Trait perceptions influence economic out-group bias:
Lab and field evidence from Vietnam

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Abstract

Group favoritism is typically directed toward in-group members and against out-group members, but these cross-group effects often vary. Little is known about why group effects on economic choices vary. We use a survey method developed in social psychology to measure stereotyped attitudes of one group toward another. These attitudes are then associated with prosociality in five experimental games (also using an unusual amount of individual-level sociodemographic control). We present evidence from an artificial field experiment of a majority group with high status (Vietnamese) exhibiting no disfavoritism toward a lower-status out-group (Khmer) and typical disfavoritism to a second out-group (Chinese). Both Vietnamese and Chinese groups see the Khmer as warm but incompetent, attitudes which seem to activate empathy rather than contempt. The results suggest that measuring between-group stereotype attitudes can be used to predict the sign of cross-group favoritism in other natural settings. (142 words)

Keywords: behavioral economics, stereotypes, field experiments, trust, group affiliation, ingroup-outgroup

Economic evidence from the lab and field is establishing the complex nature of human social preferences over economic allocations, beyond the benchmark of simple self-interest.[1] Part of this emerging view is that people often have an identity tied to group membership (Akerlof and Kranton 2010, 2005, 2000) that influences economic activity (Bertrand and Mullainathan 2004; Cutler et al. 1999; Darity and Mason 1998; Guiso et al. 2009; Yinger 1998).

Early experiments indicate that people typically favor in-group members over out-group members, even when groups are instant and artificial (e.g., Tajfel (1970)). Group membership effects have recently attracted the attention of economists, who are using new empirical approaches to understand group-based preference and their impact on economic outcomes.[2]

Social psychologists have created substantial evidence that how out-group members are treated depends on how the outgroup is stereotypically perceived on traits such as "warmth" and "competence" (see Katz and Braly, 1933, for an early implementation). This approach is called the "stereotype content" model (SCM; Fiske et al., 2002, 2007;. In this study we introduce these trait-stereotype constructs to experimental economics using a combination of artificial-choice field experiments and survey data. Subjects in 12 small villages populated by Vietnamese, Khmer, and Chinese people rated competition from other groups, and their warmth, status and competence. They also played five incentivized games measuring aspects of prosociality and partnership.

The main finding is that the Khmer are perceived as warm, but low in status and competence, and also are not disfavored as outgroups typically are. Other groups act as generously toward the Khmer in allocation games, and are as likely to punish others who treat them badly, as they are do for their own ingroup. However, in trust games and coalition formation there is typical outgroup bias toward the Khmer. We describe this pattern as offering the Khmer a handout (in allocations and third-party defense), but not a handshake (in games with mutual benefit resembling business partnership).

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[1] Social preference theories and measures have also influenced cognitive neuroscience (e.g., Fehr and Camerer (2007) and Tricomi et al. (2010)).

[2] See also Ball et al. (2001), Goette et al. (2006), Charness et al. (2007), and Li (2009), and Abbink et al. (2010).

The paper is organized as follows. The next section I briefly describes scientific background on social preferences and group identity effects to which we contribute. Section II describes the experimental design. Section III reports results and section V concludes.

I. Empirical background

There is a rapidly-growing literature on social preferences, groups, and identity effects. The literature is much too large to review thoroughly here. Therefore, we describe some topics briefly and mention how our contribution may be of interest in understanding those topics.[3]

Many experiments and field studies show that people care about how much other people earn, and will sacrifice to increase inequality, to help a group or its worst-off member, or to enhance their social image (Fehr and Schmidt 1999; Charness and Rabin 2002; Fehr et al. 2009). Group favoritism typically increases prosociality between group members and decreases prosociality toward outgroup members, but some studies do not show cross- group effects. A couple of studies showed outgroup favouritism, typically "upward" favouritism of a higher-status outgroup.[4]

An underresearched question in economics is when cross-group effects are large or small, and why.

One partial explanation is stereotypes, which can be accurate or mistaken. For example, Fershtman and Gneezy (2001) and Burns (2006) found patterns of unjustified experimental mistrust of Eastern Jews and South African Blacks, respectively. They suggest this mistrust is driven by mistaken stereotypes about how those low-status groups will actually behave. However, in their studies stereotypes are essentially defined as

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[3] See Sobel (2002), Akerlof and Kranton (2005), Croson and Gneezy (2009) and Fehr et al. (2009) for reviews.
[4] Friesen et al. (2012) report outgroup favoritism by Canadian children of East Asian ethnicity toward White and South Asian children. Bauer et al. (2012) report partial outgroup favouritism among children (in an envy game, but not in a sharing game) in Georgia and Sierra Leone who were unaffected by wars in those areas.

expectations of trustworthy behavior and are inferred from behavior of the trusting investor subjects, not measured directly.

Another prominent explanation is that cross-group effects reflect how a group's social status is rewarded or penalized. In experimental economics, status has been experimentally manipulated by awarding random gold stars or by trivia expertise. These assignments have been shown to influence rent allocation (Ball et al. 2001), group learning and coordination on Pareto-improved outcomes (Kumru and Vesterlund 2010; Eckel and Wilson 2007), and public goods games with punishment (Eckel et al. 2010).

Fiske et al. (2002) develop a model of stereotype content with two dimensions, namely competence and warmth. They suggest high-status groups are either admired or disliked dependent on whether they are perceived as warm or cold. Successful out-groups which are considered cold are often disliked because they are viewed as a competitive threat (e.g., Jews and Asians in their model). On the other hand, in-group members and close allies are often perceived as competent and warm. This perception leads to ingroup favoritism. Similarly, low-status groups are pitied if they are perceived as warm (e.g., disabled people), and are disdained if they are perceived as cold (e.g., welfare recipients).

II.   Research methods

Our paper adds to this experimental economics literature on prosociality and groups in three ways. First, we measuring group stereotyping directly, at the individual level, the stereotype SCM measures. Second, we study three ethnic groups, instead of two. Then we can test whether the Vietnamese (majority) behave differently toward a high-status outgroup (rich Chinese) and a low-status outgroup (poor Khmer). (However, this inference is limited because only two of 12 villages have all three ethnic groups.) Third, we measure several socio-demographic variables at the individual level that happen to be strongly correlated with group identity (such as income). This enables us to test whether there are true cross-group differences, controlling for other variables, an inference most previous studies could not actually make because of limited individual-level controls.[5]

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[5] Sociodemographic controls in earlier studies included race and survey measures related to trust (Glaeser et al. 2000), gender (Fershtman and Gneezy 2001), age and gender (Burns 2006; van der

Vietnam has some advantages as a field site. Subjects are highly literate (92%) but relatively poor; so they are presumably highly motivated by monetary stakes which are small (by Western standards) but which have a lot of local purchasing power. As a result, all of the experiments are done at very high stakes levels, comparable to the highest stakes used in previous field or lab experiments. Having survey responses from the 2002 World Bank survey enabled us to handpick a sample of villages where multiple ethnic groups live, and to separate the effects of income, education and other socioeconomic factors from cross-group effects (as discussed in the last paragraph).

Experiments were conducted in twelve villages in the Mekong Delta in July and August 2006. The experimental subjects were previously interviewed during a 2002 standard measurement survey. Since there is a four-year gap between the 2002 measures and the experimental data collected in 2006, any change in demographics in that time admittedly creates a classic errors-in-variables challenge that biases results toward zero. Of course, ethnicity does not change in that time so we presume that those results are robust to measurement error from the time lag.[6]

We selected twelve villages where at least two ethnic groups had been interviewed in the 2002 survey as research sites. In each village, 25 households were interviewed. Some descriptive statistics of the twelve experimental sites are given in Table 1. In villages indexed by VK1, VK2, …VK8, both Vietnamese and Khmer households were interviewed. In villages VC1 and VC2, Vietnamese and Chinese households were interviewed. In two villages, VCK1 and VCK2, Vietnamese, Khmer, and Chinese households were interviewed.

Merwe and Burns 2008), measures of land, house type and education (Fehr et al., 2008; Hoff et al., 2011). The most extensive set of controls-- age, gender, income and education—are in Buchan et al. (2011). Note that age and gender are useful controls for many reasons, but since they do not covary much with group ethnicity they are not a control for whether group effects are due to other variables. Our study includes all these measures (except for land, though it is highly correlated with wealth in most of the world, which we include) along with other measures. Bahry and Wilson (2004) use gender and age individual controls in comparing behavior among Tatarstan and Sakha (former USSR republics), as well as (experimental) group level controls for other variables. They find no group effects on behavior in trust games, which is a reminder that including more controls could conceivably account for part or all of the apparent group differences shown in other studies with fewer or no controls. Chen et. al. (2013) use the novel approach (in experimental economics) of priming of ethnicity, finding effects in coordination and PD games (Chen et al., 2014).

[6] Note also that ethnicity is clearly established (i.e., subjects self-report confidently).

Table 2 summarizes correlations between key variables (which are defined in Table A1). None are so high that multicollinearity will reduce power substantially. Since our main interest is treatment of the Khmer, we just note that Khmer are relatively less educated, more likely to work in traditional labor instead of business, and more likely to live in lower-income villages than other groups.

[Table 1: About here]
[Table 2: About here]

A week before the experiments, research coordinators contacted local government officials in each research site and asked them to invite one person from each of the 25 previously surveyed households to the experiments. In villages VK1, VK2, VK3, and VK8, battle of sexes[7], coalition, envy, and trust games were played in that order.[8] The dictator game was added *after* we conducted experiments in these four villages. In villages VKC1, VKC2, VK4, VK5, and VK7, battle of sexes, coalition, envy, trust, dictator games were played in that order. We then added the third party punishment game when we conducted experiments in villages VC1, VC2 and VK6. In the last three villages the experiment alternated the order of dictator game and third party punishment game across subjects. We ran additional sessions of the third party punishment game in VK2 and VK3.

Subjects were randomly assigned the role of Player 1, 2 or 3 in the coalition game. Subjects played both the roles of Player 1 (investor) and Player 2 (trustee) in the trust game, Player 1 (sender) and Player 2 (receiver) in envy game and dictator game. The order of roles was randomized across subjects in the trust and third party punishment games. In the envy and dictator games, subjects played the role of Player 1 (sender) first, then Player 2 (receiver), since Player 2 make no decisions in the envy and dictator games. Before the experiments started, potential subjects were divided into groups, and were given ID tags of different colors upon arrival. We informed the subject the colors of their

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[7]Battle-of-the-sexes games results are not reported in this paper.
[8] Yamagishi et al. (2013) conducted an experiment with similar games to our study, spread over three and a half years, and found consistency within individuals in pro-social across different games. .

identification tags were based on ethnicity.[9] It might be possible to convey ethnicity information by last names, etc. However, we chose this explicit labeling procedure to increase internal validity, at the possible expense of drawing special attention to ethnicity. We used the strategy method, asking subjects their decisions contingent on the color group of their opponents, since a within-subject comparison has the most statistical power.

In each session, a trained Vietnamese experimental assistant (a Can Tho University student) read general instructions out loud in Vietnamese. A different trained student read the same instructions in Khmer. Then subjects left the room, one by one, and a student assistant read the instruction for each game for each subject, and assisted the subjects in each game.[10] All Khmer subjects had the opportunity to be assisted by Khmer-speaking assistants. The experimental procedure is illustrated in Figure A.1 in the Appendix.

Before the subjects played games, we conducted a quiz for the first two games (the battle of sexes and coalition games). Twelve subjects either failed the quiz and were asked to leave, or decided to leave the session for other reasons. In total, N=145, 131 and 58 Vietnamese, Khmer and Chinese subjects participated in the experiments (total N=334).[11] The average experimental pay for each subject was 97,300 dong ($6 US, about four days' wages for unskilled labor). Experiments lasted two hours. After subjects played the games, we gave a questionnaire on social network connections and

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[9] In VK1 and VK8 villages, Vietnamese and Khmer subjects were divided into white and red groups, respectively. In villages VK 2, 3, 4, 5, 6, and 7, we divided subjects into four groups by ethnicity and income. High-income Vietnamese, low-income Vietnamese, high-income Khmer, and low-income Khmer were assigned white, black, red and pink ID tags, respectively. The instruction said the colors of their identification tags were based on ethnicity and income. In each game, subjects were first asked their decisions if their opponents were either white or black groups (Vietnamese), and red or pink groups (Khmer). Afterward, they were asked their choices contingent on each of the four color groups. Similarly, in VC villages, subjects were divided into four groups, white, black, red and pink (high-income Vietnamese, low-income Vietnamese, high-income Chinese, and low-income Chinese, respectively). The subjects were first asked their decisions for each game if their opponents were either white or black groups (Vietnamese), then if their opponents were either red or pink groups (Chinese). In this paper, we report the effects of ethnicity on decisions in games and leave the analysis of ethnicity and income effects for future analysis.

[10] We prepared Vietnamese instruction for Vietnamese and Chinese subjects, and Khmer instruction for Khmer subjects. Vietnamese instruction was provided to Khmer subjects upon request.

stereotyping images of other ethnicities. Information on the ethnicity of 10 nearest neighbors was also collected to look for social distance effects.[12]

Group stereotypes were measured using the questionnaire developed by Fiske et al. (2002). Subjects rated other ethnic groups on 5-point scales reflecting competence, warmth, status and competition. Measuring stereotyping and group membership exogenously from the experimental behavior is actually very important. Many studies just assert that there are status or group differences and then take empirical differences to affirm those assertions. The conclusions of these studies may well be correct. However, a more objective and bold method is to measure status differences independently, as we did, and see whether behavioral differences are associated with measured status.

Table 3 gives the average (standardized) measures of four group dimensions (see Table A3 for how the measures are aggregated from items). The most regular pattern is that the Khmer are perceived as warm, incompetent, and low-status by both of the other two groups. Fiske et al. (2002) conjecture that the combinations of warmth and competence produce four clusters of out-group attitudes; admiration (out-group seen as competent and warm), envious prejudice (out-group seen as competent but cold), contemptuous prejudice (out-group seen as incompetent and cold), and paternalistic prejudice (out-group seen as incompetent but warm). Figure 1 graphs the means of estimated factors on a two-dimensional warmth-competence space. The Chinese and Vietnamese see the Khmer as warm but incompetent (paternalistic prejudice), and the Khmer see the other two groups in the opposite way (envious prejudice).

[Figure1: About here]
[Table 3: About here]

III.   Games and Results

We use five experimental games to measure altruism and cooperation. We used these five different games because the fixed costs of travelling to these sites and

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[12] Our longer working paper discusses measures and possible effects of social distance and political power (see Tanaka and Camerer, 2012). We exclude these analyses in this paper because there were no large robust effects (as also found by Bahry and Wilson (2004) in former USSR countries).

conducting the experiments is high, and subjects in these villages are quite tolerant of long experimental multi-game sessions (given the high rate of pay).

The games also measure distinct aspects of sociality. Three games—dictator, envy, and third party punishment (3PP) games—measure impure altruism and altruistic punishment. The dictator game measures altruism or social image. The envy game allows an inequity-efficiency tradeoff. The 3PP games measure whether people will enforce norms (at a cost) of appropriate sharing.

In those three games, the subject does not receive any direct financial benefit from giving or punishing. In contrast, the trust and coalition formation games a subject can benefit only if a paired subject exhibits a type of reciprocity or coordination on mutual benefit. These measure stylized versions of business cooperation.

A. Envy and Dictator Games

In the envy allocation game there a sender player 1 receives 12k dong, and decides how much player 2 should receive from the experimenter. Player 1 has can give player 2 0, 5, 10, 12, 15, 30 or 60 (in units of 1000 dong). Notice that no matter how much player 1 sends to player 2, the sender's own payoff does not change.

If player 1 is selfish, or prefers to earn more than player 2 (e.g. a positive preference for advantageous inequality), perhaps because of rivalry to player 2, she will send 0k. If player 1 is strongly inequality-averse she will send 12k. If player 1 is strongly concerned about efficiency she will send 60k (as in Charness and Grosskopf (2001)). The game is therefore a simple one-dimensional index of allocational preferences which includes selfishness, inequality preference or aversion, and efficiency as expressed by possible behaviors. Note that while we refer to it as an "envy game", it clearly measures the *relative strength* of envy (or disadvantageous inequality) and efficiency.

A simple constant-sum dictator game to examine social norms of distributional fairness. Player 1 (Sender) has 10k dong and can award any integer (x1000) amount to player 2 (Receiver).[13]

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[13] Brañas-Garza (2006) finds when subjects know that receivers are poor, they send significantly higher amounts. Fershtman and Gneezy (2001) conducted dictator games with two major ethnic groups in Israel and found no significant in-group bias.

Figure 2 shows the mean amounts sent in the dictator and envy games. Exploiting the power of the within-subjects design, within-subject Wilcoxon rank-sum tests are used to see whether subjects send different amounts across groups. Subjects typically exhibit in-group favoritism by giving significantly more to their own group members than to other group members.

In the envy and dictator games, the Vietnamese give more to their own group than to Chinese (p=0.073, p=0.024). The Chinese give more to their own group than to Vietnamese only in the envy game (p=0.019). Khmer exhibit the strongest outgroup bias against both Vietnamese and Chinese in both envy (p=0.000 and p=0.002) and dictator games.(p=0.000 and p=0.004, respectively). However, there is one unusual cross-group exception—the Vietnamese give more to Khmer than to their own group members in both games, and the Chinese give more to Khmer in dictator game, (though both types of outgroup favoritism are not statistically significant.

The within-subject tests just described only used data from the two VKC villages. We also conducted ordered logit regressions using the decisions made in these games as dependent variables in *all* villages, to test for out-group discrimination. Controls are included for village fixed effects, income, education and other socioeconomic factors. Table 4 shows the results. The dummy variable "X-Outgoup" takes the value 1 if the subject in group X is matched with an outgroup member, and 0 otherwise. The dummy variable "X-OutgoupK " takes the value 1 if the subject in group X is matched with a Khmer outgroup, and 0 otherwise.

The Vietnamese and the Khmer show strong out-group discrimination (coefficients V-Outgroup and K-Outgroup) in both envy and dictator games. However, both the Vietnamese and Chinese favor the Khmer outgroup more in both games (evidenced by the positive V-OutgroupK and C-OutgroupK interactions). The regression results show strong evidence of general out-group discrimination but relative favoritism (i.e., a positive X-OutgroupK coefficient, significant only for Vietnamese) toward the Khmer outgroup in envy and dictator games.

[Figure 2: About Here]
[Table 4: About here]

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We also did regressions using outgroup dummy variables and interactions, as in Table 4, including individual-level stereotyping measures of warmth, competence, status and competition. These results are shown in Table 5. In Table 5 the three outgroup dummies are collapsed into a single measure, as are the two X-OutgroupK dummies. These coefficients measure *general* outgroup disfavoritism (variable Outgroup) and general moderation of that disfavoritism (variable OutgroupK) towards the Khmer. If *all* of the positive interaction effect of the X-OutgroupK variable was due to stereotype measures, and there were individual differences in measure stereotypes toward Khmer that accounted for the general behavioral differences, the X-OutgroupK coefficient would be zero.

Unfortunately, the individual-level stereotype measures are apparently too variable to explain the aggregate outgroup discrimination robustly. If the outgroup effects were completely due to stereotype measures, the significance of the Outgroup and OutgroupK variables would disappear when the stereotypes are included. However, the Outgroup and OutgroupK coefficients are very similar in magnitude and significance when stereotyping is excluded (top panel of Table 5) or included (bottom panel of Table 5).[14] Interestingly, there are additional effects of warmth (positive) and competition (negative) on envy game allocations, independent of group affiliation.

The weak unrobust correlations of these individual-level stereotype measures is a disappointing result. We think the result is driven by three possible effects: language, factor analytics, and weak causality.

The first possibility is imperfect language translation. The English words used in the study were taken from Fiske et al. (2002, Study 2); they are familiar terms such as "intelligent". As is standard practice, these words were first translated into Vietnamese and Khmer by our assistants, then back-translated from their respective translations into English again. Extensive discussion followed over a two-week period to stabilize the translations. Even so, there is always some ambiguity caused by this translation (and by underlying differences in how languages map local concepts). For example, the term "intelligent" had a higher factor weight on the status factor we recovered (along with

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[14] The same is true for trust games (see Table A.6).

"prestigious jobs", "successful" and "educated") than on the competence factor, where its weight was predicted to be highest. If the warmth-competence distinction is universally important, then the remedy for the limits in our approach is to work harder at creating lists of language-specific words which connote warm and competence (and exploring other nonlinguistic ways to measure attitudes).

The second explanation is that the two key factors, warmth and competence, result from different weights on the initial 16 items used to derive the factors. Warmth is a better-measured factor, in the sense that the average (absolute) weights on items predicted and not predicted to make up that factor are 0.34 and 0.05. Competence is a more poorly-measured factor, because the corresponding average of the predicted vs. nonpredicted item weights were 0.25 and 0.10. (These weighting differences could be a by product of imperfect English-Vietnamese and English-Khmer translation.) We think this explains why individual-level warmth *does* correlate strongly with envy and trust Player 2 behavior, but competence correlations are not strong.

The third explanation is that it is not clear how perceived competence should have a causal effect on behavior in the games in Table 5 (envy, dictator and trust). Warmth is more straightforward since it is natural to predict of positive prosociality toward a warm person.

B. Third party punishment game

If the dictator game reflects social norms about distributional fairness among different ethnic groups, an important question arises about whether violators of such norms will be punished, and by whom. Third party punishment appears to be distinctive to humans (Riedl et al. 2012), sensitive to status (Eckel et al. 2010) and is thought to be crucial to maintenance of effective large-scale societies. We conduct a third party punishment (3PP) game to study altruistic punishment, i.e., punishment of a violator of social norms at a cost to punisher which does not directly benefit the punisher.[15]

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[15] Bernhard et al. (2006), Fehr and Fischbacher (2004), Goette et al. (2006), Hoff et al. (2009).

As in the dictator game, in 3PP one player 1 decides what portion of 10k dong to send to player 2. Player 3 is endowed with 5k dong and has an option of punishing player 1, contingent on the amount of money player 1 sends to player 2. If player 3 decides to punish, 1,000 dong will be subtracted from his/her own endowment of 5k, and 3k dong will be taken away from player 1. Player 1 is aware that player 3 can punish him/her when he/she makes a decision.

Behavior in 3PP provides a subtler measure of potential ingroup bias. Two studies (Bernhard et al. 2006; Goette et al. 2006) showed that ingroup members in the player 3 role will punish those who don't allocate enough to their ingroup members in the player 2 role—they are defending their peers. .

We conducted a third party punishment game in VK and VC villages. To gather the most information, we used a strategy method in which third-party punisher Player 3 stated what the lowest acceptable allocation was, from player 1 to player 2, that they would not punish. We call this the minimum "accepted"— i.e., unpunished—offer. A high minimum means the punishing player 3 expects player 1 to be quite generous and punishes a wider range of low offers. A low minimum means the punishing player is lenient, and won't punish even if the receiver player 2 gets very little.

[Figure 3: About here]

Figure 3 displays the mean minimum accepted offers by Player 3 (the punisher). The top graph shows the theoretical prediction based on ingroup bias: Punishers in group A will be lenient in punishing senders from their group A (a lower threshold) and more demanding when receivers are in their group A (a higher threshold).

The data from VK and VC villages match the predicted ingroup-bias pattern for Khmer in VK villages and for both groups, V and C, in VC villages. However, there is no such bias among Vietnamese punishers in VK villages: They actually defend the Khmer, and punish Vietnamese dictators, more aggressively. However, there is simply a lack of typical ingroup bias (seen in the VC villages against Chinese), not a significant ingroup bias favoring the Khmer (see regression results in Table A4).

C. Trust and coalition games

We conduct the binary trust game to study trust and reciprocity (Camerer and Weigelt 1988). In a binary trust game Player 1 (sender) has two choices, A (invest) or B (don't invest). Choice A gives both players 20k dong and ends the game. Choice B doubles the amount available doubles to 60k dong, which can then be divided equally, 30k dong each (repay) or divided into 10k and 50k dong (don't repay). Player 1 may be worse off if he/she trusts the receiver and is not reciprocated.

Several groups have demonstrated how trusting behavior can be partly explained by altruism, because trusting investors who are altruistic invest without expecting to have much money repaid (Ashraf et al. 2006; Carter and Castillo 2002; Holm and Danielson 2005). We use the decisions made in envy game to control for such altruistic motivations. Several previous experiments have used trust games and typically found small intergroup effects.[16]

Coalition game

The coalition game was introduced by Habyarimana et al. (2006). There are three players, numbered 1-3. Each player simultaneously, and without communication, chooses one coalition partner. If two players choose each other they earn 15k dong each. If no two players choose each other everyone earns nothing. Each player is basically voting for which of the other players she prefers to form a group with, whom she thinks will also choose her.

We use trust and coalition formation games to measure pro-social attitudes in stylized versions of business cooperation. In contrast to the dictator, envy and 3PP games, in trust and coalition games extra surplus can be created *only if one group can count on reciprocation by another group*. Given the perceived stereotype of the Khmer as

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[16] Glaeser et al. (2000) find an ingroup effect on trustee money repaid. Bouckaert and Dhaene (2004) find no ingroup effects among Belgian businessmen. In a protocol with partner choice Bornhorst et al. (2010) find no ingroup favoritism but Northern Europeans cultivate better reputations and therefore earn more than Southerners. Buchan et al. (2011) find that public good contributions to a cross-country "world group" depends on a measure of global social identity (controlling for four key sociodemographic variables).

incompetent and low-status, it is possible that while the other groups exhibit outgroup-neutrality in helping Khmer, the same behavior will not extend to games that require reciprocation to create mutual gain.

[Figure 4: About here]

Indeed, in trust and coalition games, the lack of outgroup bias toward Khmer shown in the three distributional games largely disappears. Figure 4 presents the proportion of players 1 and 2 who trusted and reciprocated in binary trust game. All groups generally invest more often as player 1 if they know that their partner (player 2) is in their own group, except for Vietnamese who invest more often to Chinese than to their own group. However, ingroup favoritism or Chinese favoritism by Vietnamese is not statistically significant except for the Khmer who trust their own group members more often than outgroup members (see Tables 4-5). In general, Player 2's in all groups reciprocate more often when the player 1 is in their own group. Both the Khmer and Chinese reciprocate to their own group members more often than to the Vietnamese, and the differences are statistically significant using within-subject tests (Figure 4). Logit regressions of trust and reciprocation also show significant negative outgroup bias, with no differential outgroup bias toward Khmer, when expectations of repayment and envy-game giving are included as controls (Table A5).

Behavior in the coalition game can be summarized rather easily (Figure A2). We report just choices from the VKC villages which are the most interesting. (In the two-group villages there is overwhelming own-group choice by all three groups.) Choices are simply 0-1 choices of partners from another group; so aggregate data are how often people in each group choose those in another group as partners. Vietnamese choose Chinese over Khmer 61% of the time as coalition partners. Chinese exhibit a similar preference, choosing Vietnamese 56% of the time. Since the sample sizes are small these results are not significantly different from equal choice rates, but they are consistent with exclusion of the Khmer in mutually-beneficial cooperation. Since the Khmer are chosen the least often by both of the other groups they earn the least (6,620 dong). Khmer choose

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Chinese most often; as a result Chinese expected earnings are highest (12,609) and Vietnamese are next highest (8,839). The ratio of almost two between the highest-earning group (Chinese) and the lowest-earning group (Khmer) is a crude experimental index of likely gains from exchange in mutually-beneficial transactions. Note that the earnings ranking C > V > K from this game also matches the average surveyed income ranking between groups (as shown in Table 1).

IV. Conclusion

Psychometric scales of perceived traits of social groups have been used successfully in psychology to explain ingroup and outgroup behavioral effects. We introduce these measures to experimental economics, comparing three ethnic groups in rural Vietnam. We used a battery of five games, three of which involve unidirectional prosociality (dictator, envy and 3PP) and two of which involve cooperation for mutual gain (trust and coalition formation).

Both Vietnamese and Chinese participants perceive the third group, the Khmer, as low in status but also warm and incompetent. Behaviorally, while the V and C groups exhibit negative outgroup treatment toward each other, they are outgroup-neutral toward the Khmer in games that involve helping. However, they exhibit the typical negative outgroup effect toward the Khmer in the cooperation games involving trust and coalition formation. We summarize the results in a simple way as suggesting that the other groups offer the low-status Khmer a handout but not a handshake.

Unfortunately, the effect of trait perception is only evident at an aggregate level. When individual-level stereotype trait measures are introduced, outgroup treatment persists. That is, even if there is a general perception that warm, incompetent Khmer deserve help, the variation in individual perceptions of those traits does not account for variation in individual behavior toward the Khmer. Further research may establish better individual-level reliability for these measures.

Empirical features of this study were designed to work together to establish the stereotype effects described above. Group favoritism has been shown in many experiments with random "instant" groups. That evidence immediately raises the

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question of whether similar effects are present in naturally-occurring groups. However, previous studies of naturally-occurring groups have not typically controlled well for many individual-level variables which are highly correlated with group membership. (Note that those group differences are helpfully randomized away in artificial laboratory groups.)

Our study controlled for demographic effects by matching experimental results with extensive survey evidence. The lack of negative outgroup effects toward the Khmer that is evident in the simplest analyses is also statistically significant when socio-demographic variables that are correlated with Khmer membership are included. Inclusion of sociodemographic controls is crucial to establishing group effects in field data. For example, there is substantial evidence that prosociality increases with education. Since we found that Vietnamese give more to Khmer than vice versa, this could be simply due to the fact that the Vietnamese are more educated. This possible confound can only be convincingly ruled out because we measured education and included it as a control.

Moving forward, our results suggest that economists should consider including stereotype trait measures in research on group differences. Suppose one identified two ethnic groups, A and B, and group A considers the B's warm, incompetent and low-status. Our results suggest that one could *predict* there would not be negative outgroup treatment of the B's in advance, from these trait perceptions.

Future research along these lines should first focus on establishing better individual-level measures of warmth and competence. These could include alternatives to word-based rating scales, such as behavioral questions "Would you want this person as a neighbor[17] [or friend, or business partner]". Another possible method is psychophysiological reactions to facial images of different ethnicities.[18] One could also reverse the presumed direction of causality, by measuring whether ingroups and outgroups created artificially (e.g. Chen and Li, 2009) change warmth and competence judgments of those groups' members.

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[17] The "neighbor" question is used in the World Values Survey.
[18] For example, Todorov et al. (2005) famously found that competence judged from politicians' headshot photos was strongly correlated with their vote shares in actual elections.

Stereotype measures could also be associated with a wide range of economic activity beyond social games and decisions, many of which can be studied both experimentally and in field data. These could include decisions about who to hire in a company, which defendants to convict in a trial, or who should lead a group.

Finally, stereotype measures and experimental behavior could be linked to institutions. For example, the Khmer in southern Vietnam are aboriginal— that is, they were natives in a region that became part of Vietnam in the 17th century. One can draw parallels between the Khmer and the history and treatment of aboriginal peoples in Australia, Canada, and the United States (e.g. Native Americans), and perhaps in many other parts of the world. Modern policies are often generous in helping these aboriginal people directly (see Appendix section A.1). For example, the Khmer get subsidies in health insurance, taxes and education. However, despite these subsidies, aboriginal groups have not achieved substantial economic success and are typically not broadly involved in large-scale economic activity (e.g., running large companies or leading politically). We hypothesize that aboriginal groups in other countries are also perceived as the Khmer are—warm, incompetent, and low-status. These perceptions may ccount for both subsidies, direct or indirect exclusion from business opportunity and political power.

Future research along these lines should first focus on establishing better individual-level measures of warmth and competence. These could include alternatives to word-based rating scales, such as behavioral questions "Would you want this person as a neighbor[19] [or friend, or business partner]". Another possible method is psychophysiological reactions to facial images of different ethnicities.[20] One could also reverse the presumed direction of causality, by measuring whether ingroups and outgroups created artificially (e.g. Chen and Li, 2009) change warmth and competence judgments of those groups' members.

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Table 1
Descriptive statistics of 12 study villages

	VKC1	VKC2	VK1	VK2	VK3	VK4	VK5	VK6	VK7	VK8	VC1	VC2
Number of household												
	403	604	419	372	634	463	296	960	500	264	284	526
Ethnicity of household head (%)												
Vietnamese	9.9	72.2	93.6	20.7	88.3	48.6	30.1	80.8	35.6	21.6	68.3	70.2
Khmer	26.6	3.1	4.5	77.2	10.7	48.6	68.9	18.9	64.4	78.4	0.7	0.7
Chinese	63.5	24.7	1.9	2.1	1.0	2.8	1.0	0.3	0.0	0.0	31.0	29.1
Percentage of village officials by ethnicity (%)												
Vietnamese	44.5	62.5	100.0	44.4	81.8	44.4	42.9	80.0	71.4	28.6	83.3	100.0
Khmer	33.3	12.5	0.0	44.4	18.2	55.6	57.1	20.0	28.6	71.4	0.0	0.0
Chinese	22.2	25.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0
Number of subjects												
Vietnamese	8	23	5	12	26	9	5	10	4	4	25	14
Khmer	5	8	5	31	20	6	12	5	19	20		
Chinese	15	4									15	24
Total	28	35	10	43	46	15	17	15	23	24	40	38
Mean household income of subjects (million dong)												
Vietnamese	18.4	14.6	37.2	25.5	28.0	18.8	15.1	21.9	21.0	18.0	44.7	18.4
Khmer	19.1	7.6	17.4	23.3	11.1	14.6	17.2	15.1	13.1	10.0		
Chinese	13.7	44.5									28.8	25.6
Total	16.0	16.5	27.3	23.8	20.7	17.1	16.6	19.6	14.5	11.3	38.7	23.0
Omitted games	3P	3P	3P,D	D	D	3P	3P	--	3P	3P,D	--	--
Age (mean)	45.9	43.3	45.7	41.7	37.1	56.2	54.5	46.4	55.7	43.9	41.4	42.9
Gender (male %)	0.50	0.40	0.60	0.44	0.33	0.53	0.41	0.53	0.39	0.48	0.35	0.50
Education (mean)	4.4	5.6	5.5	7.1	5.1	7.5	2.8	7.9	2.5	3.6	8.3	3.4

Note: The envy, trust and coalition games were played at all villages. Omitted games are dictator (D) and third-party punishment (3PP)

Table 2
Correlations between sociodemographic variables

	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)
1)Age	1.00												
2)Gender	0.01	1.00											
3)Education	-0.41	0.10	1.00										
4)Traditional	0.10	0.05	-0.10	1.00									
5)Trade	-0.04	-0.08	-0.08	-0.26	1.00								
6)Business	-0.05	0.11	0.22	-0.22	-0.13	1.00							
7)Public	-0.08	0.08	0.28	-0.17	-0.06	-0.08	1.00						
8)Private	-0.10	0.11	0.06	-0.12	-0.08	-0.07	-0.05	1.00					
9)Casual	0.00	0.08	-0.26	-0.16	-0.18	-0.14	-0.13	-0.11	1.00				
10)Power	-0.05	0.05	0.05	0.10	-0.13	0.04	0.04	-0.03	0.12	1.00			
11)ReIncome	-0.08	0.04	0.29	0.08	-0.07	0.00	0.06	-0.04	-0.12	-0.02	1.00		
12)MnIncome	-0.13	-0.01	0.33	-0.30	0.05	0.22	0.07	0.20	-0.16	-0.17	-0.01	1.00	
13)Gini	-0.18	-0.06	0.14	-0.20	0.09	0.05	-0.03	0.15	-0.06	-0.03	-0.01	0.69	1.00
14)Vietnamese	-0.12	0.12	0.28	-0.07	0.00	0.15	0.05	-0.07	-0.12	0.32	0.15	0.12	0.15
15)Chinese	-0.04	0.02	0.12	-0.26	0.17	0.12	0.09	0.17	-0.10	-0.40	-0.02	0.35	0.26
16)Khmer	0.16	-0.14	***-0.38***	***0.28***	-0.13	***-0.24***	-0.12	-0.06	0.20	-0.01	-0.14	***-0.40***	-0.35

Note: Correlations of Khmer ethnicity with variables discussed in the text are printed in
bold italics.

Table 3

Mean estimated factors of stereotypes by ethnicity

(1) Stereotyped image of Vietnamese	Mean estimated factors			
Subjects' ethnicity	Competence	Warmth	Status	Competition
Chinese	-0.20	-0.13	0.47	-0.03
Khmer	0.03	-0.28	0.41	0.18

(2) Stereotyped image of Khmer	Mean estimated factors			
Subjects' ethnicity	Competence	Warmth	Status	Competition
Vietnamese	-0.42	0.25	-0.66	-0.09
Chinese	-0.75	0.67	-0.45	-0.04

(3) Stereotyped image of Chinese	Mean estimated factors			
Subjects' ethnicity	Competence	Warmth	Status	Competition
Vietnamese	0.89	0.13	-0.07	-0.27
Khmer	0.30	-0.32	0.16	0.50

Table 4

Results of ordered logit and logit regressions for envy, dictator and trust games

	Envy Game (Ordered-logit)	Dictator Game (Ordered-logit)	Trust Game (Player 1) (Logit)	Trust Game (Player 2) (Logit)
Khmer	0.686***	-0.385*	0.746	-0.548*
	(0.256)	(0.223)	(0.310)	(0.299)
Chinese	0.108	-0.283	0.116	-0.675**
	(0.290)	(0.287)	(0.359)	(0.331)
V-Outgroup	-0.503**	-0.599***	0.431	-0.398
	(0.197)	(0.192)	(0.291)	(0.251)
K-Outgroup	-1.057***	-0.343***	-0.906***	-0.796***
	(0.184)	(0.112)	(0.276)	(0.259)
C-Outgroup	-0.418*	-0.007	-0.463	-0.603**
	(0.214)	(0.190)	(0.358)	(0.253)
V-OutgroupK	0.565**	0.680***	-0.613*	0.331
	(0.264)	(0.261)	(0.338)	(0.308)
C-OutgroupK	0.642	0.338	0.314	0.562
	(0.412)	(0.378)	(0.531)	(0.476)
Constant			-0.897***	0.398
			(0.214)	(0.198)
Pseudo R2	0.011	0.007	0.023	0.043
N	552	646	552	552

Note: *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level. Standard errors are in parentheses. We adjusted standard errors for correlations within individuals.

Table 5

Coefficients on Khmer-outgroup variable with and without individual-level stereotype measures

	Envy Game (Fixed effect ordered-logit)	Dictator Game (Fixed effect ordered-logit)	Trust Game (Player 1) (Fixed effect logit)	Trust Game (Player 2) (Fixed effect logit)
Baseline				
Outgroup	-0.703***	-0.358***	-0.351*	-0.513***
	(0.120)	(0.092)	(0.203)	(0.158)
OutgroupK	0.535***	0.362**	-0.131	0.306
	(0.175)	(0.157)	(0.230)	(0.245)
+ Stereotyping				
Outgroup	-0.739***	-0.487***	-0.232	-0.456***
	(0.134)	(0.112)	(0.205)	(0.176)
OutgroupK	0.613**	0.734***	-0.612	0.056
	(0.252)	(0.248)	(0.468)	(0.321)
Competence	0.136	0.208*	-0.146	-0.103
	(0.111)	(0.115)	(0.182)	(0.133)
Warmth	0.269**	0.085	-0.069	0.309**
	(0.113)	(0.109)	(0.158)	(0.134)
Status	0.036	0.214*	-0.362**	-0.080
	(0.115)	(0.127)	(0.172)	(0.150)
Competition	-0.322***	-0.091	-0.102	-0.158
	(0.109)	(0.109)	(0.146)	(0.117)

Note: We conducted ordered logit and logit regressions with village fixed effects. We adjusted standard errors for correlations within individuals. Robust standard errors are in parentheses. * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 10% level.
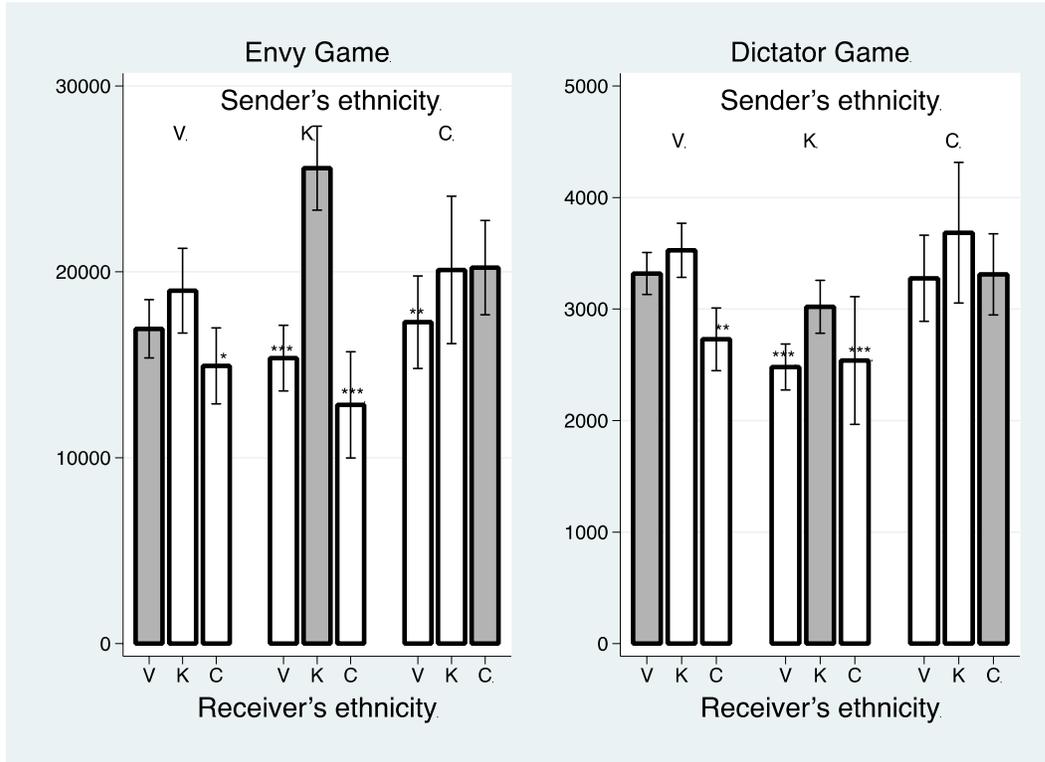
Figure 1

Mean estimated factors of stereotypes (warmth and competence) by ethnicity
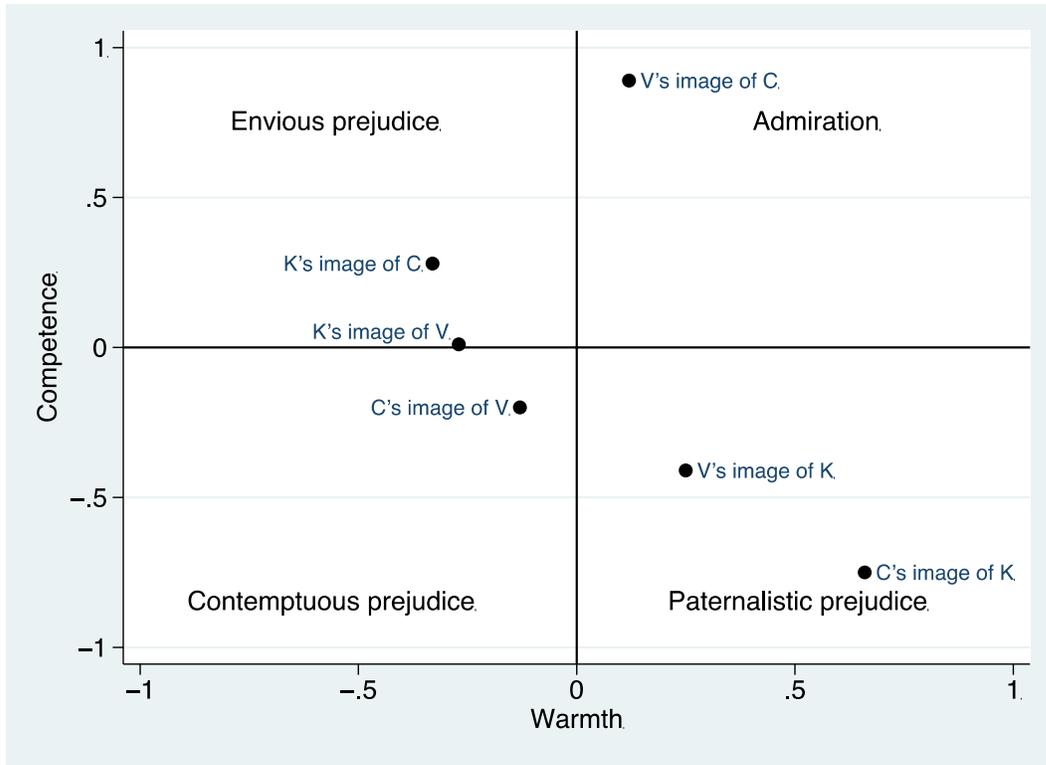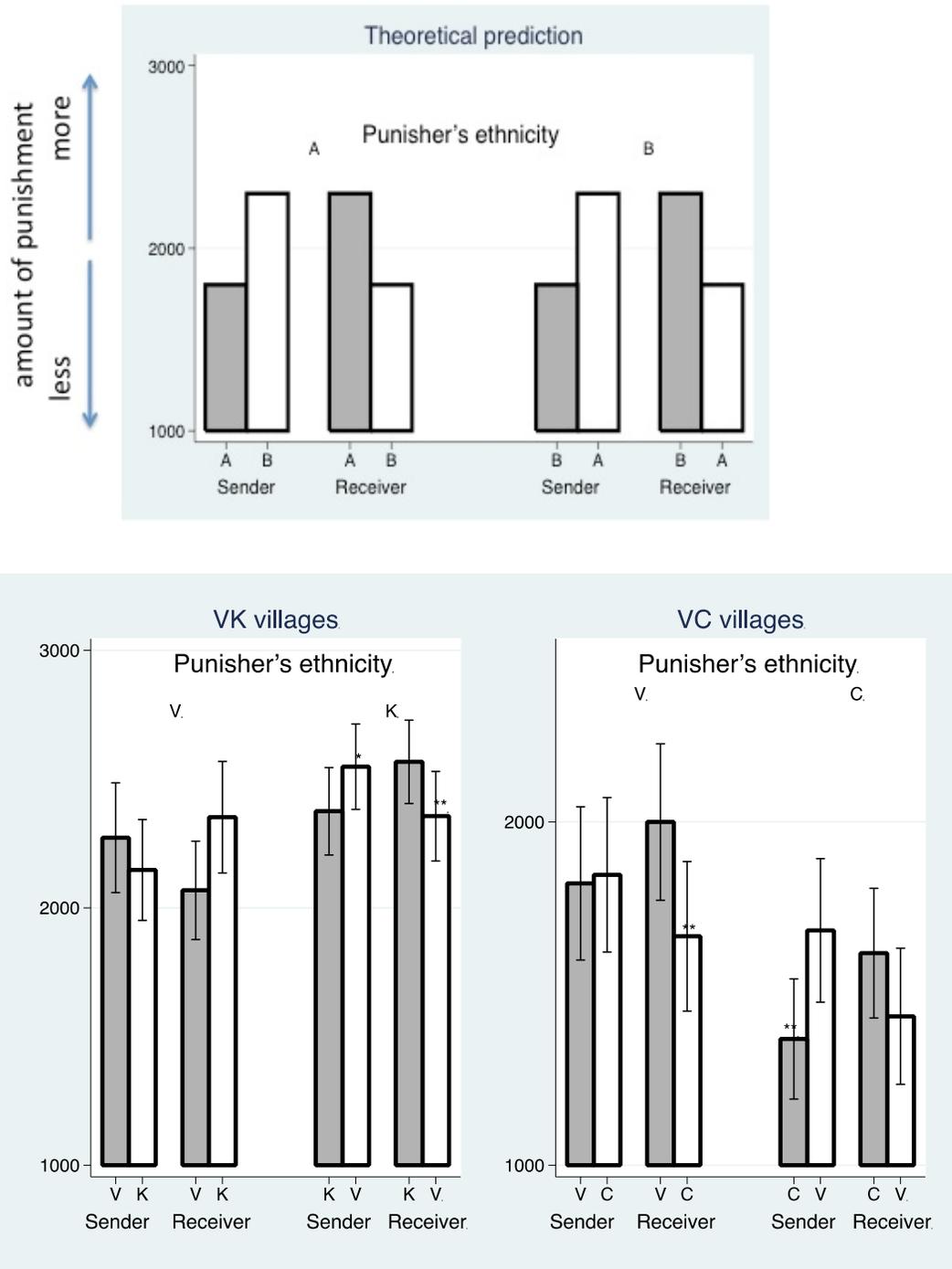
Figure 2

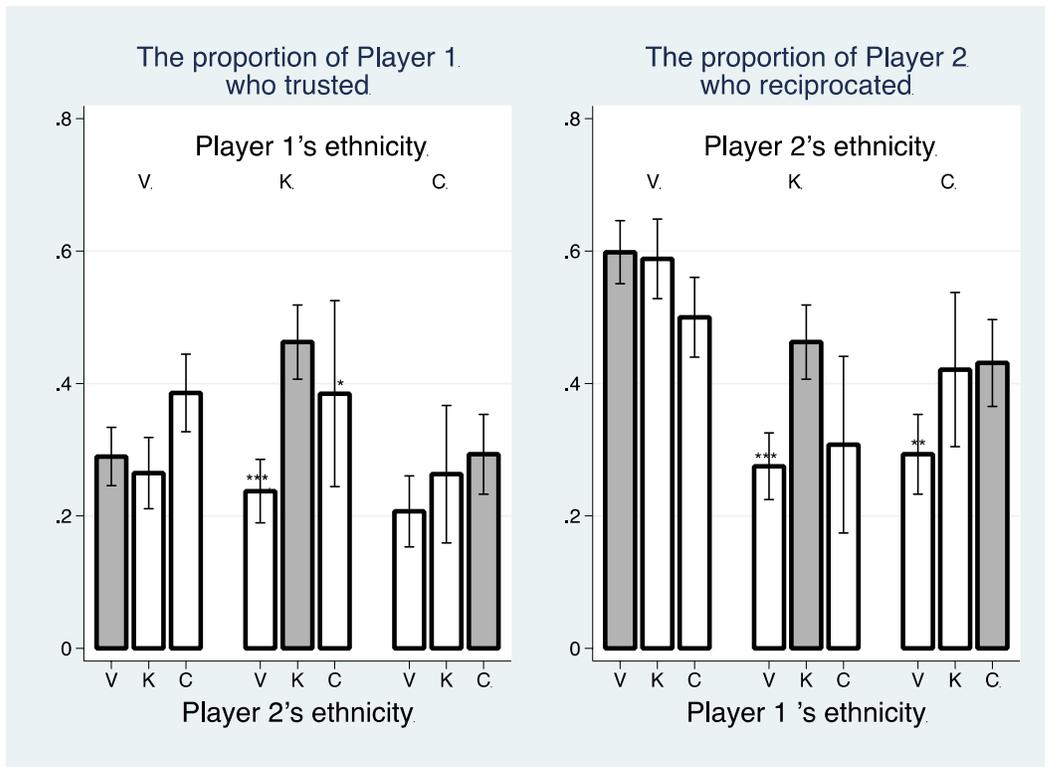**The mean amount sent in envy and dictator games**

Colored bars indicate own-group. Within-subject Wilcoxon rank-sum test results for own-other differences are shown with asterisks; *p<.01, **p<.05, ***p<.001. Vertical error bars represent the standard error of the mean.

Figure 3
Mean minimum accepted offers in the third party punishment game

Note: A higher number indicates a higher willingness to punish (i.e., more generous offers are punished). Within-subject Wilcoxon rank-sum test results for own-other differences are shown with asterisks; *p<.01, **p<.05, ***p<.001. Vertical error bars represent the standard error of the mean.

Figure 4
 Proportion of Player 1 and Player 2 who trust and reciprocate in trust game

Note: Shaded bars indicate own-group. The results of within-subject Wilcoxon rank-sum test for own-other group differences are shown with asterisks; *p<.01, **p<.05, ***p<.001. Vertical error bars represent the standard error of the mean.