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

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Abstract

As the workforce becomes increasingly diverse, motivating individuals from different backgrounds to work together effectively is a major challenge facing organizations. In a experiment conducted at two large public universities 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 prisoner's dilemma games. By priming a fragmenting (ethnic) identity, we find that, compared to the control, Asians exhibit significantly more ingroup cooperation and outgroup discrimination, while Caucasians are not responsive to ethnic priming. In comparison, priming a common organization (school) identity effectively reduces group bias for Asians in the coordination game, resulting in a significant increase of both ingroup and outgroup cooperation. However, in games with a unique inefficient Nash equilibrium, the effects of priming a common identity are more complex. While priming alleviates the negative effects of the competitiveness stereotype on cooperation among UCLA Asians, it enhances such negative effects among University of Michigan Asians.

Keywords: social identity, diversity, prisoner's dilemma, experiment
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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 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, Bromley and Saxe 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, Polzer, Barsade and Neale 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, Pearson, Dovidio, Shelton and Trail 2009). In another study, emphasizing a common ingroup identity increased satisfaction with coworkers in ethnically diverse workgroups (Cunningham 2005).

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, Huffman and Meier 2006), where the dominant strategy is to completely free ride or defect. Furthermore, it improves coordination in the battle of sexes game (Charness, Rigotti and Rustichini 2007), the provision point mechanism (Croson, Marks and Snyder 2008), and the minimum effort game (Chen and Chen forthcoming). 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 vs. fragmenting identity on coordination and cooperation in a series of prisoner's dilemma games with varying incentives for cooperation. Using subjects from two large public universities with comparable academic standing (the University of Michigan and the University of California at Los Angeles), we prime participant school identity as their common identity, and ethnic identity as the fragmenting identity.

Our results show that participants from ethnic minority and majority populations respond differently to priming. Specifically, Asians are more responsive to priming than Caucasians. Even in the control sessions absent of priming, an ethnic cue, such as the last name of the other player, can produce significant ingroup favoritism among University of Michigan (hereafter UM) Asian students, most of whom are first-generation ethnic minorities. Furthermore, our treatments also produce more significant effects among Asians. For example, priming ethnic identity significantly decreases outgroup cooperation among UM Asians compared to the control, while it has no effect among Caucasians. Lastly, priming a common (school) identity reduces group bias for UM Asians in the coordination game, resulting in a significant increase of both ingroup and outgroup cooperation. However, in games with a unique inefficient Nash equilibrium, the effects of priming a common identity are more complex. While priming alleviates the negative effects of the competitiveness stereotype on cooperation among UCLA Asians, it enhances such negative effects among UM Asians. The differential response to priming from first-generation (UM Asian students) and second- or third-generation (UCLA Asian students) ethnic minorities has policy implications for socializing new immigrants which we will elaborate in Section 5.

This paper contributes to the literature on the effects of group identities on cooperation and coordination 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 relevant real-life work environments. Second, this study goes beyond documenting the intergroup bias in individual choices and focuses on the interplay of an individual's multi-dimensional social identities when

that individual interacts with others in a strategic setting. We use the identity priming technique from social psychology to manipulate the salience of the respective identities to examine how evoking different dimensions of these identities impacts intergroup bias. Third, this study is among the first in the economics and management science literature to empirically evaluate the effectiveness of using common identity as a nonpecuniary source of worker motivation among an ethnically diverse group of participants.

The rest of the paper is organized as follows. Section 2 presents the experimental design. Section 3 presents our hypotheses. In Section 4, we present our analysis and results. Section 5 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 social backgrounds, specifically two different ethnic groups (Caucasian and Asian), as differentiated by participant surnames in this study. The incentivized tasks in the experiment involve choices to cooperate or coordinate with another employee in the organization. Thus, the experiment 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 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, Chen and Burrows 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, Quinn and Spencer 1998), individuals from lower socio-economic status (Croizet and Claire 1998) and women in math (Spencer, Steele and Quinn 1999).

On the other hand, while activating negative stereotypes can hurt performance, activating positive stereotypes can boost performance. In one experiment, Shih, Pittinsky and Ambady (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, Pittinsky and Trahan 2006). These priming techniques have also been applied to study risk and time preferences in economics (Benjamin, Choi and Strickland 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, Dovidio, Gurtman and Tyler (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 dilemma 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 the sessions study at the same university (UM or UCLA), these questions pertain to an individual's common identity of being part of her university. Because the two universities share comparable academic standings, we minimize the possibility that the impact of the common identity priming may be influenced by participants' perception on the standing of their universities.[1] 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

[1]Li, de Oliveira and Eckel (2010) design a controlled field experiment in two neighborhoods in Dallas, TX, to study the impact of having a common identity on individual contributions to local public goods. They find that the same common identity priming leads to opposite outcomes. While it *decreases* the likelihood of giving in the poor neighborhood, it *increases* the likelihood of giving in the mid-income neighborhood.

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. The questionnaires 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 games. This class of games is among the simplest of those which capture the tension between individual and group interests. It has also been used in the social identity literature in psychology to investigate the causes of group bias (Yamagishi and Kiyonari 2000, Simpson 2006).

Figure 1 presents the extensive forms of the five sequential prisoner's dilemma games 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.

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 game are chosen such that $p^* \in \{0,\ 1/4,\ 1/2,\ 2/3,\ 3/4\}$, which corresponds to games 0 to 4. In game 1, player 1 should cooperate if she believes that at least 1/4 of player 2s are conditional cooperators. In contrast, in game 4, player 1 will cooperate when she believes that the percentage of conditional cooperators exceeds 3/4. Other things being equal, we expect to see the likelihood of player 1's cooperation decrease from game 0 to game 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 $p^* = 1/2$.

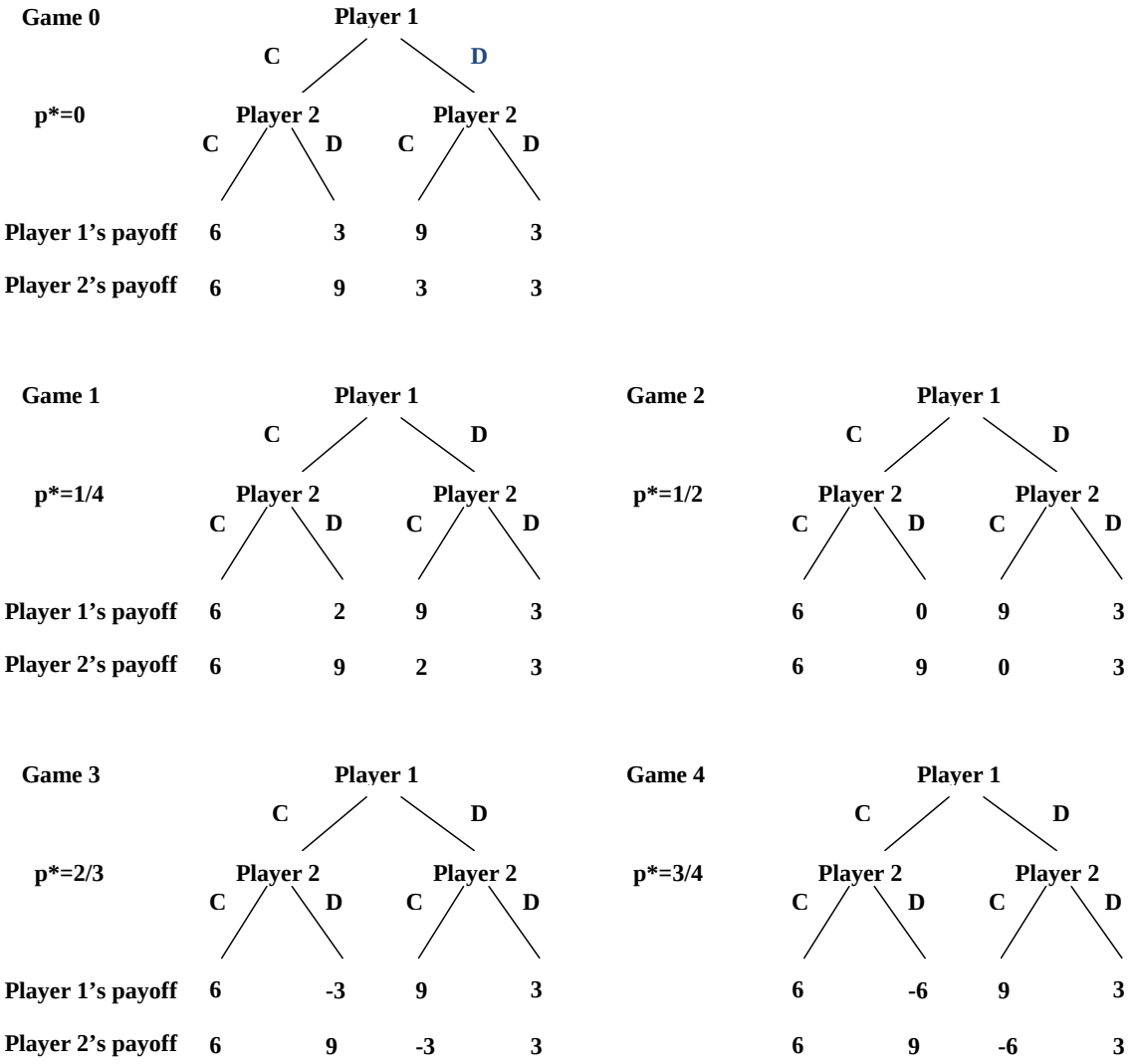


Figure 1: Extensive Form Representation of Games Used in the Experiment

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)," where A1 and B1 are the neutral terminology used in the instruction for cooperation, and A2 and B2 correspond to defection. The use of the strategy method effectively transforms the extensive form games in Figure 1 into the normal form games in Figure 2.

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

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

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

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

Game 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 Games Used in the Experiment

In normal form representation, game 0 has four Nash equilibria, {(D, DD), (C, DD), (D, CC), (D, DC)}, while each game in games 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 games 1-4, DC is weakly dominated by DD, and as expected, empirically adopted least often (Section 4). In game 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 game 0. Note that player 2's other joint-payoff-maximizing strategy, CC, is weakly dominated, and thus not rational.

2.3 Experimental Procedure

At both UM and UCLA, we implement one control condition and two identity treatments, each of which has five independent sessions per school. 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 school 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 prisoner's dilemma (PD) 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 PD 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 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.[2]

Unlike most laboratory experiments that use anonymous matching, we provide the co-player's ethnic background information in all three treatments. Specifically, the co-player's last name appears on the screen in the UM sessions. 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. At UCLA, we display an acronym that combines three pieces of information including the the co-player's grade standing (Freshman, Sophomore, etc.), ethnicity, and player ID.[3] For example, a participant is told that she is matched with "FreshAsianCA1" or "SophCaucasianCA3." The grading standing and player ID are added to alleviate any potential experimenter demand effect.

Furthermore, to maintain the priming effect over time, we select four pictures 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. 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

[2]The 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.

[3]We were not able to obtain UCLA IRB approval to display subject last names.

are not provided until the end of the experiment. The experimental instructions and the pictures are included in Appendix B.

Note in all the treatments, including the control condition, co-player's last name (or ethnicity) was 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 treatment 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 is included in Appendix C.

Table 1: Features of Experimental Sessions

Site	Participants					
	UM		UM	UCLA		UCLA
Treatments	Caucasian	Asian	Total	Caucasian	Asian	Total
Fragmenting ID	19	21	8×5	17	23	8×5
common ID	19	21	8×5	19	21	8×5
Control	20	20	8×5	21	19	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. Fifteen sessions were conducted at the School of Information Lab at the University of Michigan from May to July 2008, with 61 Asian and 59 Caucasian participants. Another 15 sessions were conducted in the California Social Science Experimental Laboratory (CASSEL) at UCLA in May 2009, with 63 Asian and 57 Caucasian participants. All 240 of our subjects were students from UM and UCLA.

For each session at UM, we pre-screened the last names of potential participants, with a threshold of at least three participants with European last names, and three with Chinese last names. For each session at UCLA, as CASSEL does not allow any ethnic screening, we over-recruited subjects for each session to ensure the same minimal number of Asian and Caucasian students in each experimental session as in UM. Extra subjects were directed into a separate room for a survey session unrelated to this experiment. At each site, each subject participated in only one session. We use z-Tree (Fischbacher 2007) to program our experiments. Each treatment session lasts approximately one hour. 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 at UM ($18 at UCLA), including the show-up fee. Data are available from the authors upon request.

3 Hypotheses

We are interested in whether, and to what extent, a fragmenting or common identity affects inter- and intra-ethnic group coordination and cooperation, and whether this effect varies between mi-

nority and majority groups. In what follows, we state our alternative hypotheses, while our general null hypothesis is that behavior does not differ between groups or treatments.

Based on the social psychology and economics literature on social identity and decision making, we expect that subjects will show favoritism towards those from the same ethnic group. In the control sessions, since a match's last name or ethnicity is displayed, we expect some degree of ingroup favoritism and outgroup discrimination even in the absence of priming.

Hypothesis 1 (Control: player 1)**.** *In the control sessions, player 1s are more likely to cooperate with those from the same ethnic group.*

Hypothesis 1 is reminiscent of the experimental results from Fershtman and Gneezy (2001), where Israeli Jewish participants exhibit mistrust towards men of Eastern origin in trust games, where ethnic origins are inferred from the names of their matches. They further identify mistaken ethnic stereotypes (as opposed to a "taste for discrimination") as the source of mistrust.

As game 0 and games 1-4 have different structures, we separate our hypotheses on player 2's strategies by game sets. While game 0 might reflect the effects of social identity on coordination, games 1-4 reflect its effects on the use of a unique but inefficient Nash equilibrium strategy. Of player 2's two weakly dominant strategies in game 0, we expect the Pareto dominant one to be selected, i.e., the rational joint-payoff-maximizing strategy (rJPM).

Hypothesis 2 (Control: player 2)**.** *In the control sessions, player 2s are more (less) likely to choose rJPM (DD) when matched with those from the same ethnic group in game 0 (games 1-4).*

Compared to the control sessions, we expect that ingroup favoritism (and outgroup discrimination) will be stronger in the ethnic priming treatment when the ethnicity of participants is made more salient.

Hypothesis 3 (Ethnic priming: player 1)**.** *Compared to the control, player 1s are more likely to cooperate with those from the same ethnic group, and less likely to cooperate with those from the other ethnic group in the ethnic identity treatment.*

Hypothesis 4 (Ethnic priming: player 2)**.** *Compared to the control, in game 0 (games 1-4), player 2s are more (less) likely to choose rJPM (DD) with an ingroup match under the ethnic identity treatment.*

Lastly, compared to the control, in the school priming treatment where a common school identity is primed, we expect less intergroup bias.

Hypothesis 5 (School priming: player 1)**.** *Compared to the control, in the school priming treatment, an ingroup match will be equally likely to cooperate, while an outgroup match will be more likely to cooperate.*

For player 2, the likelihood of adopting the rational joint-payoff-maximizing (always defect) strategy increases (decreases) from the control to the school priming treatment in game 0 (games 1-4).

Hypothesis 6 (School priming: player 2)**.** *In game 0 (games 1-4), player 2s are more (less) likely to choose rJPM (DD) under the common identity treatment, compared to the control or ethnic identity treatment.*

4 Results

In this section, we present the effects of priming ethnic and school identities on coordination (game 0) and cooperation (games 1-4). Since game 0 has multiple Pareto ranked equilibria while games 1-4 each have a unique but inefficient Nash equilibrium, we analyze them separately. As player 1 has two strategies, we investigate intergroup preference and treatment effects on her likelihood to cooperate. In comparison, player 2 has four strategies. We focus on intergroup preference and treatment effects on his likelihood to choose rJPM in game 0 and DD in games 1-4. Both strategies are weakly dominant in the respective games, and the empirical mode of distribution for player 2 in the respective games.

Several common features apply throughout our analysis. First, in all our analyses, standard errors are clustered at the individual level to control for the potential dependency of individual decisions across games.[4] In particular, a test of proportions with standard errors clustered at the individual level is used unless it is specified otherwise. Second, we use a 5-percent statistical significance level as our threshold to establish the significance of an effect. Lastly, because the UCLA experimental protocol is modified with acronyms replacing last names, we present our UM results as our primary results, and UCLA results as secondary evidence for robustness checks, although the complete data analyses from both sites are reported.

4.1 Control

We first present our analysis of players' strategies and beliefs in the control sessions. Recall that an identity-neutral questionnaire was used in the control sessions. However, since the match's last name (acronym) is displayed in each game at UM (UCLA), participants can infer the ethnic identity of their match. Therefore, if there exists any group effect based on name and inferred identity alone, the control sessions establish a baseline group effect. In what follows, we first present the UM analysis and results, followed by a parallel analysis for the UCLA data.

Figure 3 presents player 1s' average rate of cooperation in all games in the control sessions at UM (top) and UCLA (bottom). The horizontal axis presents the matching types of each pair, AA (Asian player 1 matched with Asian player 2), AC (Asian player 1 matched with Caucasian player 2), CC (Caucasian player 1 matched with Caucasian player 2), and CA (Caucasian player 1 matched with Asian player 2). For each matching condition, the white bar denotes the average cooperation rate (and standard deviation) in game 0 while the black bar denotes the average cooperation rate (and standard deviation) in games 1-4. So the comparison of cooperation rate between the AA and AC pairs yields evidence on intergroup preferences by Asians, while the comparison between the CC and CA pairs yields evidence for Caucasians. Comparing AA and AC matchings at UM, we find higher rates of cooperation between AA than between AC matchings. In contrast, the cooperation rates of CC and CA matchings at UM are very similar, indicating that Caucasian player 1s are equally likely to cooperate with both an ingroup and an outgroup match.

Result 1 (Control: player 1)**.** *In games 1-4, while UM Asian player 1s are significantly more likely to cooperate with an ingroup match than with an outgroup match (36% vs. 21%, $p = 0.025$, one-sided), UM Caucasian player 1s are equally likely to cooperate with an ingroup and an outgroup*

[4] We do not cluster the standard errors at the session level, as participants make their decisions independently, and do not get any feedback on their decisions until the end of the experiment.

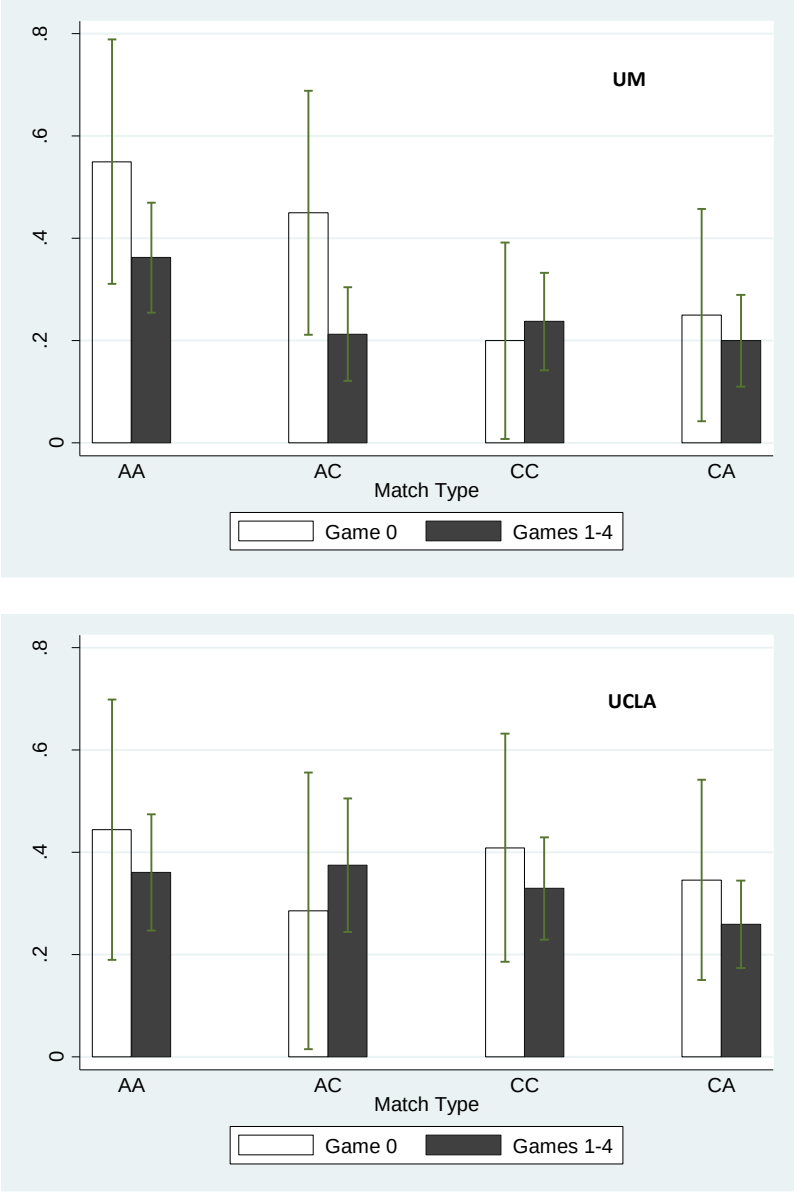


Figure 3: Player 1s' Average Rate of Cooperation in the Control Sessions

match (24% vs. 20%, $p = 0.125$, one-sided).

In comparison to games 1-4, UM Asians' ingroup favoritism and outgroup discrimination are not significant in game 0 (55% vs. 45%, $p = 0.159$, one-sided). However, pooling the ingroup and outgroup data, we find that UM Asian player 1s are significantly more cooperative than Caucasian player 1s in game 0 (50 vs. 23%, $p = 0.043$, one-sided).

Furthermore, the UCLA control sessions participants do not exhibit significant group behavior. Result 1 indicates that UM Asian player 1s are more responsive to the implications of last names, while UM Caucasians and UCLA players do not differentiate their decisions by the ethnic identities of their matches. This analysis leads us to reject the null in favor of Hypothesis 1 for UM Asians, but not for other players.

In a game-by-game analysis, we find that, in the control sessions, players are sensitive to the incentive variations across games. Specifically, we expect that the cooperation rate should decrease from game 0 to game 4. At UM, the proportion of cooperation for an Asian player 1, when matched with another Asian (Caucasian), decreases from 55% (45%) in game 0 to 35% (25%) in game 4. This decrease indicates that Asian player 1s are sensitive to the variations in payoff incentives across games. However, for UM Caucasian first movers, this decrease is present only when they are matched with an Asian (25% in game 0 to 10% in game 4), and not when they are matched with another Caucasian. We find a similar decrease of cooperation in the UCLA study.

While player 1's strategy conveys her trust in player 2, player 2's strategy reflects his reciprocal preference.

In game 0, we find that UM Asian player 2s are weakly more likely to choose the rational joint-payoff-maximizing strategy (rJPM) with an ingroup match than with an outgroup match (50% vs. 30%, $p = 0.067$, one-sided), while UM Caucasian player 2s are equally likely to choose rJPM with an ingroup or an outgroup match (65% vs. 60%, $p = 0.334$, one-sided).

In games 1-4, we find that the likelihood of choosing the unique Nash equilibrium strategy DD (always defect) between an ingroup and an outgroup match is not significantly different for either UM Asian (55% vs. 60%, $p = 0.212$, one-sided) or UM Caucasian player 2s (84% vs. 78%, $p = 0.169$, one-sided). Furthermore, we do not observe significant group behavior among UCLA player 2s.[5] Thus, absent of priming, player 2s' behavioral variations to the ethnic identities inferred from their matches' last names (or ethnicity) is not statistically significant. Thus, we fail to reject the null in favor of Hypothesis 2.

In sum, in the control sessions, we find significant ingroup favoritism and outgroup discrimination among UM Asian player 1s, and weaker or no group effects among other players. These results establish a benchmark for our evaluation of the two identity treatments in the subsequent discussion.

4.2 Ethnic Priming: Fragmenting Identities

In this subsection, we analyze subject behavior in the ethnic priming treatment. Compared to the control, priming an ethnic identity ought to fragment participants along ethnic divisions. Thus, we expect more dramatic ingroup favoritism and outgroup discrimination in the ethnic priming treatment compared to the control.

[5]However, pooling ingroup and outgroup data, we find that UCLA Asian player 2s are significantly more likely to choose DD than Caucasian player 2s in games 1-4 (82 vs. 53%, $p = 0.026$, one-sided).

Table 2: Summary Statistics and Treatment Effects in Game 0

	Player 1: Proportion of Cooperation						Treatment Effects: p-values (1-sided)			
	Control		Ethnic		School		Ethnic vs. Control		School vs. Control	
UM	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg
Asian	55	45	*41*	*17*	39	36	0.214	**0.035**	0.220	0.311
Caucasian	20	25	39	36	*56*	*18*	0.165	0.238	**0.009**	0.301
UCLA										
Asian	44	29	31	22	27	27	0.186	0.368	0.128	0.473
Caucasian	41	35	36	18	28	33	0.391	0.143	0.231	0.472
	Player 2: Proportion of rJPM						Treatment Effects: p-values (1-sided)			
	Control		Ethnic		School		Ethnic vs. Control		School vs. Control	
UM	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg
Asian	50	30	50	45	80	70	1.000	0.241	**0.022**	**0.022**
Caucasian	65	60	67	67	67	72	0.458	0.369	0.452	0.253
UCLA										
Asian	39	38	*38*	*18*	50	50	0.491	0.097	0.287	0.295
Caucasian	50	36	71	67	56	55	0.148	0.097	0.395	0.202

Notes:

a. Italics highlight a significant ingroup-outgroup difference ($p \leq 0.05$).

b. Boldfaced numbers indicate significant treatment effects ($p \leq 0.05$).

Table 3: Summary Statistics and Treatment Effects in Games 1-4

	Player 1: Proportion of Cooperation						Treatment Effects: p-values (1-sided)			
	Control		Ethnic		School		Ethnic vs. Control		School vs. Control	
UM	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg
Asian	*36*	*21*	34	25	22	27	0.434	0.391	0.165	0.362
Caucasian	24	20	39	39	*38*	*23*	0.165	0.082	0.194	0.421
UCLA										
Asian	36	38	24	36	30	18	0.185	0.462	0.307	**0.047**
Caucasian	33	26	23	20	35	38	0.261	0.322	0.453	0.199
	Player 2: Proportion of DD						Treatment Effects: p-values (1-sided)			
	Control		Ethnic		School		Ethnic vs. Control		School vs. Control	
UM	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg	Ing	Outg
Asian	55	60	*60*	*74*	84	88	0.390	0.181	**0.035**	**0.028**
Caucasian	84	78	93	93	88	86	0.182	0.063	0.362	0.217
UCLA										
Asian	85	80	*63*	*52*	50	44	**0.041**	0.056	**0.032**	**0.017**
Caucasian	55	50	71	69	61	70	0.186	0.118	0.363	0.106

Notes:

a. Italics highlight a significant ingroup-outgroup difference ($p \leq 0.05$).

b. Boldfaced numbers indicate significant treatment effects ($p \leq 0.05$).

Tables 2 and 3 present the summary statistics and treatment effects in game 0 and games 1-4 respectively. The statistical difference ($p \leq 0.05$) within each treatment between ingroup and outgroup matching is italicized, while that between a treatment and the corresponding control is highlighted in boldface. In game 0 (Table 2), while UM Caucasian player 1s do not differentiate between ingroup and outgroup matches in the ethnic priming treatment, UM Asian player 1s are significantly more likely to cooperate with an ingroup than with an outgroup match (41% vs. 17%, $p = 0.033$, one-sided), resulting in significant treatment effects compared to the control. In comparison, our analysis of player 1 behavior in games 1-4 is reported in Table 3, where neither the intergroup or treatment effect is significant at the 5% level.

Result 2 (Ethnic priming: player 1)**.** *In game 0, outgroup cooperation significantly decreases from the control to the ethnic priming treatment for UM Asian player 1s (45% to 17%, $p = 0.035$, one-sided).*

By Result 2, we reject the null in favor of Hypothesis 3 for UM Asian player 1s in game 0, but we fail to reject the null for other groups and games. Result 2 indicates that ethnic priming significantly changes Asian but not Caucasian player 1s' behavior at UM. In comparison, at UCLA, ethnic priming does not generate significant intergroup bias for Asian or Caucasian player 1s.

Next, we examine player 2 strategies. The bottom panels of Tables 2 and 3 indicate that, while Caucasian player 2s do not differentiate between ingroup and outgroup matches in any game under ethnic priming, in game 0, UCLA Asian player 2s are significantly more likely to choose rJPM with an ingroup than with an outgroup match (38% vs. 18%, $p < 0.05$, one-sided), resulting in a weakly significant decrease of outgroup cooperation (rJPM) from the control to the ethnic priming treatment (38% to 18%, $p = 0.097$, one-sided).[6] In games 1-4, UM (UCLA) Asian player 2s are significantly more likely to choose DD with an outgroup (ingroup) match, resulting in a weakly significant decrease of DD for Asian outgroup matching at UCLA compared to the corresponding control (80% to 52%, $p = 0.056$, one-sided). The only significant treatment effect across the sites for player 2s is summarized below.

Result 3 (Ethnic priming: player 2)**.** *In games 1-4, ingroup defection (DD) significantly decreases from the control to the ethnic priming treatment for UCLA Asian player 2s (85% to 63%, $p = 0.041$, one-sided).*

By Result 3, we reject the null in favor of Hypothesis 4 for UCLA Asian player 2s in games 1-4, but we fail to reject the null for other groups or games. Result 3 indicates that ethnic priming significantly changes Asian but not Caucasian player 2s' behavior at UCLA.

In sum, we find that priming ethnic identities has differential effects on Asians and Caucasians. While Caucasians are not responsive to ethnic priming, UM Asian player 1s exhibit more outgroup discrimination in game 0 when primed with their ethnic identity compared to the control sessions. In games 1-4, we also find that the treatment effect is significant only for UCLA Asian player 2s, i.e., they are significantly less likely to choose always defect when matched with an ingroup player. Consistent with our findings in the control sessions, pooling ingroup and outgroup data in games 1-4, we find that UM Asian player 2s are significantly less likely to choose DD than Caucasian player 2s (67 vs. 93%, $p = 0.008$, one-sided). The finding that ethnic priming is most effective

[6]Furthermore, pooling ingroup and outgroup data, we find that UCLA Asian players 2 are significantly less likely to choose rJPM than Caucasian player 2s in game 0 (29 vs. 69%, $p = 0.014$, one-sided).

for minority groups, Asian participants in this case, is reported for the first time, to the best of our knowledge.

4.3 School Priming: Common Identity

In our experiment, we implement the common identity as the school identity (UM or UCLA). We find that, while school priming improves coordination (game 0) for Asians, its effects on cooperation (games 1-4) are more complex. We first present the treatment and group effects from school priming on coordination, reported in Table 2 for all players.

Result 4 (School Priming on Coordination: Asians)**.** *Compared to the control, UM Asian player 2s significantly increase their likelihood of choosing rJPM for both ingroup (50% to 80%; $p = 0.022$, one-sided) and outgroup matches (30% to 70%; $p = 0.022$, one-sided), resulting in a significant overall increase of rJPM from the control to the school priming treatment (40% to 75%; $p = 0.012$, one-sided).*

School priming has two effects for UM Asians in game 0. First, it reduces intergroup discrimination, as neither Asian player 1s nor player 2s differentiate between ingroup and outgroup matches in their likelihood to cooperate (39% vs. 36%, $p = 0.389$, one-sided) or their likelihood to choose DC (80% vs. 70%, $p = 0.159$, one-sided), respectively. Second, it significantly increases the likelihood of choosing rJPM for player 2s, with no significant reduction of cooperation for player 1s. For UM Asians, the only group who discriminates between ingroup and outgroup matches in the control, school priming achieves the unifying effects, as hypothesized. By Result 4, we reject the null in favor of Hypothesis 6 for UM Asians in game 0.

Unlike UM Asians, however, in game 0, while the proportion of rJPM does not change significantly for Caucasian player 2s, Caucasian player 1s are significantly more likely to cooperate with an ingroup than an outgroup match (56% vs. 18%, $p = 0.002$, one-sided), resulting in a significant treatment effect summarized in Result 5 below. Meanwhile, the proportion of rJPM does not change significantly for Caucasian player 2s (63% vs. 69%, $p = 0.321$, one-sided).

Result 5 (School priming on coordination: Caucasians)**.** *In game 0, ingroup cooperation significantly increases in the school priming treatment compared to the control for UM Caucasian player 1s ($p = 0.003$, one-sided).*

Results 4 and 5 indicate that, in a coordination game, priming a common school identity is effective in reducing ingroup favoritism and outgroup discrimination for UM Asian players. However, the effect on UM Caucasian player 1s is puzzling, as it substantially and significantly increases their ingroup favoritism compared to the control, the opposite of what we anticipated.

We conjecture that this effect might be caused by the institutional history of the University of Michigan. Specifically, the University of Michigan was involved in a series high profile lawsuits against its preference to minorities in the undergraduate (Gratz and Hammacher v. Bollinger, 1997) and Law School admissions (Grutter v. Bollinger, 1997).[7] The Supreme Court rulings in 2003, which upheld a general affirmative action policy at the Michigan Law School but struck down its undergraduate admissions formula, caused varying reactions among the students, including

[7]See `http://www.lib.umich.edu/files/libraries/govdocs/pdf/affirm.pdf` for a collection of relevant documents and press coverage associated with the affirmative action lawsuits.

perceptions that Caucasian students were disadvantaged. This institutional history might have contributed to the increased group behavior among Caucasian students under school priming.

Although we cannot nail down the precise mechanism causing the increase of ingroup favoritism among Caucasian subjects at Michigan under school priming, we can test the robustness of this result by examining the treatment effects at a university without such a history of a decade-long affirmative action battle. Unlike UM subjects, both Asian and Caucasian UCLA player 1s are equally likely to cooperate with an ingroup and outgroup match. Thus, UM Caucasian subjects' reaction against school priming does not extend to UCLA.

Compared to the incentive structure in game 0, player 1's risk of cooperation increases from game 0 to the subsequent games. Thus, we expect the cooperation rate to decrease in games 1-4. Similar to what we find in the control sessions, this decrease is more pronounced for Asian players. Specifically, UCLA Asian player 1s decrease their likelihood to cooperate with an outgroup member from 27% in game 0 to 18% in games 1-4. Furthermore, treatment effects on Asian player 2s in UCLA and UM go in the opposite directions (Table 3 lower panel), as summarized below.

Result 6 (School priming on cooperation: games 1-4)**.** *In games 1-4, compared to the control, the proportion of the always-defect strategy DD significantly decreases (increases) for both ingroup and outgroup matching for UCLA (UM) Asian player 2s.*

The treatment effects in games 1-4 can be summarized as UM Asian player 2s becoming more competitive and UCLA Asian player 2s becoming more cooperative compared to their respective control groups. To investigate the underlying mechanisms for these different treatment effects, we report our analysis on the effects of priming on stereotypes.

As a subject's only information about her match come from the match's last name (ethnicity) at UM (UCLA), her belief about her match's choice is likely to be influenced by her innate statistical model about her match's ethnic group. We call this innate statistical model a "stereotype." Additionally, social psychology research on the effects of primed natural identities on individual choice experiments suggest that people conform to stereotypes associated with the primed identity (Shih et al. 1999). Extending such a model of conformity to stereotypes to strategic situations, we formulate a set of analyses to examine the treatment effects on stereotypes, which include those on one's own as well as those on the other ethnic groups. In the subsequent analysis, stereotypes are obtained from the post-experiment survey data.

Tables 4 and 5 each report eight probit specifications investigating the treatment effects on stereotypes at UM and UCLA, respectively. We pool data from the control and the school identity treatment for each university. The dependent variable is the likelihood of cooperation for player 1 (upper panel) and the likelihood of always defect for player 2 (lower panel). The independent variables (with omitted variables in parentheses) include the player's belief about her match's choice, the school priming treatment dummy (control), the ingroup matching dummy, the interaction between the treatment variable and ingroup matching, the stereotype variable, Other Competitive for player 1 and Self Competitive for player 2, and the interaction between the school priming treatment dummy with the stereotype variable.[8] Additionally, each specification includes game dummies.[9] While a comparison of the coefficients of the Ingroup dummy with School$\times$Ingroup

[8]The competitiveness stereotype has the strongest predictive power among all stereotype variables. The Other Competitive variable takes on a value between 1 and 7, depending on a player's belief about the competitiveness of her match's ethnic group. Similarly, the Self Competitive variable also takes on a value between 1 and 7, depending on a player's belief about the competitiveness of her own ethnic group.

[9]Estimates are not displayed due to space limitations but are available from the authors upon request.

Table 4: Effects of School Priming on Stereotypes at UM: Games 1-4

	Likelihood of Cooperation			
	Asian Player 1		Caucasian Player 1	
	(1)	(2)	(3)	(4)
Belief{2 cooperates}	0.576***	0.552***	0.643***	0.660***
	(0.135)	(0.129)	(0.136)	(0.123)
School Priming	-0.017	-0.531	0.126	0.580
	(0.130)	(0.330)	(0.112)	(0.342)
Ingroup	0.068	0.101	-0.022	0.074
	(0.052)	(0.073)	(0.037)	(0.112)
School×Ingroup	-0.140**	-0.291***	0.061	-0.032
	(0.049)	(0.090)	(0.063)	(0.107)
OtherCompetitive		-0.017		0.072
		(0.035)		(0.056)
School×OtherCompetitive		0.132		-0.084
		(0.090)		(0.063)
Observations	288	288	320	320
Log Pseudo L.	-126.041	-123.704	-115.946	-114.046
Pseudo R^2	0.246	0.260	0.363	0.374
	Likelihood of Always Defect (DD)			
	Asian Player 2		Caucasian Player 2	
	(5)	(6)	(7)	(8)
Belief{1 defects}	0.321**	0.386***	0.191	0.233*
	(0.148)	(0.151)	(0.165)	(0.156)
School Priming	0.239	-0.868*	0.083	-0.412
	(0.154)	(0.234)	(0.098)	(0.504)
Ingroup	-0.023	-0.017	0.053	0.0522
	(0.052)	(0.049)	(0.062)	(0.061)
School×Ingroup	-0.026	-0.074	-0.033	-0.028
	(0.086)	(0.101)	(0.077)	(0.075)
SelfCompetitive		0.029		-0.017
		(0.067)		(0.069)
School×SelfCompetitive		0.227*		0.098
		(0.114)		(0.096)
Observations	320	320	304	304
Log Pseudo L.	-161.441	-140.884	-129.377	-126.981
Pseudo R^2	0.155	0.263	0.048	0.066

Notes:

a. Coefficients are probability derivatives.

b. Robust standard errors in parentheses are clustered at the session level.

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

d. Game dummies are controlled for.

Table 5: Effects of School Priming on Stereotypes at UCLA: Games 1-4

	Likelihood of Cooperation			
	Asian Player 1		Caucasian Player 1	
	(1)	(2)	(3)	(4)
Belief{2 cooperates}	0.626***	0.628***	0.654***	0.650***
	(0.073)	(0.074)	(0.091)	(0.089)
School Priming	-0.248***	-0.307	0.126	-0.541**
	(0.096)	(0.262)	(0.141)	(0.195)
Ingroup	-0.028	-0.021	0.076	-0.043
	(0.129)	(0.131)	(0.088)	(0.069)
School×Ingroup	0.235	0.227	-0.150*	-0.031
	(0.170)	(0.173)	(0.074)	(0.082)
OtherCompetitive		-0.017		-0.088*
		(0.050)		(0.047)
School×OtherCompetitive		0.012		0.132**
		(0.056)		(0.052)
Observations	304	304	336	336
Log Pseudo L.	-119.688	-119.487	-135.301	-131.196
Pseudo R^2	0.349	0.350	0.359	0.378
	Likelihood of Always Defect (DD)			
	Asian Player 2		Caucasian Player 2	
	(5)	(6)	(7)	(8)
Belief{1 defects}	0.507***	0.521***	0.579***	0.568***
	(0.117)	(0.110)	(0.084)	(0.089)
School Priming	-0.236	0.682	0.199	0.746**
	(0.174)	(0.393)	(0.147)	(0.205)
Ingroup	0.066	0.108	-0.019	0.018
	(0.086)	(0.085)	(0.087)	(0.067)
School×Ingroup	0.021	-0.012	0.006	-0.008
	(0.099)	(0.104)	(0.110)	(0.094)
SelfCompetitive		0.157*		0.087**
		(0.090)		(0.043)
School×SelfCompetitive		-0.202*		-0.146*
		(0.117)		(0.078)
Observations	336	336	304	304
Log Pseudo L.	-167.919	-152.815	-160.854	-151.798
Pseudo R^2	0.225	0.294	0.214	0.259

Notes:

a. Coefficients are probability derivatives.

b. Robust standard errors in parentheses are clustered at the session level.

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

d. Game dummies are controlled for.

captures the treatment effects on intergroup preferences, a similar comparison of the coefficients of the Competitive stereotype variable with School×Competitive captures the treatment effects on stereotypes.

Result 7 (Stereotypes)**.** *In games 1-4, school priming weakly enhances the negative effect of competitiveness on cooperation for UM Asian player 2s, whereas it significantly alleviates the negative effect of competitiveness on cooperation for UCLA players.*

Support. *In specification (6) of Table 4, the coefficient for SelfCompetitive is positive but insignificant, while the coefficient for the interaction term School×SelfCompetitive is greater and significant at the 10% level, indicating a marginally significant enhancement of the self competitiveness stereotype on the likelihood of DD. In comparison, in Table 5, the coefficient of OtherCompetitive in specification (4) is negative and marginally significant, suggesting that the more competitive player 2's ethnic group is stereotyped to be, the less likely player 1 chooses to cooperate in the control. The interaction of this stereotype variable with the treatment dummy (School×OtherCompetitive) is positive and significant, suggesting that the school identity treatment counters the negative impact of OtherCompetitive on UCLA player 1's cooperation. Similarly, specifications (6) and (8) each report the positive effect of self competitiveness on DD among player 2s in the control, while the interaction of this stereotype variable with the school priming treatment (School×SelfCompetitive) produces negative and marginally significant coefficients, suggesting that the school identity treatment alleviates the negative impact of SelfCompetitive on UCLA player 2's cooperation.*

Result 7 provides some explanation of why UM and UCLA player 2s react in opposite directions under school priming. When we prime a common school identity, it has differential effects in the two universities. While it enhances the negative effects of the competitiveness stereotype on cooperation at UM, it alleviates such an effect at UCLA. An examination of the survey data confirms that UM Asian player 2s report significantly higher competitiveness in the school priming treatment than in the control sessions (6.25 versus 5.40, $p = 0.05$). The reason for this differential reaction might be traced to the reasons students choose each school. We code the responses to the priming question #5, "Why did you decide to choose your specific school?" into academic and non-academic reasons.[10] While 64% of UM Asian player 2s cite academic reasons, only 20% of UCLA Asian player 2s cite academic reasons. The difference is significant ($p = 0.044$, one-sided χ^2 test). Thus, we conclude that priming a common organization identity enhances the competitiveness of UM Asian player 2s, whereas such an effect is absent at UCLA.

The results in this section indicate that priming a common organization identity might have varying effects on the majority and minority population. Overall, Asians are more responsive to a common identity priming. However, the effect of priming depends crucially on the game structure. In the coordination game (game 0), where the potential risk of cooperation is low for player 1, priming a common identity promotes coordination and cooperation among UM Asians. However, in games with a unique Nash equilibrium (games 1-4), priming school identity enhances the negative effect of the competitiveness stereotype on the cooperation of UM Asians, but it alleviates such negative effects for UCLA Asians.

[10] Academic reasons include "good program," "reputation," and "high rank," while non-academic reasons include "location," "food" and "in-state tuition."

5 Discussions

As the workforce becomes increasingly diverse, organizations more 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.

Within the literature on identity priming, we have several new findings. First, Asians are more responsive to priming than Caucasians. Even in the control sessions, an ethnic cue, such as the last name of the other player, can produce significant ingroup favoritism among UM Asian students, most of whom are first-generation ethnic minorities. Furthermore, our treatments produce more significant effects among Asians. For example, priming ethnic identities significantly decreases outgroup cooperation among UM Asians compared to the control, while it has no effect among UM Caucasians. Lastly, priming a common (school) identity reduces group bias for UM Asians in the coordination game, resulting in a significant increase in both ingroup and outgroup cooperation. However, in games with a unique inefficient Nash equilibrium, the effects of priming a common identity are more complex. While priming alleviates the negative effects of the competitiveness stereotype on cooperation among UCLA Asians, it enhances such negative effects among UM Asians. This result uncovers the mechanisms underlying identity priming.

This paper suggests that, when interacting with others, first generation Asian immigrants are more likely to be influenced by intergroup preferences than are Caucasians. In addition, the findings suggest that their identities are malleable, which consequently influences their behavior. Since first generation ethnic minorities are more responsive to both fragmenting and common identity priming, our results offer new insights into socializing new immigrants.

Immigrants have become a substantial and increasing important segment of the labor force in the United States and many other parts of the world. In 2004, one in seven workers in the United States, i.e., more than 21 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, 40 percent come from Mexico and Central America, 25 percent from Asia, and the rest from the Western Hemisphere and Europe, more than 30 percent held bachelor's or more advanced degrees. Due to the native-born baby-boomers' exit from the labor force and the injection of these 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 – the change in the wage gap between immigrant and native-born workers (Borjas 1994, 1999) - has been extensively studied in labor economics, immigrants' social assimilation, especially at workplaces, has been significantly understudied.[11] 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 important policy implications for organizational management. For example, building employees' common identity in an organization may serve as a non-pecuniary mechanism to raise the cooperation and coordination level among employees in strategic environments and, consequently, increase the overall productivity of the organization. Organizations may also benefit from help-

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

ing their immigrant workers' social assimilation process and promoting social networking across ethnic lines, or between native-born and foreign-born workers within the organizations.

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

6 Appendix A: Pre-experiment Questionnaire

6.1 Control sessions

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

1. Name: _____ (UM only)
2. Age: _____ (UM: *Mean 23.3, Std Dev 4.3, Median 22, Min 19, Max 42*) (UCLA: *Mean 19.8, Std Dev 1.6, Median 19, Min 17, Max 24*)
3. Grade/Year:
   (a) Freshmen (UM: *0%*) (UCLA: *42.5%*)
   (b) Sophomore (UM: *0%*) (UCLA: *17.5%*)
   (c) Junior (UM: *17.5%*) (UCLA: *17.5%*)
   (d) Senior (UM: *30%*) (UCLA: *17.5%*)
   (e) $>$ 4 years (UM: *5%*) (UCLA: *2.5%*)
   (f) Graduate student (UM: *47.5%*) (UCLA: *2.5%*)
4. How often do you watch television?
   (a) every day (UM: *17.5%*) (UCLA: *20%*)
   (b) $4/5$ times a week (UM: *22.5%*) (UCLA: *15%*)
   (c) $2/3$ times a week (UM: *22.5%*) (UCLA: *32.5%*)
   (d) a few times a month (UM: *25%*) (UCLA: *17.5%*)
   (e) a few times a year (UM: *5%*) (UCLA: *5%*)
   (f) rarely if ever (UM: *5%*) (UCLA: *10%*)
   (g) Never (UM: *2.5%*) (UCLA: *0%*)
5. Do you have cable television?
   (a) yes (UM: *70%*) (UCLA: *67.5%*)
   (b) no (UM: *30%*) (UCLA: *32.5%*)
6. How often do you eat out?
   (a) every day (UM: *7.5%*) (UCLA: *2.5%*)
   (b) $4/5$ times a week (UM: *12.5%*) (UCLA: *2.5%*)
   (c) $2/3$ times a week (UM: *27.5%*) (UCLA: *42.5%*)
   (d) a few times a month (UM: *42.5%*) (UCLA: *45%*)
   (e) a few times a year (UM: *7.5%*) (UCLA: *5%*)
   (f) rarely if ever (UM: *0%*) (UCLA: *2.5%*)

(g) Never (UM: *2.5%*) (UCLA: *0%*)

7. How often do you attend movies?

   (a) every day (UM: *0%*) (UCLA: *0%*)

   (b) $4/5$ times a week (UM: *0%*) (UCLA: *0%*)

   (c) $2/3$ times a week (UM: *2.5%*) (UCLA: *2.5%*)

   (d) a few times a month (UM: *32.5%*) (UCLA: *15%*)

   (e) a few times a year (UM: *52.5%*) (UCLA: *70%*)

   (f) rarely if ever (UM: *7.5%*) (UCLA: *12.5%*)

   (g) Never (UM: *5%*) (UCLA: *0%*)

6.2 Ethnic Priming Treatment

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

1. Name: _____ (UM only)

2. Age: _____ (UM: *Mean 23.8, Std Dev 4.6, Median 22, Min 18, Max 40*) (UCLA: *Mean 20, Std Dev 1.4, Median 20, Min 18, Max 23*)

3. Grade/Year:

   (a) Freshmen (UM: *2.6%*) (UCLA: *27.5%*)

   (b) Sophomore (UM: *12.8%*) (UCLA: *30%*)

   (c) Junior (UM: *5.1%*) (UCLA: *25%*)

   (d) Senior (UM: *18%*) (UCLA: *12.5%*)

   (e) $>$ 4 years (UM: *10.3%*) (UCLA: *5%*)

   (f) Graduate student (UM: *51.3%*) (UCLA: *0%*)

4. Ethnicity:

   (a) African

   (b) Asian (UM: *48.7%*) (UCLA: *55%*)

   (c) European (UM: *51.3%*) (UCLA: *35%*)

   (d) Hispanic

   (e) Native

   (f) other (UCLA: *10%*)

   if it is other, please specify:_____

5. How many generations has your family lived in America?

(a) First Generation (UM: *48.7%*) (UCLA: *30%*)

(b) Second Generation (UM: *35.9%*) (UCLA: *30%*)

(c) More than Two Generations (UM: *15.4%*)(UCLA: *40%*)

6. From which countries did you family originate? _____

7. What languages do you speak? _____

8. Are you involved in any student organizations?

   (a) yes (UM: *46.2%*) (UCLA: *82.5%*)

   (b) no (UM: *53.9%*) (UCLA: *17.5%*)

   If yes, which ones? _____

6.3 School Priming Treatment

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

1. Name: _____ (UM only)

2. Age: _____ (UM: *Mean 22.2, Std Dev 3.0, Median 21, Min 18, Max 30*) (UCLA: *Mean 20.1, Std Dev 1.4, Median 20, Min 18, Max 24*)

3. Grade/Year:

   (a) Freshmen (UM: *0%*) (UCLA: *30%*)

   (b) Sophomore (UM: *18.9%*) (UCLA: *17.5%*)

   (c) Junior (UM: *10.8%*) (UCLA: *25%*)

   (d) Senior (UM: *35.1%*) (UCLA: *20%*)

   (e) $>$ 4 years (UM: *0%*) (UCLA: *2.5%*)

   (f) Graduate student (UM: *35.1%*) (UCLA: *5%*)

4. School: _____

5. Did you consider any other schools?

   (a) yes (UM: *62.2%*) (UCLA: *77.5%*)

   (b) no (UM: *37.8%*) (UCLA: *22.5%*)

   If yes, what other schools? _____

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

7 Appendix B: Experimental Instruction

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.

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.

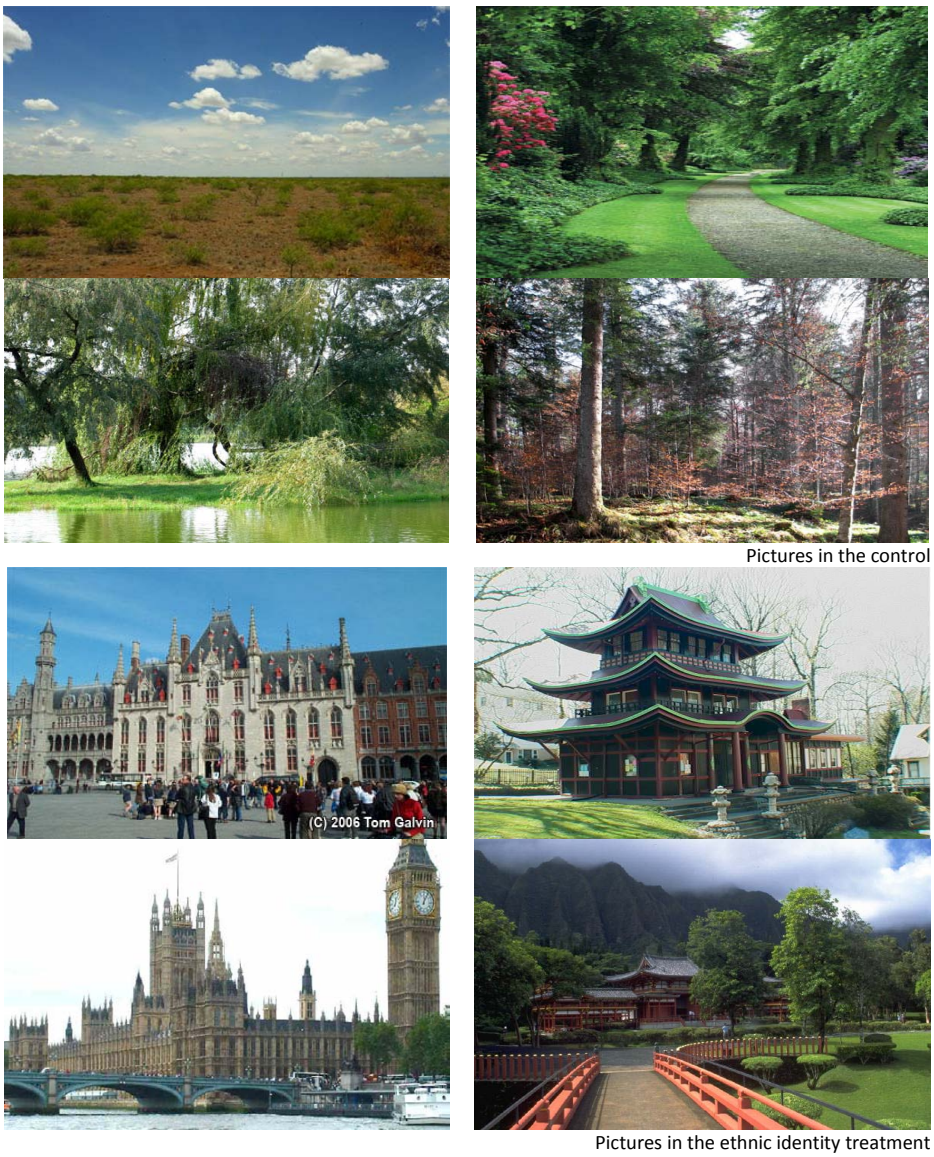
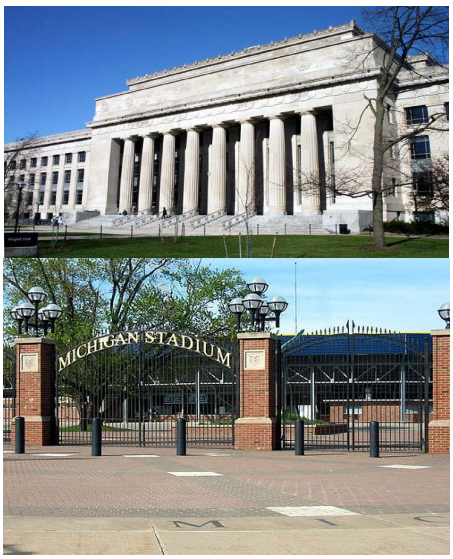
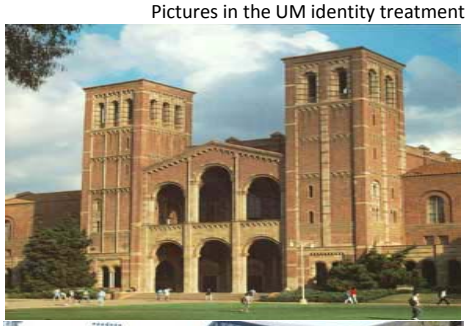


Figure 4: Priming Pictures: Control/Ethnic Priming



Pictures in the UM identity treatment



Pictures in the ULCA identity treatment

Figure 5: Priming Pictures: School Priming

8 Appendix C: Post-experiment Questionnaire

1. Please write five statements in answer to the question:“ Who am I?”
2. Gender
   (a) Male (UM: *43.1%*) (UCLA: *44.2%*)
   (b) Female (UM: *56.9%*) (UCLA: *55.8%*)
3. Ethnicity:
   (a) African (UM: *0.9%*) (UCLA: *0%*)
   (b) Asian (UM: *48.3%*) (UCLA: *50.8%*)
   (c) European (UM: *48.3%*) (UCLA: *35.8%*)
   (d) Hispanic (UM: *0%*) (UCLA: *0%*)
   (e) Native (UM: *1.7%*) (UCLA: *0%*)
   (f) other (UM: *0.9%*) (UCLA: *13.3%*)

   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 (UM: *Mean 5.1, Std Dev 1.4, Median 5, Min 1, Max 7*) (UCLA: *Mean 4.7, Std Dev 1.6, Median 5, Min 1, Max 7*)
   (b) Asian Americans are trustworthy (UM: *Mean 4.0, Std Dev 1.4, Median 4, Min 1, Max 7*) (UCLA: *Mean 4.1, Std Dev 1.4, Median 4, Min 1, Max 7*)
   (c) Asian Americans are cooperative (UM: *Mean 4.3, Std Dev 1.7, Median 4, Min 1, Max 7*) (UCLA: *Mean 4.3, Std Dev 1.5, Median 4, Min 1, Max 7*)
   (d) Asian Americans are naive (UM: *Mean 3.5, Std Dev 1.6, Median 3, Min 1, Max 7*) (UCLA: *Mean 3.8, Std Dev 1.6, Median 4, Min 1, Max 7*)
   (e) Asian Americans are sneaky (UM: *Mean 3.8, Std Dev 1.5, Median 4, Min 1, Max 7*) (UCLA: *Mean 3.9, Std Dev 1.6, Median 4, Min 1, Max 7*)
   (f) Asian Americans are competitive (UM: *Mean 5.9, Std Dev 1.4, Median 6, Min 1, Max 7*) (UCLA: *Mean 5.6, Std Dev 1.4, Median 6, Min 1, Max 7*)
   (g) European Americans are strategic (UM: *Mean 4.0, Std Dev 1.8, Median 4, Min 1, Max 7*) (UCLA: *Mean 5.0, Std Dev 1.6, Median 5, Min 1, Max 7*)
   (h) European Americans are trustworthy (UM: *Mean 4.2, Std Dev 1.6, Median 4, Min 1, Max 7*) (UCLA: *Mean 4.2, Std Dev 1.6, Median 4, Min 1, Max 7*)

(i) European Americans are cooperative (UM: *Mean 4.3, Std Dev 1.5, Median 4, Min 1, Max 7*) (UCLA: *Mean 4.4, Std Dev 1.5, Median 4, Min 1, Max 7*)

(j) European Americans are naive (UM: *Mean 3.4, Std Dev 1.6, Median 3.5, Min 1, Max 7*) (UCLA: *Mean 3.7, Std Dev 1.6, Median 4, Min 1, Max 7*)

(k) European Americans are sneaky (UM: *Mean 3.4, Std Dev 1.5, Median 4, Min 1, Max 7*) (UCLA: *Mean 4.0, Std Dev 1.6, Median 4, Min 1, Max 7*)

(l) European Americans are competitive (UM: *Mean 4.8, Std Dev 1.3, Median 5, Min 1, Max 7*) (UCLA: *Mean 5.2, Std Dev 1.6, 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 (UM: *3.5%*) (UCLA: *1.7%*)

   (b) Usually trusted (UM: *69.8%*) (UCLA: *68.3%*)

   (c) Usually not trusted (UM: *24.1%*) (UCLA: *25.8%*)

   (d) Always not trusted (UM: *2.6%*) (UCLA: *4.2%*)

8. How many siblings do you have: _____
   (UM: *Mean 1.3, Std Dev 1.3, Median 1, Min 0, Max 7*) (UCLA: *Mean 1.3, Std Dev 1.0, Median 1, Min 0, Max 6*)

9. How trusting are you?

   (a) Always trusting (UM: *16.4%*) (UCLA: *10%*)

   (b) Usually trusting (UM: *66.4%*) (UCLA: *65%*)

   (c) Usually not trusting (UM: *16.4%*) (UCLA: *25%*)

   (d) Always not trusting (UM: *0.9%*) (UCLA: *0%*)

10. There should be diversity programs to level the playing field for people from minority groups

    (a) Agree (UM: *73.3%*) (UCLA: *45%*)

    (b) Disagree (UM: *26.7%*) (UCLA: *55%*)

11. We should not allow special treatment based on race or gender. Merit should be the sole criteria

    (a) Agree (UM: *67.2%*) (UCLA: *79.2%*)

    (b) Disagree (UM: *32.8%*) (UCLA: *20.8%*)

12. Please write down the *Last *Name of your ten friends:

13. How strong is your University of Michigan (UCLA) school spirit?(UM: *Mean 5.3, Std Dev 1.8, Median 6, Min 1, Max 7*) (UCLA: *Mean 4.7, Std Dev 1.9, Median 5, Min 1, Max 7*)

14. During the experiment, how much did you pay attention to who your partner was? (UM: *Mean 3.0, Std Dev 2.0, Median 2, Min 1, Max 7*) (UCLA: *Mean 2.9, Std Dev 1.7, Median 3, Min 1, Max 7*)

15. During the experiment, I tried to maximize my own payoffs. (UM: *Mean 5.7, Std Dev 1.7, Median 6, Min 1, Max 7*) (UCLA: *Mean 5.5, Std Dev 1.6, Median 6, Min 1, Max 7*)

16. During the experiment, I tried to maximize joint payoffs. (UM: *Mean 3.7, Std Dev 1.9, Median 4, Min 1, Max 7*) (UCLA: *Mean 4.0, 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 (UM: *56.7%*) (UCLA: *68.3%*)

    (b) Disagree (UM: *20.0%*) (UCLA: *13.3%*)

    (c) Not applicable as I never chose A1(UM: *23.3%*) (UCLA: *18.3%*)

18. For player Bs, during the experiment, if player A chose A1 (the more generous option), I felt I needed to reciprocate

    (a) Agree (UM: *38.3%*) (UCLA: *40.0%*)

    (b) Disagree (UM: *53.3%*) (UCLA: *53.3%*)

    (c) Not applicable as A never chose A1(UM: *8.3%*) (UCLA: *6.7%*)

19. Do you know any participants in today's experiment

    (a) Yes (UM: *69.0%*) (UCLA: *19.2%*)

    (b) No (UM: *31.0%*) (UCLA: *80.8%*)

20. If so, please write down their last name: _____
    (UM only)

21. What do you think is the ethnicity of the person with this name? (UM only)

    (a) Chen

        i. Asian
        ii. European
        iii. Other
        if it is other, please specify: _____
        iv. I don't know

    (UM: *overall accuracy 91%; ingroup 85%; outgroup 97%.*)

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