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Abstract:
Groups often have members who hold opposing opinions on specific issues. The presence of undecided people within a group may promote cooperation among group members who hold opposing views on an issue under consideration. The study examined the joint effects of group attitude diversity (i.e. mixed attitude diversity vs. polarized attitude diversity) and one's strength of attitude on the cooperation. In groups considering a controversial issue with no undecided group members (i.e., polarized attitude diversity), people with strong attitudes were less likely than those with weak attitudes to cooperate with group members who held opposing views. However, the above differences became non-significant when participants were placed in groups with some undecided group members (i.e. mixed attitude diversity). The results from the study suggested that the presence of undecided group members mitigates the negative impact of attitude strength on subsequent cooperation.

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Abstract

Groups often have members who hold opposing opinions on specific issues. The presence of undecided people within a group may promote cooperation among group members who hold opposing views on an issue under consideration. The study examined the joint effects of group attitude diversity (i.e. mixed attitude diversity vs. polarized attitude diversity) and one's strength of attitude on the cooperation. In groups considering a controversial issue with no undecided group members (i.e., polarized attitude diversity), people with strong attitudes were less likely than those with weak attitudes to cooperate with group members who held opposing views. However, the above differences became non-significant when participants were placed in groups with some undecided group members (i.e. mixed attitude diversity). The results from the study suggested that the presence of undecided group members mitigates the negative impact of attitude strength on subsequent cooperation.

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"Our Democratic friends helped write this bill, and our Republican friends ... they're just not here. For the life of me, I do not understand it."

– Senate Committee Chairwoman Barbara Boxer, November 5th, 2009

As this preceding quote illustrates, opposing partisan members may have a lower likelihood of cooperating with each other than non-partisan members. As described in the quote, Republicans refused to cooperate with Democrats on the bill (i.e., the climate bill) to which they hold strong, opposing opinions. The main purpose of this bill is to solve the problems with global warming by setting up new limits on pollution and by encouraging more environmentally friendly business practices. This example provides real world illustration of common research findings documenting that cooperation is extremely difficult to elicit in groups where individuals hold opposing views on controversial political issues (e.g., Chi, Tsai, & Tsai, 2004; Robinson, Keltner, Ward, & Ross, 1995). Past research has also demonstrated that people with strong political beliefs usually perceive more disagreement between their own opinions and their adversaries' opinions than exists in reality (Keltner & Robinson, 1997; Robinson & Friedman, 1995; Robinson, et al., 1995).

However, in the real world, groups do not always consist of solely individuals who take opposing views. Often groups will also include members who are undecided about their position on an issue. Relatively little is known about the effects that the presence of the undecided has on the group members grappling with controversial issues. Thus, it is worthwhile to investigate the above effects on the group processes. Since introducing the undecided people to group members who have opposing views changes the diversity of attitude within the group, we attempt to distinguish between groups with only opposing partisan members and groups with opposing

partisan members and undecided group members. We termed groups with opposing partisan members and undecided group members as *mixed attitude diversity groups*; we termed groups with only opposing partisan members as *polarized attitude diversity groups*. The distinction between these two types of groups is different from past research on diversity because scholars in this area often used ideologies or values to characterize diversity within one unit (e.g., Williams & O'Reilly, 1998).

The effects of group attitude diversity may not only influence the current group processes but also change subsequent, unrelated group interactions because group decision-making is often considered as part of ongoing group life (Beersma & De Dreu, 2005). However, the study of group decision-making has primarily considered the motivational, cognitive, and behavioral processes underlying the current group decision-making processes (Bazerman, Curhan, Moore, & Valley, 2000; De Dreu & Carnevale, 2003; Pruitt, 1998). That is, past work has ignored the effects of group interactions on post-group processes and performance, such as cooperation in a subsequent, unrelated task (O'Connor & Arnold, 2001; Pruitt & Carnevale, 1993). This viewpoint highlights the importance of examining the effects of group decision-making processes on the outcomes of subsequent, unrelated tasks.

Thus, we propose that introducing undecided members to groups with members who have opposing views will increase subsequent cooperation among these members, especially for those who hold strong opposing attitudes about the issue. Furthermore, the purpose of the present paper is to examine the effects of group attitude diversity on subsequent cooperation within the group. Specifically, we investigate whether or not individuals are more likely to expect others' cooperation and cooperate with their group members when their groups include people who have opposing views and people who are undecided (i.e., the mixed attitude diversity group) than their

groups include only people who have opposing attitudes (i.e., the polarized attitude diversity group).

A second purpose of the current study is to examine the effects of group attitude diversity and one's attitude strength on subsequent cooperation. Specifically, we investigate the joint effects of group attitude diversity and one's strength of attitude on the individual's subsequent cooperation with others.

A third purpose of the present paper is to explore the potential mediator of the above effects from a perspective of expectation: When people expect others' cooperation, they are more likely to cooperate with others. Past research has shown that expectation of others' cooperation was associated with one's cooperation (Chaudhuri, Sopher, & Strand, 1994). Particularly, we investigate whether or not one's expectation of others' cooperation would mediate the above interaction effects on subsequent cooperation.

Mixed Attitude Diversity Improves Cooperation

Past research has indicated that having non-partisan members is pivotal to the success of the mediation of disputes (Bazerman & Farber, 1985; Karambayya & Brett, 1989). Thus, including non-partisan members in a group may increase cooperation between opposing partisan members within the group. In a group decision-making situation, people may regard the undecided group members as the non-partisan members because these undecided people have not formed their attitude.

Research has shown that decreased perceptions of separation within the group remove potential faultlines (Harrison & Klein, 2007); group members who perceive decreased separation may feel a connection to one another and thereby tend to cooperate with each other (Lock & Horowitz, 1990). This research has suggested that people in the mixed attitude group may

perceive less separation within the group than those in the polarized attitude group. Generally, people perceive the undecided members as people without strong political preferences. Thus, people may believe that partisan members perceive the undecided members as potential converts to their views, thereby giving the partisan members more incentive to appear reasonable and cooperative. In other words, they perceive that the undecided people may serve as a buffer between two opposing groups. In this case, people may be more likely to expect others' cooperation and cooperate with their group members in subsequent tasks than those in the polarized attitude diversity group.

Thus, we propose the following two hypotheses:

Hypothesis 1: Group attitude diversity affects the individual's expectations of others' cooperation in a subsequent, unrelated task. People are more likely to expect others' cooperation in the mixed attitude diversity group than the polarized attitude diversity group.

Hypothesis 2: Group attitude diversity affects the individual's cooperation with others in a subsequent, unrelated task. People are more likely to cooperate with others in the mixed attitude diversity group than the polarized attitude diversity group.

The Interaction Effects of Group Attitude Diversity and One's Attitude Strength

One's expectations or perceptions and the individual's strength of attitude jointly influence the individual's cooperation with others. For instance, Clarke and James (1967) found the joint effects of one's expectations of debate and strength of attitude on the individual's cooperation. When an individual expected to debate one another, an individual with a stronger attitude was more likely to cooperate with people with similar opinions by seeking support from them. However, when an individual did not expect to debate one another, the above association became non-significant.

Similarly, individuals' perceptions of a mediator's professional knowledge and the individuals' strength of political beliefs jointly affect their cooperation with the mediator. Chi, et al. (2004) discovered that when business leaders perceived that the Taiwanese governmental mediator had sufficient professional knowledge in the handling of the disputes, their strength of political beliefs was not significantly associated with their future cooperation with the governmental mediator. By contrast, when business leaders perceived that the governmental mediator lacked professional knowledge in resolving the disputes, these leaders with greater preference for an opposition party were less likely to cooperate with the governmental mediator in the future. Thus, the impact of one's attitude strength on cooperation varies as the individual's expectations or perceptions change.

We propose that an additional factor—group attitude diversity—interacting with the strength of attitude affects subsequent cooperation. Specifically, we propose that people in the mixed attitude diversity group tend to maintain a certain level of cooperation with other group members because the mixed attitude diversity group decreases perceptions of separation within the group (Harrison & Klein, 2007). The separation refers to an instance when members differ from one another in their position over a single continuous attribute within one unit, such as a group (Harrison & Klein, 2007). In this case, people believe that their group includes not only opposing partisan members but also includes undecided members and therefore they perceive lower levels of separation than those in the groups including only opposing partisan members. Thus, people in the mixed attitude diversity group are more likely to expect, establish, and maintain certain levels of cooperative relationships with other group members than those in the polarized attitude diversity group. Therefore, people's strength of attitude becomes less likely to negatively affect their expectations of other group members' cooperation and their subsequent

cooperation with other group members.

However, people in the polarized attitude diversity group perceive maximum separation within the group, especially for people with strong attitudes. Maximum separation associated with minimum cooperation occurs when there are only two divided but balanced subgroups, each holding a position away from the other, within the group (Lock & Horowitz, 1990). For instance, consider a group that includes only members who are pro or anti abortion with no members holding views in the middle. In such a group, group members are very aware of two subgroups, and thereby become less likely to cooperate with others within the group (Lock & Horowitz, 1990). In addition, social judgment theory (Sherif & Hovland, 1961; Krosnick & Petty, 1995) has suggested that compared with those with weak attitudes, people with strong attitudes are more likely to minimize the differences between people who have similar opinions and themselves, and to exaggerate the difference between people who have opposing opinions and themselves. Thus, people with strong attitudes are more likely than those with weak attitudes to perceive the polarized attitude diversity group as cleft and thereby less likely to expect of others' cooperation and cooperate with others in subsequent tasks

In sum, we propose the following two hypotheses:

Hypothesis 3: Group attitude diversity and one's attitude strength jointly affect the individual's expectations of others' cooperation in a subsequent, unrelated task. In the polarized attitude diversity group, people with strong attitudes are less likely to expect others' cooperation than those with weak attitudes. However, the above differences become non-significant in the mixed attitude diversity group.

Hypothesis 4: Group attitude diversity and one's attitude strength jointly affect the individual's cooperation with others in a subsequent, unrelated task. In the polarized attitude diversity group,

people with strong attitudes are less likely to cooperate with others than those with weak attitudes. However, the above differences become non-significant in the mixed attitude diversity group.

Expectations of Others' Cooperation and Self-Cooperation

As mentioned before, expectations of other group members may serve as the mediator of the interaction effects of group attitude diversity and attitude strength on cooperation. Several scholars (e.g., Komorita, Parks, & Hulbert, 1983) have proposed that when an individual expects that others will cooperate with himself or herself, the individual will have a stronger motivation to reciprocate the cooperation with others. Past research has demonstrated a positive relationship between one's expectations of other group members' cooperation and the individual's cooperation (e.g., Komorita, et al., 1983; Chen, Li, Liu, & Shih, 2009). Thus, we propose the following hypothesis:

Hypothesis 5: Expectations of others' cooperation mediates the joint effect of group attitude diversity and one's strength of attitude on the individual's cooperation in a subsequent, unrelated task.

The Overview of the Present Study

The purpose of the present study is to examine whether: (1) group attitude diversity affects an individual's expectations of cooperation and cooperation with others in a subsequent, unrelated task; (2) group attitude diversity and one's attitude strength jointly affect the individual's expectations of cooperation and cooperation with others in the subsequent, unrelated task; (3) one's expectations of others' cooperation mediate the joint effect of group attitude diversity and attitude strength on the individual's subsequent cooperation with others in the subsequent, unrelated task.

Participants in the current study completed a group decision-making task about a political controversial issue and then engaged in a resource allocation task unrelated to the controversial issue. We used the group decision-making task related to a political controversial issue because research has suggested that it is difficult for people to change their political attitudes and political biases against individuals who are members of an opposing group (e.g., Lieberman, Schreiber, & Ochsner, 2003). Thus, we expect that the related variables of the group decision-making task would have a significant impact on subsequent cooperation in the resource allocation task. In the group decision-making task, participants were told that their group either included members who were undecided in their opinions about the controversial issue, or not included members who were undecided. In reality, their other group members were computer simulations. In the resource allocation task, cooperation was measured by the amount of money participants chose to distribute to their group

Method

Participants. Participants were 60 adults (71.67% female). Their age ranged from 18 to 45 years (M = 21.88, SD = 1.28). All were recruited by an email listserv of people who registered

participating in behavioral studies. Participants received at least $5 compensation for completing the study.

Design. The study was a 2 Group Attitude Diversity (Mixed Attitude Diversity vs. Polarized Attitude Group) between-subjects design. All participants were randomly assigned to the two conditions. Thirty participants were assigned to the Polarized Attitude Diversity condition and the other 30 participants were assigned to the Mixed Attitude Diversity condition. We measured their strength of attitude after they made a decision for their group.

In both conditions, participants were asked to evaluate an affirmative action related educational program and then they indicated whether they supported the program, by voting *yes*, *no*, or *undecided* for the program and provided reasons for their votes. They then received the evaluations of their other group members.

Participants in the *Polarized Attitude Diversity* condition were led to believe that group consisted of four other group members: two group members voted *yes* in support of the affirmative program, and two group members voted *no*. Participants in the *Mixed Attitude Diversity* condition were led to believe that the group consisted of four other group members: two group members who were undecided about their support for an affirmative action program, one group member who voted *yes,* and one group member who voted *no*.

Procedure. The experiment was announced as a study of group decision-making. As participants arrived in the laboratory, the experimenter took each of them to separate cubicle rooms containing a laptop computer. The experimenter then explained to the participant that there were four other individuals taking the study at the same time in the other cubicles at different universities. All participants were led to believe that their computers were connected

with those of their group members. In reality, the other group members were simulated by the computer.

Participants were told that they would be completing two unrelated tasks. First, they would complete 1) a group decision-making task and afterwards, 2) a resource allocation task. In the group decision-making task, participants read about a proposal for an affirmative action type educational program that was geared towards providing opportunities to students from under-represented minority groups. Then they indicated whether they supported the program, by indicating *yes*, *no*, or *undecided* and provided reasons for their opinions. After participants submitted their evaluation of the program, they were then given the evaluations of their other group members.

Participants in the *Polarized Attitude Diversity* condition saw that of the four other members in the group, two members voted yes and two members voted no; Participants in the *Mixed Attitude Diversity* condition saw that one group member voted *yes*, one group member voted *no*, and two group members voted *undecided*. (See the Appendix).

After reading the simulated group members' opinions, participants were told that the group would vote on whether or not they would approve the educational program and that all the group members would not be informed of the result of the final decision until the end of the study. They were told that in the process of voting, the undecided option would no longer be available. Thus, the participants had only the options to vote yes or no for the educational program. The participants were then given a chance to enter their votes and to indicate the strength their attitudes underlying their positions.

Finally, participants were asked to complete the resource allocation task. This was our measure of cooperation. In this task, participants were given a chance to increase their $5

compensation through a group decision in a resource allocation dilemma task (Dawes, 1980), which was a modified version of Mulder's (2008) task. In this task, participants were told that they would be able to allocate a portion of their $5 compensation to a group pot. Compensation that contributed to the group would be multiplied by 150 percent and then equally divided among the group members. Thus, participants would be put in a position in which their outcomes would depend upon what the others in the group chose to do. They could maximize their outcomes if they chose not to contribute but all the other group members chose to contribute, but minimize their outcome if only they contributed but nobody else contributed. For instance, if participants did not contribute anything to the group, but all the other group members contributed all of their money, the participants would receive more money (i.e., $5.00 + 1/5th of $5.00 x 4 persons x 1.5 = $11.00). However, if participants contributed all their money to the group, and all the other group members did not, participants would lose money (i.e., $0 + 1/5th of $5.00 x 1 person x 1.5 = $7.50/5 = $1.50).

Then the participants answered a series of questions about expectations of other group members' cooperation (Komorita, et al., 1983), cognitive-based and affective-based trust toward other group members (Lewis & Weigert, 1985), and liking of each group member (Boulton & Smith, 1996). These variables may be potential factors that mediate the effect of group attitude diversity or the joint effect of group attitude diversity and the strength of attitude on cooperation because these variables are highly related to cooperation. In addition, we asked questions about support for affirmation action program (Lowery, Knowles, & Unzueta, 2007) at the beginning of the study because we used the variable of support for affirmation action program as a control variable.

Measures

Support for affirmative action policies. We used a modified version of Lowery, et al.'s (2007) scale of support for redistributive policies. In the modified version of the scale, we changed a couple of words to relate these items to affirmative action policies in the domain of education. We measured attitudes toward affirmative action policies by asking participants to rate their support for specific affirmative action policies. Participants rated their support for five separate policies on a 7-point scale with endpoint anchors of 1 (*strongly oppose*) and 7 (*strongly support*). The policies included: (1) a "minimum qualifications" policy, (2) a "color-blind" policy (reversed), (3) a "tiebreaker" policy, (4) a preferential training policy, and (5) a preferential recruitment policy ($\alpha = 0.79$).

Attitude strength. Immediately after providing their opinions to make the group decision-making, participants responded to two items that measured attitude strength about their opinions: "*How strong is your opinion?"* and "*Do you think it is possible to change your opinion?"* (a reverse item). Participants responded on 7 point scales with endpoint anchors of 1 (*Not strong*) and 7 (*Very strong*) for the first item and 1 (*Not at all*) and 7 (*Absolutely*) for the second item. The items were averaged for use in analysis ($\alpha = 0.72$). Higher numbers were associated with stronger attitudes.

Cognitive-based trust. Cognitive-based trust refers to one's beliefs in others' capability, credibility, and comprehension of the situation (Lewis & Weigert, 1985). Participants responded to two items that measured cognitive-based trust: "*I perceived a great deal of consensus among my group regarding our opinions about the educational program."* and "*I felt that we trusted each other on our decisions about the educational program."* Participants responded on 7 point scales with endpoint anchors of 1 (*Strongly disagree*) and 7 (*Strongly disagree*). The items were

averaged for use in analysis (α = 0.71). Higher numbers were associated with stronger cognitive-based trust.

Affective-based trust. Affective-based trust refers to one's emotional connections with others (Lewis & Weigert, 1985). Participants completed two items that measured affective-based trust: "*The other group members were open and upfront with me."* and "*In general, I believe the other group members' motives and intentions were good."* Participants responded on 7 point scales with endpoint anchors of 1 (*Strongly disagree*) and 7 (*Strongly disagree*). The items were averaged for use in analysis (α = 0.72). Higher numbers were associated with stronger affective-based trust.

Expectation of others' cooperation. Participants responded to one item that measured the expectation of others' cooperation: "*On the average, how much money do you think that each member of your group gave to the group pool? Other group members will not know your answer to this question. Please indicate your estimate in 0.5 dollar increments.*" In this question, the amount of money ranged from 0 dollar to 5 dollars. Higher amount of money were associated with higher expectations of others' cooperation.

Self-cooperation. Participants completed one item that measured their cooperation: "*Do you wish to contribute to the group pool? Please indicate your choice in 0.5 dollar increments*." They were given one minute to answer this question. In this question, the amount of money ranged from 0 dollar to 5 dollars. Higher amount of money was associated with a stronger willingness to cooperate with others.

Liking of each group member. Participants responded to one item that measured the degree of liking of each group member: "*Overall, how positively or negatively do you feel toward [Initials]?"* Participants responded on 7 point scales with endpoint anchors of 1 (*Very*

negatively) and 7 (*Very positively*). We averaged the liking scores based on each group member's first decision of voting for the educational problem, such as voting for yes, no, or undecided for the educational program.

Results and Discussion

Our results demonstrated no significant effects of the related variables of support for affirmative action policies on expected cooperation and self-cooperation, including the initial votes of the educational program ($r = 0.25$, $p > .05$ for expected cooperation; $r = 0.22$, $p > .05$ for self-cooperation), the final votes of the educational program ($r = 0.07$, $p > .05$ for expected cooperation; $r = 0.07$, $p > .05$ for self-cooperation), and the individual difference based on Lowery et al.'s (2007) scale ($r = 0.08$, $p > .05$ for expected cooperation; $r = 0.14$, $p > .05$ for self-cooperation). Thus, we excluded the related variables of support for affirmative action policies in the subsequent regression analyses.

TESTING HYPOTHESES 1 & 2: The effects of group attitude diversity

Hypothesis 1: Group attitude diversity affects the individual's expectations of others' cooperation in a subsequent, unrelated task. People are more likely to expect others' cooperation in the mixed attitude diversity group than the polarized attitude diversity group.

Hypothesis 2: Group attitude diversity affects the individual's cooperation with others in a subsequent, unrelated task. People are more likely to cooperate with others in the mixed attitude diversity group than the polarized attitude diversity group.

We tested the effects proposed in Hypotheses 1 and 2 using ANOVA. However, we did not find any conditional differences of group attitude diversity on expectations of others' cooperation ($F = 0.01$, $p > .05$) and self-cooperation ($F = 0.42$, $p > .05$). Thus, the results did not support our Hypotheses 1 and 2.

TESTING HYPOTHESES 3 & 4: The interaction effects of group attitude diversity and one's attitude strength.

Hypothesis 3: Group attitude diversity and one's attitude strength jointly affect the individual's expectations of others' cooperation in a subsequent, unrelated task. In the polarized attitude diversity group, people with strong attitudes are less likely to expect others' cooperation than those with weak attitudes. However, the above differences become non-significant in the mixed attitude diversity group.

Hypothesis 4: Group attitude diversity and one's attitude strength jointly affect the individual's cooperation with others in a subsequent, unrelated task. In the polarized attitude diversity group, people with strong attitudes are less likely to cooperate with others than those with weak attitudes. However, the above differences become non-significant in the mixed attitude diversity group.

We tested the interaction effect proposed in Hypotheses 3 and 4 using the moderated regression procedure outlined by Aiken and West (1992). We adopted the mean-centered method to reduce collinearity between the predictors and their interaction terms. We found significant coefficients of the attitude strength × group attitude diversity interaction term on expectations of others' cooperation ($\beta = 0.30$, $p < .05$) and self-cooperation ($\beta = 0.31$, $p < .05$).

Then we examined the interaction effect by using different dummy codes to look at the regression weights (simple slopes) of attitude strength in the two group attitude diversity conditions (Holmbeck, 2002). As predicted, attitude strength was significantly associated with expectations of others' cooperation ($\beta = -0.56$, $p < .01$) and self-cooperation ($\beta = -0.61$, $p < .01$) in the *Polarized Attitude Diversity* condition. However, attitude strength was not significantly

associated with expectations of others' cooperation (β = 0.01, $p > .10$) and self-cooperation (β = 0.04, $p > .10$) in the *Mixed Attitude Diversity* condition.

The results suggested that the mixed attitude group weakened the negative associations of one's attitude strength with the individual's expectations of others' cooperation and willingness to cooperate with others in a subsequent, unrelated task. Thus, our results supported Hypotheses 3 and 4.

TESTING HYPOTHESIS 5: The mediating effect of expectation of others' cooperation.

Hypothesis 5: Expectations of others' cooperation mediate the joint effects of group attitude diversity and attitude strength on subsequent cooperation.

We tested the mediated models using the mediated regression procedure outlined by Baron and Kenny (1986). First, we separately regressed cognitive-based trust, affective-based trust, and expectations of others' cooperation on the attitude strength × group attitude diversity interaction term and its predictors. We did not find any significant associations between the interaction term and cognitive-based trust ($\beta = 0.11$, $p > .10$) or affective-based trust ($\beta = 0.07$, $p > .10$). Thus, we dropped the cognitive-based trust, affective-based trust variables in the subsequent regression analyses.

As mentioned above, there was a significant effect of the interaction term on expectations of others' cooperation ($\beta = 0.30$, $p < .05$). Then we regressed self-cooperation on expectations of others' cooperation, the attitude strength × group attitude diversity interaction term, and the predictors of the interaction term, simultaneously. We found that expectations of others' cooperation was associated with self-cooperation ($\beta = 0.81$, $p < .001$), but the above interaction term was no longer associated ($\beta = 0.07$, $p > .10$). Based on the above analyses and the result of the Sobel test, expectations of others' cooperation fully mediated the relationship between the

interaction term and self-cooperation (Sobel test, $z = 2.36$, $p < .05$). Thus, our results supported Hypothesis 5.

Additional Analyses. There may be several alternative explanations and mediators accounting for the effects observed. For instance, liking may also account for the decreased perceptions of separation because perceptions of separation is negatively related to similarity (Harrison & Klein, 2007) and similarity is positively associated with liking (Clore & Byrne, 1974).

Based on the above reasons, the purpose of additional analyses is to examine (1) whether or not the liking of other group members would mediate the effects of group attitude diversity on self-cooperation (1) whether or not the liking of other group members would mediate the interaction effects of group attitude diversity and attitude strength on self-cooperation and (2) whether or not similar opinions would leads to high levels of liking of other group members. We first examined the conditional effect of group attitude diversity on the liking scores, but we did not find any significant conditional effect ($t = 1.24$, $p > .05$). Then we examine the relationship between the above interaction and the liking, but we did not find a significant relationship between these two variables ($\beta = 0.17$, $p > .10$). Thus, the liking of other group members did not mediate the above conditional effects or interaction effects on self-cooperation.

Then we examined the relationships between participants' voting decisions for the educational program and the degree of liking of each group member. We found that, in the Mixed Attitude Diversity condition, people who voted "yes" liked group members who voted "yes" more than those who voted "no" ($\beta = 0.60$, $p < .001$); people who voted "no" liked group members who voted "no" more than those who voted "yes" ($\beta = - 0.41$, $p < .001$). However, we did not find a significant association between participants' voting decisions and the liking of

undecided group members. In the Polarized Attitude Diversity condition, people who voted "yes" liked group members who voted "yes" more than those who voted "no" although the difference is not significant ($\beta = 0.11$, $p > .10$); people who voted "no" liked group members who voted "no" more than those who voted "yes" ($\beta = - 0.44$, $p < .001$). The above results generally demonstrated a link between similarity and liking (Krosnick & Petty, 1995) but this connection became non-significant when targets of evaluation were undecided in their attitudes ($\beta = - 0.18$, $p > .05$) in the Mixed Attitude Diversity condition.

General Discussion

In this study, we did not find that people were more likely to cooperate with others in subsequent task within the mixed attitude diversity group than within the polarized attitude diversity group. It could be that a participant believed that partisan members wanted to convert the undecided individuals to their views and therefore perceived the mixed attitude diversity group as competitive. Thus, the participant became less cooperative with other group members.

However, we discovered evidence that group attitude diversity interfered with relationships between one's strength of attitude and the individual's subsequent cooperation. Specifically, we found that a group member tended to maintain a certain level of cooperation within the mixed attitude diversity group, regardless of the member's strength of attitude. In the polarized attitude diversity group, a group member's subsequent cooperation was negatively susceptible to the member's attitude strength. Furthermore, in the polarized attitude diversity group, one's strength of attitude was negatively associated with the individual's expectation of others' cooperation, which in turn increased cooperation with other group members.

As mentioned above, we proposed that the direct effect and moderating effect of group attitude diversity was due to reduced separation. Scholars have used several theories, such as

theories of similarity attraction (Byrne, 1971; Clore & Byrne, 1974; Newcomb, 1961), social identity and self-categorization (Hogg & Terry, 2000; Tajfel & Turner, 1979), and attraction selection-attrition (Schneider, 1987; Schneider & Goldstein, 1995) to explain the relationship between separation and cooperation. They have proposed that reduced separation associated with greater similarity generates higher cooperation and trust (e.g., Locke & Horowitz, 1990). By contrast, increased separation associated with lower similarity yields lower cooperation and higher conflict (e.g., Tsui, Ashford, St. Clair, & Xin, 1995).

Another interpretation of the above findings might be that the mixed attitude diversity group may increase variety: members differing from one another qualitatively within a group (Harrison & Klein, 2007). An increased variety is associated with a lower likelihood of forming coalitions with like others because each group member becomes relatively unique and thereby needs to maintain certain levels of cooperative relationships with others within the group (Harrison & Klein, 2007). This research has suggested that the mixed attitude diversity group neutralizes the negative effects of attitude strength on cooperation through an increased variety within the group.

In addition, we can draw on complementarity theory (Carson, 1969; Kiesler, 1983; Tracey & Ray, 1984) to explain our findings. Complementarity theory proposes that opposite styles on the dominance dimension are regarded complementary (Carson, 1969; Leary, 1957; Kiesler, 1983). An individual who is dominant invites submissive responses from others, and an individual who is submissive invites dominant behaviors from others.

Based on this theory, complementary interactions contribute to more stable, enduring, and satisfying relationships (Kiesler, 1996). In our study, a satisfying relationship between group members would involve subsequent cooperating for mutual benefit. We believe that one with a

strong attitude will be complemented by group members who are undecided in their attitudes whereas one with a weak attitude will be complemented by group members who have formed their attitudes.

To relate complementarity theory to our current findings, we identify the commonality between the dominance dimension and strength of attitude. Past research has suggested that dominant individuals are controlling and independent in personal relationships whereas submissive individuals are self-critical, passive, and timid (Morey, 2007). People with stronger attitudes (or people who have reached their decision) are more likely to insist on their opinions and resistant to change their attitudes than those with weaker attitudes (or people who are undecided in their attitudes) (Krosnick & Petty, 1995). It would thus be reasonable to conclude that the dominant personality type is associated with strong attitudes because dominant people and people with stronger attitudes are reluctant to be changed by others. The submissive personality, on the other hand, is associated with weak attitudes because both submissive people and people with weaker attitudes are susceptible to external stimuli.

Based on the above argument, when a group includes only members who have formed their attitudes, a group member with a weak attitude will be complemented by other group members, which fosters the individual's subsequent cooperation with others. However, when the group includes both people who have formed their attitudes and who are undecided in their attitudes, this complementary effect would become less significant because the individual with a weaker attitude is complemented only by group members who have formed their attitudes or because the individual with a stronger attitude is complemented only by the undecided group members.

The current research differs from prior research on group cooperation because it investigates the effects of the factors on subsequent cooperation rather than current cooperation. Past research has focused on the predictors directly relevant to current cooperation. For instance, researchers examined such predictors as an expectation of others' cooperation (Yamagishi & Kiyonari, 2000), greed (Kollock, 1998), and communication (Kerr & Kaufman-Gilliland, 1994). However, the current study examined the effects of attitude strength on subsequent cooperation because we measured participants' strength of attitude and cooperation in two unrelated tasks.

The results contribute to a growing body of work that illuminates the negative effects of attitude strength on social outcomes. The present findings showed that when other group members had formed their attitudes, one's strength of attitude negatively influenced the individual's cooperation. Similarly, Skitka, Bauman, and Sargis (2005) found that strength of attitude increased social distance from an attitudinally dissimilar other. These above findings suggested that strength of attitude is detrimental to social relationships or other related social outcomes.

Limitations and future directions

Since the present paper is an initial investigation of how group attitude diversity and one's strength of attitude might jointly affect cooperation among group members, there may be some limitations that could be addressed. First, in the Mixed Attitude Diversity condition, the undecided group members might be the majority of the group, which prevents a formation of coalitions within the group. Specifically, there might be only one single person to oppose or support the educational program in this condition. Thus, future research should examine whether or not the formation of coalitions influences cooperation within the group by adding two

simulated group members who have opposing views on the affirmative action issue to group and by adding a measure of the levels of forming coalitions within the group to the present study.

In addition, we have proposed that perceptions of separation or variety is an potential factor that mediates the effect of group attitude diversity and the joint effect of group attitude diversity and one's strength of attitude on subsequent cooperation. However, we did not actually measure the perceptions of separation or variety within the group. Future studies ought to examine the potential mediators by measuring of the perceptions of separation or variety within the group.

Another limitation of the current study is that the manipulation of the mixed attitude diversity group might lead to perception differences in undecided group members. For instance, some people might perceive the undecided group members as individuals who were unaware of full benefits or drawbacks of the educational program, but other people might perceive the undecided as another third type of group whose position is contingent on certain circumstances. To further understand how people perceive the undecided group members, future studies ought to require participants to provide reasons why their group members vote undecided for the program.

Yet another limitation of the present paper is that we did not disentangle the causal relationships between one's expectations of others' cooperation and one's own subsequent cooperation. To address this limitation, we conducted an alternative mediator analysis and found that one's subsequent cooperation mediated the joint effects of group attitude diversity and the individual's strength of attitude on the individual's expectations of others' cooperation (Sobel test, $z = 2.50$, $p < .05$), which is consistent with *false consensus effect*, the tendency for individuals to project their way of thinking onto others (Ross, Greene, & House, 1977). This

effect implies that when people choose to cooperate with others, this behavioral tendency will foster an expectation of others' cooperation. Thus, future studies require exploring the causality between one's cooperation and expectation of others' cooperation.

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Appendix

Group Attitude Diversity: the Polarized Attitude Diversity Condition
1. J. T. A. voted "No" for the Summer Affirmative Action Internship Program. Reasons: Many whites are still poor. These white students can be passed even if they work hard. 2. Y. N. voted "Yes" for the Summer Affirmative Action Internship Program. Reasons: ???. 3. R. L. B. voted "No" for the Summer Affirmative Action Internship Program. Reasons: 4. T. P. voted "Yes" for the Summer Affirmative Action Internship Program. Reasons: I think people can learn that persons of the opposite race are people too, more or less just like themselves.
Group Attitude Diversity: the Mixed Attitude Diversity Condition
1. J. T. A. voted "No" for the Summer Affirmative Action Internship Program. Reasons: Many whites are still poor. These white students can be passed even if they work hard. 2. Y. N. voted "Undecided" for the Summer Affirmative Action Internship Program. Reasons: ???. 3. R. L. B. voted "Undecided" for the Summer Affirmative Action Internship Program. Reasons: 4. T. P. voted "Yes" for the Summer Affirmative Action Internship Program. Reasons: I think people can learn that persons of the opposite race are people too, more or less just like themselves.