Which Hat to Wear? Impact of Natural Identities on Coordination and Cooperation

Yan Chen[a,1,*], Sherry Xin Li[b,2], Tracy Xiao Liu[c,3], Margaret Shih[d,4]

[a] *School of Information, University of Michigan, 105 S. State Street, Ann Arbor, MI 48109, United States*
[b] *School of Economic, Political and Policy Sciences, University of Texas at Dallas, 800 W. Campbell Road, Richardson, TX 75080, United States*
[c] *Department of Economis, Tsinghua University, Beijing, China*
[d] *UCLA Anderson School of Management, 110 Westwood Plaza, Los Angeles, CA 90095-1481, United States*

Abstract

As the workforce becomes increasingly diverse, motivating individuals from different backgrounds to work together effectively is a major challenge facing organizations. In an experiment conducted at a large public university in the United States, we manipulate the salience of participants' multidimensional natural identities and investigate the effects of identity on coordination and cooperation in a series of minimum-effort and prisoner's dilemma games. By priming a fragmenting (ethnic) identity, we find that, compared to the control, participants are significantly less likely to choose high effort in the minimum-effort games, leading to less efficient coordination. In comparison, priming a common organization (school) identity significantly increases the choice of a rational joint payoff maximizing strategy in a prisoner's dilemma game.

JEL Classification: C7, C91

Keywords: social identity, diversity, prisoner's dilemma, minimum-effort game, experiment

1. Introduction

As the world becomes increasingly integrated and the workforce becomes more diverse, motivating individuals from diverse backgrounds to work together effectively is a major challenge facing organizations today. While increasing diversity in groups has been found to elicit positive outcomes such as enhancing thoughtful decision processes (Nemeth, 1986), expanding access to social networks and resources (Tushman,

*Corresponding author.
Email addresses: yanchen@umich.edu (Yan Chen), sherry.xin.li@utdallas.edu (Sherry Xin Li), tracy.umich@gmail.com (Tracy Xiao Liu), margaret.shih@anderson.ucla.edu (Margaret Shih)
[1] University of Michigan. Phone: 1-734-764-9488. Fax: 1-734-764-1555.
[2] University of Texas at Dallas
[3] Tsinghua University
[4] University of California at Los Angeles

1977), promoting innovation (Van Der Zee and Paulus, 2008), and facilitating problem solving (Hong and Page, 2001), increasing diversity also introduces group biases that may contribute to conflict among group members (Pelled, Eisenhardt and Xin 1999; Hargreaves Heap and Zizzo 2009). As a result, organizations wishing to obtain the benefits associated with diversity must also learn how to manage diversity in order to facilitate coordination, cooperation and positive interpersonal relationships among their members.

Research findings underscore the importance of effectively promoting coordination, cooperation and positive interpersonal relationships among members of an organization. Positive relationships have been associated with a host of important outcomes such as more effective sharing of resources and information, greater trust and better performance (Blatt and Camden 2006; Gruenfeld, Mannix, Williams and Neale 1996). Thus, integrating a diverse workforce, and motivating members who come from different backgrounds to work effectively towards a common goal is an important task facing many organizations.

However, despite this importance, organizations trying to promote better coordination and cooperation in diverse groups face several challenges in accomplishing this goal. First, work on minimal groups in psychology and near-minimal groups in economics finds that individuals are predisposed to favor the ingroup over the outgroup to enhance and maintain positive self-esteem (Tajfel and Turner, 1979). As a consequence, individuals perceive their ingroup members to be more similar to them than members of the outgroup (Allen and Wilder, 1975) and ascribe more positive traits to ingroup members (Brewer, 1979). Individuals are also more likely to help members of the ingroup over the outgroup (Crosby et al., 1980), to allocate more rewards to ingroup members (Wilder, 1986), and to show more charity, less envy, more positive reciprocity, less negative reciprocity, and more social welfare maximizing actions towards ingroup members (Chen and Li, 2009). In sum, research on minimal and near-minimal groups has collected a great deal of evidence showing that highlighting different social identities may fragment a group by introducing group biases that lead to counterproductive outcomes.

However, in the real world, people can be simultaneously identified along many dimensions of identity (Hewstone, 1996). Consider an African American male accountant who is a partner in his firm. He may be identified by his gender (male), his race (black), his role (partner), his occupation (accountant) or his organization (firm). Some of these identities may be shared by other members of the group, while other identities may not. Thus, highlighting these different identities may call forth different group orientations and their consequent behaviors within an organization. Furthermore, research finds that feelings of similarities to others within a group can be situationally altered by manipulating the salience of different social identities (Chatman et al., 1998). While highlighting uncommon identities may fragment a group, highlighting common identities might unify a group.

In practice, common identities have been used to create common goals and values. For example, Nike founder Phil Knight and many of his employees have tattoos of the Nike “swoosh" logo on their left calves as a sign of group membership (Camerer and Malmendier, 2007). To create a common identity, organizations have attempted various team-building exercises, such as simulated space missions where the crew works

together to overcome malfunctions while navigating through space (Ball, 1999). While standard economic theory does not have an explanation for such phenomena, research on social identity shed lights on the effects of common identity on organization outcomes.

Social psychology work on intergroup relations finds that highlighting a common ingroup identity can reduce intergroup bias (Dovidio, Gaertner, and Saguy 2009; Gaertner and Dovidio 2000). For instance, college roommates from differing ethnic backgrounds who perceived more common identities were less likely to show decline in their friendship than roommates who did not (West et al., 2009). In another study, emphasizing a common ingroup identity increased satisfaction with coworkers in ethnically diverse workgroups (Cunningham, 2005). In a multilevel public goods game across six countries, self-reported identification with the world as a whole predicts contributions to a global public good (Buchan *et al.* 2011).

Moreover, evidence in experimental economics finds that a common group identity increases cooperation in public goods games (Eckel and Grossman, 2005) and prisoner's dilemma games (Goette et al., 2006), where the dominant strategy is to completely free ride or defect. Furthermore, it improves coordination in the battle of sexes game (Charness et al., 2007), the provision point mechanism (Croson et al., 2008), and the minimum-effort game (Chen and Chen, 2011). The latter two games have multiple Pareto ranked equilibria; a salient common identity leads to the selection of a more efficient equilibrium.

This study extends previous research on the effects of a common identity on economic behavior. In particular, we investigate the effects of highlighting a common versus fragmenting identity on coordination and cooperation in a series of prisoner's dilemma and minimum-effort games with varying incentives for cooperation. Using subjects from a large public university in the United States, we prime participant school identity as their common identity, and ethnic identity as their fragmenting identity.

By priming a fragmenting (ethnic) identity, we find that, compared to the control, participants are significantly less likely to choose high effort in the minimum-effort games, leading to a reduction in efficient coordination. In comparison, priming a common organization (school) identity significantly increases the choice of a rational joint payoff maximizing strategy in a prisoner's dilemma game. Furthermore, we find that priming school identity interacts with stereotypes in interesting ways.

This paper contributes to the social identity literature in several ways. First, rather than inducing group identity in the laboratory, we study two naturally existing social identities - ethnic identity and organization identity. Thus, compared to studies using induced group identity, our results can be more easily applied to real-life work environments. Second, this study goes beyond documenting the intergroup bias in individual choices. We use the identity priming technique from social psychology to manipulate the salience of the respective identities to investigate the extent to which evoking different dimensions of these identities impacts individual choices in coordination and cooperation. Third, this study is among the first in economics to empirically evaluate the effectiveness of using a common identity as a design tool to increase coordination and cooperation among an ethnically diverse group of participants. Lastly, compared to social psychology studies of natural identities, we demonstrate that identity priming interacts with the strategic properties of games. The same priming technique can have

different effects in different games.

The rest of the paper is organized as follows. Section 2 presents the experimental design. In Section 3, we present our analysis and results. Section 4 discusses the results and concludes.

2. Experimental Design

Our experimental design simulates a work environment in an organization in which employees have multi-dimensional social identities and engage in strategic interactions with one another involving potential tradeoffs between self interest and group interest. Although our participants share a common organization identity, they come from diverse ethnic backgrounds. The incentivized tasks in the experiment involve choices to cooperate or coordinate with another employee in the organization. Thus, the experimental design captures three important factors that may influence individual choices at a workplace: self interest, group interest, and intergroup relations. We use the priming method from social psychology to make one of the participants' natural identities salient before they participate in a sequence of one-shot prisoner's dilemma and minimum-effort games.

In this study, we are interested in several questions. First, do people exhibit ingroup favoritism and outgroup discrimination, even in the absence of priming, when the other player's ethnic identity is known? Second, does group behavior intensify when we prime a fragmenting (ethnic) identity? Lastly, can we alleviate ingroup favoritism and outgroup discrimination by priming a common organization identity? In what follows, we describe the priming method, introduce the games and present the experimental procedure.

2.1. Identity Priming

Priming is an experimental technique in psychology that introduces certain stimuli ("primes") to activate individuals' social knowledge structures (Bargh, 2006). The types of primes include text (e.g., a questionnaire, an article, or a word scrambling game), image, or audio.

Priming social identities can impact people's behavior and attitudes outside of their awareness and control (see Bargh and Chartrand 1999 for a review), as demonstrated by social psychologists in a large body of work on identity priming. In these laboratory studies, psychologists have found that making social identities salient often induces study participants to adopt behaviors that are consistent with the stereotypes associated with the identity. These effects occur even when participants are not aware that they are being primed. In one study, college students primed with stereotypes of the elderly walk more slowly as they exit the study than those who are not primed with stereotypes of the elderly (Bargh et al., 1996). In another study, Steele and Aronson (1995) find that African American students who are stereotyped to be poor students underperform on academic tests when asked to indicate their race prior to taking the test. These effects have also been documented in other groups such as Hispanic Americans (Aronson et al., 1998), individuals from lower socio-economic status (Croizet and Claire, 1998) and women in math (Spencer et al., 1999).

On the other hand, while activating negative stereotypes can hurt performance, activating positive stereotypes can boost performance. In one experiment, Shih et al. (1999) examined the performance of Asian women on a mathematics test. Women are stereotyped to have inferior quantitative skills (Benbow 1995; Hedges and Nowell 1995) while Asians are stereotyped to have superior quantitative skills (Steen, 1987). Shih et al. (1999) find that Asian American women perform better on a mathematics test when their ethnic identity is primed, but worse when their gender identity is primed, compared to a control group with neither identity primed. In contrast, Asian Americans taking a verbal test showed the reverse pattern of performance. In this case, women are stereotyped to be verbally talented while Asians are not. Asian American women perform higher on the verbal test when their gender is salient, and worse when their ethnicity is made salient (Shih et al., 2006). These priming techniques have also been applied to study risk and time preferences in economics (Benjamin et al., 2010).

Identity priming can also activate intergroup bias. Simply exposing individuals to words indicating ingroup or outgroup identity can elicit differential judgements from people. Perdue et al. (1990) find that subliminally exposing individuals to words associated with the ingroup and the outgroup (i.e. “us", “them") affects how quickly study participants judge positive and negative words. Participants are more quick to judge positive to be positive if exposed to ingroup words such as “us," and more quick to judge negative words to be negative if exposed to outgroup words such as “them". In the present study, we use identity priming methods to examine if individuals automatically exhibit intergroup bias in prisoner’s dilemma and coordination games.

We choose two ethnic groups, Caucasians and Asians, which can be differentiated by their last names. For Asian participants, we focus on those with Chinese last names in order to avoid potential complex intergroup preferences among different Asian groups, e.g., Chinese and Japanese.

We adopt the priming technique from Shih et al. (1999), and subtly activate a social category outside of participants’ awareness in the identity treatments. The stimuli are introduced through a pre-experiment questionnaire. In the ethnic identity treatment, the questions pertain to an individual’s ethnic background, family history (“How many generations has your family lived in America?" and “From which countries did you family originate?"), and cultural heritage (“What languages do you speak?"). In the school identity treatment, subjects are asked about which school they attend. They are then asked to reflect on their choices of schools when applying for college (“Did you consider any other school? If yes, what other schools?", “Why did you decide to choose your specific school?"). Since the subjects in each experimental session study at the same university, these questions pertain to an individual’s common identity of being part of her university. In the control sessions, the questions are designed to be identity neutral, i.e., related to neither the ethnic nor the school identities. Subjects are asked about their activities in leisure time, for example, “How often do you watch television?" “How often do you eat out?" and “How often do you attend movies?" The identity neutral questionnaire is designed to preserve the direct comparability with the two identity treatments. These procedures are adopted from those used in past psychology experiments and the questionnaires are modified versions of those used in Shih et al. (1999). The primes are designed to make salient the appropriate social identity and activate the constructs associated with the identity. A social identity is attached to a whole host

of associated traits, stereotypes, social expectations, and schemas (Deaux, 1996). The questionnaires and summary responses are included in Appendix A.

2.2. The Games

To investigate intergroup and intragroup coordination and cooperation under conditions when a fragmenting or a common identity is made salient, we choose variants of the prisoner's dilemma and minimum-effort games. This class of games is among the simplest of those which capture the tension between individual and group interests. The prisoner's dilemma game has also been used in the social identity literature in psychology to investigate the causes of group bias (Yamagishi and Kiyonari, 2000; Simpson, 2006).

2.2.1. The Prisoner's Dilemma Games

Figure 1 presents the extensive forms of the five sequential prisoner's dilemma games (PD) in our experiment. In each game, player 1 has two strategies, cooperate (C) or defect (D), whereas player 2 has four strategies:

- Always cooperate (CC): cooperate if player 1 cooperates, and cooperate if player 1 defects.
- Always defect (DD): defect if player 1 cooperates, and defect if player 1 defects.
- Reciprocal (CD): cooperate if player 1 cooperates, and defect if player 1 defects.
- Opposite (DC): defect if player 1 cooperates, and cooperate if player 1 defects.

Note that, while we use C and D throughout the paper for the ease of exposition, the subjects are given neutral terminologies. Player 1 (2), called player A (B) in the instructions, has actions A1 (B1) and A2 (B2), corresponding to C and D, respectively.

In one-shot scenarios, a sizeable literature on social preferences uncovers a non-negligible number of conditional cooperators in social dilemma types of games (Fehr and Gaechter, 2000; Healy, 2007). Healy (2007) models the sequential prisoner's dilemma game as a game of incomplete information about player 2's types. Specifically, let p be player 1's belief that 2 is a conditional cooperator. Assuming risk neutrality, player 1 will choose to cooperate if the expected value from cooperation is at least as great as the expected value from defection, i.e.,

$$p\pi_1(C,C) + (1-p)\pi_1(C,D) \geq \pi_1(D,D).$$

Therefore, player 1 prefers to choose the lottery rather than choosing Defect if and only if the likelihood that player 2 is a conditional cooperator is sufficiently high, or $p \geq p^*$, where

$$p^* = \frac{\pi_1(D,D) - \pi_1(C,D)}{\pi_1(C,C) - \pi_1(C,D)}.$$

In our experiment, payoffs in each PD game are chosen such that $p^* \in \{0, 1/4, 1/2, 2/3, 3/4\}$, which corresponds to PD games 0 to 4. In PD 1, player 1 should cooperate

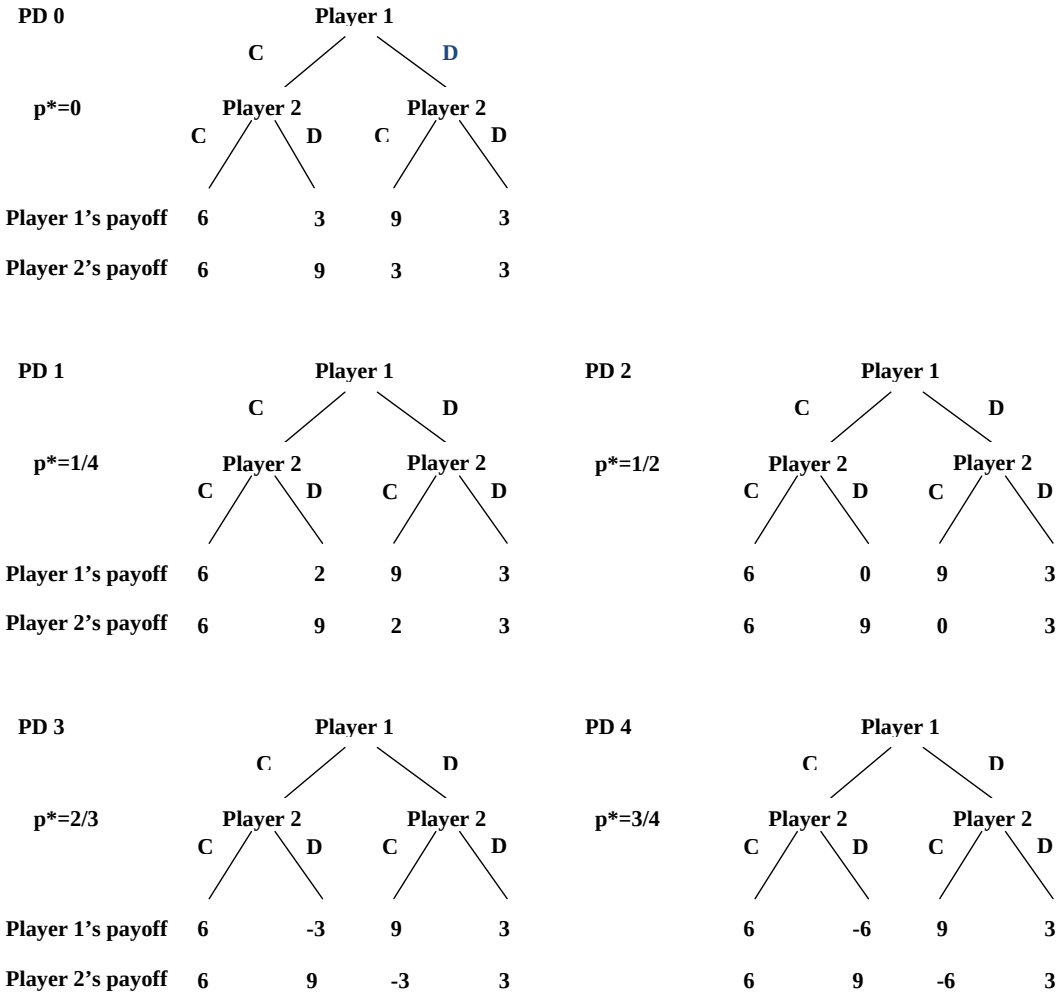


Figure 1: Extensive Form Representation of the Prisoner's Dilemma Games (PD)

if she believes that at least 1/4 of player 2s are conditional cooperators. In contrast, in PD 4, player 1 will cooperate when she believes that the proportion of conditional cooperators exceeds 3/4. Other things being equal, we expect to see the likelihood of player 1's cooperation decrease from PD 0 to PD 4.

In this design, the range of thresholds for cooperation enables us to measure the sensitivity and robustness of group behavior under varying incentives. This design feature is an improvement over previous studies, where only one threshold is implemented, such as in Yamagishi and Kiyonari (2000) who implement a sequential prisoner's dilemma game with $p^* = 1/2$.

To accurately elicit player 2's type, we use the strategy method. Specifically, player 2 is asked to submit a complete strategy without knowing player 1's choice, in the form of "if A chooses A1, I choose _(B1 or B2); if A chooses A2, I choose _ (B1 or B2)." The use of the strategy method effectively transforms the extensive form games in Figure 1 into the normal form games in Figure 2.[5]

In normal form representation, PD 0 has four Nash equilibria, {(D, DD), (C, DD), (D, CC), (D, DC)}, while each game in PD 1-4 has a unique pure strategy Nash equilibrium, (D, DD). Thus, behavior in game 0 measures group effects on *coordination*, while behavior in games 1-4 measures group effects on *cooperation*.

Of player 2's four strategies, DC (i.e., doing the opposite to what player 1 does) warrants more discussion. In PD 1-4, DC is weakly dominated by DD, and as expected, empirically adopted least often (Section 3). In PD 0, however, DC is a *weakly dominant* strategy for player 2. Comparing player 2's two weakly dominant strategies, DD and DC, we note that DC maximizes joint payoffs and Pareto dominates DD. Specifically, if player 1 chooses to defect, DC leads to a higher joint payoff without sacrificing own payoff (3 regardless); however, if player 1 chooses to cooperate (which leads to a joint payoff of 12 regardless what player 2 does), player 2 chooses to defect to maximize self interest. Therefore, we name DC as the rational joint-payoff-maximizing strategy (hereafter rJPM) in PD 0. Note that player 2's other joint-payoff-maximizing strategy, CC, is weakly dominated, and thus not rational.

2.2.2. The Minimum-Effort Games

To further investigate the effects of identity priming on coordination, we choose a series of the minimum-effort games (ME) used in Goeree and Holt (2005). To make them comparable to the PD games, we transform the 2×2 minimum-effort games in Goeree and Holt (2005) in three ways. First, we multiply all payoffs by 10 so that the payoffs are similar in magnitude to those in the PD games. Second, we transform the normal form games to the extensive form and then apply the strategy method. Lastly,

[5] Figuières et al. (2012) study voluntary contribution to public goods under three conditions, sequential treatment with information (about earlier contributions within round), sequential treatment without information, and a simultaneous treatment. They find that contributions under sequential treatment without information are not significantly different from that under the simultaneous treatment. A crucial difference between our implementation of the sequential move without information and theirs is that our player 2s submit strategies *conditional* on player 1's move, whereas later movers in Figuières et al. (2012) cannot condition their contributions on earlier contributions. Therefore, based on their Result 1, we expect our sequential without information implementation to be equivalent to the normal form games in Figure 2.

PD 0	CC	DD	CD	DC
C	6, 6	3, 9	6, 6	3, 9
D	9, 3	3, 3	3, 3	9, 3

PD 1	CC	DD	CD	DC
C	6, 6	2, 9	6, 6	2, 9
D	9, 2	3, 3	3, 3	9, 2

PD 2	CC	DD	CD	DC
C	6, 6	0, 9	6, 6	0, 9
D	9, 0	3, 3	3, 3	9, 0

PD 3	CC	DD	CD	DC
C	6, 6	-3, 9	6, 6	-3, 9
D	9, -3	3, 3	3, 3	9, -3

PD 4	CC	DD	CD	DC
C	6, 6	-6, 9	6, 6	-6, 9
D	9, -6	3, 3	3, 3	9, -6

Figure 2: Normal Form Representation of the Prisoner's Dilemma Games (PD)

we use five different cost parameters to vary the predictions of equilibrium selection, as explained after we introduce the games.

Figure 3 presents the extensive forms of the five sequential minimum-effort games. Similar to the PD games, player 1 in sequential ME games has two strategies, high effort (H) or low effort (L), while player 2 has four strategies:

- Always choose high effort (HH): high effort if player 1 chooses H, and high effort if player 1 chooses L.
- Always choose low effort (LL): low effort if player 1 chooses H, and low effort if player 1 chooses L.
- Reciprocal (HL): high effort if player 1 chooses H, and low effort if player 1 chooses L.
- Opposite (LH): low effort if player 1 chooses H, and high effort if player 1 chooses L.

As the minimum-effort games belong to the class of potential games (Monderer and Shapley, 1996), we can vary a cost parameter so that the potential maximizing equilibrium is either the low- or high-effort equilibrium. Define c as player i's marginal cost of effort. As discussed in Goeree and Holt (2005), in the 2×2 version of the game, when $c > 0.5$, {L, L} is the potential maximizing equilibrium, whereas {H, H} is the potential maximizing equilibrium when $c < 0.5$. Thus, $c^* = 0.5$ is the cutoff cost parameter.

Given sufficient time to learn, Goeree and Holt (2005) demonstrate that *stochastic* potential maximization is a good predictor for the outcome distributions.[6] Using induced identities and a continuum of strategies in the lab, Chen and Chen (2011) demonstrate that, when $c = 0.75$, play converges to the low-effort equilibrium in the control and with outgroup matching, but it converges to the high-effort equilibrium with ingroup matching. This is consistent with their theoretical prediction that a salient ingroup identity changes equilibrium selection by changing the potential function of the game.

In comparison to Chen and Chen (2011), we investigate whether differentially activated *natural* identities might influence equilibrium selection with varying strength of incentives. Therefore, we choose $c \in \{0.4, 0.5, 0.6, 0.7, 0.8\}$. With this set of parameters, the low-effort equilibrium maximizes the potential for $c > 0.5$, whereas the high-effort equilibrium maximizes the potential when $c = 0.4$. At the cutoff value, $c^* = 0.5$, play is diffused without identity priming, and it should converge to the high-effort equilibrium with in-group matching. Previous experimental evidence suggests that potential maximization provides a benchmark for comparative statics, although not good point predictions. Thus, we expect that as c increases, the likelihood of coordination to the efficient high-effort equilibrium will decrease.

As in the prisoner's dilemma games, the strategy method transforms the extensive form games in Figure 3 into the normal form games in Figure 4.

[6] Fatas and Morales (2013) apply an alternative step-thinking model to the experimental data from Goeree

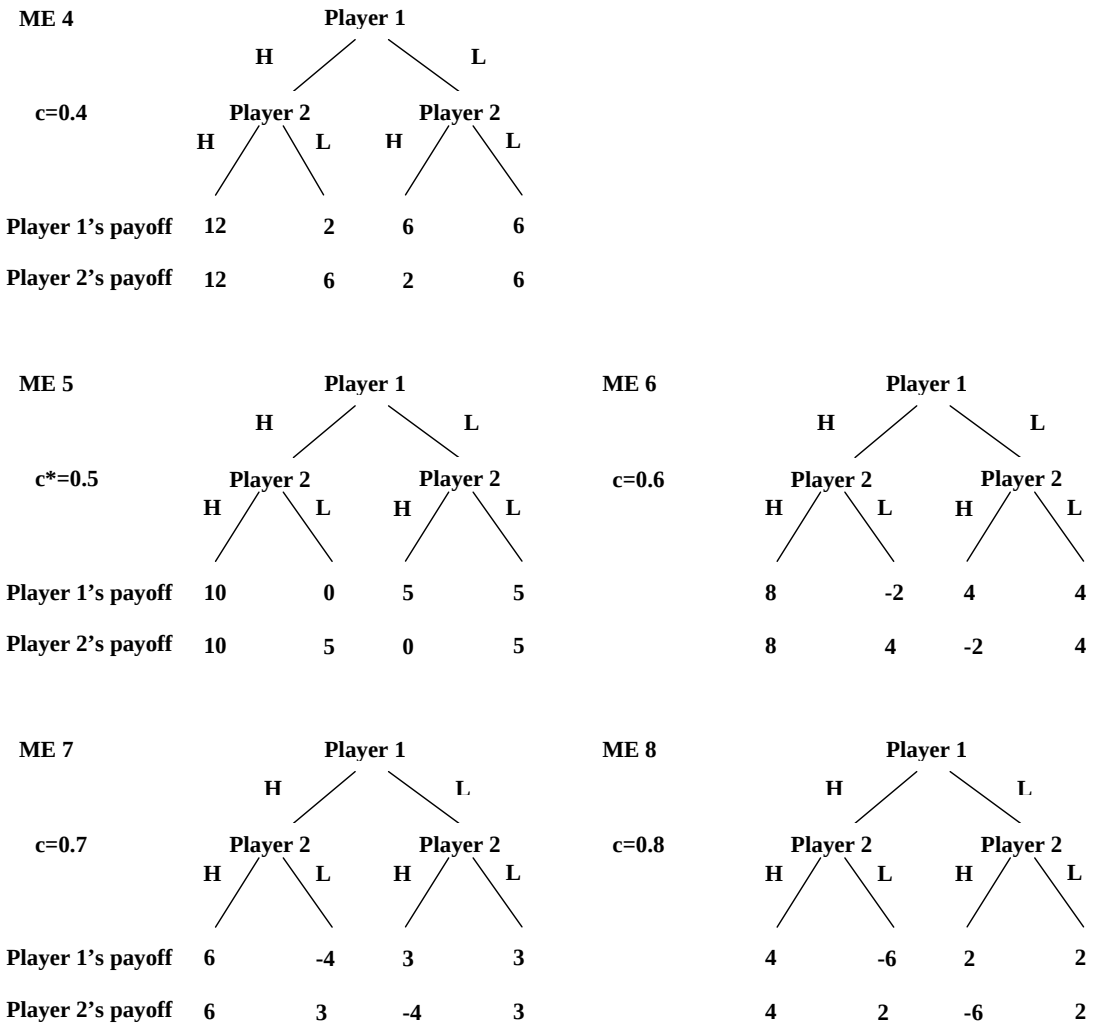


Figure 3: Extensive Form Representation of the Minimum-Effort Games (ME)

ME 4	HH	LL	HL	LH
H	12, 12	2, 6	12, 12	2, 6
L	6, 2	6, 6	6, 6	6, 2

ME 5	HH	LL	HL	LH
H	10, 10	0, 5	10, 10	0, 5
L	5, 0	5, 5	5, 5	5, 0

ME 6	HH	LL	HL	LH
H	8, 8	-2, 4	8, 8	-2, 4
L	4, -2	4, 4	4, 4	4, -2

ME 7	HH	LL	HL	LH
H	6, 6	-4, 3	6, 6	-4, 3
L	3, -4	3, 3	3, 3	3, -4

ME 8	HH	LL	HL	LH
H	4, 4	-6, 2	4, 4	-6, 2
L	2, -6	2, 2	2, 2	2, -6

Figure 4: Normal Form Representation of the Minimum-Effort Games (ME)

In its normal form representation, each of the five games has three pure strategy Nash equilibria, {(H, HH), (H, HL), (L, LL)}. Note that HL is player 2's only weakly dominant strategy. In addition, conditional on player 1's choice, HL also maximizes joint payoff. Therefore, HL maximizes player 2's self-interest as well as joint payoff, making it a strong predictor for player 2s' behavior.

2.3. Experimental Procedure

At the University of Michigan, we implement one control condition and two identity priming treatments, each of which has five independent sessions for the PD and ME games, respectively. The two treatments include an ethnic identity treatment where we prime participants' (fragmenting) ethnic identities and a school identity treatment where we prime participants' common University of Michigan identity. We explain our experimental procedure in detail below.

Common to all three experimental conditions, each session consists of eight subjects and three stages: a pre-experiment questionnaire to prime a participant's natural identity in the treatments and an identity-neutral questionnaire for the control condition, four rounds of two-person games, each with a different match, and a post-experiment questionnaire to elicit demographics information and to check the effects of priming.

In the first stage, participants in each experimental session fill out a pre-experiment questionnaire designed to prime ethnic or school identity in the two respective treatments, or an identity-neutral questionnaire in the control condition.

In the second stage, eight subjects in each session are randomly assigned as player 1 or 2 in the two-person games for four rounds. Although their player roles are fixed during the experiment, their match in each round is different in order to minimize repeated game effects. In each round, each participant plays the five PD (or ME) games with her match. To control for any game order effect within a treatment, we use a Latin Square design, whereby each of the five sessions in a treatment has a different game order.[7]

Unlike most laboratory experiments that use anonymous matching,[8] we provide the co-player's ethnic background information in all three treatments. Specifically, the co-player's last name appears on the screen. For example, a participant is told that she is matched with "Chen" or "Smith" while making the decision. The displayed name is the co-player's real last name.

Furthermore, since the participants go through several rounds, we expose them to photos as an unobtrusive means to reinforce the primes.[9] We select four pictures

---

and Holt (2005) and obtain precise point predictions for the observed results.

[7]The PD game orders include 0-1-2-3-4, 1-2-3-4-0, 2-3-4-0-1, 3-4-0-1-2, and 4-0-1-2-3, so that each game has appeared once in each position. The ME game orders follow the same process.

[8]Andreoni and Petrie (2004) is a notable exception where subjects' digital photos are presented to their partners in a laboratory fundraising experiment.

[9]The use of posters and pictures to prime stereotypes is a common procedure in psychological priming studies. For instance, Cheryan et al. (2009) used posters to make salient stereotypes in the computer sciences. Chen and Bargh (1997) exposed participants to picture of Black and White faces to prime stereotypes associated with race.

for each treatment, and display one picture at a time on the computer screen for five seconds before subjects proceed to the next round. In the ethnic identity treatment, pictures of architecture from China and Europe are shown, while in the school identity treatment, subjects see pictures of their university landmarks. In the control sessions, identity-neutral landscape pictures are shown. These photos were pretested to establish that they primed the appropriate identities and that they were equally positive in valence.[10] Additionally, we elicit individual beliefs about her match's decision in each game, and reward each correct guess with 2 points. Feedbacks on their matches' actual decisions are not provided until the end of the experiment. The experimental instructions and the pictures (Figures 9, 10 and 11) are included in Appendix B.

Note in all the treatments, including the control condition, co-player's surname is provided to subjects before they make decisions. We choose this design to make the setting more comparable to real-life social interactions at workplaces. When people interact with one another at work, they have the information on their co-workers' ethnicity. Therefore, compared to an alternative design in which no information is provided on the co-player, the current control condition serves as a better benchmark and carries more natural generalization to organization design.

In the third stage, we conduct a post-experiment survey, which collects information on demographics, self-statements, strategies used during the experiments, and evaluation of ethnic stereotypes. The post-experiment questionnaire and summary responses are included in Appendix C.

Table 1: Features of Experimental Sessions

	Participants					
	PD Games			ME Games		
Treatments	Caucasian	Asian	Total	Caucasian	Asian	Total
Ethnic	19	21	8×5	19	21	8×5
School	19	21	8×5	20	20	8×5
Control	20	20	8×5	20	20	8×5

Table 1 summarizes the features of the experimental sessions, including treatments, number of participants, and ethnic compositions by treatment. Overall, 30 independent computerized sessions were conducted at the School of Information Lab at the University of Michigan, with a total of 240 student subjects. The 15 sessions of PD games were conducted from May to July 2008, with 62 Asian and 58 Caucasian participants. Another 15 sessions of ME games were conducted from June to July 2012, with 61 Asian and 59 Caucasian participants.[11]

[10] For the pretest, we had coders rate the photos on how ethnic, UM related, and positive they were. We found that the ethnic architecture were rated as more ethnic than the other photos. The UM photos were more UM related than the other photos. Furthermore, there were no differences in how positive the photos were.

[11] Another 15 sessions of the PD games were conducted in the California Social Science Experimental Laboratory (CASSEL) at UCLA in May 2009, with 63 Asian and 57 Caucasian participants. However, due

For each session, we pre-screen the last names of potential participants, with a threshold of at least three participants with European last names, and three with Chinese last names. Each subject participates in only one session. We use z-Tree (Fischbacher, 2007) to program our experiments. Each session lasts approximately one hour, with the first 15 minutes used for instructions. The exchange rate is set to 8 points for $1. In addition, each participant is paid a $5 show-up fee. Average earnings per participant are $20 in PD games and $28 in ME games, including the show-up fee. Data are available from the authors upon request.

3. Results

Before we present the results several data issues warrant some discussions. Recall that information on subject's ethnicity is revealed to co-players through last names. In 5% (3%) of PD (ME) observations, subjects are matched with their acquaintances. Among the acquaintances, 88% of them come from the same ethnic group, which makes it impossible to disentangle the acquaintance effect from intergroup preference.[12] We thus exclude them from the main analysis. The second issue is that some subjects miscategorize their matches' ethnicities. The post-experiment survey shows this affects 8% (6%) of PD (ME) observations. For these observations, the match ethnicity is recoded to reflect subjects' perception.[13] We also report results using the actual ethnic identities (i.e., without recoding) in footnotes whenever the recoding affects statistical significance. In addition, seven subjects in PD games, self-identified as economics graduate students or post-doc, are significantly more likely to choose to defect compared to other subjects.[14] We include them in the analysis and control for special subjects effect in our regressions.

Two common features apply throughout our analysis. First, standard errors are clustered at the individual subject level to control for potential interdependency of individual decisions across games.[15] Second, two-sided p-values are reported.

---

to a restriction from the UCLA IRB, we were not able to display participant last names. The change in protocols renders the results from the two sites incomparable. Therefore, the UCLA results are not presented here. They are included in a previous version, and are available from the authors upon request.

[12] Among these acquaintance pairings, the proportion of player 2s choosing rJPM in PD 0 (or DD in PD 1-4) is 69% (62%), compared to 59% (80%) for non-acquaintance pairings. Additionally, the proportion of player 1s choosing high effort in ME games among acquaintance (non-acquaintance) pairings is 100% (85%).

[13] A match is coded as "outgroup" in the analysis if a player categorizes the match's ethnicity as "other" or "don't know". Among the 59 participants with Caucasian last names for the ME games, 5 of them are African American and 7 of them report their ethnicity as "other." In ME games, for the two African American player 1s with European last names, as their choices are not different from Caucasian participants and they were treated similarly by their co-players, we code them as Caucasian based on their matches' perception. Additionally, to make the analysis comparable with PD games, we exclude all "Asian(Caucasian)-Other" matches in ME games. The results remains the same if we keep them.

[14] Among economics graduate students and post-doc, the cooperation rate as player 1 is 12.5% in PD 0, and 0 in PD 1-4. As player 2, the proportion of them choosing rJPM (DD) in PD 0 (PD 1-4) is 35% (75%).

[15] Recall that participants make their decisions independently, without any feedback on their decisions until the end of the experiment.

We are interested in the extent to which the ethnic and school priming influences coordination (ME games, PD 0) and cooperation (PD 1-4), respectively. Since earlier studies in social psychology suggest that favoritism towards ingroup and discrimination against outgroup may occur separately (Brewer, 1999), we examine the treatment effects on ingroup favoritism, outgroup discrimination, and intergroup differentials, respectively. The analysis focuses on individual strategies although the results are largely consistent with actions-based analysis.

Table 2 presents the outcome distribution in each of the five ME games. Tables 9 to 14 in Appendix D separately tabulate the same information by match types. Recall that each of the ME games has three Pareto-ranked Nash equilibrium outcomes, {(H, HH), (H, HL), (L, LL)}. One of the Pareto-efficient Nash equilibrium outcomes, (H, HL), is the mode of distribution in every game of every treatment. Furthermore, the reciprocal strategy, HL, accounts for over 95% of player 2 strategies in each game, which indicates that any treatment effect is likely to be caused by player 1 strategies. Going from ME 4 to ME 8, we observe a general increase in L in each treatment, consistent with the prediction of potential games. In our subsequent analysis of ME games, we will focus on player 1 strategies.

Similarly, Table 3 presents the outcome distributions in each of the five PD games. Again, Tables 15 to 18 in Appendix D tabulate the same information by match type. Nash equilibrium outcomes are again italicized, whereas the mode of distribution is boldfaced. Recall that PD 0 has four Nash equilibrium outcomes, {(D, DD), (C, DD), (D, CC), (D, DC)}. Two of player 2's strategies, DD and DC (or rJPM), account for over 80% of player 2's choices. In PD 1-4, the unique Nash equilibrium outcome, (D, DD), is also the mode of distribution in each treatment, and DD accounts for more than 2/3 of player 2's choices. Therefore, in subsequent analysis of player 2 strategies, we will focus on DD and DC in PD 0, and DD in PD 1-4.

3.1. Control

Recall participants in the control sessions are given information (i.e., last name) that reveals the match's ethnicity, although the pre-survey is intended to be identity neutral. This design enables us to identify potential group effects associated with the revelation of ethnicity *information*. It makes the setting comparable to real-life workplaces where co-workers have information about others' ethnicity.

The results from the control sessions in the minimum-effort games, presented in columns (1) and (2) in Table 4, establish a baseline for comparison with the two identity treatments. The top panel pertains to player 1s' choice of high effort and the bottom panel to player 2s' choice of the reciprocal HL strategy. We present results for all players, as well as Asian and Caucasian players separately. While player 1s are more likely to choose high effort when matched with an ingroup member, this intergroup difference is not statistically significant. In comparison, player 2s are significantly more likely to choose HL when matched with an outgroup member, which is driven by Asian players. This outgroup favoritism has also been observed among East Asian children in a dictator game (Friesen et al. 2012) and among the Vietnamese towards the Khmer in dictator and envy games after controlling for socio-demographic variables (Tanaka and Camerer 2013).

Table 2: Outcome Distribution in the Minimum-Effort Games

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	*0*	1	***94***	0	H	*0*	0	***91***	0	H	*0*	0	***93***	0
L	0	*0*	5	0	L	0	*0*	9	0	L	0	*0*	7	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	*0*	5	***92***	0	H	*0*	0	***77***	0	H	*0*	0	***87***	0
L	0	*0*	3	0	L	0	*0*	23	0	L	0	*0*	13	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	*0*	3	***85***	1	H	*0*	0	***75***	0	H	*0*	0	***88***	0
L	0	*1*	10	0	L	0	*0*	25	0	L	0	*0*	12	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	*0*	1	***82***	1	H	*0*	0	***72***	0	H	*1*	0	***87***	0
L	0	*1*	14	0	L	0	*0*	28	0	L	0	*0*	12	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	*0*	3	***78***	0	H	*0*	0	***73***	0	H	*0*	1	***78***	0
L	0	*1*	18	0	L	0	*0*	27	0	L	0	*0*	21	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	*0*	3	***86***	1	H	*0*	0	***78***	0	H	*0*	0	***87***	0
L	0	*1*	10	0	L	0	*0*	22	0	L	0	*0*	13	0

Notes:

a. Nash equilibrium outcomes, {(H, HH), (H, HL), (L, LL)}, are italicized.

b. The mode of distribution is boldfaced.

Table 3: Outcome Distribution in the Prisoner's Dilemma Games

PD 0	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	3	16	*1*	16	C	0	10	*4*	19	C	0	4	*1*	26
D	*7*	*20*	4	***33***	D	*3*	*21*	9	***35***	D	*1*	*18*	1	***49***
PD 1	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	3	21	0	3	C	1	38	6	3	C	0	16	0	3
D	5	***49***	5	13	D	4	***42***	3	3	D	8	***68***	3	3
PD 2	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	3	21	1	0	C	0	24	4	0	C	0	24	0	0
D	0	***55***	19	1	D	1	***54***	14	3	D	1	***65***	7	3
PD 3	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	17	4	1	C	0	28	5	0	C	1	20	4	0
D	4	***49***	23	1	D	1	***55***	10	0	D	3	***62***	9	0
PD 4	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	16	5	0	C	1	26	4	0	C	0	19	3	0
D	4	***57***	17	0	D	1	***56***	12	0	D	1	***72***	5	0
Mean	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	2	18	2	4	C	1	25	5	4	C	0	17	2	6
D	4	***46***	14	10	D	2	***46***	9	8	D	3	***57***	5	11

Notes:

a. Nash equilibrium outcomes in PD 0, {(D, DD), (C, DD), (D, CC), (D, DC)}, and in PD 1-4, {(D, DD)}, are italicized.

b. The mode of distribution is boldfaced.

Table 4: Summary Statistics in the Minimum-Effort Games

	Player 1: Proportion of High Effort					
	Control		Ethnic		School	
	(1)	(2)	(3)	(4)	(5)	(6)
	Ing	Outg	Ing	Outg	Ing	Outg
All	92	90	74	79	86	93
Asian	91	93	75	80	84	89
Caucasian	93	87	71	78	90	96
	Player 2: Proportion of HL					
	Control		Ethnic		School	
	(1)	(2)	(3)	(4)	(5)	(6)
	Ing	Outg	Ing	Outg	Ing	Outg
All	***94***	***98***	100	100	100	99
Asian	***90***	***96***	100	100	100	99
Caucasian	100	100	100	100	100	99

Notes: Italicized boldfaced numbers highlight a significant ingroup-outgroup difference ($p \leq 0.05$).

Since PD 0 has multiple Pareto ranked equilibria while PD 1-4 each have a unique but inefficient Nash equilibrium, we report results separately for PD 0 and PD 1-4 in Table 5. The top panel pertains to player 1s' choice of cooperation and the bottom panel to player 2s' choice of DD and rJPM (DD) strategy in PD 0 (1-4). The proportions are italicized and boldfaced if the ingroup-outgroup comparison within a treatment is statistically significant ($p \leq 0.05$).

Pairwise comparisons between columns (1) and (2) as well as (7) and (8) in the top panel of Tables 5 indicate higher rate of ingroup cooperation by player 1s in all PD games. However, none of the pairwise comparisons is significant at the 5% level.

Similar comparisons in the bottom panel of Table 5 indicate that player 2s in PD 0 are more likely to choose a joint payoff maximizing strategy rJPM with an ingroup than with an outgroup match. These observations in the control sessions thus suggest, at least qualitatively in PD games, ingroup favoritism and outgroup discrimination as a result of the match's ethnicity information being revealed. These results are partially consistent with Fershtman and Gneezy (2001), who find that Israeli Jewish participants exhibit mistrust towards men of Eastern origin in trust games, where ethnic origins are inferred from the names of their matches.

In contrast to player 2s' choices in PD 0, their choices in PD 1-4 show outgroup favoritism. The rate of the always-defect strategy DD is higher with an ingroup than with an outgroup match (columns 7-8 of the middle panel in Table 5), and significantly higher for Caucasian player 2s (88% vs. 76%, $p < 0.01$).[16] This lower rate of DD

[16]However, this comparison is no longer significant if we do not correct for the misperceptions of ethnic identities (83% vs. 78%, $p = 0.38$).

Table 5: Summary Statistics in Prisoner's Dilemma Games

	PD 0						PD 1-4					
	Player 1: Proportion of Cooperation						Player 1: Proportion of Cooperation					
	Control		Ethnic		School		Control		Ethnic		School	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg
All	42	32	39	29	40	25	29	20	40	32	24	22
Asian	64	41	37	20	40	25	30	23	38	24	20	19
Caucasian	24	23	41	36	40	25	28	18	41	39	33	24

	PD 0						PD 1-4					
	Player 2: Proportion of DD						Player 2: Proportion of DD					
	Control		Ethnic		School		Control		Ethnic		School	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg
All	37	36	34	28	19	24	77	68	76	85	85	88
Asian	41	42	27	33	18	19	68	58	67	76	83	90
Caucasian	31	31	***46***	***23***	20	29	***88***	***76***	92	93	90	85

	PD 0					
	Player 2: Proportion of rJPM					
	Control		Ethnic		School	
	(1)	(2)	(3)	(4)	(5)	(6)
	Ing	Outg	Ing	Outg	Ing	Outg
All	53	47	49	58	75	74
Asian	41	26	45	43	77	76
Caucasian	69	62	54	73	70	71

Notes: Italicized boldfaced numbers highlight a significant ingroup-outgroup difference ($p \leq 0.05$).

with an outgroup match is due to player 2s' increased positive reciprocity towards an outgroup match in games 1-4.[17] This outgroup favoritism, while opposite to the findings in earlier studies with near-minimal groups in the lab (Chen and Li, 2009), has been reported in studies with natural identities (Friesen et al. 2012, Tanaka and Camerer 2013). Nevertheless, since we are primarily interested in how different identity priming influences individual choices and their intergroup preferences, these findings in the control sessions serve as a benchmark for the analysis of the treatment effects of ethnic and school priming.

3.2. Treatments

In this subsection, we investigate the extent to which identity priming affects individual behavior in the ME games, PD 0, and PD 1-4, respectively. For each result, we first present the aggregate treatment effects (Table 6). We then discuss heterogeneous impact of identity priming on Asian and Caucasian subjects separately (Table 7).

Table 6 presents six probit specifications investigating the treatment effects of identity priming, each of which corresponds to each role's strategy by game.[18] The dependent variables are player 1's choice of high effort in the ME games (column 1), player 1's choice of cooperation in PD 0 (column 2), player 2's choice of rJPM (column 3) or DD (column 4) in PD 0, player 1's choice of cooperation in PD 1-4 (column 5), and player 2's choice of DD in PD 1-4 (column 6), respectively. As we are interested in the treatment effects, the independent variables of interest are ethnic priming and school priming. The control is the omitted category. We also control for special subjects, i.e., economics graduate students and post-doctoral scholars, and game fixed effects. Coefficient estimates are reported. Standard errors in parentheses are clustered at the individual subject level.

We first investigate behavioral changes in the ethnic priming treatment relative to the control sessions. Recall subjects in both treatments are given information on the match's ethnicity. The only difference is that the pre-survey in the ethnic priming treatment is used to activate ethnic identities, whereas that in the control is designed to be identity neutral. We focus on the treatment effect, i.e., how ethnic priming, in addition to information on match's ethnicity (surnames), influences participant behavior, relative to the control.

As ethnic priming might subtly activate fragmenting identities, compared to the control sessions, we expect that participants will be less cooperative in the ethnic priming treatment.

Hypothesis 1 (Ethnic Priming)**.** *Compared to the control, players are less cooperative in the ethnic priming treatment.*

In the minimum-effort games, Hypothesis 1 implies that, compared to the control, player 1s will be less likely to choose high effort in the ethnic priming treatment. Sim-

[17] For Caucasian player 2s in the control (PD 1-4), when player 1 cooperates, the proportion of cooperation is 10% for an ingroup match and 20% for an outgroup match ($p < 0.01$). When player 1 defects, the proportion of cooperation is 16% for an ingroup match and 17% for an outgroup match ($p = 0.312$).

[18] The regression for player 2's strategies in the ME games is omitted due to the lack of variations across treatments as shown in Table 4.

Table 6: Aggregate Treatment Effects of Identity Priming: Probit

Games:	ME 4-8	PD 0			PD 1-4	
Roles:	Player 1	Player 1	Player 2		Player 1	Player 2
Strategies:	High Effort	Cooperation	rJPM	DD	Cooperation	DD
Specification:	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic Priming	-0.652**	-0.072	0.168	-0.211	0.328	0.314
	(0.319)	(0.292)	(0.334)	(0.345)	(0.285)	(0.290)
School Priming	-0.073	-0.072	0.674**	-0.426	0.045	0.532*
	(0.305)	(0.311)	(0.309)	(0.337)	(0.333)	(0.321)
Constant	1.038***	-0.358	0.012	-0.397*	-0.793***	0.661***
	(0.268)	(0.235)	(0.218)	(0.222)	(0.236)	(0.229)
Observations	1,030	227	227	227	876	908
Log Pseudo L.	-389.6	-143.8	-146.1	-133.4	-515.8	-446.3
Pseudo R^2	0.08	0.01	0.05	0.03	0.014	0.02

Notes:

a. Game dummies and special subjects are controlled for.

b. Coefficients are reported.

c. Robust standard errors in parentheses are clustered at the individual level.

d. Significant at: * 10-percent level; ** 5-percent level; *** 1-percent level.

ilarly, in PD 0, it implies that, compared to the control, player 1s will be less likely to choose cooperation, whereas player 2s will be less (more) likely to choose rJPM (DD).

Result 1 (Ethnic Priming on Coordination)**.** *In the minimum-effort games, ethnic priming reduces the likelihood that player 1 chooses high effort by 13.6% compared to the control. In comparison, ethnic priming has no statistically significant effect in PD 0.*

Support. *Column (1) in Table 6 shows that ethnic priming significantly reduces player 1's choice of high effort (-0.652, $p < 0.05$, marginal effect 13.6%) in the ME games. Consequently, the Pareto-efficient Nash equilibrium outcome, (H, HL), is selected 11% less often in ethnic priming treatment than in the control. In comparison, none of the coefficients of ethnic priming in columns (2) - (4) is significant at the 5% level.*

For each column in Table 6, we further analyze potential heterogeneous subgroup effects of identity priming in Table 7. Specifically, Table 7 provides the results separately for Asian and Caucasian subjects. In addition, the interaction terms of identity primes with the ingroup dummy variable allow the impact of identity primes to vary for the different types of group matching (Brewer 1999).[19] Again, Table 7 presents probit specifications with standard errors clustered at the individual subject level. We again

[19]An alternative empirical approach is to allow three way interactions among identity prime (ethic or school), matching type (ingroup or outgroup), and ethnic background (Asian or Caucasian). Results are robust to the alternative specifications, but Table 7 are easier to interpret.

control for special subjects and game fixed effects, and omit the coefficients due to the space constraint.

Result 1 suggests that on average player 1's choice of high effort in the ethnic prime treatment is 13.6% lower than that in the control. The reduction in player 1's high effort happens for all types of pairings, including 17.7% for Asian ingroup pairing, 13.9% for Asian outgroup pairing, 23.3% for Caucasian ingroup pairing, and 7.5% for Caucasian outgroup pairing (columns 1 and 2 in Table 7).[20] Further analyzing these effects by pairing type, i.e., the coefficient estimates of the Ethnic Priming variable and its interaction with Ingroup in columns (1) and (2) in Table 7, we cannot reject that the reduction in player 1's high effort differs in any pairing from others. Therefore, by Result 1, we reject the null in favor of Hypothesis 1 for ME games.

Result 2 (Ethnic Priming on Cooperation)**.** *In PD 1-4, while ethnic priming has no aggregate treatment effect, Caucasian players are significantly more likely to choose DD when matched with an outgroup member under ethnic priming, compared to the control condition.*

Support. *In Table 6, neither coefficient of ethnic priming in columns (5) or (6) is significant at the 5% level. In column (12) of Table 7, the coefficient of ethnic priming is positive and significant (*0.788*,* $p < 0.05$*, marginal effect 15.7%), indicating that, compared to the control, Caucasian players are significantly more likely to choose DD when matched with an outgroup member.*

We next evaluate how school identity priming influences individual behavior compared to the control sessions. Recall the common identity prime, implemented in the pre-survey, is designed to subtly activate individual's common identity of being part of her university. We again focus on the treatment effect, i.e., how school identity priming, in addition to the information on a match's ethnicity, influences behavior relative to the control. In the school priming treatment, we expect less intergroup bias compared to the control.

Hypothesis 2 (School Priming)**.** *Compared to the control, a player will be more cooperative in the school priming treatment.*

In the minimum-effort games, Hypothesis 2 implies that, compared to the control, in the school priming treatment, player 1 will be more likely to choose high effort with either an ingroup or an outgroup match. Similarly, in the prisoner's dilemma games, it implies that, compared to the control, in the school priming treatment, player 1s will be more likely to cooperate with an ingroup or an outgroup match. For player 2s, the likelihood of adopting rJPM (DD) strategy increases (decreases) from the control to the school priming treatment in PD 0 (PD 1-4).

[20] The marginal effect of ethnic priming for outgroup (or ingroup) is computed as the change in probability of player 1's choice of high effort when the ethnic priming variable changes from 0 to 1, and the ingroup dummy variable takes the value of 0 (or 1). Although the marginal effect is significant for none of these pairing types due to the smaller sample sizes ($p > 0.10$), the aggregate effect of ethnic priming on all player 1's choice of high effect (13.6%) is statistically significant at the 5% level. Marginal effects in the remainder of this section are computed in the same way.

Table 7: Treatment Effects of Identity Priming by Player Ethnicity: Probit

	ME 4-8		PD 0						PD 1-4			
	Player 1		Player 1		Player 2				Player 1		Player 2	
	High Effort		Cooperation		rJPM		DD		Cooperation		DD	
	Asian	Caucasian	Asian	Caucasian	Asian	Caucasian	Asian	Caucasian	Asian	Caucasian	Asian	Caucasian
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ethnic	-0.645	-0.377	-0.612	0.399	0.518	0.311	-0.350	-0.245	0.032	0.629	0.471	0.788**
	(0.520)	(0.448)	(0.436)	(0.462)	(0.572)	(0.499)	(0.575)	(0.541)	(0.434)	(0.425)	(0.419)	(0.372)
School	-0.273	0.665	-0.325	0.073	1.369**	0.273	-0.713	-0.064	0.022	0.206	1.109*	0.315
	(0.532)	(0.411)	(0.493)	(0.412)	(0.598)	(0.505)	(0.640)	(0.523)	(0.499)	(0.511)	(0.573)	(0.394)
Ingroup	-0.136	0.372	0.596*	0.026	0.419	0.209	-0.035	0.000	0.234	0.330**	0.259	0.499***
	(0.217)	(0.371)	(0.362)	(0.333)	(0.255)	(0.338)	(0.236)	(0.381)	(0.302)	(0.162)	(0.282)	(0.140)
Ethnic×Ingrp	-0.048	-0.587	-0.090	0.099	-0.343	-0.717	-0.202	0.651	0.183	-0.264	-0.528	-0.556
	(0.300)	(0.461)	(0.528)	(0.596)	(0.329)	(0.463)	(0.430)	(0.440)	(0.429)	(0.230)	(0.382)	(0.517)
School×Ingrp	-0.081	-0.915**	-0.137	0.395	-0.423	-0.251	0.080	-0.276	-0.187	-0.069	-0.596*	-0.231
	(0.441)	(0.458)	(0.468)	(0.483)	(0.483)	(0.597)	(0.477)	(0.572)	(0.313)	(0.254)	(0.360)	(0.414)
Constant	1.184***	0.804**	-0.230	-0.748**	-0.599	0.293	-0.279	-0.502	-0.834**	-1.005***	0.242	0.831**
	(0.443)	(0.366)	(0.333)	(0.344)	(0.431)	(0.335)	(0.411)	(0.361)	(0.371)	(0.336)	(0.319)	(0.372)
Observations	545	485	115	112	122	105	122	105	428	448	488	420
Log Pseudo L.	-209.5	-173.1	-70.1	-67.2	-74.5	-65.9	-68.7	-62.4	-245.5	-259.8	-261.0	-160.6
Pseudo R^2	0.07	0.12	0.07	0.02	0.12	0.01	0.07	0.02	0.02	0.05	0.06	0.05

Notes:

a. Game dummies and special subjects are controlled for.

b. Coefficients are reported.

c. Robust standard errors in parentheses are clustered at the individual level.

d. Significant at: * 10-percent level; ** 5-percent level; *** 1-percent level.

In Table 6, for the ME games (column 1), school identity priming does not affect player 1's choice (-0.073, $p > 0.10$), mainly because player 1's likelihood of choosing high effort in the control is already as high as 91%. Nevertheless, an interesting subgroup result is that the school identity priming increases Caucasian player 1's choice of high effort with *outgroup* (87% in the control vs. 96% in the school priming treatment, Table 4), but has little impact on their choice of high effort with ingroup matches (93% in control vs. 90% in the school priming treatment, Table 4). Consequently, the school identity priming significantly alleviates Caucasian player 1's outgroup discrimination, which is reflected by the coefficient estimate of the School*Ingroup variable in column (2) of Table 7 (-0.915, $p < 0.05$).

We next turn to PD 0. Since the school priming does not affect player 1's decisions or player 2's choice of the DD strategy, we focus on player 2's choice of the rJPM strategy. Result 3 summarizes our analysis of school priming in ME and PD 0.

Result 3 (School Priming on Coordination)**.** *While school priming has no effect on the ME games, in PD 0, the common school identity priming makes player 2s significantly more likely to choose the rJPM strategy compared to the control (with a marginal effect of 24.8%). This increase in rJPM is mainly contributed by Asians.*

Support. *In column (3) of Table 6, the coefficient of school priming is positive and significant (0.674, $p < 0.05$, marginal effect 24.8%). The treatment effects by player type and pairing in Table 7 shows that this increase in player 2's rJPM as the result of school priming is shared by all pairing types, and is primarily driven by Asians' behaviors: 34.6% ($p < 0.05$) by Asian ingroup pairing, 48.4% ($p < 0.05$) by Asian outgroup pairing, 1% ($p > 0.10$) by Caucasian ingroup pairing, and 9% ($p > 0.10$) by Caucasian outgroup pairing (marginal effects are computed based on columns 5 and 6 in Table 7).*

By Result 3, we reject the null in favor of Hypothesis 2 that school priming increases participant cooperativeness for both ingroup and outgroup matches. Compared to the impact of school priming on coordination, its impact on cooperation in PD 1-4 is more complex.

An interesting result on the aggregate treatment effect in PD games 1-4 is that the school identity priming marginally increases player 2's choice of DD strategy (0.532, $p < 0.10$, marginal effect 14.6%, column 6, Table 6). As shown in the subgroup analysis in Table 7, this increase in player 2's choice of DD happens to all pairing types. Specifically, the increase in DD is 28.2% ($p < 0.05$) for Asian outgroup pairing, 15.7% for Asian ingroup pairing ($p > 0.10$), 6.8% ($p > 0.10$) for Caucasians outgroup pairing, and 1.4% ($p > 0.10$) for Caucasian ingroup pairing (marginal effects are computed based on columns 11 and 12 of Table 7).

The increase in Asian player 2's choice of DD as the result of school priming is surprising. Although it is marginally significant, it is in sharp contrast to previous findings in the social psychology literature that shows activating the salience of shared social identity could increase cooperative behavior (Gaertner and Dovidio, 2000). Therefore, we investigate this finding in the remainder of this section. Our analysis indicates that priming school identity makes player 2s, especially Asian player 2s, act more competitively, compared to their counterparts in the control. One possible explanation, as

suggested by social psychology research on stereotypes, is that social identity priming may make individual's behavior conform to stereotypes (i.e., some innate statistical models of characteristics or behaviors) of the social categories associated with the primed identities (Shih et al. 1999). We thus conjecture that, while subtly activating a common identity, the school identity priming may also introduce school specific cues for behavior (e.g., being competitive) that subsequently influence individual decisions.

This conjecture is formulated based on subject responses to post-experiment questions on stereotypes. Subjects are asked to report, on a 1 to 7 Likert scale, their perceptions of the competitiveness of each ethnicity. Asian participants report 6.27 for Asians in the school priming treatment, significantly higher than the 5.4 in the control ($p = 0.05$, one-sided Wilcoxon rank-sum test). In other words, the school identity priming may have influenced the ethnic stereotype of being competitive, particularly among Asians. In contrast, the perception of self competitivenss for Caucasian player 2s does not change from control to the school priming treatment (5.2 vs. 4.9, $p = 0.246$, one-sided Wilcoxon rank-sum test). In the analysis below, we further examine the impact of school priming on player 2's choice of DD strategy in PD 1-4 by controlling for players' competitiveness perception and allow this perception to vary in response to the school priming. Doing so enables us to isolate the impact of school priming from its influence through stereotypes.

Results are reported in Table 8. We include data from the control and the school priming treatment.[21] The dependent variable is the likelihood of player 2s choosing the DD strategy. In addition to the school priming dummy (the control in the omitted category), the ingroup matching dummy, their interaction, we also control for an individual's competitiveness perception (SelfCompetitiveness) and its interaction with the school treatment dummy, age, gender, special subjects, and game fixed effects. Standard errors are clustered at the individual level. We summarize the analysis of school priming on cooperation below.

Result 4 (School Priming on Cooperation)**.** *While school priming does not have any significant aggregate effect in PD 1-4, after controlling for the impact of school priming on the individual competitiveness stereotype, however, we find that school priming makes Asian player 2s significantly (weakly) less likely to choose the always-defect strategy with an ingroup (outgroup) match.*

Support. *Table 6 (column 6) indicates that school priming marginally increases player 2's choice of DD (0.532, $p < 0.10$). Table 8 shows that after we control for individual competitiveness stereotype, school identity priming reduces Asian player 2's choice of DD (column 1) with both outgroup (-5.234, $p < 0.10$, marginal effect 30.6%) and ingroup matches (joint effect of -5.234 and -0.803, $p < 0.05$, marginal effect 38.7%).*[22] *In contrast, neither school priming nor individual competitiveness stereotype influences Caucasian player 2's choice of DD ($p > 0.10$ for all relevant variables in column 2).*

[21] Including data from the ethnic identity treatment does not change the results. In addition, ethnic priming does not affect individuals' competitiveness perceptions.

[22] The marginal effect of school priming for ingroup is computed as the change in probability of Asian player 2's choice of DD when the school priming variable changes from 0 to 1, and the ingroup dummy variable takes the value of 1.

Table 8: Effects of School Priming on Stereotypes (PD 1-4): Probit

Likelihood of Always Defect (DD)		
	(1)	(2)
	Asian	Caucasian
School Priming	-5.234*	-0.760
	(2.722)	(2.143)
Ingroup	0.138	0.537***
	(0.327)	(0.141)
School×Ingroup	-0.803**	-0.260
	(0.353)	(0.460)
SelfCompetitive	-0.143	0.089
	(0.219)	(0.320)
School×SelfCompetitive	1.146**	0.200
	(0.499)	(0.399)
Women	0.745	-1.118**
	(0.492)	(0.483)
Age	0.099	-0.015
	(0.065)	(0.069)
Constant	-1.905	1.758
	(1.364)	(2.284)
Observations	284	280
Log Pseudo L.	-121.3	-118.0
Pseudo R^2	0.27	0.08

Notes:

a. Game dummies and special subjects are controlled for.

b. Coefficients are reported.

c. Robust standard errors in parentheses are clustered at the individual level.

d. Significant at: * 10-percent level; ** 5-percent level; *** 1-percent level.

Furthermore, the positive and significant interaction term School×SelfCompetitive (1.146, $p < 0.05$, marginal effect 28.2%) suggests that the school priming at the University of Michigan triggers Asian subjects' self perception of competitiveness, leading to higher rate of DD by Asian player 2s in the school treatment relative to the control.

On the methodology front, our analysis demonstrates the importance of measuring stereotypes or trait perceptions of natural social groups when studying the effects of group identity on economic decision making. While our study uses self stereotypes to gain insights into intergroup behavior, Tanaka and Camerer (2013) use stereotypes towards other groups to understand the lack of outgroup discrimination among the Vietnamese towards the Khmers in their study.

Overall, we find that priming different natural identities can influence behavior in coordination and cooperation settings, the extent to which priming is effective depends on the incentive structures. Specifically, priming a fragmenting ethnic identity significantly decreases efficient coordination, whereas priming a unifying school identity significantly increases the choice of a rational joint-payoff-maximizing strategy, and Asians' cooperation. Our results suggest that priming a common organizational identity is an effective tool to alleviate intergroup discrimination and improve overall cooperation.

4. Discussions

As the workforce becomes increasingly diverse, organizations frequently encounter the issue of motivating individuals from different backgrounds to work together towards a common goal. Our paper investigates the effects of priming a fragmenting (ethnic) versus a common organization identity on coordination and cooperation among Asian and Caucasian students in a controlled laboratory experiment.

We have several new findings. First, priming a fragmenting (ethnic) identity significantly decreases efficient coordination compared to the control. In comparison, priming a common (school) identity significantly increases the choice of a joint payoff maximizing strategy. However, in games with a unique inefficient Nash equilibrium, the effects of priming a common identity are more complex. As priming enhances the negative effects of the competitiveness stereotype on cooperation among Asians, we observe a marginally significant decrease of cooperation from control to school priming treatment. However, after we control for the perception of competitiveness and its interaction with school priming, school priming enhances cooperation for both Asian ingroup and outgroup matching compared to control.

Our study sheds light on policy making for organizations facing a diverse work force. Immigrants have become a substantial and increasingly important segment of the labor force in the United States and many other parts of the world. In 2012, 16 percent of the workers in the United States, i.e., more than 25 million workers, were foreign born. These foreign-born workers accounted for more than half of the growth of the U.S. labor force during the past decade. Among these foreign-born workers, 38 percent come from Mexico and Central America, and 28 percent from Asia.[23] Due to

[23] `http://www.bls.gov/spotlight/2013/foreign-born/`, retrieved on November 27,

the native-born baby-boomers' exit from the labor force and the injection of immigrant workers into the labor force, workplaces will continue to become more diverse. The U.S. Congressional Budget Office predicts that "[u]nless native fertility rates increase, it is likely that most of the growth in the U.S. labor force will come from immigration by the middle of the century."

Although economic assimilation of immigrants, i.e., the change in the wage gap between immigrant and native-born workers, has been extensively studied in labor economics (Borjas 1994, 1999), immigrant social assimilation has been significantly understudied.[24] This study underscores the importance to understand the factors that influence immigrant workers' social assimilation and the impact on their social interactions with others at workplaces. It also has policy implications for organizational management. For example, building employees' common identity in an organization may serve as an identity-based mechanism to raise the cooperation and coordination level among employees in strategic environments and, consequently, increase the overall productivity of the organization.

It would be interesting for future research to study the impact of these policies on behaviors of workers from other ethnic groups, and to study whether the results can be generalized beyond ethnic lines to other "group" contexts, such as gender groups or different professional groups. Finally, we hope to extend this study to the field, and investigate the extent to which organizational policy design that focuses on common identity building may influence cooperation and coordination among workers.

Acknowledgements: We thank Jim Andreoni, Robert Gazzale, Uri Gneezy, Nancy Kotzian, Jeff MacKie-Mason, Robert Sandy, Mark Wilhelm, and seminar participants at Duisburg-Essen, IUPUI, Michigan, UCSD and the International Meetings of the Economic Science Association (2010 Copenhagen, 2011 Chicago) for helpful discussions and comments, and Brian MacKie-Mason for excellent research assistance. The financial support from the National Science Foundation through grants no. SES-0720943 and BCS-1111019 is gratefully acknowledged.

2013.

[24] An exception is Cox and Orman (2010) who study immigrants' trust and trustworthiness in a lab experiment.

References

Allen, V.L., Wilder, D.A., 1975. Categorization, belief similarity, and intergroup discrimination. Journal of Personality and Social Psychology 32, 971–977.

Andreoni, J., Petrie, R., 2004. Public goods experiments without confidentiality: a glimpse into fund-raising. Journal of Public Economics 88 (7-8), 1605 – 1623.

Aronson, J., Quinn, D.M., Spencer, S., 1998. Stereotype threat and the academic underperformance of minorities and women. In: Swim, J.K., Stangor, C. (Eds.), Prejudice: The targets perspective, Academic Press, New York.

Ball, J.R., 1999. 'space missions' focus on team building. The Greater Baton Rouge Business Report 17 (15), 31.

Bargh, J., Chen, M., Burrows, L., 1996. Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. Journal of Personality and Social Psychology 71, 230–244.

Bargh, J.A., 2006. What have we been priming all these years? on the development, mechanisms, and ecology of nonconscious social behavior. European Journal of Social Psychology 36, 147168.

Bargh, J.A., Chartrand, T.L., 1999. The unbearable automaticity of being. American Psychologist 54, 462–479.

Benbow, C.P., 1995. Sex differences in mathematical reasoning ability in intellectually talented preadolescents: Their nature, effects, and possible causes. Behavioral and Brain Sciences 11, 169–232.

Benjamin, D.J., Choi, J.J., Strickland, A.J., 2010. Social identity and preferences. American Economic Review 100 (4), 1913–1928.

Blatt, R., Camden, C.T., 2006. Positive relationships and cultivating community. In: Dutton, J.E., Ragins, B.R. (Eds.), Exploring positive relationships at work: Building a theoretical and research foundation, Lawrence Erlbaum Associates, Mahwah, NJ, pp. 243–264.

Borjas, G., 1994. The economics of immigration. Journal of Economic Literature 32, 1667–1717.

Borjas, G., 1999. The economic analysis of immigration. In: Ashenfelter, O., Card, D.E. (Eds.), Handbook of Labor Economics, North Holland, Amsterdam.

Brewer, M.B., 1979. Ingroup bias in the minimal intergroup situation: A cognitive-motivational analysis. Psychological Bulletin 86, 307–324.

Brewer, M.B., 1999. The psychology of prejudice: Ingroup love and outgroup hate? Journal of Social Issues 55 (3), 429–444.

Buchan, N.R., Brewer, M.B., Grimalda, G., Wilson, R.K., Fatas, E., Foddy, M., 2011. Global social identity and global cooperation. Psychological Science 22, 821 – 828.

Camerer, C.F., Malmendier, U., 2007. Behavioral organizational economics. In: Diamond, P., Vartiainen, H. (Eds.), Behavioral Economics and Its Applications, Princeton University Press, Princeton and Oxford.

Charness, G., Rigotti, L., Rustichini, A., 2007. Individual behavior and group membership. Amer. Econ. Rev. 97, 1340 – 1352.

Chatman, J.A., Polzer, J.T., Barsade, S.G., Neale, M.A., 1998. Being different yet feeling similar: The influence of demographic composition and organizational culture on work processes and outcomes. Administrative Science Quarterly 43, 741–780.

Chen, M., Bargh, J.A., 1997. Nonconscious behavioral confirmation processes: The self-fulfilling consequences of automatic stereotype activation. Journal of Experimental Social Psychology 33, 541–560.

Chen, R., Chen, Y., 2011. The potential of social identity for equilibrium selection. American Economic Review 101 (6), 2562–2589.

Chen, Y., Li, S.X., 2009. Group identity and social preferences. American Economic Review 99 (1), 431–457.

Cheryan, S., Plaut, V.C., Davies, P.G., Steele, C.M., 2009. Ambient belonging: How stereotypical cues impact gender participation in computer science. Journal of Personality and Social Psychology 97 (6), 1045–1060.

Cox, J., Orman, W., 2010. Immigrant assimilation, trust and social capital. IZA Discussion Paper No. 5063.

Croizet, J.C., Claire, T., 1998. Extending the concept of stereotype threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. Personality and Social Psychology Bulletin 24, 588–594.

Crosby, F., Bromley, S., Saxe, L., 1980. Recent unobtrusive studies of black and white discrimination and prejudice: a literature review. Psychological Bulletin 87, 546–563.

Croson, R.T.A., Marks, M.B., Snyder, J., 2008. Groups work for women: Gender and group identity in the provision of public goods. Negotiation Journal 24 (4), 411–427.

Cunningham, G.B., 2005. The importance of a common in-group identity in ethnically diverse groups. Group Dynamics: Theory, Research and Practice 9, 251–260.

Deaux, K., 1996. Social identification. In: Higgins, E.T., Kruglanski, A.W. (Eds.), Social Psychology: Handbook of Basic Principles, The Guilford Press, New York.

Dovidio, J.F., Gaertner, S.L., Saguy, T., 1980. Commonality an the complexity of we: Social attitudes and social change. Personality and Social Psychology Review 13, 3–20.

Eckel, C.C., Grossman, P.J., 2005. Managing diversity by creating team identity. Journal of Economic Behavior & Organization 58 (3), 371–392.

Fatas, E., Morales, A.J., 2013. Step thinking and costly coordination. Economics Letters 120 (2), 181 – 183. URL http://www.sciencedirect.com/science/article/pii/S0165176513001419.

Fehr, E., Gaechter, S., 2000. Cooperation and punishment in public goods experiments. American Economic Review 90, 980–994.

Fershtman, C., Gneezy, U., 2001. Discrimination in a segmented society: An experimental approach. Quarterly Journal of Economics 116 (1), 351–377.

Figuières, C., Masclet, D., Willinger, M., 2012. Vanishing leadership and declining reciprocity in a sequential contribution experiment. Economic Inquiry 50 (3), 567–584. URL http://dx.doi.org/10.1111/j.1465-7295.2011.00415.x.

Fischbacher, U., 2007. z-tree: Zurich toolbox for ready-made economic experiment. Experimental Economics 10 (2), 171–178.

Friesen, J., Arifovic, J., Wright, S.C., Ludwig, A., Giamo, L., Baray, G., 2012. Ethnic identity and discrimination among children. Journal of Economic Psychology 33 (6), 1156 – 1169. URL http://www.sciencedirect.com/science/article/pii/S016748701200089X.

Gaertner, S.L., Dovidio, J.F., 2000. Reducing intergroup bias: The common ingroup identity model. The Psychology Press, Philadelphia, P.A.

Goeree, J.K., Holt, C.A., 2005. An experimental study of costly coordination. Games and Economic Behavior 51 (2), 349 – 364. Special Issue in Honor of Richard D. McKelvey.

Goette, L., Huffman, D., Meier, S., 2006. The impact of group membership on cooperation and norm enforcement: Evidence using random assignment to real social groups. Amer. Econ. Rev. 96 (2), 212–216.

Gruenfeld, D.H., Mannix, E.A., Williams, K.Y., Neale, M.A., 1996. Group composition and decision making: How member familiarity and information distribution affect process and performance. Organizational Behavior and Human Decision Processes 67, 1–15.

Hargreaves Heap, S.P., Zizzo, D.J., 2009. The value of groups. American Economic Review 99, 295–323.

Healy, P.J., 2007. Group reputations, stereotypes, and cooperation in a repeated labor market. Amer. Econ. Rev. .

Hedges, L.V., Nowell, A., 1995. Sex differences in mental test scores, variability, and numbers of high-scoring individuals. Science 269, 41–45.

Hewstone, M., 1996. Contact and categorization: Social psychological interventions to change intergroup relations. In: Macrae, N., Stangor, C., Hewstone, M. (Eds.), Stereotypes and stereotyping, Guilford Press, New York, p. 323368.

Hong, L., Page, S.E., 2001. Problem solving by heterogeneous agents. Journal of Economic Theory 97, 123–163.

Monderer, D., Shapley, L.S., 1996. Potential games. Games and Economic Behavior 14, 124–143.

Nemeth, C.J., 1986. The differential contributions of majority and minority influence. Psychological Review 93, 23–32.

Pelled, L.H., Eisenhardt, K.M., Xin, K.R., 1999. Exploring the black box: An analysis of work group diversity, conflict and performance. Administrative Science Quarterly 44, 1–28.

Perdue, C.W., Dovidio, J.F., Gurtman, M.B., Tyler, R.B., 1990. Us and them: Social categorization and the process of ingroup bias. Journal of Personality and Social Psychology 59, 475–486.

Shih, M., Pittinsky, T.L., Ambady, N., 1999. Stereotype susceptibility: Identity salience and shifts in quantitative performance. Psychological Science 10 (1), 81–84.

Shih, M., Pittinsky, T.L., Trahan, A., 2006. Domain-specific effects of stereotypes on performance. Self and Identity 5, 1–14.

Simpson, B., 2006. Social identity and cooperation in social dilemmas. Rationality and Society 18 (4), 443–470.

Spencer, S., Steele, C.M., Quinn, D.M., 1999. Stereotype threat and women's math performance. Journal of Experimental Social Psychology 35, 4–28.

Steele, C.M., Aronson, J., 1995. Stereotype threat and the intellectual test performance of african-americans. Journal of Personality and Social Psychology 69, 797–811.

Steen, L.A., 1987. Mathematics education: A predictor of scientific competitiveness. Science 237, 251–253.

Tajfel, H., Turner, J., 1979. An integrative theory of intergroup conflict. In: Worchel, S., Austin, W. (Eds.), The Social Psychology of Intergroup Relations, Brooks/Cole, Monterey, CA.

Tanaka, T., Camerer, C.F., 2013. Trait perceptions influence economic out-group bias: Lab and field evidence from vietnam. Manuscript.

Tushman, M.L., 1977. Special boundary roles in the innovation process. Administrative Science Quarterly 22, 587–605.

Van Der Zee, K., Paulus, P., 2008. Social psychology and modern organizations: Balancing between innovativeness and comfort. In: Steg, L., Buunk, A.P., Rothengatter, T. (Eds.), Applied social psychology: Understanding and managing social problems, Cambridge University Press, New York, p. 271290.

West, T.V., Pearson, A.R., Dovidio, J.F., Shelton, J.N., Trail, T.E., 2009. Superordinate identity and intergroup roommate friendship development. Journal of Experimental Social Psychology 45, 1266–1272.

Wilder, D.A., 1986. Social categorization: Implications for creation and reduction of intergroup bias. In: Berkowitz, L. (Ed.), Advances in experimental social psychology, vol. 19, Academic Press, New York, p. 291355.

Yamagishi, T., Kiyonari, T., 2000. The group as the container of generalized reciprocity. Social Psychology Quarterly 63 (2), 116–132.

Appendix A: Pre-experiment Questionnaire

A.1 Control sessions

We are interested in your opinions and experiences about certain aspects of young adult life.

1. Name: _____
2. Age: _____ (*Mean 23.3, Std Dev 4.3, Median 22, Min 19, Max 42*)
3. Grade/Year:
   (a) Freshmen (*0%*)
   (b) Sophomore (*0%*)
   (c) Junior (*17.5%*)
   (d) Senior (*30%*)
   (e) $>$ 4 years (*5%*)
   (f) Graduate student (*47.5%*)
4. How often do you watch television?
   (a) every day (*17.5%*)
   (b) $4-5$ times a week (*22.5%*)
   (c) $2-3$ times a week (*22.5%*)
   (d) a few times a month (*25%*)
   (e) a few times a year (*5%*)
   (f) rarely if ever (*5%*)
   (g) Never (*2.5%*)
5. Do you have cable television?
   (a) yes (*70%*)
   (b) no (*30%*)
6. How often do you eat out?
   (a) every day (*7.5%*)
   (b) $4-5$ times a week (*12.5%*)
   (c) $2-3$ times a week (*27.5%*)
   (d) a few times a month (*42.5%*)
   (e) a few times a year (*7.5%*)
   (f) rarely if ever (*0%*)
   (g) Never (*2.5%*)
7. How often do you attend movies?
   (a) every day (*0%*)
   (b) $4-5$ times a week (*0%*)
   (c) $2-3$ times a week (*2.5%*)
   (d) a few times a month (*32.5%*)
   (e) a few times a year (*52.5%*)
   (f) rarely if ever (*7.5%*)
   (g) Never (*5%*)

A.2 Ethnic Priming Treatment

We are interested in your opinions and experiences about certain aspects of young adult life.

1. Name: _____
2. Age: _____ (*Mean 23.8, Std Dev 4.6, Median 22, Min 18, Max 40*)
3. Grade/Year:
   (a) Freshmen (*2.6%*)
   (b) Sophomore (*12.8%*)
   (c) Junior (*5.1%*)
   (d) Senior (*18%*)
   (e) $>$ 4 years (*10.3%*)
   (f) Graduate student (*51.3%*)
4. Ethnicity:
   (a) African
   (b) Asian (*48.7%*)
   (c) European (*51.3%*)
   (d) Hispanic
   (e) Native
   (f) other

   if it is other, please specify:_____
5. How many generations has your family lived in America?
   (a) First Generation (*48.7%*)
   (b) Second Generation (*35.9%*)
   (c) More than Two Generations (*15.4%*)
6. From which countries did you family originate? _____
7. What languages do you speak? _____
8. Are you involved in any student organizations?
   (a) yes (*46.2%*)
   (b) no (*53.9%*)

   If yes, which ones? _____

A.3 School Priming Treatment

We are interested in your opinions and experiences about certain aspects of young adult life.

1. Name: _____
2. Age: _____ (*Mean 22.2, Std Dev 3.0, Median 21, Min 18, Max 30*)
3. Grade/Year:
   (a) Freshmen (*0%*)
   (b) Sophomore (*18.9%*)
   (c) Junior (*10.8%*)

(d) Senior (*35.1%*)
(e) $>$ 4 years (*0%*)
(f) Graduate student (*35.1%*)

4. School: _____
5. Did you consider any other schools?
   (a) yes (*62.2%*)
   (b) no (*37.8%*)

   If yes, what other schools? _____

6. Why did you decide to choose your specific school? _____

Appendix B: Experimental Instructions and Screen Shots

B1. Experimental Instructions

This is an experiment in decision making. You will be asked to fill out a survey at the beginning of the experiment. You will then make a series of decisions, and fill out another survey at the end of the experiment.

The amount of money you earn will depend upon the decisions you make and on the decisions other people make. In addition, you will be paid $\$5$ for participation. Everyone will be paid in private and you are under no obligation to tell others how much you earned.

Please do not communicate with each other during the experiment. If you have a question, feel free to raise your hand, and an experimenter will come to help you.

Roles: This experiment has 8 participants, four of whom are player As and the other four are player Bs. Your assigned role will be the same for all the games. Therefore, if you are a player A, you will always be a player A. Similarly, if you are a player B, you will always be a player B.

Matching: In each of the four rounds, a player A will be matched with a player B. You will never be matched with the same player twice.

Procedure: In each of the four rounds, both players A and B will make decisions on each of five games. The outcome of each game depends on the decisions of both players.

For instance, in the Example for Review Questions on the next page, player A moves first, by choosing A1 or A2. After A makes a decision, A will be asked to guess what B will choose.

Without knowing A's decision, player B will be asked to first guess what player A has chosen. Then player B decides whether to choose B1 or B2 under each of two scenarios: (1) Player A chooses A1; (2) Player A chooses A2.

Payoff for each game is determined by both players' decisions. For example, if player A chooses A1, and player B's decision is B2 if A chooses A1, and B1 if A chooses A2, the outcome of the game is (A1, B2), with payoffs 40 for A and 30 for B. Note that all of A's decisions and payoffs are in red, while B's are in blue.

In addition, a player earns 2 points for each correct guess. For example, if player A's guess is that B will choose B2. If it turns out to be correct, A will get 2 points. Otherwise, A will get zero point.

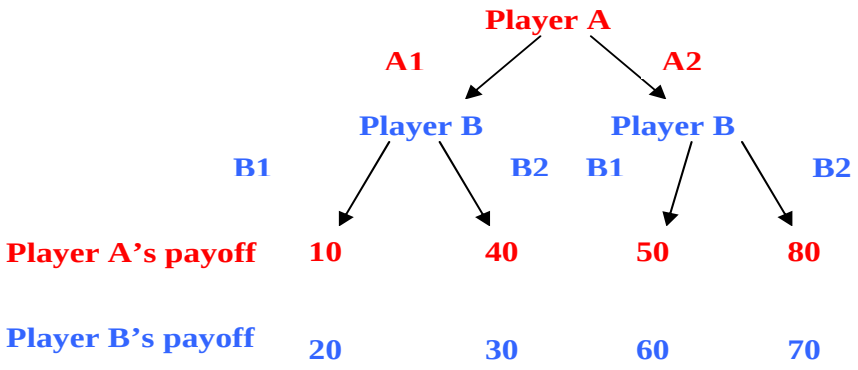
Feedback: You will not get any feedback after each game. At the very end of the experiment, you will be shown a history screen, with your decisions, your match's decisions, the accuracy of your guesses, and your payoff for each of the twenty games.

Total Payoffs: In each of the four rounds, your payoff will be the sum of your payoffs in all five games. Your total payoff will be the sum of your payoffs in all four rounds, i.e., in all 20 games. Your earnings are given in points. At the end of the experiment you will be paid based on the following exchange rate:

$1 = 8 points.

In addition, you will be paid $5 for participation, and 25 cents for answering each of the review questions correctly.

Review Questions: To help you understand the game, we will go over a number of review questions about the following made-up example. Each correct question is worth 2 points.



Example for Review Questions

1. If Player A chooses A1, and player B chooses B1 when A chooses A1,
   A's payoff is _____, and B's payoff is _____.
2. If Player A chooses A1, and player B chooses B2 when A chooses A1,
   A's payoff is _____, and B's payoff is _____.
3. If Player A chooses A2, and player B chooses B1 when A chooses A2,
   A's payoff is _____, and B's payoff is _____.
4. If Player A chooses A2, and player B chooses B2 when A chooses A2,
   A's payoff is _____, and B's payoff is _____.
5. Player B guessed that Player A had chosen A1.
   If Player A actually chooses A1, Player B's payoff from her guess is _____ points.
   If Player A actually chooses A2, Player B's payoff from her guess is _____ points.
6. True or False: you are always matched with the same player throughout the Experiment.
   (a) True
   (b) False

Please raise your hand if you are finished with the review questions. An experimenter will come over and grade it. Please check that you have written down your name and ID number on the first page.

B2. Screen Shots

This section contains screen shots from the z-Tree program, including player 1's decision screen (Figure 5) and belief elicitation screen (Figure 6), as well as player 2's decision screen (Figure 8) and belief elicitation screen (Figure 7). They are followed by the priming pictures in the control (Figure 9), ethnic (Figure 10) and school priming treatments (Figure 11), respectively.

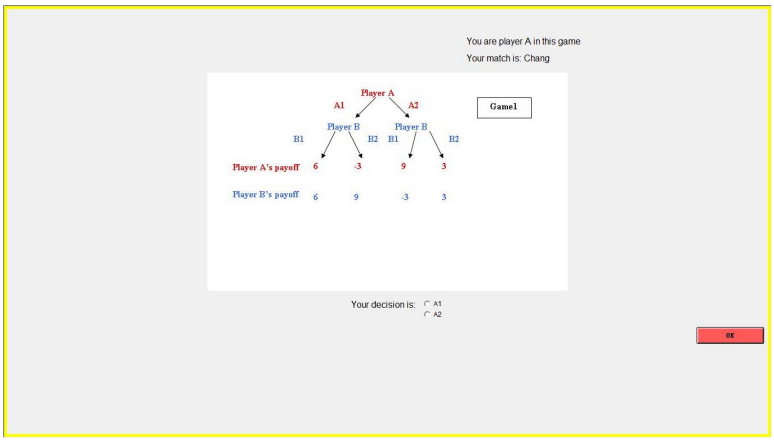


Figure 5: Player 1's Decision Screen

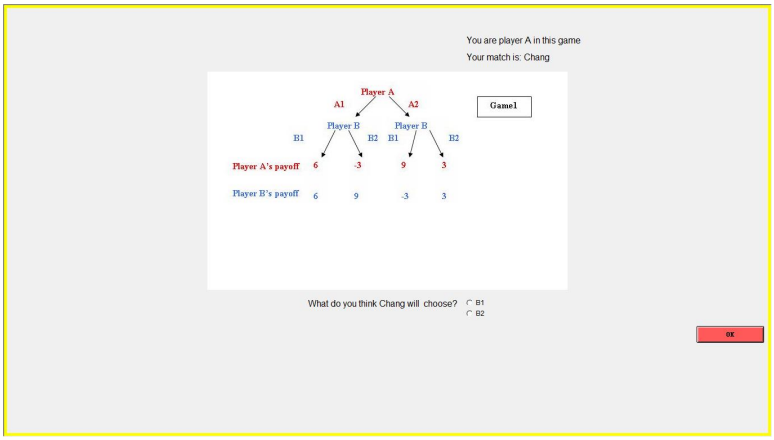


Figure 6: Player 1's Belief Elicitation Screen

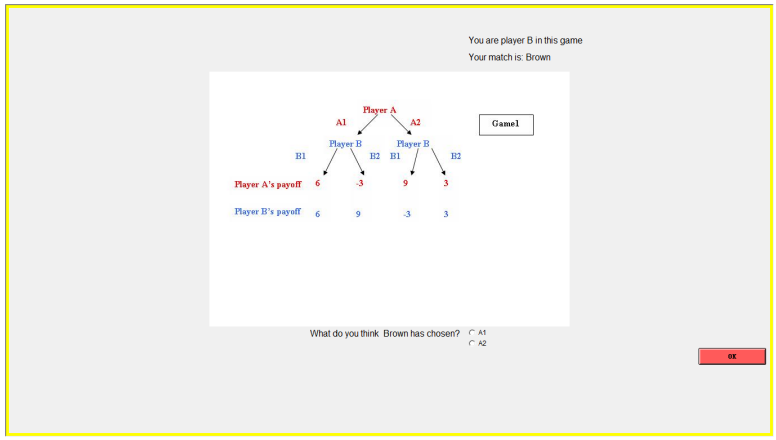


Figure 7: Player 2's Belief Elicitation Screen

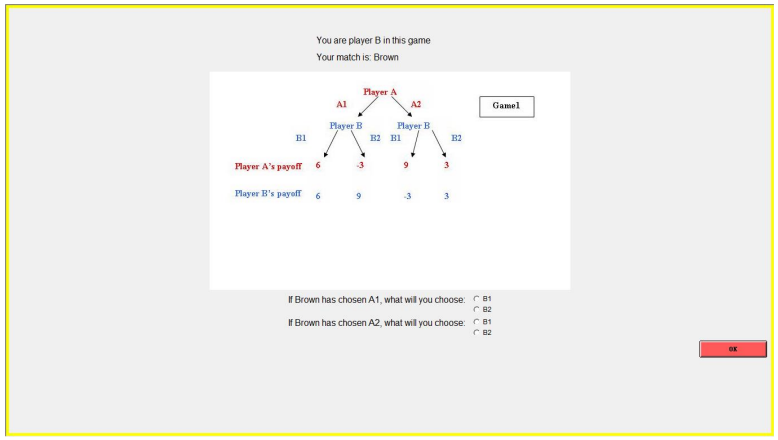


Figure 8: Player 2's Decision Screen

Figure 9: Priming Pictures: Control Condition

Figure 10: Priming Pictures: Ethnic Priming Treatment

Figure 11: Priming Pictures: School Priming Treatment

Appendix C: Post-experiment Questionnaire

1. Please write five statements in answer to the question: “Who am I?"
2. Gender
   (a) Male (*43.1%*)
   (b) Female (*56.9%*)
3. Ethnicity:
   (a) African (*0.9%*)
   (b) Asian (*48.3%*)
   (c) European (*48.3%*)
   (d) Hispanic (*0%*)
   (e) Native (*1.7%*)
   (f) other (*0.9%*)

   if it is other, please specify:_____
4. From which countries did you family originate?
5. What do you think is the experiment about?
6. How common do you think these stereotypes are in society?
   (a) Asian Americans are strategic (*Mean 5.1, Std Dev 1.4, Median 5, Min 1, Max 7*)
   (b) Asian Americans are trustworthy (*Mean 4.0, Std Dev 1.4, Median 4, Min 1, Max 7*)
   (c) Asian Americans are cooperative (*Mean 4.3, Std Dev 1.7, Median 4, Min 1, Max 7*)
   (d) Asian Americans are naive (*Mean 3.5, Std Dev 1.6, Median 3, Min 1, Max 7*)
   (e) Asian Americans are sneaky (*Mean 3.8, Std Dev 1.5, Median 4, Min 1, Max 7*)
   (f) Asian Americans are competitive (*Mean 5.9, Std Dev 1.4, Median 6, Min 1, Max 7*)
   (g) European Americans are strategic (*Mean 4.0, Std Dev 1.8, Median 4, Min 1, Max 7*)
   (h) European Americans are trustworthy (*Mean 4.2, Std Dev 1.6, Median 4, Min 1, Max 7*)
   (i) European Americans are cooperative (*Mean 4.3, Std Dev 1.5, Median 4, Min 1, Max 7*)
   (j) European Americans are naive (*Mean 3.4, Std Dev 1.6, Median 3.5, Min 1, Max 7*)
   (k) European Americans are sneaky (*Mean 3.4, Std Dev 1.5, Median 4, Min 1, Max 7*)
   (l) European Americans are competitive (*Mean 4.8, Std Dev 1.3, Median 5, Min 1, Max 7*)
7. Generally speaking, would you say that people can be trusted or that you can’t be too careful in dealing with people?
   (a) Always trusted (*3.5%*)
   (b) Usually trusted (*69.8%*)

(c) Usually not trusted (*24.1%*)
(d) Always not trusted (*2.6%*)

8. How many siblings do you have: _____
(*Mean 1.3, Std Dev 1.3, Median 1, Min 0, Max 7*)
9. How trusting are you?
   (a) Always trusting (*16.4%*)
   (b) Usually trusting (*66.4%*)
   (c) Usually not trusting (*16.4%*)
   (d) Always not trusting (*0.9%*)
10. There should be diversity programs to level the playing field for people from minority groups
   (a) Agree (*73.3%*)
   (b) Disagree (*26.7%*)
11. We should not allow special treatment based on race or gender. Merit should be the sole criteria
   (a) Agree (*67.2%*)
   (b) Disagree (*32.8%*)
12. Please write down the *Last *Name of your ten friends:
13. How strong is your University of Michigan school spirit? (*Mean 5.3, Std Dev 1.8, Median 6, Min 1, Max 7*)
14. During the experiment, how much did you pay attention to who your partner was? (*Mean 3.0, Std Dev 2.0, Median 2, Min 1, Max 7*)
15. During the experiment, I tried to maximize my own payoffs. (*Mean 5.7, Std Dev 1.7, Median 6, Min 1, Max 7*)
16. During the experiment, I tried to maximize joint payoffs. (*Mean 3.7, Std Dev 1.9, Median 4, Min 1, Max 7*)
17. For player As, during the experiment, if I chose A1 (the more generous option), I hoped player B would see it as a sign of trust and reciprocate.
   (a) Agree (*56.7%*)
   (b) Disagree (*20.0%*)
   (c) Not applicable as I never chose A1(*23.3%*)
18. For player Bs, during the experiment, if player A chose A1 (the more generous option), I felt I needed to reciprocate
   (a) Agree (*38.3%*)
   (b) Disagree (*53.3%*)
   (c) Not applicable as A never chose A1 (*8.3%*)
19. Do you know any participants in today's experiment
   (a) Yes (*69.0%*)
   (b) No (*31.0%*)
20. If so, please write down their last name: _____

21. What do you think is the ethnicity of the person with this name?
   (a) Chen
      i. Asian
      ii. European
      iii. Other
         if it is other, please specify: _____
      iv. I don't know
   (*overall accuracy 91%; ingroup 85%; outgroup 97%.*)

Appendix D: Additional Tables

In this appendix, we present the outcome distribution in each of the ME (PD) games for different matches, including Asian-Asian (AA), Caucasian-Asian (CA), Caucasian-Caucasian (CC) and Asian-Caucasian (AC) matches. Additionally, 7 of out 60 players B report their ethnicity as “other" in the ME games, so we have two more match categories including Asian-Other (AO) and Caucasian-Other (CO) matches.

Table 9: Outcome Distribution in the Minimum-Effort Games: AA Match

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	5	**91**	0	H	0	0	**90**	0	H	0	0	**89**	0
L	0	0	5	0	L	0	0	10	0	L	0	0	11	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	14	**86**	0	H	0	0	**65**	0	H	0	0	**84**	0
L	0	0	0	0	L	0	0	35	0	L	0	0	16	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	5	**82**	5	H	0	0	**70**	0	H	0	0	**95**	0
L	0	5	5	0	L	0	0	30	0	L	0	0	5	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	5	**82**	0	H	0	0	**80**	0	H	0	0	**8**	0
L	0	5	9	0	L	0	0	20	0	L	0	0	16	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	5	**77**	0	H	0	0	**70**	0	H	0	0	**68**	0
L	0	5	14	0	L	0	0	30	0	L	0	0	32	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	6	**84**	1	H	0	0	**75**	0	H	0	0	**84**	0
L	0	3	6	0	L	0	0	25	0	L	0	0	16	0

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 30$, $n_2 = 30$.

Table 10: Outcome Distribution in the Minimum-Effort Games: CA Match

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**100**	0	H	0	0	**95**	0	H	0	0	**100**	0
L	0	0	0	0	L	0	0	5	0	L	0	0	0	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	6	**89**	0	H	0	0	**74**	0	H	0	0	**100**	0
L	0	0	6	0	L	0	0	26	0	L	0	0	0	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	6	**83**	0	H	0	0	**79**	0	H	0	0	**95**	0
L	0	0	11	0	L	0	0	21	0	L	0	0	5	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**72**	6	H	0	0	**74**	0	H	0	0	**95**	0
L	0	0	22	0	L	0	0	26	0	L	0	0	5	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	6	**67**	0	H	0	0	**68**	0	H	0	5	**85**	0
L	0	0	28	0	L	0	0	32	0	L	0	0	10	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	3	**82**	1	H	0	0	**78**	0	H	0	1	**95**	0
L	0	0	13	0	L	0	0	22	0	L	0	0	4	0

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 30$, $n_2 = 30$.

Table 11: Outcome Distribution in the Minimum-Effort Games: CC Match

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**100**	0	H	0	0	**86**	0	H	0	0	**83**	0
L	0	0	0	0	L	0	0	14	0	L	0	0	17	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**100**	0	H	0	0	**71**	0	H	0	0	**100**	0
L	0	0	0	0	L	0	0	29	0	L	0	0	0	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**93**	0	H	0	0	**79**	0	H	0	0	**83**	0
L	0	0	7	0	L	0	0	21	0	L	0	0	17	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**86**	0	H	0	0	**57**	0	H	0	0	**92**	0
L	0	0	14	0	L	0	0	43	0	L	0	0	8	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**86**	0	H	0	0	**64**	0	H	0	0	**92**	0
L	0	0	14	0	L	0	0	36	0	L	0	0	8	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**93**	0	H	0	0	**71**	0	H	0	0	**90**	0
L	0	0	7	0	L	0	0	29	0	L	0	0	10	0

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 21$, $n_2 = 21$.

Table 12: Outcome Distribution in the Minimum-Effort Games: AC Match

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**95**	0	H	0	0	**93**	0	H	0	0	**100**	0
L	0	0	5	0	L	0	0	7	0	L	0	0	0	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**100**	0	H	0	0	**100**	0	H	0	0	**86**	0
L	0	0	0	0	L	0	0	0	0	L	0	0	14	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**90**	0	H	0	0	**64**	0	H	0	0	**86**	0
L	0	0	10	0	L	0	0	36	0	L	0	0	14	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**90**	0	H	0	0	**64**	0	H	7	0	**86**	0
L	0	0	10	0	L	0	0	36	0	L	0	0	7	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**90**	0	H	0	0	**79**	0	H	0	0	**79**	0
L	0	0	10	0	L	0	0	21	0	L	0	0	21	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**93**	0	H	0	0	**80**	0	H	1	0	**87**	0
L	0	0	7	0	L	0	0	20	0	L	0	0	11	0

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 23$, $n_2 = 23$.

Table 13: Outcome Distribution in the Minimum-Effort Games: AO Match

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**100**	0	H	0	0	**100**	0
L	0	0	**50**	0	L	0	0	0	0	L	0	0	0	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**100**	0	H	0	0	33	0
L	0	0	**50**	0	L	0	0	0	0	L	0	0	**67**	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**83**	0	H	0	0	**67**	0
L	0	0	**50**	0	L	0	0	17	0	L	0	0	33	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**100**	0	H	0	0	**67**	0
L	0	0	**50**	0	L	0	0	0	0	L	0	0	33	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**100**	0	H	0	0	**50**	0
L	0	0	**50**	0	L	0	0	0	0	L	0	0	**50**	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**97**	0	H	0	0	**63**	0
L	0	0	**50**	0	L	0	0	3	0	L	0	0	37	0

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 7$, $n_2 = 7$.

Table 14: Outcome Distribution in the Minimum-Effort Games: CO Match

ME 4	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**83**	0	H	0	0	**80**	0
L	0	0	**50**	0	L	0	0	17	0	L	0	0	20	0
ME 5	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**100**	0	H	0	0	**67**	0	H	0	0	**80**	0
L	0	0	0	0	L	0	0	33	0	L	0	0	20	0
ME 6	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**83**	0	H	0	0	**80**	0
L	0	0	**50**	0	L	0	0	17	0	L	0	0	20	0
ME 7	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**100**	0	H	0	0	**67**	0	H	0	0	**80**	0
L	0	0	0	0	L	0	0	33	0	L	0	0	20	0
ME 8	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**50**	0	H	0	0	**83**	0	H	0	0	**80**	0
L	0	0	**50**	0	L	0	0	17	0	L	0	0	20	0
Mean	Control					Ethnic					School			
	HH	LL	HL	LH		HH	LL	HL	LH		HH	LL	HL	LH
H	0	0	**70**	0	H	0	0	**77**	0	H	0	0	**80**	0
L	0	0	30	0	L	0	0	23	0	L	0	0	20	0

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 7$, $n_2 = 7$.

Table 15: Outcome Distribution in the Prisoner's Dilemma Games: AA Match

PD 0	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	6	**24**	6	18	C	0	18	5	18	C	0	5	0	27
D	0	18	6	**24**	D	0	9	23	**27**	D	5	14	0	**50**
PD 1	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	24	0	0	C	0	27	18	0	C	0	14	0	0
D	12	**41**	6	18	D	5	**32**	9	9	D	14	**68**	5	0
PD 2	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	6	29	0	0	C	0	27	5	0	C	0	27	0	0
D	0	**47**	12	6	D	5	**45**	18	0	D	5	**59**	9	0
PD 3	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	24	6	0	C	0	**36**	9	0	C	5	18	9	0
D	18	**35**	18	0	D	5	32	18	0	D	5	**59**	5	0
PD 4	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	24	6	0	C	5	27	0	0	C	0	9	5	0
D	12	**47**	12	0	D	5	**41**	23	0	D	0	**77**	9	0
Mean	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	2	25	4	4	C	1	27	7	4	C	1	15	3	5
D	8	**38**	11	9	D	4	**32**	18	7	D	5	**55**	5	10

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 31$, $n_2 = 31$.

Table 16: Outcome Distribution in the Prisoner's Dilemma Games: CA Match

PD 0	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	**21**	0	5	C	0	5	10	19	C	0	0	0	19
D	**21**	**21**	11	**21**	D	10	**29**	5	24	D	0	19	5	**57**
PD 1	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	5	21	0	5	C	5	**43**	5	5	C	0	19	0	0
D	11	**32**	11	16	D	10	33	0	0	D	10	**71**	0	0
PD 2	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	5	16	0	0	C	0	14	5	0	C	0	19	0	0
D	0	**53**	26	0	D	0	**57**	19	5	D	0	**71**	10	0
PD 3	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	16	0	5	C	0	24	5	0	C	0	14	0	0
D	0	32	**42**	5	D	0	**57**	14	0	D	0	**76**	10	0
PD 4	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	11	0	0	C	0	24	14	0	C	0	24	0	0
D	5	**53**	32	0	D	0	**52**	10	0	D	5	**67**	5	0
Mean	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	2	17	0	3	C	1	22	8	5	C	0	15	0	4
D	7	**38**	24	8	D	4	**46**	10	6	D	3	**61**	6	11

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 32$, $n_2 = 32$.

Table 17: Outcome Distribution in the Prisoner's Dilemma Games: CC Match

PD 0	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	8	0	15	C	0	23	0	**31**	C	0	10	10	**40**
D	0	23	0	**54**	D	0	23	0	23	D	0	10	0	30
PD 1	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	31	0	8	C	0	**46**	0	8	C	0	20	0	10
D	0	**62**	0	0	D	0	**46**	0	0	D	0	**60**	10	0
PD 2	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	31	0	0	C	0	31	0	0	C	0	20	0	0
D	0	**62**	8	0	D	0	**54**	15	0	D	0	**70**	0	10
PD 3	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	23	8	0	C	0	38	8	0	C	0	**50**	0	0
D	0	**54**	15	0	D	0	**54**	0	0	D	10	40	0	0
PD 4	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	31	0	0	C	0	23	0	0	C	0	30	0	0
D	0	**62**	8	0	D	0	**77**	0	0	D	0	**70**	0	0
Mean	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	25	2	5	C	0	32	2	8	C	0	26	2	10
D	0	**52**	6	11	D	0	**51**	3	5	D	2	**50**	2	8

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 24$, $n_2 = 24$.

Table 18: Outcome Distribution in the Prisoner's Dilemma Games: AC Match

PD 0	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	4	12	0	23	C	0	0	0	14	C	0	5	0	24
D	4	19	0	**38**	D	0	23	5	**59**	D	0	24	0	**48**
PD 1	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	4	15	0	0	C	0	41	0	0	C	0	14	0	5
D	0	**62**	4	15	D	0	**59**	0	0	D	5	**67**	0	10
PD 2	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	15	4	0	C	0	27	5	0	C	0	29	0	0
D	0	**58**	23	0	D	0	**59**	5	5	D	0	**62**	5	5
PD 3	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	12	4	0	C	0	18	0	0	C	0	14	5	0
D	0	**69**	15	0	D	0	**77**	5	0	D	0	**62**	19	0
PD 4	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	0	8	12	0	C	0	27	0	0	C	0	19	5	0
D	0	**65**	15	0	D	0	**64**	9	0	D	0	**71**	5	0
Mean	Control					Ethnic					School			
	CC	DD	CD	DC		CC	DD	CD	DC		CC	DD	CD	DC
C	2	12	4	5	C	0	23	1	3	C	0	16	2	6
D	1	**55**	12	11	D	0	**56**	5	13	D	1	**57**	6	12

Notes: The mode of distribution is boldfaced. The number of players is $n_1 = 28$, $n_2 = 28$.