input type="radio"/>

Thank you! You will return to this decision at the end of the session. At that time you will choose the cards that determine your earnings.

DONE

If you would like to review the instructions click RETURN.

RETURN

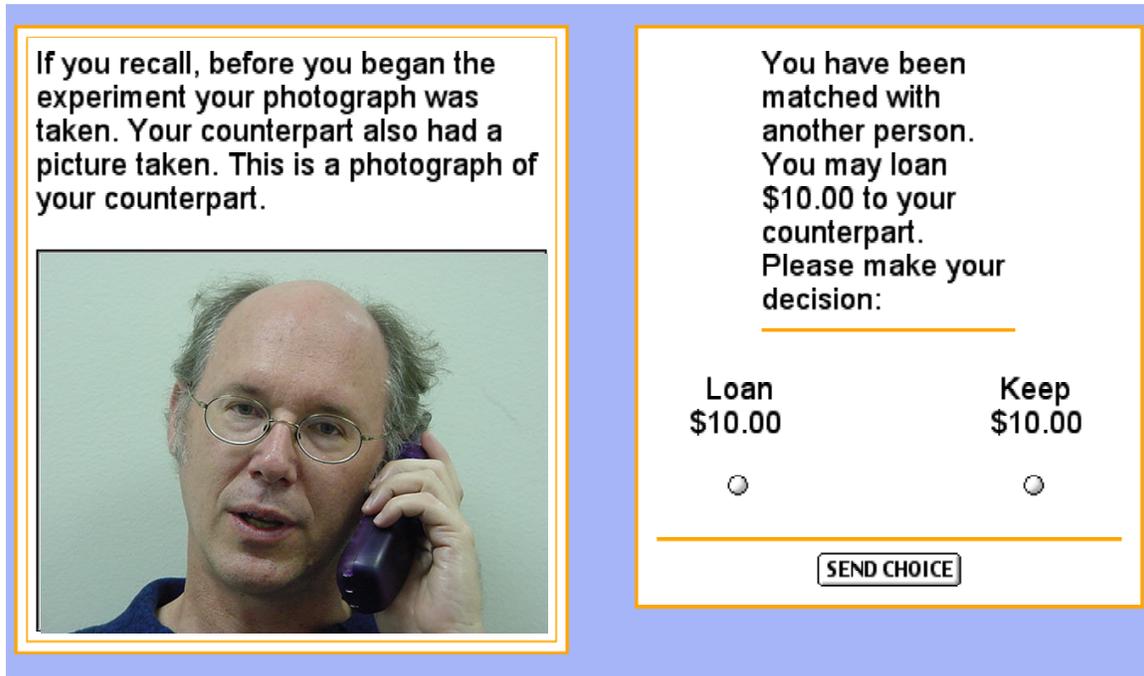
All subjects, then, completed the Zuckerman sensation seeking scale, participated in a trust game and then completed the financial risk instrument. (The relationship among the risk instruments and trust behavior is examined in more detail in Eckel and Wilson, 2002a.)

Information treatments. We vary the information given to subjects about their counterparts using two different treatments. Subjects were not told the university with which they were paired, but were told their counterparts were in “Virginia” or “Houston” (giving us the opportunity to use to good advantage the phrase, “Houston, we have a problem.”).

The first treatment revealed the sex of the counterpart. In this treatment, prior to completing the Zuckerman scale, subjects were asked to answer eight questions with a limited number of responses. Based on these responses, subjects were told the answers to four of the questions: favorite color of their counterpart, whether their counterpart liked dogs, whether their counterpart liked movies and their counterpart’s sex. We are particularly interested in the impact of knowing the sex of counterpart on the likelihood of making a loan and what is returned if the loan is made.

In the second treatment, subjects entered the laboratory and were told they would have four photographs taken of them. All photographs were taken with a Sony Mavica digital camera, with the individual’s face centered in the picture, with the top of the head marking the top of the picture and the chin marking the bottom of the picture. Lighting and background were the same at both sites. In two of the photographs the subject was instructed to give a neutral expression, while in the remaining two photographs the subject was instructed to smile. The subject was told that these photographs would be used in the experiment, and that they would get to choose which one they wanted their counterpart to see. All four photographs were uploaded to the server as soon as they were taken and the subject was sent to a computer terminal. When the experiment was ready to begin the subject was shown all four of the pictures and then instructed to chose one that would be sent to that individual’s counterpart at the remote site. Prior to making a decision about being trusting or trustworthy, each subject viewed the photograph selected by the counterpart. A sample decision screen is shown in Figure 1. In this setting the counterpart knew not only the sex of the counterpart, but also the race, ethnicity, attractiveness, demeanor, etc., of the subject.

Figure 1. Sample Decision Screen, Treatment 2



Post-Experiment questionnaire: After completing all decisions, subjects were asked to complete a three part questionnaire that collected 1) demographic information, 2) answers to survey questions designed to measure trustworthiness and altruism, and 3) debriefing information. The measures of trustworthiness and altruism were taken from Wrightsman’s (1991) “Philosophies of Human Nature Scale.” A total of 14 items were used, randomly ordered and reflected, and presented to subjects in an on-line questionnaire. Responses to the items were arrayed on a 6-point Likert scale ranging from Strongly Agree to Strongly Disagree (on this scale subjects had no neutral mid-point and were forced to agree or disagree responses).

Procedure. A total of 246 subjects, half at Virginia Tech and half at Rice University, participated in 11 experimental sessions. Subjects were recruited from introductory classes in Principles of Economics at Virginia Tech, and from dining halls at Rice University, and were told to report at a specific time to an off-campus laboratory at their respective locations. The number of subjects in a session ranged from 10 to 34. Subjects were 58.5 percent male and just over 90 percent of subjects were between the age of 18 and 22. Care was taken to recruit an ethnically-diverse subject pool. Nevertheless, two thirds were Caucasian. Minorities included 7.3 percent African-American, 11.4 percent Asian-American, 8.9 percent Hispanic and the remaining 5.7 percent self-identified foreign nationals.

When subjects arrived at the lab they were asked to sign a consent form and given a card assigning them to a specific computer. If the session was one in which facial images were used, then subjects posed for four pictures as described above. Subjects were seated at their machines

and told that they could browse the internet before the experiment began. Because subjects arrived at different times and because we had to coordinate activity at two sites, we allowed subjects to browse, rather than converse with one another once in the lab. Once both sites had an equal number of subjects, then everyone was asked to stop browsing and open a window on the machine pointing to the experiment.¹

Oral instructions were read to subjects before beginning. After that, subjects went through a set of self-paced, computerized instructions. In a post-experiment questionnaire 92.7 percent very strongly or strongly agreed that the instructions were clear. Once subjects began the experiment, no talking was allowed. Subjects were asked to raise their hands if they had a question or problem, and the experimenter would answer their questions privately.

Once subjects completed the experiment, they were paid one at a time and in private. At that time subjects were handed a debriefing form and asked whether they had any questions. Throughout the course of the experiment no deception was used.

Phase 2

Design and procedure. In this experiment subjects were asked to rate a series of photos, as well as an additional. There was a total of 222 photos, including 99 VT photos from experiment 1 rated by Rice students, and 99 from Rice rated by VT students, as well as 24 photos of VT students from another experiment. Subjects were recruited over the internet using the subject-pool lists of both labs. The initial email explained the payment procedure, and directed subjects to a website where they registered from their own computer, then responded at their own pace.

Each subject was asked to rate 20 photos on a 15 word-pair items scale and was paid \$.25 per photo. After completing the ratings subjects were reminded that they could pick up their payment at a specific time and place, or email a contact for an appointment. Photos and their order were randomly assigned to each subject.

A total of 196 subjects participated: 52% were male and 48 % were female. While subjects were asked to rate 20 photos this could not be enforced, and some did not complete the list: 80 percent (158 subjects) of the subjects rated all 20 of the photos, while the remainder rated between 1 and 15 photos. Subjects spent an average of 80 seconds per photo (with a standard deviation of 51 seconds). Because of incompleteness, the number of ratings per photo ranged from 8 to 28, with the interquartile range between 12 and 17 ratings.

Each face was evaluated using 15 opposite word pairs. Many of these word pairs were taken from a larger set used in Scharleman, et al. (2001). An additional set of items were added and the list was further refined in Wilson and Branton (2002). A sample of the word-pair items and the screen used by subjects is shown in Figure 2, which reproduces a decision form. A complete

¹ The experiment had a form of a messaging service so that the experimenters at each site could communicate when everyone was ready, etc. However, because this was the first time that we had attempted this type of an experiment, we relied on telephone and kept an open line during each experiment. The most typical problem involved limited turnout at one site or the other.

listing of the word pairs is given in Table 5 below. The left/right order of the word pairs was randomly fixed prior to the experiment and that order was not varied during the experiment. The order of presentation of the word pairs was randomized across each photograph for each subject. This provides control over response-set bias in the word pairs.

Figure 2: A Sample Screen and Subset of the Word Pairs Used in the Evaluation Experiment

<p>For each word pair please find the word that best fits the person in the photograph. Also, please pick how well you think that word fits the person in the photograph.</p>					<p>Photograph number 1.</p>		
	Very Well	Well	Somewhat Well	Somewhat Well	Well	Very Well	
Suspicious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Trusting
Competitive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Cooperative
Honest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dishonest
Respectful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Disrespectful
Complaining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Accepting
<p>If you have filled in a value for each row then go to the next page.</p> <p style="text-align: center;"><input type="button" value="NEXT PAGE"/></p>							

Results

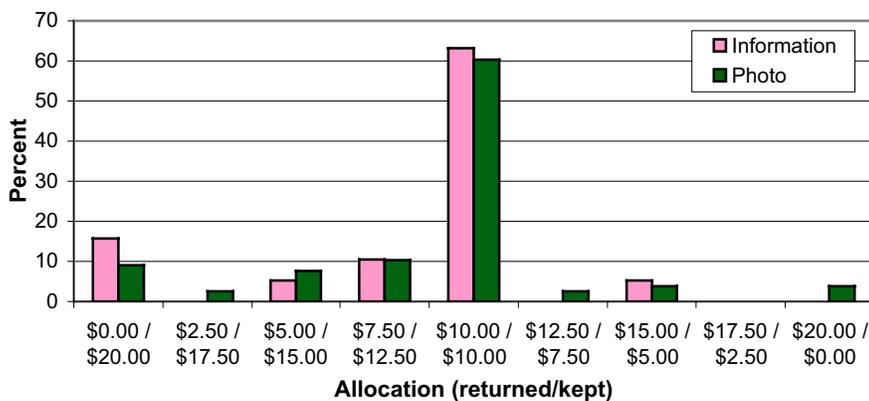
Table 2 reports aggregate results by treatment. In both treatments, almost 80 percent of first-movers made the \$10 loan to their counterpart, an exceedingly high rate of trust. The amount returned was slightly higher in the photo treatment, though the difference was not statistically significant ($t = 0.83, p = .41$). Overall, trusting did not pay off, with second movers returning slightly less on average than the initial \$10 transfer. In neither case does the information treatment affect the overall level of trust and reciprocity.

TABLE 2: Percentage of First Movers Making the Loan (Frequencies in Parentheses) and Average Amount Returned by Second Movers (SD in parentheses)

Manipulation	% Lending \$10 (Trusting)	Amount Returned (reciprocity)
Information on Counterpart	79.2 (19/24)	\$8.16 (4.07)
Photo of Counterpart	78.8 (78/99)	\$9.00 (4.00)
Total	78.9 (97/123)	\$8.84 (4.00)

The distribution of amounts returned is shown in figure 3. Modally, second movers returned exactly what was loaned. While this might seem like a fair allocation, it only means that the money was returned to the first mover and the second mover kept the surplus. This varied only slightly by manipulation. Keep in mind that subjects were limited to fixed allocations of the \$20. There is little difference here between the two treatments. A larger proportion of subjects returned more than \$10 to their counterpart after viewing their photograph (10.2 percent) than when they knew only the sex of their counterpart (5.3 percent). Three in the photograph condition returned all \$20, while none in the information only did so. By and large, first movers took a big risk and they ordinarily received only what they put in. Only a handful of subjects returned more than \$10

Figure 3: Distribution of Amount Returned



Sex, ethnicity, and trust. Table 3 below shows the percent of trusting moves by all first-movers, broken down by sex and ethnicity of the counterpart. In the first part of the table, we see that women are less likely to be trusted than men in the Information treatment, but equally likely to be trusted in the Photo treatment. The second part of the table shows that, in the photo treatment, members of minority groups are less likely to be trusted than Caucasian counterparts (69.0 percent v. 82.9 percent, respectively, $\chi^2 = 2.37$, $p=.12$). African-Americans are least likely to be trusted (57.1 percent, $\chi^2 = 2.68$, $p=.10$).

Table 3. First movers: percent making a trusting move (loan \$10) by characteristic of counterpart:

	Information	Photo
Men	82.3 14/17	78.9 45/57
Women	71.4 5/7	78.6 33/42
Caucasian	--	82.9 58/70
African-American	--	57.1

		4/7
Asian	--	66.7 10/15
Hispanic	--	100.0 3/3
Foreign	--	75.0 3/4
Total Minority	--	69.0 20/29

Table 4 below indicates trusting behavior by the characteristics of the decision maker. The most noticeable result here is that women are less likely than men to trust in the information treatment ($\chi^2 = 2.97$, $p=.085$), but more likely to trust in the photo treatment ($\chi^2 = 3.048$, $p=.081$).

Table 4: First movers: percent making a trusting move (loan \$10) by own characteristics:

	Information	Photo
Men	92.3 12/13	72.9 43/59
Women	63.6 7/11	87.5 35/40
Caucasian	68.8 11/16	78.8 52/66
African-American	100.0 2/2	71.4 5/7
Asian	100.0 1/1	84.6 11/13
Hispanic	100.0 4/4	85.7 6/7
Foreign	100.0 1/1	66.7 4/6
Total Minority	100.0 8/8	78.8 26/33

Expectations about trust: In the information only treatment, just 16.7% (4/24) of second movers expected that the first mover would make the loan; similarly in the photo treatment, 21.2% (21/99) believe that the first-mover will make the loan. These expectations are not significantly related to any of the observable characteristics of the first mover or of the second mover.

Expectations about reciprocity. Sixty five percent of first movers expected second movers to reciprocate by returning at least the \$10 that was loaned. First movers in the photograph treatment had slightly greater expectations than those in the low information treatment, although those differences were not statistically significant. There is, however, a strong relationship between expectations and the decision to trust. Of those who did not trust, slightly over 80

percent did not expect to get back even \$10. By contrast, for those who made the loan, just over 77 percent thought they would have at least \$10 returned to them.

Face Evaluations and expectations about reciprocity. In the second phase of the experiment, an independent set of subjects evaluated the images of the participants in the loan experiment under the second treatment. These evaluations occurred after the experiment was conducted and the evaluations were used to create measures of attributes of each photograph. Rather than relying on self-reports or assessments by a counterpart, we ran this experiment in order to calibrate aspects of the image that a subject chose to use in the experiment. Each image was evaluated using 15 word pair items.

The 15 word pair items were analyzed using factor analysis. We expected at least two clear dimensions to emerge from these items. However, while conducting the analysis we found that there were three dimensions. The first two had eigenvalues above 1.0, while the third dimension was .72. When examining the proportion of the variance explained by the factors, it was reasonable to retain the third dimension. Varimax rotation was used to provide clearer separation between the dimensions and factor scores were then calculated for subsequent analysis. These factor scores are derived from the weights for the various items on each dimension.

Table 5: Word Pair Items for all Photographs and Recovered Dimensions from Factor Analysis
(Correlated, weaker, items are not bolded)

Reliability	Cooperativeness	Affect
Motivated/Unmotivated		
Trustworthy/Untrustworthy	Trustworthy/Untrustworthy	
Hardworking/Lazy		
Unintelligent/Intelligent		
Respectful/Disrespectful	Respectful/Disrespectful	
Selfish/Generous	Selfish/Generous	
Irresponsible/Dependable		
	Suspicious/Trusting	
	Competitive/Cooperative	
	Honest/Dishonest	
	Unfriendly/ Friendly	Unfriendly/Friendly
	Complaining/Accepting	
		Excitable/Calm
		Happy/Sad
Approximate Variance Explained by the Dimension		
75.6%	14.3%	13.1%

The dimensions are detailed in Table 5, with the word pair items that constitute each dimension placed under the appropriate column and bolded. The first dimension we characterize as containing a number of items that detail attributes relating to the trustworthiness and reliability of the photographed subject. Putting everything in a positive context, this dimension included the

following cluster of words: motivated, trustworthy, hardworking, intelligent, generous, respectful and dependable. The second dimension relates to attributes having to do with friendliness and cooperativeness perceived in the photos. This dimension included the words trusting, cooperative, honest, friendly and accepting. The final dimension appears to capture the affective state of the photographed subject and includes two word pairs with emotional characteristics: excitable and happy. Not all of the items loaded on unique dimensions. Several items were correlated with two different dimensions. For example, the trustworthy/untrustworthy word pair is correlated with both the personal and behavioral attributes dimension. Items that were strongly correlated across more than one dimension are also placed under the other dimension and not bolded.

The factor scores are all set in the same direction. A negative score means a less positive evaluation of the photograph and a positive score means a more positive evaluation. The factor scores are normally distributed $N(0,1)$. Such a score is constructed for each facial evaluation and generates a total of 3,351 scores for each dimension.

These scores were then averaged over each photograph. A total of 198 images were used in the experiment and each image has three measures associated with it: reliability, cooperativeness and affect. These measures were merged with the individual decision making data to provide an independent assessment of the photographs.

One of the 15 word pairs, attractive/unattractive, was not correlated with any of the three dimensions noted above. However, it may be an important signal for subjects so we calculated the average rating across images for attractiveness. Lower values constitute unattractive ratings and higher values represent attractive ratings (the mean rating was 3.38, with a standard deviation of .669. The lowest average rating was 1.7 and the highest average rating was 5.0).

First Mover Multivariate Model. We turn to a multivariate analysis of these data to determine whether information about the characteristics of the counterpart matter, while controlling for other aspects of the experiment and the subjects. In the models we focus on the first mover's decision to make a loan. All estimates use Probit with the selected category predicting the loan being made.

The first model, reported in Table 6, pools the Information and Photo treatments. A dummy variable is created, with a value of 1 assigned to the treatment in which subjects only find out the sex of their counterpart. A second independent variable is the Zuckerman scale that varies between 4 and 36, with lower values associated with less risk seeking. A second risk measure, based on Holt/Laury measure is also included. It ranges between 0 and 9, with lower values indicating risk aversion. Two survey measures of an individual's personal characteristics, trustworthy and altruist were included. These are derived from a questionnaire filled out following the loan and risk decisions. Using normalized values derived from factor analysis, we use two distinct dimensions relating to trustworthiness and altruism. We also include the sex of the first mover and the sex of the counterpart. In both treatments subjects knew the sex of their counterpart. Finally, we include a dummy variable for whether the subject believed that their counterpart was real.

Table 6
Probability of a trusting move (Probit regressions)
<Table lists: Coefficient, (std. error), z, and p(z)>

Variable	Model 1 (Treatments 2 & 3)	Model 2 (Treatment 2)	Model 3 (Treatment 3)	Model 4 (Treatment 3)
Intercept	.704 (.750) 0.938 <i>0.348</i>	-1.389 (1.338) -1.038 <i>0.299</i>	-.551 (.565) -0.974 <i>0.330</i>	-.724 (.529) -1.368 <i>0.171</i>
Low Information (1=Sex Only 0=Photograph)	-.463 (.401) -1.155 <i>0.248</i>	--	--	--
Zuckerman	.050 (.022) 2.219 <i>0.026</i>	--	.069 (.025) 2.782 <i>0.005</i>	.0719 (.024) 2.942 <i>0.003</i>
Holt/Laury	.040 (.091) 0.442 <i>0.658</i>	--	--	--
Trustworthy	.196 (.175) 1.120 <i>0.263</i>		-.023 (.209) -0.109 <i>0.913</i>	--
Altruist	.023 (.176) 0.131 <i>0.895</i>		.222 (.243) 0.912 <i>0.362</i>	--
Sex 1=Female 0=Male	.322 (.291) 1.106 <i>0.269</i>		.808 (.365) 2.212 <i>0.027</i>	.735 (.346) 2.123 <i>0.034</i>
Counterpart's Sex 1=Female 0=Male	-.164 (.287) -0.572 <i>0.568</i>	-1.050 (.884) -1.188 <i>0.235</i>	-.164 (.329) -0.498 <i>0.618</i>	--
Real Counterpart 1=Yes 0=No	-1.286 (.498) -2.584 <i>0.010</i>	-1.771 (.967) -1.831 <i>0.067</i>	--	--
Shared	--	1.473 (.632) 2.331 <i>0.020</i>	--	--

Minority Counterpart	--	--	-1.107 (.508) -2.179 <i>0.029</i>	-.906 (.450) -2.012 <i>0.044</i>
Asian Counterpart	--	--	.614 (.578) 1.063 <i>0.288</i>	.486 (.561) 0.865 <i>0.387</i>
Reliability Scale	--	--	.832 (.397) 2.097 <i>0.036</i>	.785 (.371) 2.115 <i>0.034</i>
LL	-54.99	-6.08	-40.71	-41.26
Pseudo r2	0.13	0.50	0.20	0.19
N	123	24	99	99

The first model includes variables common to both treatments. The results indicate a positive relationship between sensation-seeking, measured by the Zuckerman scale, and the willingness to make a loan, although the Holt/Laury instrument is not significantly related to the decision. This is consistent with ideas that sensation-seeking is associated with the willingness to trust, since trusting is a kind of gamble. However, the weakness of the Holt/Laury instrument seems to imply that subjects do not view the decision as a lottery. The only other variable that is significant in this model is whether the counterpart was thought to be real, which carries a negative sign. While this may seem odd, in another paper (Eckel and Wilson, 2002b) we report that subjects were skeptical whether their counterpart was real. Because the interaction was via the internet, there was some suspicion that the experimenter was not really pairing subjects across locations. As a consequence, subjects who believed they were not paired with a “real” counterpart tended to trust at very high rates, thinking that the *experimenter* would not treat them poorly. Those who believed they were playing against a real counterpart (76.2 percent) were less likely to make a loan. In this model, the personal characteristics of the subject and the sex of the subject or and counterpart are not significantly related to the decision.

The second model examines only treatment 1, and includes a variable specific to that treatment: SHARED is a summary measure of the number of answers to questionnaire items that subjects shared in common. Recall that prior to beginning this experiment, subjects were asked eight different questions. Four of the counterpart’s answers were presented to the decision maker. This variable is the number of matches over the answers between the counterpart and the decision maker. We find that, once again, whether the counterpart was real or not matters. As well, the new variable SHARED also is statistically significant. The greater the number of matches (up to 4) the more likely a subject is to trust the counterpart. In separate models, unreported here, we included the Zuckerman scale, but its impact was consistently insignificant in the models of this treatment. What we conclude from this model is that there is a possible in-group effect that is brought on by something as simple as matching in terms of the same sex, liking the same color, liking dogs and enjoying movies. This is consistent with substantial

numbers of findings that point to the ease of generating an in-group effect (see Tajfel ** and the overview by Brewer and Brown, 1999).

The third model turns to the second treatment where subjects viewed the image of their counterpart. Model 3 includes measures concerning the individual's own personal characteristics (the Zuckerman scale and personal trustworthiness and altruism), their own sex and the sex of their counterpart and whether their counterpart was a non-Caucasian minority or Asian. These characteristics were easily discernable from the image that the counterpart viewed. Also included is a variable that summarize one aspect of the assessment of the photograph from Phase 2: Cooperativeness reflects the perceived niceness of the second mover. Whether or not the counterpart was real is not used here: in all settings in which the individuals did *not* regard their counterpart as real, all 15 subjects went ahead and made the loan. In Model 3 we find that both the Zuckerman risk seeking scale and whether the subject is female are positively related to providing the loan. No other personal characteristics are correlated with the trusting decision. Several characteristics of the counterpart are now very important. If one's counterpart is a minority, there is a strong negative relationship. This effect is in addition to the effect of cooperativeness. Here we see that the higher the cooperativeness scale, the more likely a subject is to trust. These findings support the idea that subjects use information about their counterparts not so much to form the basis for an in-group, but rather to gauge the trustworthiness of the counterpart. The first-mover's personal trustworthiness is not important for this decision. The first mover is taking a risk and uses information about the counterpart's image to make that decision. Interestingly, women are more likely to trust in this treatment.

Model 4 retains only a subset of the variables and illustrates the power of risk seeking, the sex of the first mover, the minority status of the second mover and an independent assessment of the trustworthiness of the photograph. Figure 3 illustrates the effects for different combinations of the sex of the first mover as well as whether the counterpart is Caucasian or not. Several important points can be noted from the figure and these estimates. First, it is clear that risk and trust are positively related. However, it is not financial risk (as measured by the Holt-Laurie scale), but rather the Zuckerman sensation seeking scale. It is as if subjects need the context of the photograph in order to rely on their willingness to take such a risk. This seems likely in that the Zuckerman scale does not correlate with making the loan in the low information treatment. Second, subjects clearly look to information about their counterpart. In the low information treatment subjects were more likely to make the loan based on the number of items which they shared with their counterpart. In the high information treatment subjects immediately rely on an obvious characteristic – the race and ethnicity of their counterpart. When doing so they are much less likely to make a loan to a non-Caucasian. However, it is not simply race and ethnicity. Subjects make a subjective assessment of the trustworthiness of the counterpart. This seemingly subjective judgment is borne out by an independent evaluation of the image that each subject chose for the experiment. The more positive the evaluation the more likely the counterpart was trusted and a loan made.

Figures 4-7 below illustrate simulations of the probability of trusting for treatment 2 using model 4 above. Figures 4 and 5 show trust for male and female counterparts. In Figure 4 we assume average or median values for the variables other than the Cooperativeness factor. In Figure 5, we assume average or median values for the variables other than the Zuckerman scale. Figures 6

and 7 simulate trust for minority and non-minority counterparts.

Figure 4

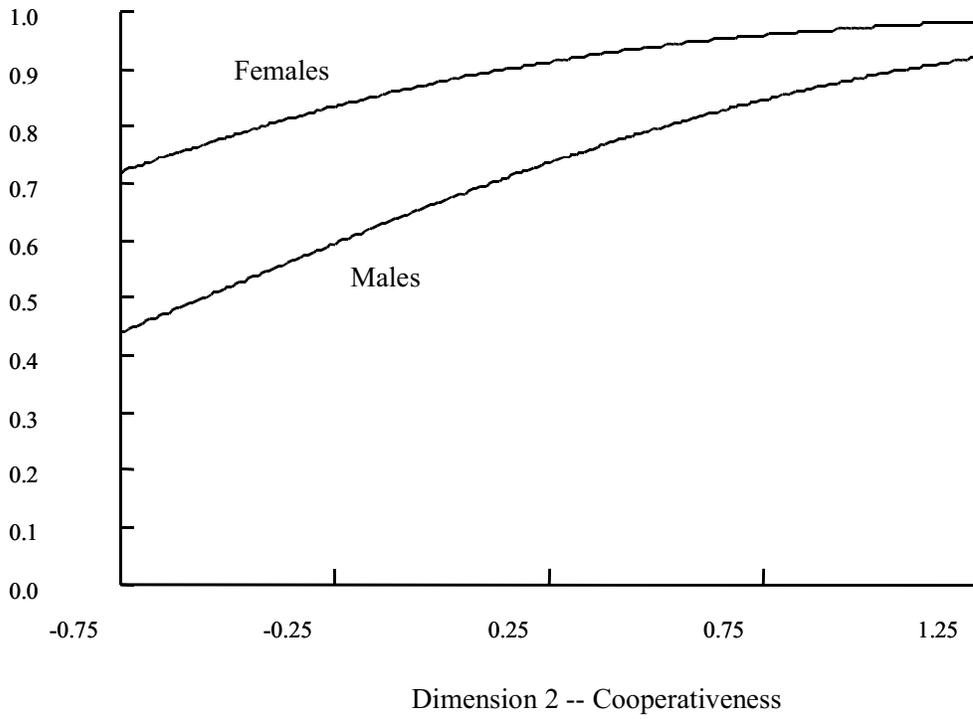


Figure 5

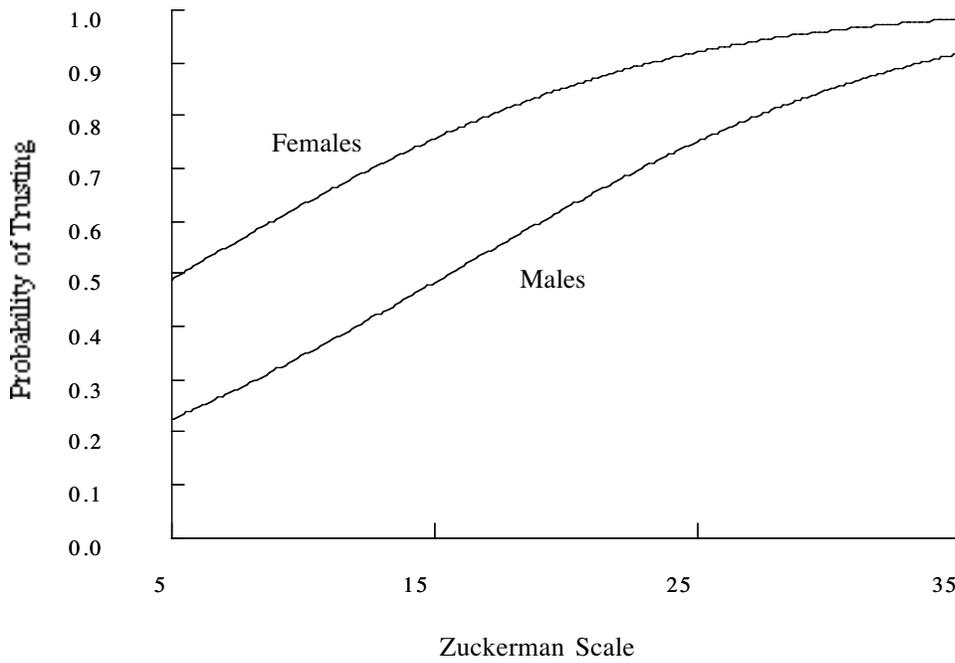


Figure 6

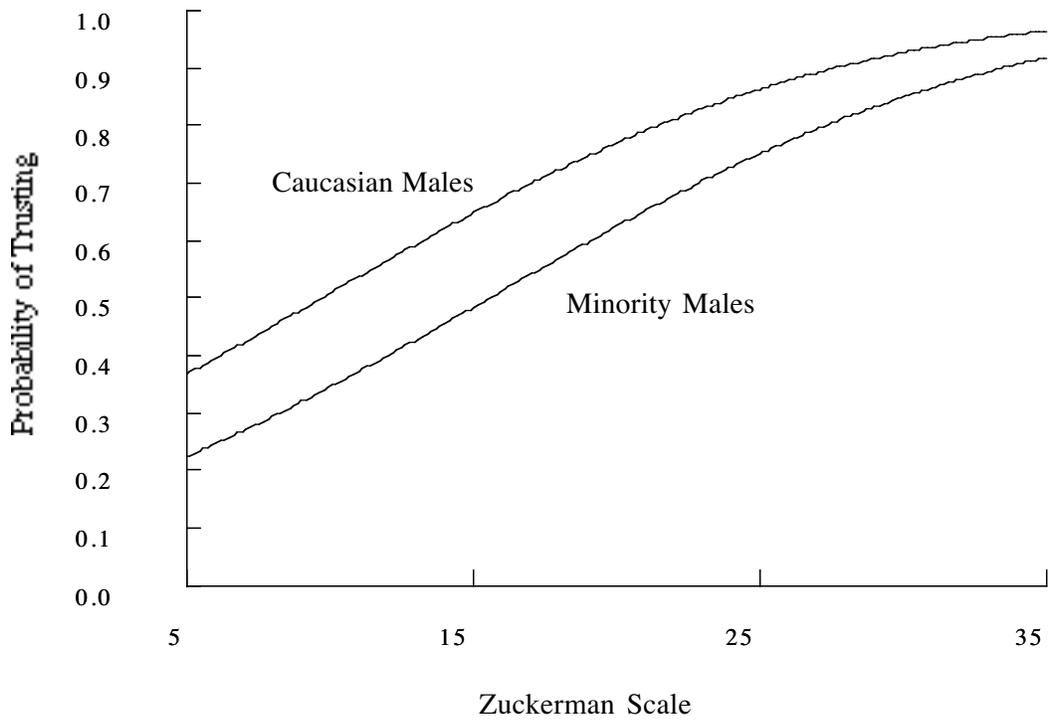
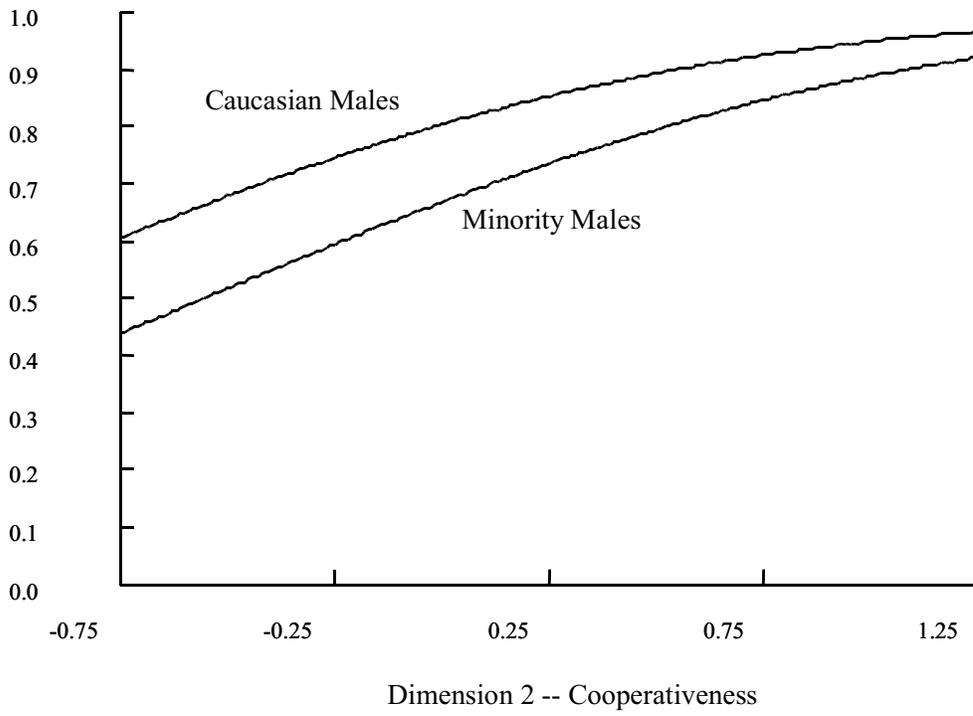


Figure 7



Second Mover.

We now turn to the second mover and what was returned to the first mover if a loan was made. Because the first mover could only make an all-or-nothing loan decision, it is easy to compare the allocation decision by the second mover. Several different models were run using the dollars returned to the counterpart. However, because of the distribution of returned values (see figure 1) we settled on a simple dummy variable for the dependent variable. We measure whether the second mover returned at least what was loaned (\$10 or more). If less than the loan was returned (or nothing returned) the dependent variable took on a value of zero.

The first model pools the two treatments and includes a dummy variable for the low information treatment. As well, dummy variables are included for the sex of the second mover and the counterpart. We have no expectation that risk enters into the decision because there is no action that the first mover can take affecting the second mover. Again, once the decision was made (and the risk instruments were answered) subjects filled out a questionnaire concerning personal attributes. These fall into two dimensions, trustworthiness and altruism, and have been computed as factor scores. Finally, we include a measure of beliefs on the part of the second mover. Prior to being told whether the loan had been made (but after subjects knew something about the characteristics of their counterpart) the second mover was asked to predict whether the loan would be made.²

Table 7: Probit analysis of amount returned. 1=returned at least the amount loaned.

	Model 1 (treatments 1 and 2)	Model 2 (Treatment 1)	Model 3 (Treatment 2)
Intercept	.242 .326 0.744 0.457	3.102 2.558 1.213 0.225	1.833 .919 1.996 0.046
Low Information (1=Sex Only 0=Photograph)	.395 .374 1.057 0.290	--	--
Sex of 2 nd Mover (1=Female 0=Male)	-.147 .293 -0.500 0.617	--	--
Counterpart's Sex (1=Female 0=Male)	.539 .292 1.842 0.066	-.677 1.037 -0.652 0.514	.382 .347 1.100 0.271
Trustworthy	.533 .176 3.030 0.002	1.395 .632 2.208 0.027	.391 .195 2.002 0.045
Altruist	-.248	--	--

² A number of other specifications were tried, including whether the counterpart was thought to be real, etc. None of these alternative specifications fit as well as the model reported here. <Note as well that beliefs are uncorrelated with any characteristics of the photograph – including minority, sex, attractiveness.>

	.188 -1.321 0.187		
Beliefs	.246 .338 0.730 0.465	--	--
Shared	--	-.450 .664 -0.677 0.498	--
Minority Counterpart	--	--	.280 .363 0.770 0.442
Affect	--	--	.920 .460 1.998 0.046
Individual Attractiveness	--	--	-.409 .252 -1.620 0.105
LL	-52.33	-8.045	-39.797
Pseudo r2	0.15	0.40	0.176
N	105	24	81

Few of the independent variables contribute much to the first model. There is no difference between the treatments and the sex of the second mover does not matter. Subject beliefs do not matter, nor does a measure of altruism. What does make a difference is the sex of the counterpart. A female counterpart who has made a loan is more likely to have the loan repaid. Also important is the trustworthiness of the second mover. This has a very strong effect. However, the measure could be a bit problematic in that subjects who returned at least \$10 answered the scale items at the end of the experiment to rationalize their behavior. Even so, these items do not mention trustworthiness, but have been found by others to tap such a dimension. The parameter estimate is strong and in the proper direction

The second model turns to the low information treatment and retains the sex of the counterpart, the trustworthiness measure and then includes the measure of shared answers to four of the eight questions asked at the outset of the experiment. In the first mover model this variable was found to be a strong predictor. However, in model two it does not have a significant effect. Nor does the counterpart's sex. Almost all of the variance is explained by the measure of trustworthiness. It stands to reason that only the personal characteristics of the second mover, whose actions are independent of the first mover (and given the anonymity built into the experiment), should matter.

The third model examines only the high information treatment. In this treatment second movers have more information about the first mover. We include both the counterpart's sex and whether the counterpart was non-Caucasian. In addition we include an independent evaluation of the first mover that relates to that individual's general affect. This includes a sense of whether the first mover was perceived to be happy and calm (versus sad and excitable).³ Finally, we include one additional variable that rates the attractiveness of the second mover, based on that individual's photograph. While this might seem odd, other work has shown that the attractiveness of a subject is negatively related to cooperation. The attractiveness of the first mover was not significantly related to the decision about how much to return.

In model 3, the sex of the counterpart is not significantly related to the decision. More interesting, whether the counterpart was a non-Caucasian did not matter either. While race and ethnicity are used in making a decision of whether to trust, such a cue has no effect on trustworthiness. What makes a difference is the individual's self-rating of trustworthiness. That is offset, however, by the individual's own attractiveness. Second movers who score higher on a trustworthiness scale are more likely to repay at least \$10. However, the more attractive the subject, the less likely the loan will be repaid. This latter finding is consistent with that noted by Mulford et al., 1998. In their experiment more attractive subjects were chosen more often in a one-shot prisoner's dilemma game and those attractive subjects were more likely to defect. Here they are less likely to repay a loan (although there is a fair amount of variation in the parameter estimate). Finally, we find that that the affective image signaled by the first mover has a positive effect on returning the loan.

These second mover data are interesting in that they point out that individual trait characteristics predict whether an individual is trustworthy in behavior. When viewing the counterpart, race and ethnicity do not matter for the decision to return the loan. What does matter is the perceived demeanor of the loaner.

Discussion and Conclusion.

<A conclusion would be nice>

³ We also looked at other the other dimensions capturing an evaluation of the first mover. This variable provides the best fit.

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