

Running Head: EFFECTS OF RACIAL DIVERSITY

Word count (main text, notes, and acknowledgments): 2473

Effects of Racial Diversity on Complex Thinking in College Students

Anthony Lising Antonio, Stanford University

Mitchell J. Chang, University of California at Los Angeles

Kenji Hakuta, Stanford University

David A. Kenny, University of Connecticut

Shana Levin, Claremont McKenna College

Jeffrey F. Milem, University of Maryland at College Park

**To be published in Psychological Science**

Author Note

Authors are listed in alphabetical order. The first author was the lead investigator.

Address correspondence to Anthony Lising Antonio, Stanford University, School of Education, Stanford, CA 94305-3084; ph: 650-723-4053; fax: 650-725-3936; email: [aantonio@stanford.edu](mailto:aantonio@stanford.edu).

### Abstract

An experiment varying the racial (Black/White) and opinion composition in small-group discussions was conducted with college students ( $N=357$ ) at three universities 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. Generally positive effects on integrative complexity were found when the groups had racial and opinion minority members and when members reported having racially diverse friends and classmates. Findings are discussed in terms of social psychological theories of minority influence and social policy implications for affirmative action. The research supports claims about the educational significance of race in higher education, as well as the complexity of its interaction with contextual and individual factors.

## Effects of Racial Diversity on Complex Thinking in College Students

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, 1999; 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 and ethnic issues positively predicts student retention, intellectual and social self-concept, and overall satisfaction with college (Gurin, 1999; 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 and personality 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, 2003). This paper aims to advance the scientific understanding of the educational effects of race 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 ironically 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, the situation in which a few members of the group hold opinions that are different from those of the majority. Research shows that opinion minorities in groups leads to increased divergent thinking and perspective taking (Nemeth, 1992). Experimental studies have found group interaction between the divergent perspectives of majority and minority opinion holders enhances 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. This novel perspective introduced by racial diversity may be either actual or perceived. In

the current study, we examine the effects of diversity on the perceived novelty of individuals' contributions to a group discussion.

This study uses as its main outcome the construct of integrative complexity (IC), which refers to cognitive styles that involve the differentiation and integration of multiple perspectives and dimensions (Suedfeld, Tetlock, & Streufert, 1992). Simple reasoning occurs when a single dimension (e.g., good-bad) is used to consider an issue, i.e., there is no differentiation. Low IC individuals tend to utilize simple, rigid, and 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. 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 in a 2x2 factorial design. The two independent variables are group racial 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. Thirty-one collaborators were used in experiments; all were blind to the purposes of the study. The study was conducted at three selective research universities. Participants were recruited through campus flyers and e-mails. If they expressed interest, they were given a questionnaire to collect information on their race, background characteristics -including contact with racially diverse others<sup>1</sup>-, and their opinions on several social issues. Those who agreed with the most prevalent position of one of two target social issues (against child labor practices in developing countries or in favor of 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 (135 men, 222 women; age  $M=20.0$ ,  $SD=3.6$ ) were assigned to same-sex experimental groups consisting of three participants and one research collaborator. In each experiment, a facilitator led the participants and the collaborator into the laboratory and sat them around a 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 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 participant to begin by orally stating his or her opinion. This was followed by an unstructured 15-minute discussion during which the collaborator followed a script written to express agreement or disagreement with the majority of the participants. Of the 357 participants, 108 were in groups in which the collaborator disagreed with everyone (i.e., extreme opinion minority condition) and 123 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 66 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.

After completion of the second essay, participants were given a second prompt asking them to indicate their agreement or disagreement with a different social issue (either child labor practices or the death penalty, the alternate of the first issue) and to write a short essay describing their support or opposition to this second issue. We call this the transfer essay because it tests whether any stimulation of complex thinking due to the group discussion on the first topic transfers to thinking on a second topic. Participants were given 15 minutes to complete their essay. Participants were subsequently asked to complete a questionnaire in which they rated each member of their group, including the collaborator, with regard to their contributions to the earlier discussion. Participants rated how much each group member 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 (alpha of .90) to form an index of Perceived Novelty (scale range from 1 to 7).

All 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 Suedfeld et al. (1992). The interrater reliability was .70 for the pre-discussion measure, .62 for the post-discussion measure, and .66 for the transfer 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

Four different outcome variables were analyzed. 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). Third, we tested for the effects of collaborator race and collaborator opinion on IC in the post-discussion measure. Fourth, we tested for the effects of collaborator race and opinion on IC in the transfer measure. All analyses were multilevel regression analyses that allowed initially for group-level effects. 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 others, 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,  $t(108)=2.05$ ,  $p=.042$ ,  $d=.29$ ; for Opinion,  $t(108) = -6.39$ ,  $p < .001$ ,  $d= -1.07$ ). That is, participants judged the collaborator's contribution to the discussion as more novel when the collaborator was Black, even though the White collaborator followed the same script in the group discussion (least squares mean of 5.56 for the Black collaborator and 5.27 for the White collaborator). In addition, participants who were in opinion minority groups rated the collaborator higher for perceived novelty ( $M=5.95$ ) than participants who were in opinion majority groups ( $M=4.88$ ). 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.

### Pre-discussion Integrative Complexity

The IC of the pre-discussion essays was analyzed for effects of collaborator race and participant background characteristics. The effect of collaborator opinion was not considered because the participants were unaware of the positions of the other participants or the collaborator at this point in the experiment. A marginally significant main effect of collaborator race was indicated (for the White collaborator  $M=1.83$  and for the Black collaborator  $M=1.94$ ;  $t(352)=1.70$ ,  $p=.09$ ,  $d=.18$ ). No significant interactions of race with university site, issue, age, gender, and contact with racially diverse others were detected.

### Post-discussion Integrative Complexity

We found a main effect for collaborator opinion [ $t(351)= -3.91$ ,  $p < .001$ ,  $d = -.51$ ], such that participants in groups in which the collaborator held a minority opinion showed

higher IC ( $M=1.88$ ) than those in groups in which the collaborator agreed with the three members of the group ( $M=1.63$ ). There was no effect of collaborator race, nor did it interact with other variables. There was, however, a significant main effect for diversity of racial contact such that participants reporting higher levels of diverse racial contact showed higher levels of IC [ $t(351)=2.47$ ,  $p=.014$ ,  $r=.13$ ].

### Transfer

There were no main effects of collaborator race or collaborator opinion. Similar to the post-discussion analysis, there was a positive effect on IC for contact with racially diverse others [ $t(352) = 2.66$ ,  $p=0.008$ ,  $r=.14$ ]. The analysis of interaction effects indicated one significant interaction of collaborator race by issue [ $t(352) = -1.98$ ,  $p=.049$ ]. For those now writing on the topic of child labor, those who had a Black collaborator in the group had higher IC scores ( $M=1.91$ ) than those with a White collaborator ( $M=1.52$ ;  $d=.73$ ); however, for those now writing on the topic of the death penalty the race difference was much smaller ( $M=1.71$  of Black collaborator and  $M=1.68$  for White collaborator;  $d=.06$ ).

### 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 a greater level of IC. Our results also indicate that the presence of a minority opinion stimulates greater IC, consistent with social psychological theories of minority influence. We also found that self-reported racially diverse contacts were significantly and positively related to IC. Results are highly consistent with earlier non-experimental research and findings based on self-reported data (Astin, 1993; Gurin, 1999) and support claims about the importance of race as a factor in higher education (Chang et al., 2003). Moreover, findings that the racial diversity of a

student's close friends and classmates was more strongly associated with IC than the racial diversity of the discussion group imply that prolonged contact with racially diverse others may have stronger effects on students' complex thinking than the more limited contact involved in a single discussion group. However, given the non-experimental nature of this variable, causal inference is weaker.

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 we found robust racial diversity effects for perceived novelty, its effect on IC was interactive in one analysis and of marginal significance in another. These promising results warrant additional experimentation to more fully understand the effect of racial diversity on complex thinking.

## References

- Astin, A.W. (1993). What matters in college. San Francisco: Jossey-Bass.
- Chang, M. J. (1999). Does racial diversity matter?: The educational impact of a racially diverse undergraduate population. Journal of College Student Development, 40, 377-395.
- Chang, M.J., Witt, D., Jones, J., & Hakuta, K. (Eds.). (2003). Compelling interest: Examining the evidence on racial dynamics in higher education. Stanford, CA: Stanford University Press.
- Feldman, K. & Newcomb, T. (1969). The impact of college on students. San Francisco: Jossey-Bass.
- Gruenfeld, D.H. (1995). Status, ideology, and integrative complexity on the U.S. Supreme Court: Rethinking the politics of political decision making. Journal of Personality and Social Psychology, 68, 5-20.
- Gruenfeld, D.H. & Hollingshead, A.B. (1993). Sociocognition in work groups: The evolution of group integrative complexity and its relation to task performance. Small Group Research, 24, 383-405.
- Gruenfeld, D.H., Thomas-Hunt, M., & Kim, P. (1998). Cognitive flexibility, communication strategy, and integrative complexity in groups: Public versus private reactions to majority and minority status. Journal of Experimental Social Psychology, 34, 202-206.
- Gurin, P. (1999). The compelling need for diversity in higher education, Expert testimony in Gratz, et al. v. Bollinger, et al. Michigan Journal of Race & Law, 5, 363-425.
- Janis, I. (1972). Victims of groupthink. Boston: Houghton Mifflin.

- Levine, J. M., & Resnick, L. B. (1993). Social foundations of cognition. Annual Review of Psychology, 44, 585-612.
- Mullen, B. & Copper, C. (1994). The relation between group cohesiveness and performance: An integration. Psychological Bulletin, 115, 210-227.
- Nemeth, C.J. (1992). Minority dissent as a stimulant to group performance. In S. Worchel, W. wood, & J.A. Simpson (Eds.), Group processes and productivity (pp. 95-111). Newbury Park, CA: Sage.
- Nemeth, C. J. & Wachtler, J. (1983). Creative problem solving as a result of majority versus minority influence. European Journal of Social Psychology, 13, 45-55.
- Overall, J.E., & Woodward, J.A. (1975). Unreliability of difference scores: A paradox for measurement of change. Psychological Bulletin, 82, 85-86.
- Pascarella, E. & Terenzini, P. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.
- Smith, D.G. & Associates. (1997). Diversity works: The emerging picture of how students benefit. Washington, D.C.: Association of American Colleges and Universities.
- Suedfeld, P., Tetlock, P.E., & Streufert, S. (1992). Conceptual/integrative complexity. In C. P. Smith (Ed.), Motivation and personality: Handbook of thematic content analyses (pp. 393-400). New York: Cambridge University Press.

### Acknowledgments

The research was supported in part by grants from the Carnegie Corporation of New York, the Ford Foundation, the William and Flora Hewlett Foundation, the James Irvine Foundation, and a gift from the Richard Parsons Family Foundation. Expert assistance was provided by Danielle Popp, Tina Gridiron Smith, William Perez, Linda DeAngelo, Lorena Olivarez, Kim Misa, Nancy Cha, and Paul Umbach.

### Footnotes

<sup>1</sup> The measure is an average of two 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.