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Cultural Variation in the Minimal Group Effect

Carl F. Falk[1], Steven J. Heine[2], and Kosuke Takemura[3]

Abstract

The minimal group effect (MGE) is one of the most robust psychological findings in studies of intergroup conflict, yet there is little evidence comparing its magnitude across cultures. Recent evidence suggests that the MGE is due in part to a projection of one's own perceived characteristics onto the novel in-group. Because of cultural variability in self-enhancement motivations, we thus expected that those from East Asian cultures would exhibit a diminished MGE relative to Westerners. A large and diverse sample of Japanese and American participants completed a traditional minimal group study. American participants were more likely to show an in-group bias in group identification, perceived group intelligence, perceived group personality traits, and resource allocation. Furthermore, these cultural differences were partially mediated by self-esteem. We discuss the implication of these findings for theories of intergroup conflict and suggest multiple directions for future cross-cultural research on the MGE.

Keywords

intergroup relations/prejudice, cultural psychology, group processes, social cognition

Having lost his immediate family due to the holocaust, Henri Tajfel set out to uncover the underlying psychological reasons that led to prejudice, discrimination, and intergroup conflict. Surprisingly, Tajfel (1970) found that conflict was possible between groups that had no history of preexisting stereotypes or prejudice. Even without meeting other group members, participants who are categorized into two separate groups via some random process or based on relatively trivial criteria tend to exhibit in-group identification, enhancement of the in-group's positive qualities, out-group derogation, and greater resource allocation toward in-group members (e.g., Brewer, 1979; Tajfel, Billig, Bundy, & Flament, 1971). This psychological phenomenon is known as the *minimal group effect* (MGE), and the experimental procedure to induce this effect has become one of the most widely used approaches to studying intergroup conflict.

Underlying many explanations for the MGE is the assumption that humans are motivated to self-enhance. For instance, self-categorization theory (SCT) and social identity theory (SIT) are often used to explain the MGE (Tajfel & Turner, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Stated succinctly, SCT states that humans have a natural tendency to form

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social boundaries that define different social categories or groups as this helps organize the social world. SIT posits that individuals' self-concept overlaps with the social groups to which they belong. Qualities from the group are therefore assimilated into the self-concept. Based on the assumption that individuals are motivated to self-enhance (Tajfel & Turner, 1986), individuals are then also motivated to enhance their social identities (i.e., in-group) and engage in comparisons among social groups. Some formulations of SIT have claimed that (a) out-group derogation enhances self-esteem and (b) low/threatened self-esteem individuals are motivated to engage in intergroup discrimination (e.g., Abrams & Hogg, 1988, cf. Turner & Reynolds, 2001).

In slight contrast to SCT and SIT, an emerging body of evidence illuminates recent theory about how self-enhancement is thought to underlie the MGE (Cadinu & Rothbart, 1996; Gawronski, Bodenhausen, & Becker, 2007; Gramzow & Gaertner, 2005; Gramzow, Gaertner, & Sedikides, 2001; Krueger, 1998; Otten, 2002; Otten & Wentura, 2001). This position focuses on individual-level (rather than group-level) processes and is summarized by Gramzow and Gaertner (2005): "We propose that, once a novel group is linked to the self, the perceiver's self-evaluation is extended automatically to this new in-group. Persons with favorable self-concepts, therefore, should spontaneously generate favorable in-group evaluations" (p. 802). Thus, mere association with a novel group is sufficient to establish a connection between the self and the group. In the absence of additional information about novel groups, the self is often automatically used as an anchor or source of information (Krueger, 1998). That is, individuals project their own attributes and self-feelings onto a newly formed in-group. This position is consistent with evidence that global self-esteem is positively related to tendencies to display in-group biases (Aberson, Healy, & Romero, 2000; Rubin & Hewstone, 1998). Additional experimental work has established that positive affective associations and trait inferences tend to automatically occur for the in-group (Otten & Moskowitz, 2000; Otten & Wentura, 1999), and that projection of the self onto the in-group (instead of the opposite direction) is likely responsible for in-group biases (Cadinu & Rothbart, 1996; Otten & Epstude, 2006).

Insofar as the MGE is (at least in part) a product of self-enhancement motivations, we may question its robustness across cultures. Specifically, a tendency to self-enhance appears to be more pronounced among North Americans than East Asians. A substantial body of evidence suggests that individuals from East Asian cultural backgrounds tend to self-enhance less than those from Western cultural backgrounds (Heine, Lehman, Markus, & Kitayama, 1999). A meta-analysis found that the Westerners self-enhanced significantly more than East Asians for 30 of 31 different methods, and that the average effect size of this cultural difference was large (d = .84; Heine & Hamamura, 2007). These cultural differences remain controversial, and a number of alternative explanations have been proposed (e.g., Brown & Kobayashi, 2002; Sedikides, Gaertner, & Vevea, 2005; Yamaguchi et al., 2007), although the evidence in support of each of these explanations has been challenged (see Falk & Heine, 2012; Heine, 2003; Heine, Kitayama, & Hamamura, 2007; Heine et al., 1999). While there are several different psychological mechanisms that have been associated with cultural variability in self-enhancement (for a review, see Heine & Buchtel, 2009), the most discussed theoretical explanation is that maintenance of face and social relationships among East Asians takes precedence over the pursuit of high self-esteem (Heine et al., 1999). Therefore, we hypothesized that East Asians would display a reduced MGE in comparison with Westerners and that this cultural difference would be due to East Asians' less positive self-views.

One source of evidence consistent with this hypothesis is that East Asians tend to evaluate the groups that they belong to less positively than do North Americans. For example, East Asians evaluate their family members (Heine & Lehman, 1997), social groups (Crocker, Luhtanen, Blaine, & Broadnax, 1994), universities (Snibbe, Kitayama, Markus, & Suzuki, 2003), gender (Bond, Hewstone, Wan, & Chiu, 1985), romantic partners (Endo, Heine, & Lehman, 2000), countries (Rose, 1985), and children's school performance (Stevenson & Stigler, 1992) less positively than do North Americans. Two exceptions to this pattern are that no cultural differences

were found in group-serving biases in evaluations of friends (Brown & Kobayashi, 2002), or in evaluations of the quality of relationships with their families and friends (Endo et al., 2000). However, evaluating one's groups positively does not necessarily indicate self-enhancing motivations, as people may choose to form relationships with desirable others, and they may form positive evaluations as a result of the experiences that they shared with others. A cross-cultural comparison of minimal groups rules out the possibility of these other factors affecting how positively people evaluate their groups.

Although the MGE is widely studied, direct cross-cultural comparisons of its magnitude are relatively sparse. Wetherell (1982) found that Polynesian children exhibited a diminished MGE relative to children with a European background. Across multiple studies, several moderators of the MGE have been found among Japanese, and a reduced or absent MGE has been found under some experimental conditions (Yamagishi, Jin, & Kiyonari, 1999; Yamagishi & Mifune, 2008). New Zealanders also have been found to have stronger in-group biases than Japanese regarding expected cooperation in a prisoner's dilemma game (Yamagishi, Mifune, Liu, & Pauling, 2008). Among Japanese, Chinese, Korean, and American business and economics students, Buchan, Johnson, and Croson (2006) found differences only between Chinese and Americans though in a direction we would expect—Chinese students did not display an MGE whereas Americans did. This cultural difference was explained by cultural variability in the tendency to maximize in-group versus individual gains and to think that the teams were in cooperation (vs. competition).

While this initial research is promising, these studies did not allow for a strict cross-cultural test of the magnitude of the MGE. For instance, most research by Yamagishi and colleagues (Yamagishi et al., 1999; Yamagishi & Mifune, 2008) lacked a Western comparison group, thereby precluding a comparison of the magnitude of the effect across cultures. In addition, both Wetherell (1982) and Buchan et al. (2006) used group induction procedures that deviated from the typical minimal group paradigm. Specifically, groups in Wetherell's (1982) study were formed from children who knew each other, and participants in Buchan et al.'s (2006) study met their in-group members and had lengthy discussions prior to making resource allocation decisions; it seems likely that meeting other group members could activate additional fairness norms or reputational concerns that differ across cultures but are typically absent from the traditional minimal group paradigm. This may be especially the case considering that the main dependent measures for all but one of the studies mentioned earlier (Yamagishi et al., 1999; Study 2) included resource allocation or a game where an economic outcome was at stake (e.g., dictator's game, prisoner's dilemma). It therefore remains unexplored whether the MGE as it is traditionally studied varies across cultures, whether this holds for other types of dependent measures (e.g., perception of in-group vs. out-group characteristics), and whether cultural variability in self-enhancement plays any role in the effect.

The present research was designed to test cultural variability in the MGE across a variety of dependent measures and whether cultural variability in self-enhancement is a plausible explanation for any cultural differences. Toward this end, a diverse sample of Japanese and American participants completed an online study that induced minimal groups and measured in-group biases in group identification, perceived intelligence, group personality characteristics, and resource allocation. We expected that Americans would exhibit greater in-group biases than Japanese on all of these measures and that self-esteem would mediate the cultural differences.

Method

Participants

Our sampling strategy was to obtain a large and diverse sample from the general population of the United States and Japan. Three hundred and forty-six Japanese participants were recruited by Cross Marketing, Inc., a Japanese marketing research firm, and received between 100 and 150

JPY. Seven hundred and ten individuals from the United States participated via Amazon's Mechanical Turk (e.g., see Buhrmester, Kwang, & Gosling, 2011) in exchange for $.50; 601 of these participants reported being born in the United States or Canada and were selected for inclusion. To ensure data quality, 22 Japanese and 7 American participants failed manipulation checks regarding which group they were assigned to and were excluded from analyses, yielding a final sample of 324 Japanese and 594 Americans. All participants from Japan reported being born in Japan and of Japanese ethnicity. The American sample described their ethnicity as mostly White/European (80.71%), followed by Black (6.77%), Asian/Pacific Islander (4.74%), Hispanic (3.05%), mixed ethnicity (2.71%), Native American (1.35%), and Middle Eastern (0.68%).

Overall, both samples had a wide range of ages, education levels, and socioeconomic status (SES). Both Americans ($M = 33.63$, $SD = 12.38$, range = 18-88) and Japanese ($M = 32.93$, $SD = 7.82$, range = 19-45) had approximately the same average age, $t(913) = .92$, $p = .36$. However, the Americans had a greater proportion of females (61.19%) than the Japanese (52.16%), $\chi^2(1) = 6.63$, $p = .01$.[1] SES was measured on a 9-point scale in which participants indicated whether they felt they were closer to the *top* (9) or the *bottom* (1) relative to other people in the society of their country (Cantril, 1965). Both cultural groups spanned the entire range of SES allowed by the rating scale and reported being close to the midpoint (5) on average, but Japanese ($M = 5.40$, $SD = 1.62$) reported slightly higher perceived SES than the Americans ($M = 5.16$, $SD = 1.61$), $t(914) = -2.13$, $p = .03$. The cultural groups also differed in the highest level of education they had attained, $\chi^2(4) = 113.74$, $p < .001$: high school or less (Japanese: 23.15%; Americans: 10.34%), some university, technical, or vocational training (Japanese: 8.95%, Americans: 34.41%), 2- to 4-year university or technical degree (Japanese: 56.48%; Americans: 34.92%), some graduate school (Japanese: 0.93%; Americans: 5.59%), and advanced/graduate degree (Japanese: 10.49%; Americans: 14.75%).

Procedure

All American participants completed the study in English whereas Japanese participants completed the study in Japanese. All materials were translated into Japanese by a Japanese researcher and were independently checked for accuracy by two bilingual research assistants.

Participants completed this study via the Internet in a questionnaire format. At the outset, participants read, "For part of this study, we are going to test whether people with different artistic preferences have any differences in other domains," and then indicated their preference for one of two abstract art pictures (both by Wassily Kandinsky). Participants who chose the picture with green overtones (*Improvisation 7*) were assigned to the "Green team" and those who chose the picture with blue overtones (*Yellow, Red, Blue*) were assigned to the "Blue team." This procedure is similar to the widely used art preference task initially used by Tajfel et al. (1971). To establish some semblance of connection between the participant and their in-group, we informed them that there are "likely similarities between you and the other participants on your team" and "it could be that there are real thinking style differences among the teams." Although participants were informed that they would be asked to complete items from popular intelligence tests and personality scales, there was no explicit mention of competition among the two groups.

Next, participants completed measures in the following order: (a) in-group versus out-group identification, (b) ratings of whether certain personality traits were characteristic of each group, (c) expected cognitive performance on the intelligence tasks for each group, (d) self-esteem, (e) perceived desirability of the personality traits in (b) above, (f) in-group versus out-group resource allocation, (g) manipulation check, (h) demographic information, and (i) two items from Raven's Progressive Matrices intelligence test.[2]

Measures

Group identification. Participants completed a 6-item measure of identification with the in-group (3 items; α = .93, for Japanese; α = .94, for Americans) and out-group (3 items; α = .96, for Japanese; α = .93, for Americans). These items were adapted from an 18-item measure previously utilized in research on the MGE (e.g., Greive & Hogg, 1999; Yamagishi & Mifune, 2008). Example items include "How much do you identify with the BLUE group?" and "To what extent do you feel strong ties with the BLUE group?" They were rated on a Likert scale from 1 (*not very much*) to 7 (*very much*).

Group personality traits. Using a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*), participants were asked, to "indicate your perception of the characteristics of the BLUE and GREEN team members, NOT including yourself," for each of five personality traits (friendly, rude, hard-working, considerate, and lazy). Participants rated the in-group and out-group for each trait (e.g., "Members of the BLUE team are friendly"). We chose these traits to measure positive and negative characteristics that might be important for maintaining interdependent relationships. Similar measures have been used in previous research using personality traits to assess self-enhancement and group enhancement across cultures (e.g., Falk, Heine, Yuki, & Takemura, 2009; Heine & Lehman, 1997), and in research on the MGE (Brewer, 1979). To control for idiographic perceptions of the positivity of each trait, in a separate section of the study participants rated the social desirability of each trait on a 7-point Likert scale.

Group intelligence. Participants read a brief description of intelligence test items they expected to complete: "Using a multiple-choice format, this task asks participants to identify which item is missing from a matrix of items. Good performance on this task requires high intelligence and good logical reasoning." Four items then asked participants to estimate each group's performance on the test: "What percentage of members on the BLUE[GREEN] team will complete the items in this task correctly?" and "What percentage of members on the BLUE[GREEN] team will make errors on the items in this task?" (reverse coded). These items were rated on a 10-point scale with each anchor representing a 10% range (0%-9%, 10%-19%, etc.) and were combined separately for the in-group (α = .50, for Japanese; α = .57, for Americans) and the out-group (α = .50, for Japanese; α = .59, for Americans).

Resource allocation. Participants were told to imagine that they were eligible for "a monetary bonus," and that they would not decide their own bonus, but instead "you will decide the bonus that other participants will receive." Participants were then asked to pick one of seven allocations of payment. The response options were drawn from the multiple alternative matrices (Bornstein et al., 1983) and included three allocation strategies that favored the in-group, three that favored the out-group, and one in which allocation was equal for each group. Americans saw response options in cents whereas Japanese saw these options in Japanese yen (Table 1). This measure has been utilized in previous research on the MGE, and presenting the allocation in terms of a "bonus" payment produces more intergroup discrimination (Gaertner & Insko, 2001).

Self-esteem. Self-esteem was measured using the single-item self-esteem scale ("I have high self-esteem"; Robins, Hendin, & Trzesniewski, 2001) rated on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*).[3]

Manipulation check. Two true/false manipulation check questions asked participants regarding group membership: "I am a member of the BLUE[GREEN] team." An additional true/false question asked participants whether the teams were competing with one another.

Table 1. Response Options and Actual Within-Culture Response Proportions for Japanese and Americans on the Resource Allocation Measure.

	A	B	C	D	E	F	G
Japanese response options							
Blue team (¥)	38	45	47	34	29	42	22
Green team (¥)	42	35	28	34	47	22	42
American response options							
Blue team (US$)	0.38	0.45	0.47	0.34	0.29	0.42	0.22
Green team (US$)	0.42	0.35	0.28	0.34	0.47	0.22	0.42
Within-culture response proportions							
Americans	*.03*	**.18**	**.27**	.49	*.01*	**.03**	*.002*
Japanese	*.08*	**.10**	**.06**	.64	*.07*	**.02**	*.02*

Note. Participants' in-group responses always appeared on the top row of possible response options. For actual response proportions, in-group-favoring strategies are in bold; out-group-favoring strategies are in italics.

Results

Preliminary Analyses

Overall, there was a preference for the blue picture (63.29%) versus the green picture (36.71%), $\chi^2(1) = 64.85$, $p < .001$, and participants had a tendency to think that the teams were engaged in competition (58.28%), $\chi^2(1) = 25.03$, $p < .001$. Cultural variability was observed in picture preferences, $\chi^2(1) = 15.59$, $p < .001$, such that the blue picture preference was driven by the Americans (68.01%, blue picture preference), $\chi^2(1) = 77.10$, $p < .001$, but the preference was only marginally significant for Japanese (54.63%, blue picture preference), $\chi^2(1) = 2.78$, $p = .10$. A marginally significant cultural difference was observed in the tendency to think that the groups were engaged in competition, $\chi^2(1) = 3.01$, $p = .08$, such that Americans were more likely to think that the teams were engaged in competition (60.48%), $\chi^2(1) = 25.77$, $p < .001$, than the Japanese (54.32%), $\chi^2(1) = 2.42$, $p = .12$.

In addition to cultural variability in picture preferences and the tendency to view the teams in competition, we previously noted several demographic variables that differed across cultures (i.e., gender, SES, and education level). Thus, there are five possible covariates that could be justifiable to include in all analyses. However, all effects that are of interest are in the same direction as that reported below, and all cultural differences in the MGE remain significant. Therefore, to simplify presentation of results, in the following text we report results without these covariates and explicitly note any cases among our main analyses in which the significance level crossed the conventional $\alpha = .05$ boundary when the covariates were included.

Minimal Group Effects

Our guiding hypothesis was that Japanese participants would display less of an in-group bias than American participants. Note that in all analyses, culture was coded as a dummy variable with Japanese as the reference group (i.e., Japanese = 0; American = 1).

Group identification. A relative in-group identification preference measure was obtained by subtracting out-group identification from in-group identification; positive scores thus indicated an in-group bias. We found a significant cultural difference in group identification, $b = .86$, $t(916) = 7.92$, $p < .001$, $d = .56$, such that both Americans and Japanese displayed relative in-group identification versus the out-group, but this preference was more pronounced for Americans ($M = 1.57$,

SD = 1.67), $t(593) = 22.88$, $p < .001$, $d = .94$, than for Japanese ($M = .70$, $SD = 1.40$), $t(323) = 9.08$, $p < .001$, $d = .50$.

Group intelligence. A composite of in-group bias was formed in the same manner as group identification scores. A significant cultural difference in in-group bias in perceived intelligence emerged, $b = 1.15$, $t(916) = 7.00$, $p < .001$, $d = .51$. While Americans thought other in-group members would perform better than out-group members on intelligence test items ($M = 1.14$, $SD = 2.58$), $t(593) = 10.82$, $p < .001$, $d = .44$, Japanese displayed an opposite nonsignificant pattern ($M = -.01$, $SD = 1.97$), $t(323) = -.06$, $p = .96$, $d = -.003$.

Group personality traits. To control for idiographic differences in how participants perceived the desirability of each personality trait, a multilevel modeling approach was utilized for analysis of perceived group differences in personality traits. The following model was fit using R's lme4 package (Bates, Maechler, & Bolker, 2011; R Development Core Team, 2011):

Level 1 equation:

$$Y_{ij} = \beta_{0i} + \beta_{1i} Desire_{ij} + \beta_{2i} Group_{ij} + \beta_{3i} Desire_{ij} Group_{ij} + r_{ij}.$$

Level 2 equations:

$$\begin{aligned}
\beta_{0i} &= \beta_{00} + \beta_{01} Culture_i + \beta_{02} DesireMean_i + u_{0i} \\
\beta_{1i} &= \beta_{10} + \beta_{11} Culture_i + \beta_{12} DesireMean_i + u_{1i} \\
\beta_{2i} &= \beta_{20} + \beta_{21} Culture_i + \beta_{22} DesireMean_i + u_{2i} \\
\beta_{3i} &= \beta_{30} + \beta_{31} Culture_i + \beta_{32} DesireMean_i + u_{3i}.
\end{aligned}$$

Y_{ij} represents person i's endorsement of personality trait j. At Level 1, this was predicted by idiographic perceptions of trait desirability (Desire; centered within person), a dummy code indicating whether the endorsement was made for the in-group or out-group (Group; Out-group = 0; In-group = 1), and the interaction of trait desirability and group membership. Level 2 equations contained a dummy code for Culture (Japanese = 0; Americans = 1) and each individual's mean trait desirability ratings (DesireMean; grand mean centered). This modeling strategy is consistent with recommendations when a cross-level interaction is the primary effect of interest (e.g., Enders & Tofighi, 2007; Kreft, de Leeuw, & Aiken, 1995). In addition, random effects were estimated for each Level 1 effect (u_{0i} through u_{3i}).

Conceptually, a positive trait desirability–endorsement relationship within each person indicates endorsement of traits that were viewed as socially desirable. The coefficient for the Desire × Group interaction indicates whether this strength of relationship is stronger for the in-group versus the out-group, with a positive coefficient indicating that the in-group was attributed more desirable traits than the out-group. Of primary interest is a cross-level interaction, β_{31}, which indicates whether there are cultural differences in the Desire × Group interaction.

Results indicated that the expected Culture × Desire × Group cross-level interaction was significant, $b = .11$, $z = 6.21$, $p < .001$ (see also Table 2). Although both cultural groups exhibited a significant in-group bias as indicated by Desire × Group interactions, this effect was stronger for Americans, $b = .15$, $z = 17.51$, $p < .001$, than for Japanese, $b = .04$, $z = 2.75$, $p < .01$. Finally, a positive desirability–rating relationship was observed for both cultural groups in rating both the in-group and out-group (ps < .001; see Figure 1).

Resource allocation. To simplify the presentation of resource allocation results, the seven allocation strategies were recoded as an ordered categorical variable with three possible responses:

Table 2. Fixed Effect Estimates for Personality Trait Analyses.

Fixed effect	Coefficient	*SE*	*z*
Intercept			
Intercept, β_{00}	3.41	0.04	80.96****
Culture, β_{01}	0.53	0.05	9.89****
DesireMean, β_{02}	0.16	0.06	2.55***
Desire slope			
Intercept, β_{10}	0.09	0.02	5.31****
Culture, β_{11}	0.04	0.02	1.79*
DesireMean, β_{12}	0.06	0.03	2.05**
Group			
Intercept, β_{20}	0.02	0.03	0.74
Culture, β_{21}	0.08	0.36	2.30**
DesireMean, β_{22}	0.01	0.04	0.32
Group × Desire			
Intercept, β_{30}	0.04	0.01	2.75***
Culture, β_{31}	**0.11**	**0.02**	**6.21****
DesireMean, β_{32}	−0.01	0.02	−0.31

Note. The cross-level interaction indicating the cultural variability in the minimal group effect is in bold.
*$p \leq .10$. **$p \leq .05$. ***$p \leq .01$. ****$p \leq .001$.

(a) allocation favoring the out-group, (b) equal distribution among groups, and (c) allocation favoring the in-group. An ordered logistic regression indicated that culture was a significant predictor of resource allocation such that Americans chose more in-group favoring strategies than did Japanese, $b = 1.43$, $z = 9.52$, $p < .001$ (see Table 1). Interestingly, while Americans displayed an in-group bias in resource allocation, $\chi^2(1) = 263.52$, $p < .001$, this bias was absent for Japanese, $\chi^2(1) = .31$, $p = .58$.

Mediation Analysis

The aforementioned results established that Americans (vs. Japanese) had a greater in-group bias for group identification, perceived intelligence, personality traits, and resource allocation. To establish evidence consistent with self-esteem mediating these cultural differences, we expected that (a) Americans would be significantly higher on self-esteem than Japanese (Path A), and (b) self-esteem would positively predict in-group bias (Path B) above and beyond the effect of culture. The observation of significant effects for both of these steps is sufficient to establish evidence for mediation (e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In addition, *p* values for each indirect effect (Path A × Path B) were estimated using the partial posterior method (Biesanz, Falk, & Savalei, 2010; see Table 3).

Consistent with previous research, cultural differences were present in self-esteem, $b = 1.51$, $t(916) = 14.97$, $p < .001$, $d = 1.04$, such that Americans ($M = 5.00$, $SD = 1.46$) reported much higher self-esteem than their Japanese counterparts ($M = 3.49$, $SD = 1.44$). The next step in testing our hypotheses regarding mediation was to add self-esteem as a predictor (in addition to culture) in all models presented in the previous section. In the case of personality trait endorsement, self-esteem was added as a predictor to all Level 2 equations (see Krull & MacKinnon, 2001). The results of these analyses indicated that self-esteem was a significant positive predictor of in-group bias in identification, $b = .12$, $t(915) = 3.45$, $p < .001$, expected performance on intelligence test items, $b = .12$, $t(915) = 2.23$, $p = .03$, personality trait endorsement, $b = .02$, $z = 3.30$,

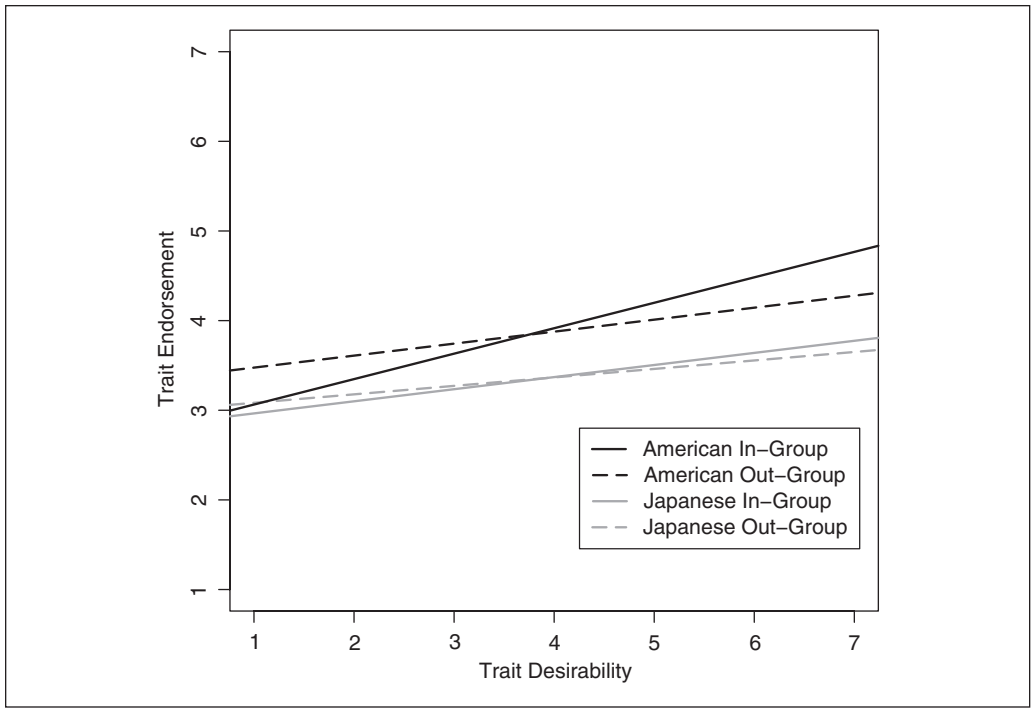

Figure 1. Trait desirability–endorsement slopes for Americans and Japanese for both the in-group and out-group.

Table 3. Mediation Analyses Results for Culture → Self-Esteem → In-Group Bias.

In-group bias	Indirect effect[a]	*p*	Effect of culture[b] (standard error)	*p*
Identification	.19	<.001	.68 (.12)	<.001
Intelligence	.18	.03	.97 (.18)	<.001
Personality traits	.02	<.001	.09 (.02)	<.001
Resource allocation	.13	.06	1.31 (.16)	<.001

[a]The indirect effect is the product of Paths A and B. Its associated *p* value is the statistical test for mediation (Biesanz et al., 2010).
[b]The effect of culture is the cultural difference in in-group bias remaining after controlling for self-esteem.

$p < .001$, and was a marginally significant predictor of more in-group favoring resource allocation strategies, $b = .08$, $z = 1.86$, $p = .06$.[4] In all cases, the effects of culture on all in-group bias measures were reduced, but remained significant (see Table 3). Thus, evidence consistent with partial mediation was established for all in-group biases.

Supplementary Analyses[5]

Self-esteem × Culture. Our approach to mediation analysis is parsimonious in that it assumes that the effects of self-esteem on the MGE are approximately the same for each cultural group. However, if self-esteem is less important in East Asian cultures, we might expect it to be less related to the MGE. To test this possibility, we added a Culture × Self-esteem interaction term to each

model in the previous section. The interaction was marginally significant for group identification, $b = .14$, $t(914) = 1.86$, $p = .06$, such that self-esteem was a positive predictor of group identification for both cultural groups—significant for Americans, $b = .17$, $t(914) = 3.89$, $p < .001$, but not for Japanese, $b = .03$, $t(914) = .53$, $p = .60$. In all other cases, interaction terms indicated that the effect of self-esteem in predicting MGEs was *not* different across cultures ($ps \geq .22$). These results indicate that our parsimonious approach is preferred.[6]

Competition. Although initially intended only for checking whether both cultural groups perceived similar levels of intergroup competition, we performed additional analyses with perceived competition as it differed across cultures, and theoretically plays an important role in the MGE (e.g., Brewer, 1979; Buchan et al., 2006). If considered simultaneously with self-esteem and culture, perceived competition was a significant predictor of in-group bias in identification, $b = .33$, $t(907) = 3.15$, $p < .01$, expected intelligence test performance, $b = .34$, $t(907) = 2.14$, $p = .03$, personality trait endorsement, $b = .05$, $z = 3.57$, $p < .001$, and in-group favoring resource allocation, $b = .46$, $z = 3.43$, $p < .001$, and was a significant mediator of cultural differences in identification ($p = .05$), personality trait endorsement ($p = .05$), and resource allocation ($p = .05$), and a marginally significant mediator of perceived intelligence ($p = .07$). In these analyses, self-esteem remained a significant mediator of identification ($p < .001$), intelligence ($p = .02$), and personality traits ($p = .001$), and a marginally significant mediator of resource allocation ($p = .08$). Cultural differences in the MGE remained even after controlling for competition and self-esteem (all $ps < .001$). The results with competition replicate those by Buchan et al. (2006) and provide evidence for multiple mediators (perceived competition and self-esteem).

Discussion

The results of this study provide evidence of cultural variability on a variety of in-group bias measures under the minimal group paradigm. Americans displayed a stronger pattern of in-group biases on all measures than did Japanese. For perceived intelligence and resource allocation, an in-group bias for Japanese was absent. Importantly, our mediational findings provide support that these cultural differences were due, at least in part, to cultural differences in self-esteem. Americans reported higher self-esteem than Japanese, and higher self-esteem individuals tended to display greater degrees of in-group bias on all outcomes. Our results are therefore consistent with both previous research on the existence of cultural variability in self-enhancement (Heine & Hamamura, 2007), and research suggesting that the MGE may be partly due to a projection of self-feelings and attributes onto the in-group (Gramzow & Gaertner, 2005).

Importantly, we have both identified cultural variability in a psychological phenomenon, and taken the next step in providing some explanatory evidence for its variability. Impressively, partial mediation of MGE was observed even though self-esteem was measured by a single item—meaning the role of self-esteem may be underestimated due to low reliability, and also leaves room for some individual/cultural variation in interpreting the term "self-esteem" (Heine et al., 1999; Schmitt & Allik, 2005). Nonetheless, we observed comparable relations between this self-esteem measure and three of the four MGE variables within both cultures, which suggests that people in the two cultures were not interpreting self-esteem in substantially different ways. Based on the current set of results, it is reasonable to expect that other cultures who exhibit lower levels of self-enhancement than Westerners may also exhibit a reduced MGE (e.g., Mexican Americans; Tropp & Wright, 2003; Chileans; Heine & Raineri, 2009; and Native Americans; Fryberg & Markus, 2003). Careful selection of a third group that also differs on some other important psychological dimension may illuminate the strength of self-enhancement motivations in MGE and help to identify other processes that can be responsible for cross-cultural variation.

While our theoretical position is that self-esteem is an important component of cultural variability in the MGE, other psychological processes may also be involved. Although not part of our initial hypothesis, perceived competition among the in-group and out-group was also a significant mediating variable, which is consistent with previous findings (Buchan et al., 2006). As study materials were held constant across cultures and no explicit mention of competition was made, the most likely explanation for this finding is a tendency for Westerners to focus more on intergroup competition and East Asians to focus more on intragroup cooperation and relationship harmony (Takemura, Yuki, & Ohtsubo, 2010). Importantly, we found that self-esteem was still a significant mediator alongside perceived competition.

As additional cultural variation in the MGE was observed above and beyond self-esteem and perceived competition, other processes are also likely involved, some of which may constitute a cultural bias in the minimal group paradigm or our implementation of it. For instance, Brewer and Yuki (2007) argue that minimal group paradigms are successful in activating individuals' "collective self," which constitutes abstract social group representations such as "nation" or "university" in which many individuals may never meet each other. While such kind of social identities may be important for Westerners, the "relational self" that is defined by one's social ties in a network of relationships is arguably a more important social identity representation for East Asians (Brewer & Yuki, 2007; Yuki, 2003). Thus, it is possible that minimal group paradigms do not activate a social identity that would lead East Asians to identify with their in-group. Similarly, East Asians may be less likely to trust novel individuals (Yamagishi & Yamagishi, 1994) and perceive there to be few opportunities to form new relationships or change social groups in their current society (Falk et al., 2009; Yuki et al., 2007), and thus may be hesitant to identify with a novel in-group. These theories, however, speak most directly to the group identification aspect of the minimal group paradigm. For these other accounts to explain all of our results, we would expect that cultural variability in group identification would be able to nearly fully explain cultural differences in in-group biases for resource allocation, personality trait attributions, and perceived intelligence. Although the study was not specifically designed for this purpose, controlling for in-group bias in identification still results in significant cultural differences on all other in-group bias measures.[7]

We also chose a standard minimal group induction procedure based on actual art preferences for practical reasons (e.g., avoiding deception and providing a basis for group differences) that was close to that used extensively in previous research (Tajfel et al., 1971). Although use of the same abstract art stimuli in each culture ensured standardization, it is possible that art preferences are viewed as more important or indicative of personality among Westerners than they are among East Asians. While there have been some studies indicating different esthetic preferences across cultures (e.g., Masuda, Gonzalez, Kwan, & Nisbett, 2008), to our knowledge we are unaware of any research that supports this alternative explanation. Given the other mediational effects observed, we think it is more parsimonious to conclude that self-esteem and perceived competition are more central explanations.

A variety of other processes and moderators of the MGE or in-group biases have also been observed in the literature, including the degree of uncertainty participants feel (Greive & Hogg, 1999), whether participants feel like active participants of their in-group or more like observers (Aberson et al., 2000; Brown, Collins, & Schmidt, 1988), whether self or group identities are most salient (Verkuyten & Hagendoorn, 2002), and the subjective positivity or negativity of the characteristics of some traits (Mummendy, Otten, Berger, & Kessler, 2000). We have little theoretical basis for judging whether some of these processes may be operating at different degrees across cultures and their study represents an area ripe for future research.

While our results in comparing Japanese and American's perception of a novel in-group is consistent with previous findings in actual groups (see Heine, 2003, and our introduction), our findings should be taken to reflect on individual-level psychological processes rather than

group-level processes. There are two reasons for this. First, the theory underlying how individuals project their self-image onto novel in-groups is focused on individual-level processes (Gramzow & Gaertner, 2005). Second, participants rated "other members" more generally, did not interact with other group members, and knowledge of other group members did not stretch beyond knowing their art preferences. Thus, other group-level processes that are more relevant for less minimal or real-world groups (e.g., Brown, 2000) remain to be investigated across cultures.

Because our study was designed to investigate cross-cultural differences rather than the absolute existence of the MGE, evidence for the universality of the effect was mixed. Japanese displayed an in-group bias on some, but not all measures, and we did not investigate whether minimal group biases have any functional purpose across cultures (see Norenzayan & Heine, 2005). We speculate that the discrepancy among dependent measures arose because each measure may be influenced to different degrees by the various processes involved in the MGE. For example, it is not uncommon for the MGE to be more pronounced for some measures than for others (e.g., Brewer, 1979; Mummendy & Otten, 1998). Our results among Japanese are consistent with previous research finding in-group biases in the evaluation of personality traits, but not in resource allocation under similar experimental conditions (Yamagishi et al., 1999). It has been suggested that a bias in group evaluations or identification can occur simply due to categorizing oneself in a group, but feeling as though individuals mutually influence each other and their success is important for a resource allocation bias to arise (Yamagishi et al., 1999). As our study was not designed to tease apart the multiple other processes involved in the MGE, the investigation of why no in-group bias in perceived intelligence was observed among the Japanese remains an interesting question.

While the minimal groups that we created were consistent with how the paradigm is traditionally used (e.g., Tajfel et al., 1971), such groups were not "minimal" in the strictest sense as they were not completely arbitrary (i.e., randomly assigned) and experimental features led participants from both cultures to think that the groups were in competition. Thus, even stricter minimal groups can be created to investigate whether an in-group bias exists at all for some cultural groups. On one hand, our sampling strategy has advantages over purely student samples in that we obtained a much more representative cross-section of each population as indicated by the diversity in age, education level, and SES. However, the universality of the MGE can be further investigated with cultural groups that tend to be very different than we studied here, such as non-industrialized or small-scale societies. The observation or absence of in-group biases in strictly minimal group paradigms among such other samples would be particularly informative for elucidating the innate and culturally shaped processes underlying the MGE.

Certainly there is ample theory and evidence to suggest that humans have a tendency to create social group boundaries and that this may help us determine who is trustworthy or who to cooperate with or who to discriminate against (e.g., Henrich & Henrich, 2007; Sidanius, 1993). Current evidence suggests that young children (e.g., 5-year-olds) display an MGE across implicit and explicit measures and when groups are as minimal as possible (Dunham, Baron, & Carey, 2011). However, we have already noted a case where the MGE appears to vary across children of different cultures (Wetherell, 1982). Thus, the best theoretical explanation we can offer at this point is that some processes involved in the MGE (e.g., projection of the self onto the in-group) may be innate or occur automatically, but that cultural learning is an important component and can have the power to shape such tendencies further (e.g., feelings about the self, automaticity of novel group identification, perceived intergroup competition). An interesting avenue for future research may then explore whether cultural variability exists in implicit in-group preferences under the minimal group paradigm (e.g., Pinter & Greenwald, 2011) and the developmental trajectory for this possible cultural variation.

Despite the limitations, the overarching implication of our results is that theories of intergroup conflict that assume that self-enhancement motivations are universal (e.g., self-identity theory; Turner et al., 1987) may need to be reformulated without this assumption. At the very least, we must recognize that theories developed to explain intergroup conflict cannot be culture free, and that a comprehensive understanding of intergroup conflict requires theory that is able to explain variability in the MGE across a wide variety of contexts and populations and for multiple different types of in-group biases.

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Notes

1. Ten participants had missing values on at least one of the following variables: age, gender, socioeconomic status (SES), and education. Considering this is an extremely small proportion of the sample, listwise deletion was used in cases where these variables were included in any analyses.
2. Performance on the items from the Raven's progressive matrices was not predictive of any minimal group effect (MGE) and did not differ across culture. Therefore, these items are not discussed further.
3. The word *jishin* (自信) was used as a translation of "self-esteem" for this item. Though *jisonshin* (自尊心) or *jisonkanjyo* (自尊感情) are well-known as literal translations of "self-esteem" (especially in the academic literature), they are not commonly used by ordinary Japanese. Instead we chose *jishin* through the consensus method of translation.
4. The effect of self-esteem on group intelligence, $b = .10$, $t(894) = 1.86$, $p = .06$, and resource allocation, $b = .07$, $z = 1.48$, $p = .14$, remain in the same direction, but become slightly diminished if all possible covariates are included in these models (gender, SES, education, picture choice, and competition).
5. We thank two anonymous reviewers for suggestions to perform the majority of these analyses. Cultural variability in response style (e.g., moderacy bias among East Asians) was also raised as a possible alternative explanation to our results. Our preference is to follow recommendations by Fischer (2004): analyses equivalent to mixed models, where possible, are conducted and within-culture effects and effect sizes are compared. Within-person standardization procedures (e.g., ipsatizing) are also possible for group identification, perceived group intelligence, and group personality traits (though not recommended by Fischer, 2004) and would require excluding 285 subjects on the group identification measure and 160 subjects on the group intelligence measure due to no within-subject variation (e.g., a subject chooses the same response category, usually the midpoint, for all items for the in-group and out-group). If ipsatizing is performed, significant cultural differences are still observed on these dependent measures (all ps $< .001$). As for the effects within each culture, Japanese displayed an MGE for identification, $t(167) = 11.54$, $p < .001$, $d = .89$, and perceived personality traits, $b = .08$, $z = 2.66$, $p = .01$, but not for perceived intelligence, $t(244) = -.61$, $p = .54$, $d = -.04$. Americans had a significant MGE for identification $t(464) = 45.14$, $p < .001$, $d = 2.09$; perceived personality traits, $b = .39$, $z = 18.01$, $p < .001$; and perceived intelligence, $t(512) = 12.96$, $p < .001$, $d = .57$. Above and beyond culture, self-esteem was still a significant predictor of identification, $b = .15$, $t(630) = 2.49$, $p = .01$; perceived intelligence, $b = .05$, $t(755) = 1.86$, $p = .06$; and personality traits, $b = .05$, $z = 3.82$, $p < .001$, establishing the second path of the mediational model.
6. Such interactions were not significant for group intelligence, $b = .11$, $t(914) = .98$, $p = .33$; resource allocation, $b = .07$, $z = .68$, $p = .49$; and personality traits, $b = -.01$, $z = -1.24$, $p = .22$. Furthermore, adjusted R^2 did not improve when modeling a different relationship of self-esteem with MGE within

each culture for group intelligence (both R^2 = .05), and Akaike Information Criterion (AIC; lower values of AIC are better) became worse for resource allocation (1,575.42 vs. 1,576.96) and group personality traits (24,785 vs. 24,787). For those still interested in within-culture effects of self-esteem on each MGE, they are as follows: (a) perceived intelligence, b = .05, $t(914)$ = .52, p = .60, for Japanese, and b = .16, $t(914)$ = 2.38, p = .02, for Americans; (b) resource allocation, b = .04, z = .47, p = .64, for Japanese, and b = .10, z = 1.92, p = .06, for Americans; and (c) personality traits, b = .03, z = 2.72, p <.01, for Japanese, and b = .01, z = 2.25, p =.02, for Americans. Note that all coefficients were positive for all cultural groups as expected and did not significantly differ across cultures.

7. Controlling for group identification, the cultural differences are b = .90, $t(915)$ = 5.40, p < .001, for group intelligence; b = .07, z = 3.79, p < .001, for the in-group bias in personality traits; and b = 1.28, z = 8.36, p < .001, for resource allocation.

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