Effects of Racial Diversity on Complex Thinking
in College Students

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Abstract

An experiment varying the racial (Black/White) and opinion composition in small group discussions was conducted with college students (N=357) to test for effects on the perceived novelty of group members' contributions to discussion and on participants' integrative complexity. Results showed that the presence of racial and opinion minorities were both perceived as contributing to novelty. Positive effects on integrative complexity were found when the groups had opinion diversity, and an interaction effect was found such that participants who reported less racial diversity in their regular contacts benefited more in groups that contained racial diversity. Several other significant effects for racial diversity are reported. Findings are discussed in terms of social psychological theories of minority influence and social policy implications for affirmative action. They support claims about the importance of race in higher education, as well as the complexity of its interaction with contextual and individual factors.
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Previous research has found that racially diverse educational environments are associated with positive intellectual and social outcomes for college students (Astin, 1993; Chang, 1999; Gurin, 1997; Smith & Associates, 1997). Racial diversity in the student body is linked to the likelihood that a student would interact with someone of a different race or ethnicity and engage in discussions of racial or ethnic issues. Frequent interaction across race and discussion of racial/ethnic issues positively predict student retention, overall satisfaction with college, intellectual self-concept, and social self-concept (Gurin, 1997; Smith & Associates, 1997). The existing evidence, however, is based largely on quasi-experimental or correlational designs using self-report data. No study to date has randomly assigned students to conditions of racial diversity and directly examined cognitive outcomes.

The topic under investigation has implications for both theory and social policy. The study of cognitive responses to group dynamics is an important area in social psychology (Gruenfeld, 1995; Gruenfeld & Hollingshead, 1993; Levine & Resnick, 1993). The question of the empirical merits of race-conscious approaches to diversifying colleges and universities has also become prominent in recent years in the face of legal challenges to affirmative action policies (Chang, Witt, Jones, & Hakuta, in press). This paper aims to advance the scientific understanding of the role of race in higher education through a controlled, randomized experiment measuring the impact of racial diversity on the complexity of thinking in college students.
Diversity and Complex Thinking

Research in the areas of organizational behavior and group dynamics has generally shown that heterogeneity of group members typically yields better problem-solving than homogeneity of group members (Nemeth & Wachtler, 1983). Although homogeneity of group members increases solidarity and cohesiveness, these same positive effects may lead homogeneous groups to be ultimately less productive.

Several important theoretical constructs undergird these observations. One of these is the notion that cohesiveness and solidarity, which can fuel increased productivity (Mullen & Cooper, 1994), are also the foundation for a phenomenon known as groupthink (Janis, 1972), a group process that results in poor decision-making. At the core of groupthink is the unanimity of opinion, which is created by the initial homogeneity of group membership.

Another important theory is that of minority influence, referring to the situation in which a few members of the group hold opinions that are very different from those of the majority. Research shows that the presence of opinion minorities in groups leads to increased divergent thinking and perspective-taking ability (Nemeth, 1992). Experimental studies have found group interaction and the dynamics between the divergent perspectives of majority and minority opinion holders to enhance integrative complexity among majority members (Gruenfeld, Thomas-Hunt, & Kim, 1998). Homogeneous groups are not likely to produce minority opinions; on the other hand, heterogeneity of groups increases the likelihood of minority influence.

A racially diverse group may also be characterized by a divergence in backgrounds, values, attitudes, and experiences that present individuals in the group with novel situations. Conversely, group members may erroneously presume differences in the attitudes,
experiences, and opinions of students when in the presence of those who are ethnically different (White & Harkins, 1994) and then find an ethnically different group member to share their same opinion.

For the outcomes of diversity, this study uses the construct of integrative complexity (IC). IC refers to cognitive styles that involve the differentiation and integration of multiple perspectives and dimensions (Suedfeld, Tetlock, & Streufert, 1992). Simple reasoning occurs when a person uses a single dimension (e.g., good-bad) to consider an issue; there is no differentiation. Individuals with low IC tend to utilize simple, rigid, often evaluative reasoning when interpreting events and making decisions. When there is differentiation, individuals recognize the existence of alternative perspectives, but see them as independent and unrelated. At the highest level of IC, there is recognition of the trade-offs among perspectives and solutions. IC has been used in a wide body of literature in social and personality psychology (Suedfeld et al., 1992). Significant to this study, it has also been found to be associated with higher grades among college students (Gruenfeld & Hollingshead, 1993).

The focus on IC as an outcome variable is appropriate for this study of diversity in college environments. First, it addresses the development of critical thinking skills, perhaps the defining element of a collegiate education. And second, the study focuses on the effects of peer interaction, which is recognized as perhaps the most influential source of change in college (Astin, 1993; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991).

Method

The basic design of the study was the random assignment of White college students to small-group discussions that were varied factorially with respect to two variables: group race
composition and group opinion composition on a target social issue. The main outcome variable was the IC of students’ thinking about a target social issue. The experimental conditions were created through a research collaborator who acted as a participant in the discussion group. This collaborator was either Black or White, and followed a pre-determined script that either agreed or disagreed with the opinions indicated by the White participants on a prior screening survey. The collaborator was blind to the purposes of the study. The study was conducted at three different selective research universities. Participants were recruited through campus flyers and e-mails. If they expressed interest, they were screened through a survey for their race, background characteristics, and their opinions on several social issues. Those who agreed with one side of one of two target social issues (child labor practices in developing countries or the death penalty) were asked to participate in a subsequent experimental session. Participants were blind to the purposes of the study and were debriefed subsequent to participation.

A total of 357 White participants (138 men, 219 women; age $M = 20.0$, $SD = 3.6$) were assigned to same-sex experimental groups made up of three participants and one research collaborator. In each experimental session, a facilitator led the three participants and the collaborator into the laboratory and asked them to be seated around a small table. They were then given an issue prompt describing the same target social issue on which they had indicated their opinion on the screening survey. After reading the prompt, and before any discussion took place, participants were asked to indicate their agreement or disagreement with the issue as described in the prompt and to write a short essay describing their support for or opposition to the issue (the pre-discussion essay). They were given 15
minutes. Most of the participants (85 percent) indicated that they held the same position as
they did on the screening survey.

After completion of the first essay, participants were asked to discuss their opinions
on the issue. The facilitator asked each member of the group to begin by orally stating his or
her opinion. This was followed by an unstructured 15-minute discussion during which the
collaborator followed his/her script designed to agree or disagree with the majority of the
participants. Of the 357 participants, 111 were in groups in which the collaborator disagreed
with everyone (i.e., extreme opinion minority condition) and 117 were in groups in which the
collaborator agreed with everyone (i.e., extreme opinion majority condition). For 60
participants, the collaborator agreed with only 1 other group member and for the remaining
69 participants, the collaborator agreed with 2 of the other group members.

Participants were then asked to write a second essay on the same topic (the post-
discussion essay), for which they were given 15 minutes. Participants were subsequently
asked to complete a questionnaire in which they rated how much each member of their
group, including the collaborator, made others think about the issue in different ways,
introduced a novel perspective to the discussion, and was influential in the group. We
averaged these three ratings of the collaborator (Cronbach's alpha of .90) to form an index of
Perceived Novelty (scale range from 1 to 7).

The essays were rated for IC (scale range from 1 to 7) by three independent judges
who were blind to the purposes of the experiment. Procedures followed those established by
the literature (Suedfeld et al., 1992). The interrater reliability was .70 for the pre-discussion
measure and .62 for the post-discussion measure. Because the post-discussion measure is in
essence a change measure and because it is acceptable that change scores have relatively low
reliability (Overall & Woodward, 1975), the .62 value is methodologically acceptable. Moreover, because raters may have focused on different parts of the essay, interrater reliability may underestimate the reliability of the measure.

Results

Three main analyses were conducted on the data. First, we examined whether collaborator race and collaborator opinion had effects on perceived novelty. Second, we tested for the effect of collaborator race on IC in the pre-discussion measure (i.e., before the collaborator had the opportunity to express an opinion). And third, we tested for the effects of collaborator race and collaborator opinion on IC in the post-discussion measure. All analyses were multilevel regression analyses that allowed initially for variance at the level of the group. When group effects were not present, they were dropped from the model. We also tested for main effects of university site, issue, age, gender, and contact with racially diverse others¹, as well as interactions of these variables with collaborator race. Only statistically significant results are reported.

Perceived Novelty

There were statistically significant main effects for collaborator race and collaborator opinion on perceived novelty (for Race, $t(112) = 3.13, p = .002$; for Opinion, $t(108) = -6.05, p < .001$). That is, participants in the discussion groups judged the collaborator’s contribution to the discussion as more novel when the collaborator was Black, even though the White collaborator followed the exact same script in the group discussion (least squares $M = 5.66$ for the Black collaborator and $5.21$ for the White collaborator). In addition, participants who were in opinion minority groups rated the collaborator higher for perceived novelty ($M = 5.96$) than participants who were in opinion majority groups ($M = 4.91$). The
interaction of these factors was not statistically significant, but an examination of the means suggested that in groups in which the collaborator agreed with everyone else in the group, the Black collaborator was seen as more novel than the White collaborator.

We also found that age had a positive and statistically significant effect on perceived novelty of the collaborator \( t(324) = 1.97, p = .050 \) and age interacted with race \( t(324) = 1.97, p = .049 \). As shown in Figure 1, the race effect on novel ideas was especially strong for students who were older.

Pre-discussion Integrative Complexity

The IC of the pre-discussion essays was analyzed for effects of collaborator race and participant background characteristics. No main effect of collaborator race was found. However, one effect of the background characteristics paralleled the results for perceived novelty. A significant interaction effect was obtained for collaborator race with participant age \( t(343) = -2.21, p = .028 \), such that the older participants showed higher IC when they were in groups with a Black compared to a White collaborator. The race effect on IC was weaker for younger students. This is noteworthy because the impact of race on older students was found prior to discussion, based solely on the presence of a Black collaborator in the room.

Post-discussion Integrative Complexity

We found a main effect for collaborator opinion \( t(350) = -4.36, p < .001 \), such that participants in groups in which the collaborator held a minority opinion showed higher IC (M
than those in groups in which the collaborator agreed with the three members of the group ($M = 1.77$). There was no main effect of collaborator race, nor did it interact with collaborator opinion, site, gender, issue, or age. There was, however, a main effect for participant’s diversity of racial contact such that participants reporting higher levels of diverse racial contact showed higher levels of IC [$t(350) = 2.50, p = .013$]. In addition, there was a trend for diversity of racial contact to interact with collaborator race [$t(350) = -1.77, p = .078$], such that collaborator race exerted a greater effect on participants who had less diverse racial contact. When we summed the pre- and post-discussion measures to obtain an overall IC score, the interaction was statistically significant ($t(339) = -2.25, p = .014$). This effect is shown in Figure 2.

Insert Figure 2A about here Insert Figure 2B about here

Discussion

We found that the presence of a Black collaborator in the group of White participants generally led to greater perceived novelty of the collaborator and to greater levels of integrative complexity under certain conditions. Our results also indicate that the presence of a minority opinion stimulates greater IC, consistent with basic social psychological theories of minority influence. The results are highly consistent with earlier non-experimental research and findings based on self-reported data (Astin, 1993; Gurin, 1997). In addition to the effects of our experimental manipulation, we also found that self-reported racially diverse contacts were significantly and positively related to our measure of IC.
The main contributions of this study are in its use of random assignment and the application of a cognitive measure of the outcome (IC). Although the effects of racial diversity were not large, we note that these results were obtained on the basis of a single experimental session. Logically we would expect that sustained exposure to a diverse environment would lead to even larger effects. The results reported here support claims about the importance of race as a factor in higher education, as well as the complexity of its interaction with contextual and individual factors (Chang et al., in press). Our findings indicate that White students may show increased integrative complexity when they interact with Black students, particularly if they have had less contact with members of other racial groups and if they are older. The findings reported here warrant further experimental and naturalistic exploration of these effects to inform policy and practice in higher education, and a concomitant development of explanatory social psychological models.
References


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Footnote

1 This is an average of two Likert scale items measuring the racial diversity of a student's close friends and classmates (scale range of 0 to 4 with a mean of 1.72) where "0" means no contact and "4" means 100% contact.
Figure Captions

**Figure 1a.** Perceived novelty as a linear function of age for groups with either a Black or White collaborator.

**Figure 1b.** Difference in perceived novelty for groups with a Black collaborator minus groups with a White collaborator as a linear function of age, with a 95% confidence interval (CI) based on regression.

**Figure 2a.** Overall integrative complexity as a linear function of diversity of racial contact for groups with either a Black or White collaborator.

**Figure 2b.** Difference in overall integrative complexity for groups with a Black collaborator minus groups with a White collaborator as a linear function of diversity of racial contact, with a 95% confidence interval (CI) based on regression.