

# Face Value

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People pay attention to the appearance of others, and personal characteristics can affect many types of decisions. We ask, is there informational value in a face in a situation where trust and reciprocity can increase earnings? We use a laboratory trust game experiment where subjects: are unable to observe a counterpart; must observe a counterpart; or can pay to reveal a counterpart's photograph. Both senders and responders are willing to pay to observe the photos, and we show that behavior, earnings and efficiency are affected. When subjects are "face to face", efficiency is enhanced and senders have higher earnings.

We all pay attention to subtle variations in appearance and demeanor when deciding whether to pursue a relationship or interaction with someone. Students are advised of professional attire and interview techniques as a way to send the right signals to potential employers. People carefully choose tattoos and piercing as a way to costly convey their values and intentions. Hours can be spent in grooming as a way to show the appropriate level of formality or informality in appearance. As it becomes faster and easier to start new relationships electronically, visible personal characteristics revealed in posted photos may become more valuable for establishing and building trust among strangers. While anonymous exchanges are

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also on the rise, facilitated by institutions such as eBay's feedback/reputation system, they are unlikely to fully replace face-to-face interactions, even for one-shot transactions. Exchange transactions and markets for friends and associates can fail under anonymity, and appropriate signals can allow for efficient sorting. Furthermore, a recent Forbes Insights study (2009) notes that business executives overwhelmingly prefer face-to-face interactions for important transactions and for initiating profitable business relationships. It is natural to ask, then, do people put an economic value on others' faces, and does this information increase the efficiency of social relationships, such as trust?

Laboratory experiments provide a controlled environment where these questions can be addressed. Recent experimental research shows that, when subjects are shown photos of their counterparts, their decisions are affected by what they observe.<sup>1</sup> If a photograph contains valuable information, a person can use that information to differentiate behavior and thereby increase profit or utility.

We use experiments to test whether people behave differently when they see the information in a partner's photo, and if they are willing to pay for that information. We use a trust game similar to that of Joyce Berg, John Dickhaut and Kevin McCabe (1995) to explore these questions. The game is ideal because it allows us to see the differential value of a photo in a game of strategic play. In the game, a sender is paired with a responder, and both are endowed with  $M$  tokens. The sender can send any number of tokens between 0 and  $M$  tokens to the responder. Any amount sent is tripled, and the responder can return to the sender any amount between zero and the tripled amount received. While the responder makes his decision knowing

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<sup>1</sup> Some recent examples include Sara J. Solnick and Maurice E. Schweitzer (1999), James Andreoni and Ragan Petrie (2004), Markus Mobius and Tanya S. Rosenblat (2006), Rick K. Wilson and Catherine C. Eckel (2006), James Habyarimana, et al. (2007), Andreoni and Petrie (2008), and Marco Castillo and Petrie (2010). Jeannette Brosig, Joachim Weimann and Axel Ockenfels (2003) use video instead of photos.

the amount sent, the sender must decide how much to send without knowing how much will be returned. A player on one side of the interaction has to make a decision that is more strategic than the other. Information should be more valuable to the more strategic player – the sender. This allows us to explore the effect of strategic value on the willingness to purchase information in the form of a counterpart's photograph and the effect of a photo on decisions.

The innovation in our experiment is that, before making decisions in the trust game, a subject either does not see, is forced to see, or is allowed to purchase, for a predetermined price, the picture of his partner. If a picture is purchased, or if the subject is forced to see one, then the partner's picture is displayed when the subject makes a decision in the subsequent trust game with that counterpart. If a picture is not purchased or if the subject cannot see one, then the partner's identity is kept confidential.

This set-up allows us to estimate the demand for photos, quantify their value, and explore their effect on decisions. Why might a subject purchase a photo? We conjecture three possible motives. Subjects may believe that the photo has strategic value, and that their ability to "read" another subject will allow them to make more money. This motive should apply only to senders, as responders do not face a strategic decision. Second, some subjects may have a taste for observing a partner and be willing to pay to see their counterparts. Third, subjects may fear being observed if they are blind to their own partners. Since the second and third motives are equally likely to be present for subjects in both roles, any difference in demand is likely due to the first, strategic motive for purchasing a photo.

Our data give the first empirical support for the value of a photo and the differential desire to acquire this information. That people are willing to pay for this information and use it strategically suggests that theory in such environments may need to take this into account.

Our interest is to investigate the informational value of a photograph in a trust game. Previous research has shown that people are willing to pay for payoff-relevant information. In a public goods game, Robert Kurzban and Peter DeScioli (2008) show that subjects are willing to purchase information on previous-round behavior at a small fixed cost, and they use that information to adjust contributions. While information may hold value for payoffs, in other situations it may not be irrational for individuals to forego information in order to remain ignorant. There is a growing theoretical literature that suggests that people with time-inconsistent preferences may prefer to avoid information-gathering to remain optimistic or delay costs (Juan D. Carrillo and Thomas Mariotti, 2000; Manuel Amador, Iván Werning and George-Mason Angeletos, 2006). Also, there is experimental evidence that, given the self-serving opportunity to remain ignorant or hide one's decisions behind bad luck, people take that option (Jason Dana, Daylain M. Cain and Robyn M. Dawes, 2006; Dana, Roberto Weber and Jason Kuang, 2007; Tara Larson and C. Monica Capra, 2009; Castillo and Greg C. Leo, forthcoming;). We find that subjects sometimes are willing to pay for information and sometimes choose to remain ignorant, even at a price of zero.

Additionally, several experimental studies show that knowing something about the characteristics of one's partner may have informational value. This holds for knowing the social context, and for specific characteristics, such as sex and beauty.<sup>2</sup> These studies suggest that knowledge of a person's face may be valuable in a trust context.

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<sup>2</sup> For the interaction of social context and outcomes, see Iris Bohnet and Bruno S. Frey (1999), Terrence C. Burnham (2003), and Andreoni and Petrie (2004). For specific characteristics of a partner, such as sex and beauty, see Daniel S. Hammermesh and Jeff Biddle (1994), Eckel and Philip J. Grossman (1998), Mobius and Rosenblat (2006), Wilson and Eckel (2006), Andreoni and Petrie (2008), and the survey by Rachel T. A. Croson and Uri Gneezy (2009). Specific to trust games, see Nancy Buchan, Croson and Solnick (2008) and Ellen Garbarino and Robert Slonim (2009).

In our experiments, we find that given the opportunity to buy the photograph of a partner, both senders and responders do so. Senders, however, have a higher demand for photos than responders. The value of seeing the photo appears to be partly strategic. Indeed, if behavior is correlated with personal characteristics, then seeing the photo should be helpful in forming more accurate expectations about behavior. We would expect senders to be more likely to buy photos and use that information to differentiate their trust, and they do.

Interestingly, on the sender side, those who see the photo involuntarily do not send more than those who are not allowed to see the photo. But when the option is presented to buy a photo, senders who choose not to see their partners send less than those who purchase, and indeed less than those in any other treatment, suggesting that more trusting people are more likely to purchase the photo of their counterparts. On the other hand, responders who are forced to see their partners send back more, and those that purchase reciprocate even more, suggesting that seeing a photo makes responders more trustworthy and that more trustworthy responders are more likely to buy. When there is the option to buy, we find that purchasing a photo increases the earnings of senders only when the responder also has bought the photo. Transactions where agents see each others' faces pay off for the sender. Responder earnings are negatively impacted by purchasing the photo of their counterpart.

Our results indicate that the informational value of a face is non-zero. In the realm of strategic decisions, seeing the photograph of one's partner may provide information to help form expectations about behavior. This appears to be helpful to the sender when, by purchasing the photo, he succeeds in entering an interaction where the responder also faces him. This setting is most similar to the face-to-face interactions that are preferred for important business transactions.

## I. Experiment Design and Procedure

There are three treatments in our experiment. In every treatment, a subject plays a trust game with a randomly-assigned partner. The treatments differ in whether the subject sees his partner when making decisions and if there is an option to buy the picture of his partner before making decisions.

Common to every treatment is the trust game. In this game, both the first mover, the sender, and the second mover, the responder, are endowed with 10 tokens. Each token is worth \$1.50. The sender can send any number of tokens, from zero to ten, to the responder. Each token sent to the responder is tripled. The responder can return any number of tokens, from zero to the tripled amount, back to the sender. Subjects are paired with six different partners and make their decisions simultaneously and without feedback. One of the six decisions is chosen at random for payment, and subjects know this ahead of time. Each subject is randomly assigned one role (sender or responder), knows his/her role before making any decisions, and keeps the same role for the entire experiment.

Table 1 shows the three treatments. In the first treatment (T1), neither the senders nor the responders see the pictures of their partners. Subjects have no option to purchase a picture, and they do not see their partners' pictures. In the second treatment (T2), both the sender and the responder see the pictures of their partners. Subjects have no option to purchase a picture, but rather are forced to see the pictures of their partners. In the third treatment (T3), both the senders and the responders are given the option to purchase the pictures of their partners, after completing the instructions for the trust game but before making any decisions. Some subjects buy the picture and some do not.

In all treatments, each subject makes six decisions with six different randomly-assigned partners, each on a separate screen on a computer. The subject can easily click back and forth through the screens to make decisions. The sender decides how many tokens to send to the responder by moving a slider bar on each decision screen. The computer clearly indicates how many tokens the sender would keep and how many tripled tokens the responder would receive. The responder makes decisions using the strategy method, deciding how many tokens to send back to the sender for every possible number of tokens received. Decisions are made using slider bars that represent the tripled amount received for each possible choice that the sender could make. These choices are made on successive screens for each sender the responder is matched with. Each subject submits his decisions without knowing what his partner decided to do.

A photo of each subject is taken at the beginning of the experimental session for treatments T2 and T3. The photo is taken with a digital camera and is taken from the shoulders up so that the subject's face is visible but nothing else. The photo is similar to a passport or identification photo. In T3, after the trust-game instructions but before making the trust decisions, subjects must decide whether to pay to reveal the photos of their counterparts. For each of the six decisions, they are asked if they are willing to give up a fixed amount of money and see the photo of the person they are paired with for that decision. The money the subject gives up is the price the subject pays for the seeing the photo.

A subject sees a screen that displays a set of empty photo frames, representing each of the partners that a subject is already paired with, along with an array of prices for revealing the photos, as shown in Figure 1. For each partner that a subject is paired with, the subject sees a different price. The picture attached to each price is randomly assigned, and subjects know this ahead of time. Subjects must decide if they will take the money and not see the photo of their

partner, or forego the money and see the photo of their partner. Prices for sessions 1-3 were \$0.50, \$1, \$2, \$3, \$4, \$5; for session 4, \$0.20, \$0.50, \$1, \$2, \$5, \$8; for sessions 5-7, \$0, \$0.50, \$1, \$2, \$5, \$8; and for session 8, \$0, \$0.20, \$1, \$2, \$5, \$8. Both senders and responders see the exact same array of prices. Once everyone decides which, if any, photos they wish to see, subjects then make their trust decisions while observing the photos they purchased. Decisions are made “blind” for the photos that were not purchased.

If a subject decides to pay the price to see the photo of one of his partners, the photo is displayed on the top of the trust decision screen for the subsequent decision with that partner. Suppose a subject decides to see a partner at a price of \$.50, to see another partner at a price of \$1.00, to see a third partner at a price of \$2.00, and decides not to pay the higher prices required to see any of the other three partners. Then, on the decision screen for each partner whose photo he purchased, the subject sees the partner’s photo. On the decision screen for each partner whose photo he did not purchase, the subject does not see the partner’s photo. So, of the subject’s six partners, the subject sees three of the six partners’ photos. The subject’s partner does not know whether the subject bought his photo. For whichever decision is randomly chosen for payment, if the subject decided not to see the photo, then in addition to the money earned from the trust decision, the subject also receives the ‘photo money’ for that decision. If the subject decided to see the photo, he receives no extra money.

For treatment T2, in which every subject sees the photos of all six of his partners, the photo is displayed on the top of the trust decision screen for each decision. For treatment T1, in which no subject sees the photo of his partner, no photos are taken, and so none are displayed on the top of the decision screens.



A total of 306 subjects participated: sixty-four subjects participated in treatment T1 across three sessions, 70 subjects participated in treatment T2 across three sessions, and 172 subjects participated in treatment T3 across eight sessions. There were 18-24 subjects in any session. All sessions were conducted at the Experimental Economics Center (ExCEN) laboratory at Georgia State University. Subjects were recruited from introductory courses in economics, political science, sociology, biology and chemistry. Subjects were also recruited through flyers posted on campus and through ads in the campus newspaper. Each experimental session took about one hour and a half. Average total subject earnings are \$29.19 (standard deviation \$10.73).

Of the subjects in the experiments, 46.1% are men. In terms of race, 49.6% are self-described as Black or African American, 37.5% are Caucasian or White, and 12.1% are Other (including 7.3% Asian, 3.0% Indian, and 1.6% Hispanic).

## II. Demand for Pictures

We first examine the demand for pictures. Given the opportunity, do people purchase the photographs of their partners? Table 2 shows the percent of subjects who purchase a photo by the price of the photo.<sup>3</sup> Demand is downward-sloping, but even at very low prices, not everyone purchases the photo. For example, when the photos could be revealed at a zero cost, 87.5 percent

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<sup>3</sup> Note that in Session 5 of treatment T3, the decisions to buy at zero price were not coded correctly, so we do not know if subjects chose to view the picture or not. Of the 22 subjects in this session, 12 bought at a price higher than zero. In all other sessions, subjects' purchasing decisions are monotonic, so if we assume that those that bought at a higher price also bought at zero price, then there are 10 observations (out of 132 observations for the session) for which we do not know if the subject bought or not (4 senders and 6 responders). We have run robustness checks with these 10 observations by assigning them all as bought, all as did not buy, and as buying randomly, and all our results still hold. All results also hold if we drop the session and use only the seven other sessions. We keep the session for completeness and present results under the assumption that all 22 subjects bought at zero price. This assumption yields the most conservative results.

of subjects purchase the photo; at a price of \$0.20, 50% of subjects purchase.<sup>4</sup> As the price of the picture goes up, the percent of subjects purchasing photos declines as expected.

Why might a subject decide to forego information about a counterpart at a zero price? As discussed below, senders who do not purchase at a price of zero send significantly less in the trust game. Someone who intends to send zero may wish to avoid observing the recipient of their untrusting decision. Choosing to view a counterpart may select those who wish to send more, while those who plan to send less may choose to remain ignorant: the ability to voluntarily view the picture of a counterpart selects more trusting senders.

Looking at senders and responders separately, while the total number of photos purchased is not significantly different between the two groups, the tails of the distribution appear to be different. At the lowest prices (\$0 and \$0.20), there are more responders than senders who purchase, though the difference is not significant (t-test p-value=0.15); at prices above \$1, senders are more willing than responders to buy the pictures (t-test p-value=0.009). However, a chi-square test for difference in the overall distribution of the number of pictures bought by sender and responder is not significant (p-value = 0.478).

Senders pay more on average for pictures than responders. Totaling up what senders and responders pay to see the picture of their partners, senders pay on average \$1.42 (s.d.= \$3.75) and responders pay on average \$0.77 (s.d. = \$2.02). This difference is large, but only marginally significant in a one-tailed t-test (p-value=0.079). In addition, conditional on revealing *any* picture, senders who buy at all purchase more photos (2.3 compared to 1.8, t-test p-value=0.0413). This reflects the fact that the sender's decision is more strategic than the responder's. Because the responder gives a conditional response, there is no uncertainty about

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<sup>4</sup> Keep in mind that the set of prices varied across sessions, so that not every subject saw each price.

how much the sender will send. The sender, however, must decide how much to send given an expectation about what the responder will choose.

In Table 3 we report a random-effects Logit regression for the probability of purchasing a photo. The model contains variables reflecting the structure of the experiment: the price of the photo (Price), a dummy variable equal to 1 if the decision is made by a sender (Sender), and an interaction between the two variables, as well as a dummy variable for each session.<sup>5</sup> The coefficients indicate that purchases are negatively related to price, and senders have a lower probability of purchasing at the lowest prices. The coefficient on the interaction term indicates that the sender demand is more inelastic.

Overall, subjects appear to believe that seeing the face of a counterpart has value. More than 80 percent of subjects reveal a photo when it is free, and around 40 percent purchase a photo when the price is below \$1. We next discuss the effect of viewing a photo on the behavior of the subjects who do so.

### III. Trust

We have seen that many subjects are willing to pay to see the photos of their counterparts, and some are willing to pay a high price to see such photos. In this section we turn to behavior in the trust game and compare the behavior of subjects across the three treatments. Recall that in Treatment 1, subjects have no opportunity to see their counterparts' photos, and in Treatment 2 they have no opportunity to avoid seeing the photos. Table 4 presents summary information about the amount sent in the trust game, and the variability of decisions by subjects, in each treatment. The table distinguishes between situations where the photo can be seen and

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<sup>5</sup> Using individual random effects seems reasonable in this case. The treatments were assigned randomly. Regression coefficients and significance levels are very similar if session fixed effects are dropped

where it cannot. The first column shows the average amount sent when the sender cannot see his/her partner, and the second column when the photo can be seen. The first row contains data from treatments 1 and 2, where the subject has no option about whether to see the photo. The second row contains data from treatment 3, when the photo was not purchased (T3-NP) and when it was purchased (T3-P).

When there is no option to observe or not observe the photo, senders send about the same amount to the responders: the average level of trust does not vary significantly across these two treatments. When given the opportunity to purchase, for decisions where the photo is revealed, subjects behave in a similar way to subjects in T1 or T2. However, for decisions where the subjects choose not to buy the photo, trust is lower by 0.85 tokens (a 23% reduction in amount sent).<sup>6</sup> When there is the opportunity to purchase photos, decisions where the photos are revealed differ from those where they are not, indicating that more trusting senders are more likely to buy pictures.

The table also presents information on variability of decisions. The standard deviation and inter-quartile range presented are the average across subjects, and provide measures of the extent to which photos impacted the variability of decisions. Notice that individual decisions about how much to send are most variable in T2, where photos are seen for all decisions. In addition, for T3, the decisions where photos are revealed show more variability than when they were not. This provides some indication that subjects condition their choices on what they see in the photos, though this does not change average behavior.

The decision to send is examined in more detail in Table 5, which contains Tobit regressions using the individual decision data estimated with individual random effects and

group-level fixed effects.<sup>7</sup> Model 1 includes variables reflecting the experimental design. The regressions include dummy variables for treatment 2, where the photos are observed, and treatment 3, where photos can be purchased, as well as session fixed effects.<sup>8</sup> Both carry insignificant coefficients. A third dummy variable is equal to 1 if the photo was purchased (T3-P), and is significantly positive, indicating that, within that treatment, those who purchase the photo trust more (send more) than those who do not. We explore whether those who never choose to buy their partner's picture behave differently in Model 2, where we add a control for never having bought a photo. There is no significant effect.<sup>9</sup> Models 3 and 4 replicate Models 1 and 2 with fixed effects by group. All results hold.

This analysis shows that, while there is no difference in average behavior when subjects are never or always seen, when given the option to purchase a photo, those who choose to purchase a photo are more trusting, on average, than those who do not. The behavior we observe at a price of zero is consistent with strategic ignorance; given the opportunity to avoid knowledge of the identity of their counterpart, subjects who do so trust less. Thus subjects who intend not to send money to their counterpart may strategically choose not to know who that subject is.

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<sup>6</sup> Recall that each token is worth \$1.50, so 0.85 token is \$1.28. Note that, since subjects made multiple decisions, the observations are not independent, and so standard t-tests cannot be used. The regressions in Table 5 control for this interdependence.

<sup>7</sup> We would like to control for individual effects in the estimations since there are multiple observations for each subject. The assumptions of random effects might not be met in this specification. Therefore we also estimate the equations controlling for group-level fixed effects. Groups are generated by interacting dummies for sex (male/female), race (black/non-black) and gpa (above/below the median). This gives us eight group-level fixed effects. We present both sets of results for this and all subsequent regressions. All main effects hold in either specification. The results also hold if we run OLS with clustered errors by individual.

<sup>8</sup> Results here and in Table 6 are robust to dropping session fixed effects.

<sup>9</sup> If we also control for never having bought interacted with a price of zero, there are no significant effects.

#### IV. Trustworthiness

In the second stage of the trust game, responders use the strategy method to decide how much they would send back for each possible amount sent, indicating their trustworthiness. What, then, is the effect of observing photos on trustworthiness? Figure 2 shows the average amount returned by treatment. We define a response function as the percent returned for each amount sent by the sender. In the figure the black lines correspond to the no option treatments, T1 and T2. The solid lines indicate when a picture was not observed, and the dashed lines when a photo was observed. The response functions are, in general, upward sloping, consistent with other studies, and indicate that subjects return a higher percentage of what they receive as the amount sent increases.

The behavior of responders is strongly affected by viewing the photos of their counterparts: responders send back substantially more when the photo is revealed. The lowest level of trustworthiness is seen in T1, when subjects had no possibility of seeing a photo of their counterparts. When the photo is seen, the level of reciprocity is highest, whether it was purchased or seen involuntarily. The possibility of purchasing a photo increased reciprocity even when it was not purchased. Note that trust “pays” when responders return 1/3 or more of what is sent; only when pictures are seen and when the amount sent is high does trust pay in these experiments.

When we consider the effect of seeing the picture of the sender on the response function, we see an effect on both the intercept and slope. Seeing the picture of one’s partner increases the percentage returned for any offer compared to not seeing the picture, so there does appear to be some gain to senders for having their picture shown (though we did not elicit willingness to pay to have one’s picture revealed).

This pattern of behavior is explored in more detail in Table 6, which contains Tobit regressions of the percent returned with individual random effects or group-level fixed effects. The variables parallel those in Table 5. The first set of variables capture differences in the intercept. We see that the intercept for reciprocity is highest when all photos are seen by everyone, whether they are purchased or not. Here, not only can the responder see his partner, but he knows that the partner can see him. Responders are clearly more trustworthy when they can see the photos of senders.

The next set of variables includes Amount Sent and interactions between the Amount Sent and the treatments to capture differences in the slopes of the lines in Figure 2. The percent returned is positively related to the amount sent in all treatments, but this relationship is stronger for the omitted treatment (T1) and strongest for when the photo is purchased (T3-P). In T1, the subject has nothing to go on other than the amount received to determine how much to return. In this treatment, subjects respond positively when they receive a high level of trust from the sender, but not enough to make trust pay. When the photo is purchased, the responder seems to be particularly sensitive to the amount sent.

## V. Decision Profits and Efficiency

Did those subjects who bought pictures make more money? Table 7 shows average earnings by role for each of the treatment conditions. Each cell contains sender and responder earnings for a given set of conditions, based on all of the decisions made by each subject, not just the ones that were paid. The first row shows earnings for T1 and T2, when subjects had no choice over whether to see a picture or not. Reflecting the analysis so far, senders earn more and responders earn less in Treatment 2, where photos are observed by all subjects. This happens

because of changes in the behavior of responders; recall that senders send the same amount on average across T1 and T2. Efficiency (overall earnings) in this game can vary from \$30, if trust is zero, to \$60 if trust is at its 10 token maximum. Efficiency is almost identical in T1 and T2: sender and responder earnings sum to \$40.23 when the photos are not seen and \$40.26 when they are seen.

The bottom section of the table contains data from T3. Since either the sender or responder or both can purchase a photo, there are four possible outcomes. The upper left cell shows when neither sender nor responder observes the photo, so it is most comparable to T1. However, senders earn \$0.94 more and responders \$3.04 less in this situation. Efficiency is lowest here; earnings sum to \$38.24. This supports the idea that transactions between agents who have chosen not to purchase a photo are different from those where all players are anonymous. The bottom right cell, where both purchase a photo, is most comparable to T2. However, the proposer earns about \$1 more and the responder about \$1.50 less than in T2. Viewing photos does not change the efficiency of the transaction when all subjects must see or not see the photos. When neither buys the photo, efficiency is lowest.

There is only weak evidence in the data that senders are good at gauging the trustworthiness of responders from their photos. For senders that bought at least one photo, when they see the photo they tend to send more to responders that return more on average. Senders sent 3.46 tokens to responders in the lowest quartile of percent returned, and 3.81 tokens to responders in the upper quartile. However, this tendency is not statistically significant.<sup>10</sup>

Similarly, we calculated whether those who see the photos of their counterparts come closer to maximizing profit, conditional on the actual pattern of returns of their specific



responding partner. We calculate the maximum possible profit as the maximum amount of money the sender could make if he knew exactly what the responder chose for each possible amount sent. The difference between this amount and the amount the sender actually earned is smaller when the sender can see the responder (they are closer to profit maximization). In T2 the difference is \$5.20 compared to \$5.91 in T1; in T3 (looking only at senders who bought at least one photo) the amount is \$4.75 when the photo is purchased, and \$4.92 when it is not. However, this is not significant for T3 or T1 versus T2 in a regression model.

Next, looking only at data from interactions where the counterparts see each other gives some indication that senders may be better at judging what a responder will return *to them* (i.e. they may be able to identify people who will respond to them specifically). Senders send twice the tokens to responders in the highest quartile of percent returned as compared to those in the lower quartile (3.9 v. 2 tokens). However, because the number of observations is small, these differences, while tantalizing, are not statistically significant. We conclude that, despite hints to the contrary, senders appear to be overconfident in believing that they can glean information from the photos that is advantageous for them.

Table 8 contains regressions using data on all individual decisions, not just those that were paid, and are estimated with random effects and group-level fixed effects. Two models are presented for each role, with variables parallel to those in the previous regressions. Within T3, senders who buy the photo earn more when responders also purchase. Turning to responders, earnings vary within Treatment 3, depending on the pattern of purchases. When the sender does

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<sup>10</sup> We also checked the significance by running a regression of amount sent on seeing the responder interacted with a dummy for the responder's average percent returned being in the 75th percentile and up, and we find no significance.

not buy, responder earnings are lower than when the sender buys, reflecting the higher level of trust when the sender purchases the photo. However, when the responder buys, he earns less.<sup>11</sup>

In sum, comparing T1 and T2, when both photos are observed, earnings are more equitable (senders earn more and responders earn less), but efficiency does not change. In T3, when both photos are purchased, earnings are more equitable as in T2, but here efficiency is enhanced. The table shows that buying the picture helps the sender only when he succeeds in engaging in an interaction where the responder also sees him, as close as possible in our design to a face-to-face interaction. Senders make about 12 percent more in decision earnings than in anonymous interactions, and this increase outweighs the cost of the photo. The responder never helps himself in terms of earnings by purchasing the photo. The face has strategic value to the sender, but not to the responder.

## VI. Conclusions

In this research, we ask the following questions. What is the information value of a face in strategic decisions that involve trust? And, how does viewing a face affect behavior and earnings? We allow subjects to purchase access to a partner's photo and examine whether subjects do (and should) purchase photos, by comparing differences in behavior and earnings. We use a trust game with the option to purchase the photograph of one's partner, along with two treatments where photos are never seen or always seen, to examine these questions. Subjects can purchase a photo for a fixed price, and if a subject purchases the picture of his partner, the subject sees the picture when making his decision. If a subject does not purchase the picture, then the decision is strictly confidential.

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<sup>11</sup> Including demographic controls has little effect on the estimated coefficients, and there are no significant

There are four key findings. First, and most importantly, subjects will pay to see the picture of their counterparts. A counterpart's face has perceived value to decision makers. Both senders and responders are willing to buy pictures, although not everyone buys pictures, even at a price of \$0. Senders have a higher demand for pictures than responders. This makes sense since their decision to purchase includes the possibility of strategic value, in addition to a preference for seeing one's counterpart.

Second, the level of trust is very similar in the two treatments where photos must be seen and where they cannot be seen. When photos can be purchased, those who buy the photos trust more than those who do not. If the photo is not purchased, trust is significantly lower than in any other treatment; this is especially true for subjects who never buy the photo. This may be because subjects who intend not to trust can purposefully avoid discovering the identity of their counterpart, and are unlikely to buy even if the price is zero. More trusting senders are more likely to choose to purchase a photo. Senders send more when they have purchased the partner's photo; since senders do not know whether the responder has also purchased, they appear to behave as if they are in a face-to-face transaction in both instances.

Third, responders send back more when they can observe the photos of their counterparts, and still more when they purchase the photos. Responders become more trustworthy when they see the photos of their counterparts, and in addition, more trustworthy responders choose to purchase photos. As in other studies, responders tend to reward higher amounts sent: the percent returned to the sender by the responder increases as the amount sent increases. However, the percent returned is substantially higher when the photo is observed, and in addition, it is more responsive to higher amounts sent. Trust "pays" for the sender only when the responder also can see the sender's photo, when sender and responder face each other.

Fourth, sender earnings are increased when the sender succeeds in entering a transaction where the agents face each other. For transactions that result in a face-to-face pairing, sender profits are enhanced by purchasing the responder's photo. When both the sender and responder see each other, senders make 12% more than when neither partner sees the other. This occurs because more trusting senders and more trustworthy responders are more likely to purchase photos. For these transactions, the average amount paid for photos is less than the average gain in earnings. The money that the sender could have gotten in these interactions, in lieu of seeing the photo, is \$0.56 on average. The gain from face-to-face as compared to anonymous interactions is \$1.71.

Real world interactions tend to be either anonymous or face-to-face, and asymmetric anonymity is less common. Therefore it is not overly surprising that subjects with little experience with asymmetric anonymity would fail to tease apart the separate effects of seeing and being seen. Senders may erroneously attribute the greater efficiency seen in face-to-face interactions to their own abilities to judge trustworthiness, when in fact it is primarily due to the greater trustworthiness of responders who observe them. Responders may also believe there to be value in seeing their counterparts, failing to realize that their own generosity will be affected.

Our results show that subjects are willing to pay a positive price to see the photos of their counterparts. Because both senders and responders purchase photos at positive prices, it is clear that at least some subjects have a taste for observing their counterpart's photo, or fear being observed when their counterpart is blind to them. We infer from the fact that senders buy more photos at higher prices that the information from a face is perceived to have value in strategic decisions. In the trust game, knowing the identity of the counterpart has little effect on behavior when all subjects are forced to see the photos. However, the value of a face to the sender is

positive when it is chosen and both parties view each other's photos. Simply observing a counterpart's photo does not enhance the sender's ability to accurately gauge trustworthiness, but when the responder also observes, profits of the sender are enhanced. For a face to have value in strategic interactions requires that sender and responder choose to be face to face.

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**YOU ARE PLAYER RED. YOU WILL KEEP THIS ROLE FOR THE ENTIRE EXPERIMENT.**

Remember that you will be paired with six different Player BLUEs. For each Player BLUE you are paired with, you can either receive an amount of money or you can see the photo of your partner when you make your decision. This means that if you choose to not take the money for a particular Player BLUE, you will see that person's photo on the decision screen. If you choose to take the money, you will not see the person's photo on the decision screen.

For example, suppose you are given the choice to receive \$5 or see the photo of your partner. If you choose to see the photo, you are essentially paying \$5 to do so.

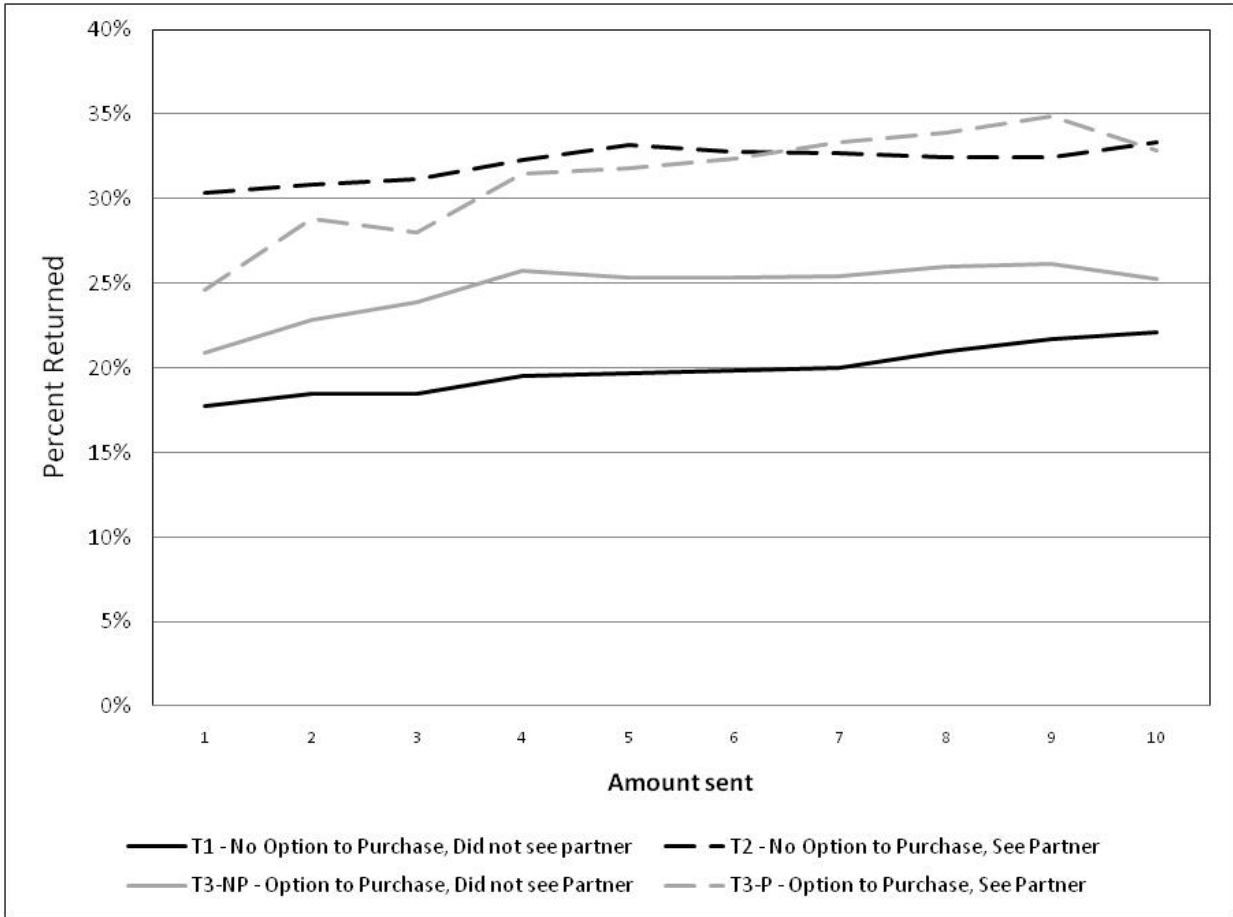
You will only receive the additional money for the decision that is randomly chosen for payment and only if you say you will take the money and not see the photo for that particular decision.

Below is the amount of money you could receive instead of seeing the photo for each of your six partners. Your partners have been randomly assigned to each amount of money. For each partner, would you like to take the money or see the partner's photo?

					
<input type="radio"/> Get \$0.50 <input type="radio"/> See Photo	<input type="radio"/> Get \$1.00 <input type="radio"/> See Photo	<input type="radio"/> Get \$2.00 <input type="radio"/> See Photo	<input type="radio"/> Get \$3.00 <input type="radio"/> See Photo	<input type="radio"/> Get \$4.00 <input type="radio"/> See Photo	<input type="radio"/> Get \$5.00 <input type="radio"/> See Photo

Submit Decisions

**Figure 1: Reveal Photo Screen**



**Figure 2: Average Percent Returned by Responders for Each Amount Sent**

**Table 1: Experiment Treatments**

	<b>Did not see Partner</b>	<b>See Partner</b>
<b>No option to purchase picture</b>	T1	T2
<b>Option to purchase picture</b>	T3-NP (did not buy picture)	T3-P (bought picture)

**Table 2: Percent of subjects who purchase a photo, by price of the photo.\***  
**(fraction in parentheses)**

<b>Price</b>	<b>Total</b>	<b>Sender</b>	<b>Responder</b>
\$0.00	87.5 (77/88)	81.8 (36/44)	93.2 (41/44)
\$0.20	52.4 (22/42)	47.6 (10/21)	57.1 (12/21)
\$0.50	39.3 (59/150)	40.0 (30/75)	38.7 (29/75)
\$1.00	22.1 (38/172)	22.1 (19/86)	22.1 (19/86)
\$2.00	9.9 (17/172)	14.0 (12/86)	5.8 (5/86)
\$3.00	7.8 (5/64)	9.4 (3/32)	6.3 (2/32)
\$4.00	6.3 (4/64)	9.4 (3/32)	3.1 (1/32)
\$5.00	4.1 (7/172)	5.8 (5/86)	2.3 (2/86)
\$8.00	1.9 (2/108)	3.7 (2/54)	0.0 (0/54)
All	22.4	23.3	21.5

(231/1032)

(120/516)

(111/516)

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Total Paid for photos (average)	\$1.42	\$0.77
Total Number Bought	1.4	1.3
<hr/>		
Total Number Bought (conditioning on having bought)	2.3	1.8

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\*Prices for sessions 1-3 were \$0.50, \$1, \$2, \$3, \$4, \$5; for session 4, \$0.20, \$0.50, \$1, \$2, \$5, \$8; for sessions 5-7, \$0, \$0.50, \$1, \$2, \$5, \$8; and for session 8, \$0, \$0.20, \$1, \$2, \$5, \$8.

**Table 3: Probability of Buying a Picture**

**Random-Effects Logit**

VARIABLES	(1)
Price	-2.669*** (0.301)
Sender	-1.049* (0.576)
Sender*Price	1.356*** (0.325)
Constant	0.990 (0.825)
Session fixed effects	Yes
Observations	1032
Number of subjects	172
Log Likelihood	-332.25

Standard errors in parentheses. Random effects at the subject level, and fixed effects at the session level. \* p<.05; \*\* p<.01; \*\*\* p<.001.

**Table 4: Average Amount Sent, Standard Deviation and Inter-quartile Range  
of Amount Sent by Treatment**

	Did not see Partner	See Partner
No option to purchase	3.41	3.46
(T1, T2)	(sd=1.20, iqr=1.78, n=192)	(sd=1.42, iqr=1.83, n=210)
Option to purchase	2.75	3.60
(T3-NP; T3-P)	(sd=0.93, iqr=1.21, n=396)	(sd=1.06, iqr=1.42, n=120)

Note: Each subject's decision is an observation, so in T3, averages contain different numbers of decisions across subjects, depending on the number of times the subject chose to buy or not buy. The average amount sent is the average across all decisions of the amount sent. The standard deviation is the average across all subjects of the standard deviation of amount sent by each subject. The inter-quartile range is the average across all subjects of the inter-quartile range of amount sent per subject.

**Table 5: Amount Sent by Sender****Tobit Regressions**

VARIABLES	(1)	(2)	(3)	(4)
	RE	RE	FE	FE
See partner, no option treatment (T2)	-0.617 (1.261)	-0.627 (1.253)	0.864 (0.569)	0.865 (0.567)
Option treatment (T3)	1.050 (1.113)	0.803 (1.254)	0.334 (0.588)	0.498 (0.661)
Option treatment, Sender buys (T3-P)	0.584** (0.241)	0.550** (0.244)	1.399*** (0.338)	1.086*** (0.375)
Never buy photo		-0.914 (0.598)		-0.733* (0.385)
Constant	2.505*** (0.860)	2.515*** (0.872)	2.073*** (0.539)	4.513*** (0.583)
Session Fixed Effects	Yes	Yes	Yes	Yes
Observations	918	918	918	918
Number of subjects	153	153	153	153
Censored observations (lower, upper)	(171, 39)	(171, 39)	(171, 39)	(171, 39)
Log Likelihood	-1741.22	-1740.28	-2032.68	-2030.86



Standard errors in parentheses. RE: Random effects at the subject level. FE: fixed effects at the group level (8 groups by sex (male/female), race (black/nonblack) and college gpa (above/below the median)). \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table 6: Percent Returned by Responder****Tobit Regressions**

VARIABLES	(1)	(2)
	RE	FE
See partner, no option treatment (T2)	18.76***	42.09***
	(2.150)	(2.537)
Option treatment (T3)	27.71***	38.89***
	(2.162)	(2.402)
See Partner, option treatment (T3, bought)	2.739**	4.102*
	(1.151)	(2.098)
Amount sent	1.048***	1.127***
	(0.138)	(0.241)
See partner, no option treatment (T2) * Amount sent	-0.627***	-0.582*
	(0.180)	(0.322)
Option treatment (T3)*Amount sent	-0.292*	-0.258
	(0.163)	(0.288)
See Partner, option treatment (T3-P)*Amount sent	0.465***	0.479
	(0.179)	(0.335)
Constant	3.296**	-9.173***
	(1.678)	(2.412)
Session fixed effects	Yes	Yes

Observations	9180	9180
Number of subjects	153	153
Censored observations (lower, upper)	(2369, 35)	(2369, 35)
Log Likelihood	-29283.88	-34245.24

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Standard errors in parentheses. RE: Random effects at the subject level. FE: fixed effects at the group level (8 groups by sex (male/female), race (black/nonblack) and college gpa (above/below the median)).\* p<.05;

\*\* p<.01; \*\*\* p<.001.

**Table 7: Decision Earnings by Treatment and Role**

**(Sender's earnings, Responder's earnings)**

	Did not see Partner	See Partner
	(T1)	(T2)
No option to purchase	(\$13.07, \$27.16)	(\$14.65, \$25.61)
(T1, T2)	(sd=\$5.26, sd=\$11.23)	(sd=4.51, sd=\$10.04)
Option to purchase		
(T3)		
	Sender does not buy	Sender buys
Responder does not buy	(\$14.01, \$24.23)	(\$13.34, \$27.71)
	(sd=\$3.67, sd=\$9.31)	(sd=\$4.40, sd=\$9.67)
Responder buys	(\$14.49, \$23.77)	(\$15.72, \$24.12)
	(sd=\$3.79, sd=\$10.00)	(sd=\$3.73, sd=\$5.73)

**Table 8: Decision Earnings****Linear Regressions**

VARIABLES	(1)	(2)	(3)	(4)
	Sender	Responder	Sender	Responder
	RE	RE	FE	FE
See partner, no option treatment (T2)	1.580 (1.087)	-1.550 (2.106)	1.750* (0.986)	-1.489 (1.954)
Option treatment (T3)	0.935 (0.805)	-2.896** (1.179)	0.978 (0.847)	-3.084** (1.141)
Option treatment (T3), Sender buys	-0.521 (0.455)	3.493*** (0.984)	-0.607 (0.429)	3.609*** (1.042)
Option treatment (T3), Responder buys	0.385 (0.501)	-0.691 (1.870)	0.435 (0.459)	-0.237 (1.737)
Option treatment (T3), Sender & Responder buy	1.763* (0.938)	-2.902** (1.313)	1.910** (0.868)	-3.351** (1.329)
Constant	13.07*** (0.755)	27.16*** (0.788)	13.31*** (1.206)	26.65*** (1.364)
Session clustered errors	Yes	Yes	Yes	Yes
Observations	918	918	918	918
Number of subjects	153	153	153	153

Overall – R <sup>2</sup>	0.022	0.020	0.032	0.026
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Standard errors in parentheses. RE: Random effects at the subject level. FE: fixed effects at the group level (8 groups by sex (male/female), race (black/nonblack) and college gpa (above/below the median)). \* p<.05; \*\* p<.01; \*\*\* p<.001.