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An Experimental Analysis

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Abstract

We use experimental data to examine the effect of ethnicity (foreign, indigenous, and mestizo) and gender on trust and trustworthiness in Peru. We find that, compared to the foreign group, the indigenous group is more trusted (positive discrimination), while the mestizo group is less trustworthy (negative discrimination). Likewise, subjects reciprocate more in favor of males. We further analyze whether cognitive ability, the Big Five Personality Traits, and the social dominance orientation scale (SODS) can predict trust and trustworthiness. We find that the Cognitive Reflection Test score is positively correlated with trust, while the cumulative college GPA is negatively correlated with trustworthiness. And neuroticism is correlated with trusting behavior, while the SODS is (negatively) correlated with the trustworthiness ratio.

JEL Codes: C72, C91, J15.

Key words: Trust, trustworthiness, cognitive reflection, personality traits, social dominance, discrimination, experiments.

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1 Introduction

There is a vast and growing body of literature examining discrimination in the labor market in developed (e.g., Aigner & Cain 1977, Bertrand & Mullainathan, 2004, Carlsson & Rooth 2007; Kass & Manger, 2010) and developing countries (e.g., Galarza & Yamada 2014, Banerjee et al. 2009, Moreno et al. 2012, Bravo et al. 2009).¹ For Peru, in addition to the labor market (Galarza & Yamada 2014), other studies have analyzed the existence of discrimination in the provision of health services (Valdivia 2010) and group formation (Castillo et al. 2013).

Nevertheless, only few studies do analyze two important aspects of the problem. First, little is still known about the reasons behind discrimination. Second, the literature on the prevalence of the discriminatory behavior in other contexts, beyond the labor market, is scant. In the case of Peru, the few existing empirical studies only examine the undergraduate students' perceptions of discrimination, yet they do not provide a measurement for it (Kogan & Galarza, 2014).

The purpose of this paper is to fill such information gap. In particular, we aim to provide empirical evidence of two possible reasons for discrimination—stereotypes or tastes—by using experimental methods in a college environment. In addition to the academic interest in disentangling the reasons behind the observed discrimination, its practical relevance lies in the policy area: the policy interventions depend on which the reason behind discrimination is. In principle, changing preferences (taste-based discrimination) seems to be harder to do than changing stereotypes (statistical discrimination). Thus, while a solution for the latter could consist in providing a broader range of information, the former requires more complex solutions, such as the development of a greater awareness of the value of diversity.

In particular, our purpose in this paper is three-fold: First, we examine whether there a strong discrimination in favor of students from an indigenous origin (versus those from foreign and mestizo origins). Prior studies about social preferences report ethnic (Fershtman & Gneezy 2001) and sexual discrimination (Delavande & Zafar 2013). If the ethnic origin captures socio-economic status then we should expect that, with everything else being constant, the expectation of “helping” should explain greater transfers to this group. Second, we aim to analyze the extent to which the possible observed discrimination is due to Stereotypes. Third, we analyze any correlation between the trusting and trustworthy behavior and three sets of indicators: cognitive ability, the social dominance orientation scale (SDOS), and the Big Five personality traits (extraversion, openness to experience, neuroticism, agreeableness, and conscientiousness) (Digman 1990, Goldberg 1990). In prior studies, cognitive ability tends to be correlated with strategic decision-making (Benito-Ostolaza et al. 2016). In turn, since the SDOS captures one's preference for inequality among social groups, we should it to be negatively correlated with pro-social altruism (Pratto et al. 1994). In recent years, several studies examine the role of the Big Five personality traits test in decision-making. In particular, prior studies (e.g., Corr et al. 2015) show that the agreeableness, the trait related to kindness and warmth, is correlated with trusting behavior.

We thus examine the effect of knowing the surname, which measures a sort of social distance,

¹For an extensive review of recent literature on this subject, see Neumark 2016 and Bertrand & Duflo 2016.

and gender of the counterpart on the decisions taken during the Trust Game (strategic interaction) and the Dictator Game (interaction based on generosity). Using our result from Trust Games and Dictator Games allow us to study whether any detected effect (by surnames or gender) depends on the type of interaction (strategic or generosity-based). This also allows us to examine the importance of stereotypes and tastes in the observed decisions. In sum, we depart from most of the recent literature in two important ways. First, in addition to examining the existence of trusting behavior and trustworthiness, we study the correlates of those decisions using administrative data about tuition (which proxies for SES) and college GPA (a proxy for cognitive ability), the Big Five Personality Traits, and social dominance orientation scale (SDOS).

The remainder of this paper is organized as follows. Section 2 reviews the most relevant literature up to date, especially concerning studies that distinguish between both types of discrimination, and examines some correlates of decisions made in the Trust or Dictator Games. Section 3 describes the methodology and experimental design we used, section 4 presents our main results, and section 5 makes some final remarks.

2 Previous work

Our paper relates to two strands of the literature: social preferences and discrimination. On the one hand, there is extensive research using double-blinded experiments to measure social preferences (e.g., Eckel & Wilson 2004 & Berg et al. 1995). Some of them study whether decisions are affected by information about the counterpart. In particular, Levitt & List (2007) report studies in which participants engage in more pro-social behavior, when the counterpart identity is known. This suggests that pro-social behavior may not be fully attributable to fairness concerns (Davis & Holt 1993). When information concerning the counterparts is added (e.g., gender or ethnic origin), one can analyze the effect of knowing such information on the decisions taken. Any statistically significant differential effect, by group, can then be thought of as discrimination. On the other hand, several studies aim to explain the reasons for discrimination, being two the main competing theories: statistical discrimination (which states that the lack of information generates stereotypes regarding different groups of individuals (Arrow 1973, Phelps 1972)) and taste-based discrimination (which states that individuals may have a particular preference to interact with certain groups of people over others (Becker 1975)).² A priori, it is unclear which reason should prevail in each particular interaction among individuals.

Among all the experiments measuring social preferences that can be used to capture discrimination, the Ultimatum Game, the Trust Game and the Dictator Game have been the most commonly chosen. We will use the last two in this study, which we describe next. The Trust Game (TG) is

²Johansson-Stenman (2008) proposes a third type of discrimination, called biased perception based discrimination, which indicates that some people are treated worse than others because they belong to a group that others mistakenly believe to have a less favorable characteristic (If, for example, it is usual to believe that group A is less trustworthy than the rest of groups in a society, then if group A is a minority, all members of that group are treated worse because they have fewer people similar to them). In any case, it is hard to detect and separate this type of discrimination from the previous two aforementioned motives. We thus will not address it in this paper.

a sequential Prisoner’s Dilemma (PD) game,³ in which the first player (the trustor) decides how much money, from his initial money endowment, to transfer to a second player (the trustee). The experimenter then triples that amount and gives it to the second player, who then decides how much money (from the tripled amount) she wishes to return. A commonly stated interpretation of this game is that the first player’s decision reflects her trust in the second player, which could arise from her altruism towards—and expected reciprocity from—her. In turn, the second player’s decision reflects how trustworthy she is (positive reciprocity). Usually, the first player transfers about half of her initial endowment and the second player returns about half of the money she receives (Levitt & List 2007). In these games, there is evidence of a willingness to pay to learn certain features of the other player, such as her physical appearance (Eckel & Petrie 2011); or to reveal one’s own characteristics (Heyes & List 2016). These results suggest that information about who the player is may affect choices made.

The Dictator’s Game (DG), on the other hand, is a TG, without the second stage; so that any strategic considerations by the first player (called now the Dictator) are ruled out. The second player now simply accepts the decision made by the first player. Typically, in DGs, more than half of the first players send a positive amount of money to the second one, with an average transfer of 20% of their endowments (Levitt & List 2007). This result reveals a marked preference for giving to the other (explained either by altruism or inequality aversion), which contradicts the prediction of a Nash equilibrium (“the dictator sends nothing”), made in a context in which individuals only worry about their own wellbeing.

Etang et al. (2011) conduct TGs, DGs and Risk Games, in order to examine the role of social distance, as measured by community membership, on trust and altruism in Cameroon. They find that more money is sent to individuals from the same community (pro-social behavior) and that the results of the TG are not correlated with attitudes towards risk (although one could expect that, in principle, trusting behavior be correlated with the degree of risk aversion, this result shows that this is not necessarily the case).

Charness & Gneezy (2003) conduct DGs and Ultimatum games (UGs) with two treatment groups, one in which the second player’s surname was revealed to the first player, and other (the control group) in which no such information was disclosed. In the DG, knowing the surname of player 2 involves transfers of higher amounts while in the UG, this information has no major effect on the amounts transferred. Thus, while generosity increases with some information about the counterpart, such behavior appears to be crowded-out by strategic concerns.

Another branch of recent studies attempt to separate the effect of statistical discrimination from that based on tastes.⁴ By comparing the amounts sent in TG and UG with those sent

³The PD is a non-cooperative game, in which two individuals aim to maximize their own utility and make decisions without knowing the other party’s choice. The prediction of the game implies that each player will choose the non-cooperative strategy, which is the worst strategy they could choose, from a social point of view.

⁴From a different perspective, Neilson & Ying (2016) develop a dynamic framework of analysis to examine a different question, taking the case of hiring decisions: whether taste-based discrimination in the present (exerted by some manager, A) can lead to statistical discrimination in the future (exerted by a different manager, B). In their model, the first type of discrimination arises from a non-productivity-related trait (if manager A hires more women just because they are more attractive than male workers, the average skill of hired men is higher than that of hired women, which allows manager B to use gender as a variable to discriminate statistically).

in DG, Fershtman & Gneezy (2001) separate stereotypes from tastes as reasons to discriminate among college students in Israel. They find significant ethnic discrimination, based on stereotypes, which is mainly exercised by males. Other laboratory experiments that disentangle the relative importance of statistical versus taste-based discrimination include Castillo & Petrie (2010) for public goods experiments and group formation with undergraduate American students, and Castillo et al. (2012a) for the taxi service in Lima, Peru. In this latter case, the authors find evidence of statistical discrimination against male passengers: they get higher initial and final prices.

Gneezy et al. (2012) use information from more than 3,000 transactions in different markets (car repair, car sales, among others) to determine the intensity of and the reasons behind discrimination. The authors find that when the object of discrimination is under the control of the individual (such as the lack of effort or motivation), the cause is animadversion (i.e., tastes), whereas, when that object is perceived as being outside the control of the individual (such as race or gender), discrimination tends to be "statistical". Similarly, in a meta-analysis of 77 experimental studies on discrimination (which altogether contain 441 results), Lane (2016) reports that about one-third of the studies finds discrimination (there is evidence of both types, statistical and taste-based discrimination), that students and non-students discriminate in a similar way, and that subjects favor the opposite gender.

Turning now to studies measuring social preferences in experiments, Sutter & Kocher (2007) examine whether trust and trustworthiness vary across different age cohorts: 8 years, 12 years, 16 years, students (22 years old in average), professional workers (32 years old in average) and retired people. In those games, subjects only interact with other participants from the same age group. Their results show that trust increases monotonically from the group of primary school students (8 years) until they are 22 years old, but remains constant afterwards, unlike trustworthiness, which is observed in all age cohorts.

Slonim and Guillen (2010) examine the nature of discrimination in TGs and whether selecting the counterpart plays a role. In their design, in both scenarios (with and without selection), the trustor knows the gender and an indicator of analytical ability of her counterpart (the authors expect to find a positive correlation between selection and trust). They find that discrimination is negligible when there is no selection. With selection, however, they find significant discrimination, in terms of the amount sent by the trustor and of choosing her counterpart: Regardless of the information about the ability of her counterpart, males prefer (as counterpart)—and send more to—females; and vice versa. In addition, the observed discrimination is explained by tastes and beliefs regarding the trustworthiness of each gender. Moreover, the authors do not find a clear relationship between gender and trustworthiness (see references cited therein, page 387).

Our study also relates to those that analyze the relationship between social distance, understood as "the perceived distance between individuals and groups" (Encyclopedia of Psychology 2000) and the analysis of who are more trustworthy. Johansson-Stenman (2008) uses survey data to examine this relationship and finds that social distance, measured by indicators such as political affiliation, negatively affects the perception of being trustworthy in Sweden. Moreover, older people and those living in small cities, are considered more trustworthy than young people and those living in big

cities.

In the same fashion, Song et al. (2012) analyze the role of social distance on decisions made in TG and DG in China. The authors find that social distance reduces the amounts transferred in TGs, but does not reduce reciprocity. Curiously, they do not find a correlation between altruism in the DG and reciprocity in the TG. The authors explain this result by alluding to the different moral considerations captured in each game (the generosity exercised over someone who cannot respond, in the DG, is different from that observed when one can punish others in some way, in the TG).

The existing literature, however, falls short in explaining the behavior observed in the experimental games. For instance, the role of variables, such as cognitive ability or personality traits are rarely examined. Corgnet et al. (2016) represents a notable exception. These authors find a positive correlation between the Frederick (2005)'s Cognitive Reflection Test (CRT) score and the amount sent by the trustor, but not by the trustee, in TGs.⁵ This result seems consistent with the empirical evidence indicating that individuals with higher cognitive abilities play more strategically (Benito-Ostolaza et al., 2016).

We contribute to the existing literature, by further examining the role of cognitive ability, captured by the CRT score and college GPA, in decisions made in the TG, in addition to the role of the Big Five Personality Traits⁶ and the Social Dominance Scale.⁷ We ultimately analyze the existence and nature of discrimination in the decisions made in Trust and Dictator Games, based on ethnicity and gender.

3 Experiments

3.1 Design

We have a 2x3 within-subjects design: we implemented two types of experimental games (Trust and Dictator Games) and the subjects were students from three ethnic groups (foreign—European or Asian—origin, indigenous origin, and mestizo origin).⁸ Our experiments were conducted at the Universidad del Pacífico (UP), with a sample of 558 undergraduate students, chosen by pairs (Student A, Student B), from different semesters and majors. Using the surnames as the ethnic marker, our sample consists of three groups: foreign-F (G1), indigenous-I (G2), and mestizo-M (G3), as shown in Table 1.⁹ The pairings of each group appears in the first row of each cell.

⁵An entire issue of the *Journal of Behavioral and Experimental Economics* analyzes the connection between cognitive abilities (using mostly the CRT, as a proxy variable) and economic decisions. See vol. 64, October 2016.

⁶In general, the Big 5 personality traits have been used to examine their correlation with aggressive behaviors (Barlett & Anderson 2012), but not with social preferences. An exception is Evans & Revelle (2008).

⁷This is an instrument used to measure the degree of preference for inequality (Michinon et al., 2005). A prior study by Densley et al. (2014) find that SODS is correlated with low trust among gang members in London.

⁸Sample foreign surnames include Calmett, Dextre, and Johannson; Indigenous surnames include those with a Quechua origin (e.g., Anchurima, Armacanqui, and Quispe) and “mestizo” surnames include the rest (e.g., Álvarez, Paredes, and Calderón).

⁹We grouped subjects, using their full names (first name + paternal surname + maternal surname).

[Table 1 about here]

At first, we wished to recruit only students taking general courses in their first, third and fifth years, with the aim to have a representative sample of students (since all students must take those courses). However, the lack of representativeness of students with foreign and indigenous surnames in these courses forced us to include participants from other courses in the sample. We used the Universidad del Pacífico registry of students to select our pairs of subjects. Our original design considered an equal number of pairs in each group shown in Table 1. However, the recruitment of subjects was difficult and we could not balance each cell in Table 1. Once we selected the pairs of students, part of our sample was recruited in their classrooms and part, via email invitations.¹⁰

3.1.1 Trust and Dictator Games

In our study, every Student A participated in the Trust Game (TG) and in the Dictator Game (DG). We randomly changed the order of play for each subject: 54.35% of subjects played the TG, followed by the DG; and the remaining 45.65% of subjects played games in the reverse order.

The TG is a sequential, two-stage game. In stage 1, Student A, the trustor, received a sealed envelope with an endowment of 10 PEN (equivalent to 3 USD) and decides how much (denoted as x_{TG})¹¹ to transfer to Student B, the trustee. This amount may be seen as a measure of the trust she has in Student B.¹² The amount of money transferred is then tripled by the experimenter ($3x_{TG}$) and given to Student B. Under the premise that subjects want to maximize their own utility, in the unique subgame perfect equilibrium (in which each player chooses the action that maximizes her individual payoffs), Student B will not return anything to Student A. Given this, the latter will not transfer anything to the former.

In our experiments, the only information that every Student A knows before making her decision (first stage) is the full name of Student B and her university affiliation (Universidad del Pacífico). Appendix 1A shows the instructions given in this stage (see “Instructions for Part I”). In the second stage of the TG, conducted a few days after Student A participated, Student B decides how much of the amount of money received ($3x_{TG}$) to transfer back to Student A (denoted as y). Student B has the same information as her counterpart when making her decision. Appendix 1B presents the instructions given in this stage.

Thus, in order to test for ethnic discrimination (to this point, such discrimination can be based both on tastes *and* stereotypes) in the levels of trust, we will compare the difference between the average amount transferred from Students A to Students B (x_{TG}) belonging to each ethnic group

¹⁰While some students did not attend class on the day we visited their classrooms, none of the attendees declined to participate. On the other hand, the success rate from our email invites was roughly 26%.

¹¹We used 1 PEN Sol coins in both stages of the TG, as well as in the DG.

¹²We are aware that this amount may also be affected by other factors, such as altruism (Student A may be happier when Student B has more money to consume), inequality aversion, and risk aversion (if, for some reason, Student A does not expect Student B will transfer back anything, she would not send anything in the first place. Studies such as Etang et al. 2011 for Cameroon, finds, however, that the trustors’ decision is not affected by their risk preferences, a finding that gives us some confidence that our results might not be confounded, to some extent, by risk considerations.

(F, I, M). We will test for gender discrimination in a similar fashion. On the other hand, to test for discrimination in the levels of trustworthiness, we will analyze the amount of money sent back by Student B (y)¹³ and the rates of return of money from Student B to Student A ($\frac{y}{3x_{TG}}$).

Turning to the Dictator Game (DG), Student B now becomes a passive player, who accepts any amount sent by Student A (call this amount, x_{DG}). Again, under the assumption that subjects want to maximize their own utility, the unique Nash equilibrium of this game implies that Student A does not transfer anything to Student B. Appendix 1A presents the instructions given in this experiment (see “Instructions for Part II”).

In the DG, the Student B’s passiveness implies that Student A does not expect any return from her, so that any stereotype she has about her counterpart (from any ethnic group—F, I, or M—or gender), becomes irrelevant in her trusting decision, thus leaving “preferences” as the only reason for discrimination. This way, the difference ($x_{TG} - x_{DG}$) gives us an indicator of the extent of taste-based discrimination.

We will further conduct a regression analysis, using information collected in the post-experimental survey, in order to find the correlates of choices made in the TG. We collected information about age, gender, ethnicity, cognitive ability (proxied by the CRT score and the cumulative college GPA),¹⁴ as well as the Big Five Personality Traits (Agreeableness, Openness to Change, Neuroticism, Conscientiousness and Extraversion), which capture essential personality traits (Corr et al. 2015),¹⁵ and the 16 items of the Social Dominance Orientation Scale (SDOE), which is an instrument used to measure the degree of preference for inequality (Michinon et al., 2005, Pratto et al. 1994).

3.2 Implementation

Our sample includes 279 Students A and their pairs (Students B). Table 2 presents the basic descriptive statistics of our participants. As shown below, our subjects are about 19 years old, have a cumulative college GPA of 13.6 (in a 0-to-20 scale), are in their fourth or fifth academic semester (with 80 credits accumulated, out of 200 credits), 46% are women, 30% have an indigenous-sounding surname, 40% have mestizo surnames and 30% have surnames of foreign origin (mainly European). These characteristics are similar for Students A and B. Moreover, the three main majors represented in our sample include Economics and Finance (between 31% and 46% of the sample, depending on whether it is Student A or Student B), Business Administration (between 27% and 36%) and Entrepreneurial Engineering (14%).

[Table 2 about here]

¹³For positive amounts of x_{TG} , y also represents an indicator of positive reciprocity.

¹⁴The CRT has shown to be correlated with cognitive abilities in previous studies (e.g., Frederick, 2005). Nevertheless, other studies suggest that, rather than cognitive reflection (which is the ability to reflect before giving an impulsive, and wrong answer), the CRT seems to capture numerical intelligence (e.g., Sinayev & Peters 2015, Welsh et al. 2013).

¹⁵Agreeableness captures the tendency to be helpful and cooperative. Openness to change reflects curiosity. Neuroticism captures a person’s tendency to experience negative emotions, such as anxiety and anger. Extraversion is often associated with energy and sociability; and Responsibility reflects the tendency to be organized and disciplined.

The data collection process was carried out in two periods, between November 8 and 30, 2016 and between January 11 and 30, 2017. As mentioned earlier, the experiments were conducted in two settings: the classrooms, with the consent of the instructors; and in previously arranged rooms and dates, scheduled via e-mail invites. Our experiments lasted for about 30 minutes, on average, for both types of Students. Participants did not receive a participation show-up fee; their monetary winnings came exclusively from the experiments in which they participated.

4 Results

One of our main aims is to determine if participants (Students A and B) show a systematic preference for members of a particular ethnic group and/or gender, acting as their counterparts, and whether the discrimination is statistical or taste-based. Thus, we present next the descriptive statistics and means difference tests by ethnic group (section 4.1). The subsequent section (section 4.2) respond to our second goal, wich is to examine whether cognitive ability (measured by the CRT score and the cumulative college GPA), the Big Five Personality Traits, and the social orientation dominance scale, affect the decisions made in the games analyzed, in a context of linear regressions.

4.1 Behavior in the Trust and Dictator Games

Table 3 and Figure 1 summarize the behavior found in the Trust Games. As shown in Table 3, the average amount (and median amount) sent by the trustor is 5.05 PEN (transfer of 50% of the endowment). Disaggregating by the ethnicity of the trustor (rows) and trustee (columns), we can observe that the former sends, on average, a larger amount to the members of the Indigenous group, both with respect to Foreigners (p-value is 0.0154) and Mestizos (p-value is 0.0334) (see the lower panel of the table, “Total”). These differences, however, remain only marginally significant for the group of trustors with Foreign surnames (see upper panel). Overall, these results suggest the existence of a positive discrimination in favor of the group with Indigenous surnames.

[Table 3 about here]

Figure 1 shows the average amounts sent by the trustor, divided by gender and ethnic group, of the trustor (top panel, A) and the trustee (bottom panel, B). Who are more trusting? While, in general, we see (panel A) that male trustors send more than female trustors, this difference by gender is only significant for the case of the Foreign group of trustors. Secondly, while the trustees from the indigenous group receive more money than those from other ethnic groups, disaggregating by gender, such difference does not appear to be statistically significant (panel B). The means tests of the average amounts sent by female and male trustors confirm the inexistence of any significant difference by gender of the recipient (see Table A3 in the Appendix).

[Figure 1 about here]

Turning now to the Dictator Game, the average amount transferred by Student A, to members of each of the three ethnic groups under scrutiny is not statistically different (see bottom panel of Table 4). However, Students A with a foreign surname do send larger amounts to Students B of indigenous origin, as compared to those of the mestizo group. Thus, if there is any discrimination in favor of the indigenous group, this would come from Students A of foreign origin and is likely to be based on preferences, rather than stereotypes. Performing a regression analysis on the amount sent, similar to that for the Trust Game, did not yield any significant result, which means that subjects focused on the Trust Game, as we expected (unreported table).

[Table 4 about here]

Why would Students A send larger amounts of money to Students B from the Indigenous group in the TG? One possibility is that they expected a different response from a Student B, depending on her ethnic origin. In other words, if the stereotype that “members of the Indigenous group return more than another group, Foreign or Mestizo” exists, it would then be justified to send, on average, larger amounts to indigenous students, in which case we would be talking about statistical discrimination (this happens to be the case, as shown in Table 6). On average, each Student B sends back 6 PEN to a Student A, which represents 34.14% of the amount they received (which is 3 times the amount sent by a typical Student A) (see Table 2, lower panel).

Table 5 reports the average amounts returned by Students B for each 1 PEN received (between 0 and 10 PEN, shown in columns), according to their ethnic origin (rows). As seen below, for each column, in general, members of different ethnic groups send different amounts, with no clear pattern. The small number of observations for each category precludes testing for mean differences to verify the statistical significance of such differences.

[Table 5 about here]

Table 6 shows the average amount sent back by the trustees, according to their ethnic group (top panel) and the trustor’s ethnic group (bottom panel), and by their respective gender. As seen in the top panel, in the case of the amount sent back in PEN (y), male trustees send significantly more than females, for each ethnic group, and overall (7.42 PEN versus 4.83 PEN). Moreover, the average amount sent by an indigenous trustee, 7.00 PEN, is significantly larger than that sent by a mestizo one, 5.52 PEN (p-value is 0.0349) and by a foreign one, 5.69 PEN (p-value is 0.0571). The bottom panel of the table shows that the trustees also tend to send significantly more money to a male counterpart, within each ethnic group and overall. In this case, however, the average amounts sent to an indigenous trustor is similar (5.78 PEN), in a statistical sense, to that sent to a mestizo (5.44 PEN), and marginally smaller than that sent to a foreign trustor (7.01 PEN, p-value is 0.0924).

[Table 6 about here]

On the other hand, in the case of the trustworthiness ratio ($\frac{y}{3x}$), which accounts for the amount received by the trustee and shows the relative return of sending 1 PEN to the trustor, a typical indigenous trustee sends back more (37.04%) than a mestizo trustee (31.88%) (p-value is 0.0438), but no more than a foreign trustee, 34.39% (p-value is 0.1996). Moreover, male trustees send more than female ones only in the case of the mestizos (35.79% versus 28.56%). Furthermore, trustees have a strong preference to send more to male trustors rather than females (36.71 versus 32.03), and this is so for foreign and indigenous trustors. We do not observe a market preference for any specific trustor’s ethnic group in regards to this trustworthiness ratio.

A possible explanation for why trustees send some money back to trustors, is because they are adverse to inequality. To contrast inequality aversion (IA), if x is the amount sent by the trustor and y is the amount returned by the trustee, when $x \leq 2$, we know that a trustee motivated by IA should choose not to return anything (i.e., $y = 0$), because any amount returned would increase the inequality between the trustor and the trustee. On the other hand, if $x > 2$, IA trustees should send back some positive amount, in order to reduce inequality. In contrast to this, a trustee who is motivated only by reciprocity considerations should send back a positive amount, whenever she receives something from the trustor ($x > 0$).¹⁶

In our sample, 82.59% of the trustees are “inequality averse”. This group has a similar cumulative college GPA (p-value is 0.3274) than the non-inequality averse. Likewise, we cannot reject the null hypothesis of equal CRT scores with the non-inequality averse subjects (p-value is 0.4018). Unsurprisingly, IA trustees send significantly more money to the trustors, compared to those who are not IA (on average, 6.93 PEN vs. 1.60 PEN). On the other hand, 93.33% of the trustees are “reciprocal” and their CRT scores and cumulative college GPA are statistically indistinguishable from those who are not. They send, on average, 6.42 PEN, compared to 0 PEN sent by the non-reciprocal trustees.

Does it pay to trust? The average rate of return is high (18.81%: from every 5.05 PEN received, 6.00 PEN are sent back). As seen in Figure 2, sending small amounts of money (up to 3 PEN) has a negative return, probably due to some punishment from the trustee, for “such a small” transfer. On the other hand, the return to trust (reciprocity) increases monotonically, for transfers of at least 4 PEN. In particular, note that fully trusting is very profitable (has a rate of return of around 40%).

[Figure 2 about here]

4.2 Understanding the decisions made in the TG

The trustor’s decision of how much money to send in the TG can be based on her perception of how trustworthy the recipient/trustee is, and this belief could be influenced by the trustee’s ethnic

¹⁶Sutter & Kocher (2007) carry out a similar analysis for Cameroon.

group or gender, in addition to her own characteristics. In this section, we examine how a set of individual variables affects the decisions made in the TG, in a linear regression context. Some of the variables of interest include the CRT score, the cumulative college GPA, the SDOS and the Big Five personality traits. It is worth to mention that the way we measure neuroticism expresses its positive dimension: emotional stability and security. The same applies to all other four personality traits. The Figures below show a tendency for males to exhibit higher CRT scores than females (both acting as trustors and trustees) for each ethnic group (Figure 3), and a very homogeneous academic performance across gender and ethnic groups (Figure 4).

[Figure 3 about here]

[Figure 4 about here]

Table 7 reports the results from the Ordinary Least Squares (OLS) regressions on the amount sent (in PEN) by the trustor in the TG. As mentioned earlier, we aim to examine the role of ethnicity, gender, cognitive ability, personality traits and the social dominance orientation scale on the amount sent. Our regressions include age, the number of accumulated credits (which serves as a proxy for university experience) and the order of the games (whether the sequence TG–DG or DG–TG was played), as control variables in columns 3 to 5.

As shown below, male trustors send (trust) more (the coefficient of *Male Trustor* is positive); they do not have any particular preference for the same or the opposite gender in explaining their sending behavior (the coefficient of *Male Trustee* is not significant). Moreover, indigenous trustees receive between 0.7 PEN and 0.9 PEN more, comparing to foreign trustees (see columns 1 to 4). In column 5, we include the SES (captured by the highest-two-tuition-scales dummy variable), the coefficient of the *Indigenous* variable turns insignificant (because this group has significantly lower SES). As for the ability, the coefficient of the CRT score is positively correlated (at 5% or 1% level of significance) with trusting behavior, a result that is robust to the inclusion of controls such as university experience, major chosen, SES, and order of the games played (columns 2 to 5). A more reflective behavior (captured by a higher CRT score), thus seems positively correlated with trusting others. In contrast with that, the coefficient of the cumulative college GPA is not significant in any of the specifications considered. This result suggests that GPA and CRT are measuring different dimensions of ability.

Lastly, in terms of the Big Five personality traits and the SDOS, only the coefficient of *neuroticism* is correlated with trust (at 5% level of significance).¹⁷ One may interpret this result as follows: subjects who are more concerned with adequacy (and thus score high in neuroticism), tend to be more cooperative/trust more. Unlike Evans & Revelle (2008), however, we do not find that agreeableness is correlated with trust.

¹⁷It is worth mentioning that each of the personality traits scores and SODS are standardized using its respective sample's mean and standard deviation, for easy of interpretation. As expected, the results are qualitatively the same if we use the raw scores.

[Table 7 about here]

In the case of the OLS regression for the trustee’s decision, the dependent variable has two specifications: the absolute amount, in PEN, sent back to the trustor (reported in Table 8), and the trustworthiness ratio (reported in Table 9). While in the former case we compare among all trustees, in the latter, we are comparing among trustees who received the same amount. The explanatory variables in both cases are the same as in Table 7. The first four columns in Tables 7 and 8 do not include the amount received from the trustor, while the fifth column does.

As shown in Table 8, trustees tend to favor male trustors. Likewise, trustees tend to send smaller amounts to people from the mestizo group, as compared to those from the foreign group (both coefficients are significant only at 10% level), in the first four specifications (columns 1 to 4). All these effects turn insignificant when we include the amount received from the trustor (column 5).

In terms of our indicators of cognitive ability, a higher cumulative college GPA is negatively correlated with trustworthiness across all specifications considered (see columns 3 to 5), while the coefficient of the CRT scores is insignificant. A plausible explanation for this result is that students with higher GPAs tend to make more strategic decisions, and thus seek to maximize their gains over others who have more altruistic or reciprocal considerations. Furthermore, none of the coefficients of the Big Five Personality traits or the SDOS is significant. Finally, Does it pay to trust? As shown in column 5, it does: on average, for each 1 PEN sent by the trustor (trustees receive 3 PEN), trustees send back 1.5 PEN (50% of the amount received).¹⁸ This result is similar to that of Etang et al. (2011) and Glaeser et al. (2000), with the difference that, in the former case, this was the only significant variable in their regression analysis on the amount sent back by the trustees.

Turning now to the analysis of the trustworthiness ratio (Table 9), the only significant coefficients are those of the cumulative college GPA and the social dominance orientation scale: subjects with higher college GPAs and those who have a stronger preference for inequality exhibit a lower trustworthiness ratio. No effect from any personality trait is observed. Furthermore, again, when we include the standardized amount sent by the trustor in the regression (see column 5), we find that a one-standard-deviation increase in such an amount, increases the trustworthiness ratio by 7.3%.

[Table 8 about here]

[Table 9 about here]

¹⁸These results are similar when we include the ethnic group of the trustees in the regression (see Table A1, in the Appendix). In this table (columns 2 to 4), we see that, in fact, indigenous trustees are more trustworthy (they send back more), compared to foreign trustees, thus providing a rationale for the trustors to send more to indigenous trustees (as seen in Table 8).

5 Concluding remarks

In this study, we use experiments to analyze peoples' behavior in Peru. In particular, we examine whether college students favor members of certain ethnic groups or gender in Trust Games. The study of trust and trustworthiness seems relevant in a college context, where collaboration may be a significant part of the undergraduate studies experience. We find a moderate level of trust (trustors send, on average, 50% of their endowments), which is greater towards individuals with indigenous-sounding surnames (as compared to those with foreign-sounding surnames). We interpret this as positive discrimination in favor of indigenous subjects. XXX Unfortunately, it is not clear whether this discrimination is due to preferences/tastes or not. Moreover, we find that the mestizo group is less trustworthy, as compared to the foreign group. We interpret this as discrimination against the mestizos. Similarly, subjects reciprocate more when a male is their counterpart.

In terms of the other correlates of trust and trustworthiness, we find that the CRT score is positively correlated with trusting behavior but not with trustworthiness, while the cumulative college GPA is negatively correlated with trustworthiness, but not with trusting behavior. This result suggests that either the CRT score may not be properly measuring cognitive ability (unlike the college GPA) or, alternatively, that the college GPA in our sample may not be capturing cognitive ability. In either case, the statistical relationship between those two measures is not significant.

Furthermore, unlike other studies such as Corr et al. (2015)—who find agreeableness to be correlated with trust—the only significant personality trait in our analysis is neuroticism (that is correlated with trusting behavior). One could argue that the concern with adequacy, which is one of the factors defining neuroticism, may have played a role in explaining trusting behavior. Interestingly, we find that the social dominance orientation scale (SDOS), which measures people's preference for inequality among social groups, appears negatively correlated with the trustworthiness ratio. Taken together, these results provide some support for including personality traits and other measures of preferences, such as the SODS, in the analysis of economic decision-making.

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Figure 1: Amount Sent by the Trustor, According to Ethnic Group and Gender of the Trustor and Trustee: Trust Game



Note: Each bar shows its 95% confidence interval.

Figure 2: Expected gains to the Trustees in the Trust Game
(In PEN)

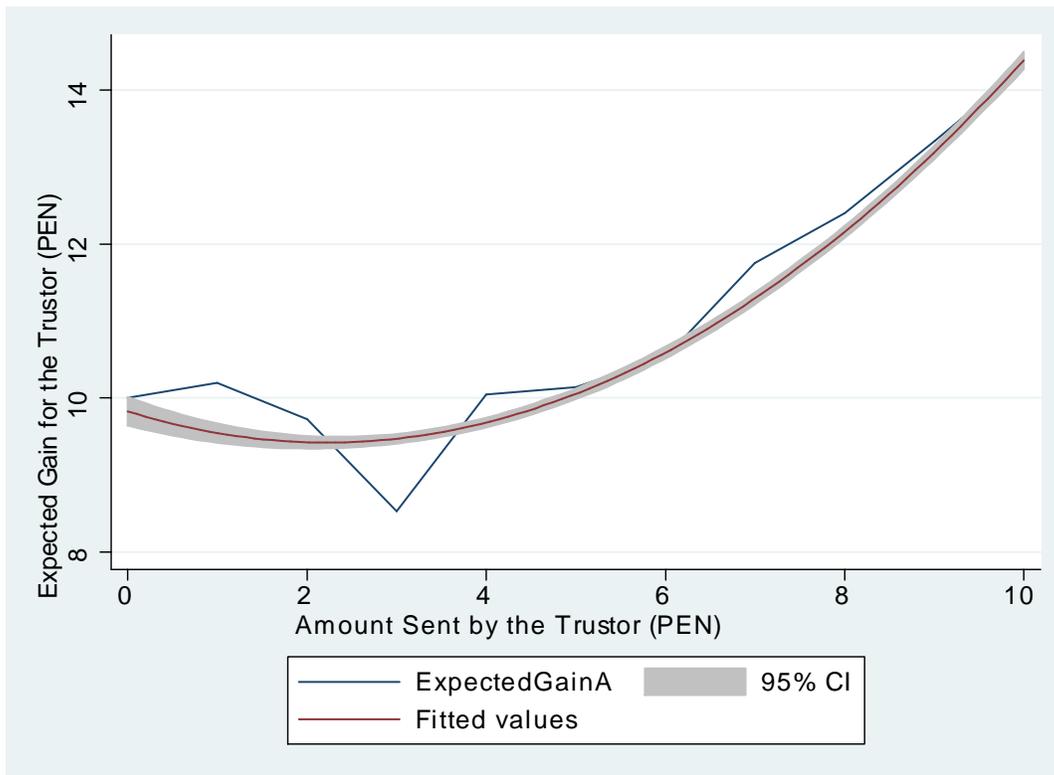


Figure 3: Trustors and Trustees: CRT Scores



Note: Each bar shows its 95% confidence interval.

Figure 4: Trustors and Trustees: Cumulative GPA



Note: Each bar shows its 95% confidence interval.

Table 1: Selected Subjects, by Ethnic Affiliation
(In Pairs)

		Student B			
		F	I	M	<i>Total</i>
Student A	F	26	24	32	<i>82</i>
	I	<i>22</i>	23	36	<i>81</i>
	M	39	34	43	<i>116</i>
	<i>Total</i>	<i>87</i>	<i>81</i>	<i>111</i>	<i>279</i>

Table 2: Subjects Descriptive Statistics

	Student A (Trustor)		Student B (Trustee)	
Age	19.53	[16, 25]	19.45	[16, 25]
Cumulative GPA	13.62	[9.52, 17.41]	13.58	[8.94, 16.88]
CRT Score	1.35	[0, 3]	1.34	[0, 3]
Cumulated No. of credits	85.01	[0, 244]	80.42	[0, 224]
Female (%)	45.52		46.95	
Ethnicity				
Indigenous (%)	29.03		29.03	
Mestizo (%)	41.58		39.78	
Foreign (%)	29.39		31.18	
Major				
Econ & Finance	31.41		45.56	
Business Administration	36.46		27.41	
Entrepren. Engineering	13.36		14.44	
International Business	9.75		7.41	
Big Five Personality Traits ^a				
Agreeableness	0.0435	[-3.37, 1.98]	-0.0977	[-6.94, 1.98]
Responsability	0.0556	[-3.31, 2.42]	-0.0442	[-5.53, 2.10]
Openness	-0.0438	[-3.24, 2.61]	0.0366	[-7.14, 2.61]
Extraversion	-0.0145	[-3.27, 2.15]	-0.3726	[-5.97, 2.14]
Neuroticism	-0.0278	[-3.20, 2.06]	0.0176	[-7.14, 2.61]
Social Dominance (SDOS) ^a	0.0900	[-1.76, 4.34]	-0.0639	[-1.75, 3.00]
Trust Game				
Amount Sent (PEN)	5.05	[0, 10]	6.00	[0, 30]
% Sent	50.50		34.14 ^b	
Dictator Game				
Amount Sent (PEN)	3.98	[0, 10]	n.a.	
Number of observations	279		279	

Range is shown in square brackets.

^a The Big Five Personality Traits and SDOS scores are standardized, using the sample's average & standard deviation.

^b It only includes those who received a positive amount from Student A.

Table 3: Amount sent by the Trustor, According to the Trustee's Ethnic Group in the Trust Game

		(PEN)				Means Tests ^a		
		Trustee						
		Foreign	Indigenous	Mestizo	Total	I vs F	F vs M	I vs M
Foreign	Avg	4.88	6.25	5.06	5.35	1.37*	-0.18	1.19*
	Range	[0, 10]	[1, 10]	[0, 10]	[0, 10]			
	Std Dev	3.06	3.07	3.46	3.24			
	N	26	24	32	82			
Indigenous	Avg	4.64	5.43	4.72	4.90	0.80	-0.09	0.71
	Range	[0, 10]	[0, 10]	[2, 10]	[0, 10]			
	Std Dev	2.56	3.47	2.24	2.71			
	N	22	23	36	81			
Mestizo	Avg	4.62	5.41	4.86	5.02	0.80 [†]	-0.25	0.55
	Range	[0, 10]	[0, 10]	[1, 10]	[0, 10]			
	Std Dev	2.52	2.81	2.86	2.72			
	N	39	34	43	123			
Total	Avg	4.70	5.67	4.87	5.05	0.97**	-0.17	0.79**
	Range	[0, 10]	[0, 10]	[0, 10]	[0, 10]			
	Std Dev	2.67	3.07	2.85	2.88			
	N	87	81	111	279			

^a Two-sided T test on the equality of means, assuming unequal variances.

* (**) Difference is significant at 10% (5%) level.

[†] p-value = 0.1029.

Table 4: Amount sent by Student A, According to Student B's Ethnic Group in the Dictator Game

		(PEN)				Means Tests ^a		
		Student B						
		Foreign	Indigenous	Mestizo	Total	I vs F	F vs M	I vs M
Foreign	Avg	4.12	5.08	3.81	4.28	0.96	0.31	1.27**
	Range	[0, 10]	[0, 10]	[0, 10]	[0, 10]			
	Std Dev	2.64	3.17	2.18	2.67			
	N	26	24	32	82			
Indigenous	Avg	3.00	4.17	4.50	4.00	1.17 [†]	-1.50**	-0.33
	Range	[0, 8]	[0, 10]	[1, 10]	[0, 10]			
	Std Dev	2.31	3.60	2.36	2.79			
	N	22	23	36	81			
Mestizo	Avg	4.00	3.56	3.67	3.75	-0.44	0.33	-0.11
	Range	[0, 10]	[0, 10]	[0, 10]	[0, 10]			
	Std Dev	2.26	2.52	2.35	2.36			
	N	39	34	43	116			
Total	Avg	3.78	4.19	3.98	3.98	0.41	-0.20	0.21
	Range	[0, 10]	[0, 10]	[0, 10]	[0, 10]			
	Std Dev	2.41	3.08	2.31	2.58			
	N	87	81	111	279			

^a Two-sided T test on the equality of means, assuming unequal variances.

* (**) Difference is significant at 10% (5%) level.

[†] p-value = 0.1011.

Table 5: Average Amount Returned by the Trustee, According to Ethnic Group and Amount Received from the Trustor

	Amount Sent by the Trustor (PEN)									
	1	2	3	4	5	6	7	8	9	10
Amount returned by Foreign	1.50	1.78	1.89	3.83	5.11	6.33	9.75	12.80	13.50	14.44
	[2]	[9]	[19]	[12]	[18]	[3]	[4]	[5]	[2]	[9]
Amount returned by Indigenous	3.00	2.11	1.33	4.89	4.94	6.20	7.75	7.67		14.24
	[1]	[9]	[9]	[9]	[17]	[5]	[4]	[3]		[21]
Amount returned by Mestizo	0.00	1.55	1.15	3.81	5.33	6.86		8.50	10.00	14.30
	[2]	[22]	[13]	[21]	[21]	[7]		[3]	[1]	[20]

Number of observations in square brackets

Table 6: Average Amount Returned by the Trustee, According to Ethnic Group and Amount Received from the Trustor

(Means Tests)

		Transfer (y), PEN			Relative Return ($\frac{y}{3x}$)				
		Female	Male	Total			Female	Male	Total
Trustee	Foreign	4.67	6.95**	5.69	I vs F*	0.3262	0.3659	0.3439	I vs F
	Indigenous	5.49	8.86***	7.00		0.3615	0.3813	0.3704	
	Mestizo	4.47	6.76**	5.52	I vs M**	0.2856	0.3579**	0.3188	I vs M**
	Total	4.83	7.42***	6.00		0.3203	0.3671**	0.3414	
Trustor	Foreign	5.13	9.94***	7.01	I vs F*	0.3296	0.4150**	0.3631	I vs F
	Indigenous	4.71	7.00***	5.78		0.3111	0.3860*	0.3462	
	Mestizo	4.67	6.26**	5.44	I vs M	0.3192	0.3266	0.3228	I vs M
	Total	4.83	7.42***	6.00		0.3203	0.3671**	0.3414	

* (**) [***] Difference is significant at 10% (5%) [1%] level.

Table 7: OLS Regression results on the amount sent by the Trustor (Trust Game)

	(1)	(2)	(3)	(4)	(5)
Male Trustor	1.1179*** (0.3475)	0.8833** (0.3705)	0.9664** (0.4076)	1.0539** (0.4084)	0.9051** (0.4183)
Male Trustee	0.0273 (0.3388)	0.0884 (0.3380)	-0.1879 (0.3475)	-0.0838 (0.3570)	0.0263 (0.3697)
Trustee is Mestizo	0.1318 (0.3884)	-0.1425 (0.3847)	-0.1492 (0.3865)	-0.1562 (0.3926)	-0.2281 (0.3984)
Trustee is Indigenous	0.9294** (0.4389)	0.8802** (0.4431)	0.7896* (0.4268)	0.7388* (0.4350)	0.6908 (0.4474)
CRT Score		0.4901*** (0.1613)	0.3880** (0.1813)	0.4513** (0.1835)	0.4943*** (0.1848)
Cumulat. college GPA		-0.0111 (0.1233)	-0.0036 (0.1308)	-0.0155 (0.1306)	0.0092 (0.1343)
Agreeableness ^a			0.2129 (0.1881)	0.1708 (0.1851)	0.1517 (0.1804)
Openness ^a			-0.2292 (0.1705)	-0.1958 (0.1693)	-0.2202 (0.1721)
Neuroticism ^a			0.4618** (0.2028)	0.5072** (0.1992)	0.4204** (0.2106)
Extraversion ^a			0.0600 (0.1814)	0.0159 (0.1803)	0.0293 (0.1850)
Conscientiousness ^a			-0.2356 (0.1960)	-0.2449 (0.2009)	-0.2241 (0.2082)
Social Dominance ^a			-0.0280 (0.1767)	-0.0068 (0.1817)	-0.0051 (0.1873)
N	279	257	257	254	242
R-squared	0.0583	0.1047	0.1467	0.1446	0.1735
Fixed Effects	No	No	No	Major Summer ^b	Major, SES ^b Summer ^b

Note: all regressions include age and a constant. Columns (3) to (5) include the num. of accumulated credits and order of the games (TG-DG or DG-TG), as controls.

^a We standardized the scores for these variables, using their respective sample mean and standard deviations.

^b ‘SES’ is a dummy for the highest two tuition scales. ‘Summer’ is a dummy for sessions ran during January 2017 (as opposed to 2016).

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: OLS Regression results on Amount Sent by the Trustee (Trust Game)

	(1)	(2)	(3)	(4)	(5)
Male Trustor	2.703* (0.674)	2.308* (0.648)	2.284* (0.657)	2.380* (0.678)	0.391 (0.350)
Male Trustee	0.0378 (0.646)	-0.595 (0.630)	-0.333 (0.673)	-0.197 (0.722)	-0.286 (0.402)
Trustor is Mestizo ^a	-1.785* (0.836)	-1.487* (0.765)	-1.358* (0.779)	-1.475* (0.813)	-0.635 (0.393)
Trustor is Indigenous ^a	-1.405 (0.901)	-1.176 (0.843)	-0.906 (0.862)	-0.836 (0.890)	0.0966 (0.419)
CRT Score		-0.0661 (0.274)	-0.166 (0.289)	-0.0598 (0.294)	0.246 (0.153)
Cumulat. college GPA		-0.377* (0.210)	-0.495* (0.232)	-0.618* (0.243)	-0.324* (0.117)
Agreeableness ^b			0.101 (0.334)	0.0338 (0.342)	0.396* (0.193)
Openness ^b			0.0467 (0.328)	0.00930 (0.333)	-0.236 (0.193)
Neuroticism ^b			0.187 (0.346)	0.254 (0.358)	0.224 (0.209)
Extraversion ^b			-0.418 (0.333)	-0.332 (0.338)	-0.285 (0.175)
Conscientiousness ^b			-0.136 (0.312)	-0.0875 (0.321)	0.0366 (0.169)
Social Dominance ^b			-0.525 (0.337)	-0.497 (0.347)	-0.0449 (0.163)
Amount Received from Trustor (PEN)					1.524* (0.0680)
N	269	249	245	239	239
R squared	0.0766	0.0788	0.1080	0.1150	0.7790
Fixed Effects	No	No	No	Major,SES ^c Summer ^c	Major,SES ^c Summer ^c

Note: all regressions include age & a constant. Columns (3) to (5) include the num. of accumulated credits as control.

^a The omitted category is the (Trustor belongs to the) Foreign group.

^b We standardized the scores for these variables, using their respective sample's mean and standard deviations.

^c 'SES' is a dummy for the highest two tuition scales. 'Summer' is a dummy for sessions ran during

January 2017 (as opposed to 2016).

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: OLS Regression results on the Trustworthiness Ratio (Trust Game)

	(1)	(2)	(3)	(4)	(5)
Male Trustor	0.0481* (0.0252)	0.0391 (0.0243)	0.0301 (0.0241)	0.0394 (0.0246)	0.0065 (0.0226)
Male Trustee	-0.0172 (0.0249)	-0.0426* (0.0254)	-0.0294 (0.0273)	-0.0185 (0.0280)	-0.0200 (0.0265)
Trustor is Mestizo ^a	-0.0417 (0.0305)	-0.0416 (0.0289)	-0.0262 (0.0275)	-0.0362 (0.0292)	-0.0223 (0.0273)
Trustor is Indigenous ^a	-0.0192 (0.0340)	-0.0167 (0.0337)	0.0059 (0.0336)	0.0066 (0.0335)	0.0221 (0.0311)
CRT Score		0.0082 (0.0111)	0.0066 (0.0116)	0.0119 (0.0113)	0.0170 (0.0110)
Cumulat. college GPA		-0.0155* (0.0079)	-0.0224** (0.0088)	-0.0324*** (0.0093)	-0.0276*** (0.0090)
Agreeableness ^b			0.0042 (0.0026)	0.0025 (0.0026)	0.0038 (0.0024)
Openness ^b			-0.0016 (0.0030)	-0.0025 (0.0029)	-0.0034 (0.0028)
Neuroticism ^b			0.0024 (0.0020)	0.0030 (0.0021)	0.0029 (0.0021)
Extraversion ^b			-0.0031 (0.0023)	-0.0024 (0.0022)	-0.0022 (0.0021)
Conscientiousness ^b			0.0015 (0.0021)	0.0017 (0.0022)	0.0021 (0.0019)
Social Dominance ^b			-0.0021** (0.0009)	-0.0022** (0.0010)	-0.0016* (0.0009)
STD Amount Sent by Trustor ^c					0.0727*** (0.0120)
N	269	249	245	239	239
R squared	0.0228	0.0425	0.1122	0.1582	0.2851
Fixed Effects	No	No	No	Major, SES ^d Summer ^d	Major, SES ^d Summer ^d

Note: all regressions include age & a constant. Columns (3) to (5) include the num. of accumulated credits as control.

^a The omitted category is the (Trustor belongs to the) Foreign group.

^b We standardized the scores for these variables, using their respective sample's mean and standard deviations.

^c Standardized amount sent by the trustor.

^d 'SES' is a dummy variable for the highest two tuition scales. 'Summer' is a dummy for sessions ran during January 2017 (as opposed to 2016).

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.