

**Difference-Education Improves First-generation Students' Grades Throughout College
and Increases Comfort with Social Group Difference**

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Abstract

Difference-education interventions provide a *contextual theory of difference*, or an understanding that social group differences come from participating in and adapting to diverse sociocultural contexts. At two selective colleges, we delivered difference-education interventions during the college transition and examined the long-term academic and intergroup outcomes. Nearly four years later, we found that first-generation students who received one of these two difference-education interventions earned higher grades and were more likely to attain honors than those in the control condition. Based on an end-of-college survey conducted with students at one of the two universities, we also found that both first-generation and continuing-generation students showed greater comfort with social group difference compared to students in the control condition. Our results contribute to the literature on intervention science by demonstrating for the first time that teaching first-generation students a contextual theory of difference can provide long-term academic benefits that persist until graduation. This work also provides evidence that that difference-education can improve an additional important set of outcomes (i.e., intergroup skills and intragroup pride).

Keywords: social class; first-generation; academic performance; higher education; intervention; intergroup relations.

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For graduates of four-year degree programs, higher cumulative grade point averages and attainment of honors at graduation are associated with tangible benefits in the labor market (e.g., higher income; Jones & Jackson, 1990; Khoo, & Ost, 2018; Thomas, 2000). However, first-generation college students (i.e., students whose parents do not have four-year degrees) confront background-specific obstacles that undermine their academic achievement (e.g., Duncan & Murnane, 2011; Fiske & Markus, 2012). As a result, these students may be less likely to realize the benefits of high academic achievement than their continuing-generation peers (i.e., students who have at least one parent with a four-year degree). However, *difference-education* interventions can improve first-generation students' academic performance through the end of their second year (Stephens, Hamedani, & Destin, 2014; Townsend, Stephens, Smallets, & Hamedani, 2019). These interventions teach students a contextual theory of difference, which is an understanding of how people's different backgrounds and social group memberships shape their experiences and outcomes. That is, students learn that social group differences come from participating in and adapting to diverse sociocultural contexts (e.g., contexts that differ by race, ethnicity, or social class). Do the academic benefits of difference-education persist through students' four years in school? In the current study, we examine whether the academic performance benefits of difference-education persist, and, also broaden the scope of outcomes investigated to include students' comfort with social group difference.¹

Continued Academic Performance Benefits for First-generation Students

¹ We use the term social-group difference to refer to variation in the experiences, opportunities, or outcomes of diverse social groups (e.g., race, gender, social class).

The social psychological literature on intervention science theorizes that seemingly small interventions can change students' long-term outcomes by giving them a new "lay theory" or way of construing their experiences in school (Blackwell, Trzesniewski, & Dweck, 2007; Cohen & Sherman, 2014; Wilson, 2011; Yeager & Walton, 2011). For example, "belongingness" interventions provide students with a theory that difficulty is normal and transient (Walton & Cohen, 2007, 2011). When struggling with a challenging assignment, students who participated in a belonging intervention may be less likely to think that they do not belong if they understand that the adversity is normal and temporary. By producing adaptive interpretations like these, this new theory can initiate a set of self-reinforcing processes that amplify the experience of belonging and ultimately reinforce the theory (cf. Miller, Dannals, & Zlate, 2017). One key indicator that an intervention operates through a recursive process is that its benefits should persist over time.

Following this logic, we theorize that difference-education also operates through recursive processes, meaning that its benefits should persist throughout students' college careers. In this intervention, students learn a contextual theory of difference, which helps them understand that their differences or experiences of feeling different in college are a product of their divergent backgrounds or life experiences (Stephens et al., 2019). This new theory serves to normalize difference by conveying that social group differences need not be negative, but instead are a normal part of coming from different contexts and can be positive. There is some evidence supporting our theorizing that a contextual theory of difference initiates a recursive process, producing lasting change for first-generation college students (Stephens et al., 2014; Townsend et al., 2019). For example, nearly two years after the intervention, first-generation students in the difference-education intervention achieved higher cumulative grade point averages (GPAs;

Townsend et al., 2019) and were more comfortable discussing their backgrounds than first-generation students in the control condition (Stephens, Townsend, Hamedani, Destin, & Manzo, 2015). If a contextual theory of difference operates as theorized, first-generation students should continue to show improved academic performance through graduation. We examine this by looking both at students' cumulative GPAs at the end of their fourth year as well as their attainment of honors.

Greater Comfort with Social Group Difference for First- and Continuing-Generation Students

Given difference-education's focus on normalizing difference, we also theorize that it should have effects beyond students' academic performance. We have previously theorized that learning a contextual theory of difference should increase students' intergroup skills, defined as understanding and navigating across social group differences (Stephens et al., 2019). We expand our theorizing and distinguish between individuals' comfort with other people's social group differences and their comfort with their own social group memberships. Specifically, we conceptualize *comfort with social group difference* as encompassing two dimensions: *intergroup skills*, which we define as individuals' comfort with other people's social group differences (e.g., cross-class friendships) and the new dimension of *intragroup pride*, which we define as individuals' comfort with their own social group memberships (e.g., participation in identity-relevant activities). In the current research, we propose that learning a contextual theory of difference should improve both first-generation and continuing-generation students' comfort with social group difference, affecting both of these dimensions.

We base our theorizing on research in both social psychology and education. Social psychological research offers evidence that using a contextual (vs. an essentialist) theory of

difference produces less discriminatory behavior, less intergroup conflict, and a reduced attachment to the status quo (e.g., Lee, Wilton, & Kwan, 2014; Levy, Plaks, Hong, Chiu, & Dweck, 2001; No et al., 2008; Williams & Eberhardt, 2008). Related research in education demonstrates that teaching students about the historical and contextual nature of persistent intergroup conflicts helps to foster psychological tendencies that suggest students may be more comfortable with diversity (e.g., Gurin, Nagda, & Zúñiga, 2013; Zúñiga, Mildred, Varghese, DeJong, & Keehn, 2012). For example, compared to students who did not enroll in an intergroup dialogue course, those who completed one showed increased perspective taking, more positive attitudes toward diversity, increased understanding of one's own group's history, and increased participation in identity-relevant extracurricular activities (e.g., Gurin et al., 2013).

Initial findings from difference-education research, which sampled a range of outcomes associated with students' experiences in college, are consistent with our theorizing that difference-education increases comfort with social group difference. For example, both first- and continuing-generation students in a difference-education intervention reported greater appreciation of difference (i.e., that students with different backgrounds and experiences can find their own way of being successful at their school and that it is important to have multiple perspectives on campus; Stephens et al., 2014). This provides some evidence for increased intergroup skills. Additionally, a lab study in which participants gave a speech about how their backgrounds matter in college offers evidence for increased intragroup pride nearly two years after an intervention. Both first-generation and continuing-generation students in the difference-education condition were more willing to discuss how different aspects of their backgrounds (e.g., family) impacted their college experiences compared to those in the control condition (Stephens et al., 2015). We build on this work in the current study and, for the first time,

systematically test our theorizing that difference-education will improve first- and continuing-generation students' comfort with social group difference—both in terms of their intergroup skills (e.g., cross-class friendships) as well as their intragroup pride (e.g., participation in identity-relevant activities).

Current Study

We investigated academic and inter/intragroup outcomes of difference-education by following up with participants from two previous interventions, which were conducted in different selective universities (i.e., Stephens et al., 2014 and Townsend et al., 2019). We combined data across these two sites to examine students' academic performance at the end of 4 years in college. We considered students' cumulative GPAs and their attainment of honors (i.e., cum laude, magna cum laude, or summa cum laude). Although honors designations at these two universities are based on students' GPAs, research suggests that having such a designation carries unique benefits (e.g., earning benefits in the first year after graduation; Khoo, & Ost, 2018). We also surveyed participants in one of the intervention studies (Townsend et al., 2019) at the end of their fourth year to examine students' comfort with social group difference.

We tested two hypotheses. Since we theorized that students' contextual theory of difference would operate through a recursive process, we expected that academic performance benefits among first-generation students in the difference-education condition would persist throughout college. Specifically, we hypothesized that first-generation students in the difference-education condition would have higher cumulative GPAs and be more likely to attain honors standing at the end of their fourth year in college, compared to first-generation students in the control condition (Hypothesis 1). In addition, we theorized that teaching students a contextual theory of difference would improve both first- and continuing-generation students' comfort with

social group difference. Thus, we hypothesized that both first- and continuing-generation students in the difference-education condition would show greater intergroup skills and intragroup pride compared to students in the control condition (Hypothesis 2).

Method

We analyzed the end-of-college academic outcomes of students who participated in two intervention studies, which were conducted at two sites. Across these studies, the difference-education intervention was delivered in different ways. In the panel difference-education intervention, participants attended an in-person panel and listened to a diverse group of junior and senior students share their stories (i.e., panel intervention; Stephens et al., 2014). In the online difference-education intervention, participants read a set of stories ostensibly written by a diverse group of junior and senior students and recent graduates (i.e., online intervention; Townsend et al., 2019). Although the delivery method differed, the content of both interventions was designed to convey a contextual theory of difference (see Stephens et al., 2014 and Townsend et al., 2019 for details). For the current study, we asked the registrars at each university for the grades, honors attainment, and course history of all students who participated in the interventions. Before merging the data, we preregistered our analysis plan for students' academic outcomes (https://osf.io/mtwsr/?view_only=277c7375a2bd4052a0c59da8f00cfbe5). Additionally, we recruited students who had participated in the online intervention study to complete an online survey in the last half of the last term of their fourth year. The survey included measures of comfort with social group differences. We report all measures, manipulations, and exclusions.

Participants. Participants were students who had participated in the panel and online interventions during their college transitions. In these interventions, we recruited as many

incoming first-generation students as possible, due to the small number of first-generation students in the population at the two selective universities. As a comparison group, we then recruited comparable numbers of continuing-generation students who roughly matched the gender and racial and ethnic backgrounds of first-generation students at those schools (see Stephens et al., 2014 and Townsend et al., 2019 for full details). For the current study, data for 10 participants was missing from university records. However, these students were both first-generation and continuing-generation, and were distributed evenly across conditions.² In addition, we included grade and honors attainment data for three participants in the online study who had complete grade data at the end of their fourth year, but whose end-of-2nd year cumulative grade point averages were previously missing (all were continuing-generation students, one in the control condition and two in the difference-education condition).

The final sample included 250 participants (i.e., 126 from the panel intervention and 124 from the online intervention). One hundred and four participants were first-generation students (i.e., neither parent had a 4-year college degree), and 146 were continuing-generation students (i.e., at least one parent had a 4-year college degree). The majority of first-generation students (69.23%) were low income (i.e., Pell grant recipients), compared with a minority of continuing-generation students (14.38%), $\chi^2(1, N = 250) = 78.21, p < .001$. Due to our matched-sample recruiting, participants' race/ethnicity did not differ significantly according to their generation status. To examine racial and ethnic differences between first-generation and continuing-generation students, we created a dummy variable (0 = *disadvantaged*, 1 = *advantaged*). Given the relationship between race and academic performance in the United States (e.g., Kao, 1995; Steele, 2010), Whites and Asians or Asian Americans were classified as academically

² Three first-generation and two continuing-generation students were in the difference-education condition, and three first-generation and two continuing-generation students were in the control condition.

advantaged, whereas African Americans, Latinos, Pacific Islanders, and Native Americans were classified as academically disadvantaged. First-generation students were not more likely to be from a disadvantaged racial or ethnic background (37.50%) than continuing-generation students (34.93%), $\chi^2(1, N = 250) = 1.12, p = .289$. See the Supplemental Material for demographics by school site.

Academic performance: Grade point average and honors. To evaluate the long-term impact of difference-education on students' end-of-college academic performance, we examined students' cumulative GPAs and whether they received academic honors (0 = no; 1 = yes).³ To retain as much data as possible in the analyses, we included 19 participants who took three years to graduate. For these participants, we used their end-of-third year cumulative grades (i.e., final grades upon graduation) as their end-of college grades. In addition, we included 24 participants who did not graduate by the spring of their fourth year. For these participants, we used their end-of-fourth year grades as their end-of-college grades.⁴ For the effects on GPA, sensitivity power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) with an alpha of 0.05, two-tailed test, indicated that we had 80% power to detect an effect size of $\eta^2 = .031$. For the effects on honors standing, sensitivity power analysis using G*Power with an alpha of 0.05, two-tailed test, indicated that we had 80% power to detect an effect size of *Odds ratio* = .155.

End-of-fourth year survey. During the last half of the last term of their fourth year, we recruited participants in the online intervention study to complete a survey. Overall, 85 students

³ Universities have different GPA standards for awarding honors. In the panel intervention, the university awards honors to the top 25 percent of the students in each school (e.g., Humanities), but the GPA cutoffs are not made public. In the online intervention, the university awards honors to those who achieve a minimum overall GPA of 3.5 or higher. We deferred to how each university defined honors standing.

⁴ All of these students were in the online intervention and most (20) were registered for a subsequent term at the same university, indicating that they either continued their undergraduate studies or began a co-terminal graduate program. The remaining four students may have filed for graduation after the spring deadline. We assigned honors standing according to university rules and based on their end-of-fourth year cumulative GPAs. The pattern and significance of our academic performance results do not change when we exclude these students from the analysis.

participated (difference-education condition $n = 44$, control condition $n = 41$). The online survey included five measures of comfort with social group differences. Three measures assessed participants' *intergroup skills*: belief that universities should acknowledge and value difference ("diversity endorsement"), teaching and learning about social group differences in school ("bridging difference"), and significance of cross-class friendships at school ("cross-class friendships"). Two measures assessed participants' *intragroup pride*: engagement in social identity-relevant extracurricular activities ("identity-relevant activities"), and identification with and pride in one's social class group ("social class identity").

We included all five measures in a one-way (intervention condition: difference-education vs. control) multivariate analysis of covariance (MANCOVA) with the covariates mentioned below. However, we focus here and in our results section on the measures that showed significant or marginal main effects of condition in follow-up univariate analyses.⁵ For these analyses, sensitivity power analysis using G*Power with an alpha of 0.05, indicated that we had 80% power to detect an effect size of $\eta^2 = .140$ for the MANCOVA and an effect size of $\eta^2 = .086$ for the univariate ANCOVAs.

Diversity endorsement. To measure participants' support for diversity efforts in higher education, we used a 6-item measure (Plaut, Garnett, Buffardi, & Sanchez-Burkes, 2011). Participants reported their agreement with these items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Example items include: "Universities should foster environments where

⁵ In addition, we measured participants' academic empowerment because previous difference-education interventions have been shown to improve first-generation students' empowerment. We predicted a 2 (condition: difference-education vs. control) \times 2 (generation status: first-generation vs. continuing-generation) interaction. Although we found the predicted marginal interaction, we are unable to draw meaningful conclusions given our low power for this analysis. We also measured participants' belief that their university appreciates difference to examine intervention effects on students' perception of their school. See the Supplemental Material for results of analyses on both measures.

differences are valued” and “One of the goals of higher education should be to teach people from different racial, ethnic, social class, and cultural backgrounds how to live and work together”).

We averaged responses on these items to create a composite, $\alpha = .922$, $M = 6.35$, $SD = .96$.

Significance of cross-class friendships. To measure the significance of participants’ cross-class friendships at school, we asked participants to report the number of close friends they have “at school” who are from a different social class background than them. Participants responded using the following scale: 0 (*none*), 1 (*one*), 2 (*two through five*), 3 (*six through ten*), and 4 (*more than ten*). We then we asked participants to report the time they spend with friends from a different social class background when they are “at school.” Participants responded using the following scale: 0 (*never*), 1 (*occasionally*), 2 (*sometimes*), 3 (*quite a lot*), and 4 (*all the time*). To capture the significance of cross-class friendships in participants’ lives, we then multiplied across these two items to create a composite. Higher scores on this measure indicate greater significance of cross-class friendships at school ($r = .670$, $M = 7.34$, $SD = 4.68$).⁶

Identity-relevant activities. To measure participants’ engagement in social identity-relevant extracurricular activities, we asked them to list the university events they had attended outside of course requirements and the student clubs or organizations in which they were members. We then coded participants’ responses for whether the event or organization was relevant to a social identity group. Specifically, we asked participants to “please describe all of the non-mandatory USC events that you chose to attend during the current academic year” and provided them with 10 text boxes in which they were to list 10 or fewer events. Next to each text box, we also provided participants with space to briefly describe the event, which we used to assist in our subsequent coding. On the following page, we asked participants to “please list ten

⁶ We also measured the significance of participants’ cross-class relationships outside of school as a comparison that should not be affected by our intervention. Results confirm this prediction, see Supplemental Material.

of the most meaningful clubs, activities, and/or organizations in which you have been involved in throughout your college experience (i.e., anything outside of paid employment and classes).” As with the events item, we provided participants with 10 spaces in which to list the organizations along with 10 spaces in which to describe them.

Following data collection, we coded participants’ responses to both the events and organizations items for whether they were (a) related to a social group identity (i.e., race/ethnicity, gender, sexual orientation, religion, or first-generation status), (b) unrelated to a social group identity (e.g., a Harry Potter-themed event), or (c) not an extracurricular event or organization (e.g., attending a lecture as required for a class). Two research assistants coded all participants’ responses and achieved good reliability (events responses, $\kappa = .88$, organizations responses, $\kappa = .92$). Therefore, we used one coder’s values (results are unchanged if we use the other coder’s values). Overall, participants reported attending under one identity-related event ($M = 0.74$, $SD = 1.34$) and being a member of under one identity-related organization ($M = 0.87$, $SD = 1.48$). Because these two were highly correlated, $r = .675$, $p < .001$, we created a composite measure of total engagement in identity-related activities by averaging the events and organizations totals ($M = 0.80$, $SD = 1.29$).

Covariates. We include five covariates in our analyses, all of which were used in the grade analyses in the panel intervention study (Stephens et al., 2014). In the Supplemental Material, we report the results of our primary analyses without covariates included.⁷ To ensure that the effects resulted from the intervention rather than from preexisting differences in

⁷ For the academic outcomes, the interaction predicting GPA becomes marginal ($p = .067$), however, the interaction predicting honors standings remains significant, as do the key predicted contrasts for both measures. For the comfort with social difference outcomes, the overall one-way MANCOVA becomes marginal ($p = .055$) and the univariate ANCOVA on identity-related activities remains significant, however, the ANCOVAs predicting diversity endorsement and cross-class friendships are no longer significant ($ps > .10$).

students' academic skills or demographic characteristics, we controlled for high school GPA, highest SAT scores, gender (male = 0; female = 1), family income (0 = not low SES; 1 = low SES; based on Pell status), and race and ethnicity. To control for race and ethnicity, we used the above-described dummy variable (disadvantaged race = 0; advantaged race = 1). For the analyses of academic outcomes, we also included the intervention study in which students participated (panel = 0; online = 1).⁸ We report raw, unadjusted means for ease of interpretation.

Results

We report key statistical results below. Full statistical results and relevant intervariable correlations are provided in the Appendix.

Academic achievement. We examined whether the difference-education intervention improved first-generation students' academic achievement at the end of college, by examining participants' end-of-fourth year cumulative GPA and attainment of honors standing.

Grade point average. We conducted a 2 intervention condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA with our standard set of covariates mentioned above. This analysis revealed a main effect for intervention condition, $F(1, 240) = 10.11, p = .002, \eta^2 = .036$, such that participants in the difference-education condition ($M = 3.50, SD = 0.33$) performed better than those in the control intervention ($M = 3.39, SD = 0.33$). Supporting Hypothesis 1, this main effect was qualified by a significant condition by generation status interaction, $F(1, 240) = 5.12, p = .025, \eta^2 = .018$. As shown in Figure 1, first-generation students in the difference-education condition ($M = 3.48, SD = 0.35$) earned higher end-of-college grades than first-generation students in the

⁸ Since participants were nested within school, we also examined the intraclass correlation coefficient and found that it was small, $p < 0.001$. Given that the GPAs of participants within each intervention study were independent, we do not report multilevel analysis. However, we find identical results with those analyses.

control condition ($M = 3.28$, $SD = 0.30$), $F(1, 240) = 12.55$, $p < .001$, $\eta^2 = .045$. Conversely, continuing-generation students in the difference-education condition ($M = 3.51$, $SD = 0.32$) did not differ from those in the control ($M = 3.47$, $SD = 0.33$), $F(1, 240) = 0.52$, $p = .470$, $\eta^2 = .002$.

In addition, there was a significant social class achievement gap in the control condition, $F(1, 240) = 5.44$, $p = .020$, $\eta^2 = .020$, such that first-generation students had lower GPAs than continuing-generation students. However, this gap was closed in the difference-education condition, $F(1, 240) = 0.30$, $p = .586$, $\eta^2 = .001$.

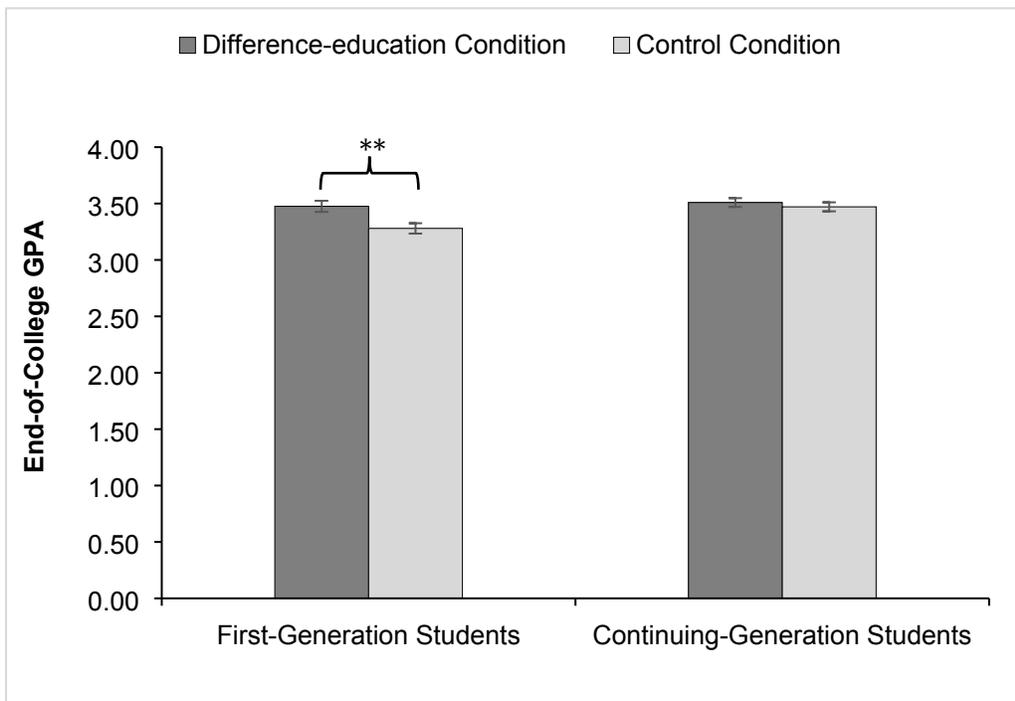


Figure 1. Mean cumulative grade point average (GPA) at the end of college as a function of generation status and intervention condition (raw means displayed). Error bars represent ± 1 standard error of the mean.

* $p < .05$, ** $p < .01$.

Honors standing. We conducted a logistic regression analysis with generation-status, intervention condition, and their interaction as predictors and with our standard set of covariates

mentioned above. We found a significant main effect of intervention condition, such that participants in the difference-education condition (47.62%) more often obtained academic honors than those in the control condition (26.61%), Wald $\chi^2(1, N = 250) = 14.13, p < .001, \text{Exp}(B) = 3.07$. In addition, the predicted generation status by condition interaction was significant, Wald $\chi^2(1, N = 250) = 5.75, p = .016, \text{Exp}(B) = .217$, see Figure 2. Consistent with Hypothesis 1, that difference-education would benefit first-generation students academically, more than three times as many first-generation students earned honors in the difference-education condition (46.15%) than in the control (13.46%), Wald $\chi^2(1, N = 250) = 15.93, p < .001, \text{Exp}(B) = 8.21$. In contrast, the intervention did not significantly impact continuing-generation students' attainment of honors standing, Wald $\chi^2(1, N = 250) = 2.47, p = .116, \text{Exp}(B) = 1.78$ (difference-education: 48.64%; control: 36.11%).

In addition, there was a marginally significant social class achievement gap in the control condition, Wald $\chi^2(1, N = 250) = 3.15, p = .076, \text{Exp}(B) = 2.57$, such that fewer first-generation students attained honors than did continuing-generation students. However, this gap was reduced in the difference-education condition, Wald $\chi^2(1, N = 250) = 1.61, p = .205, \text{Exp}(B) = .558$.

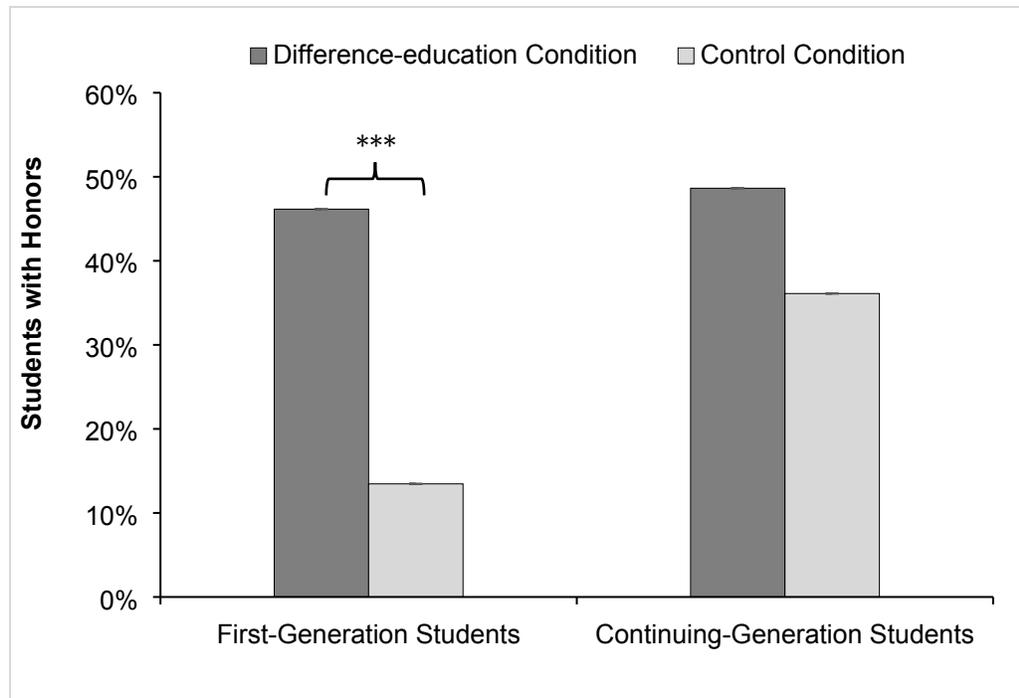


Figure 2. Percentage of students who attained honors at the end of college as a function of generation status and intervention condition.

*** $p < .001$.

Comfort with social group difference. We examined whether the difference-education intervention improved both first- and continuing-generation students' comfort with social group difference by conducting a one-way multivariate analysis of covariance (MANCOVA): intervention condition (control = 0 vs. difference-education = 1). We included our standard set of covariates mentioned above, as well as participants' generation status in order to account for potential pre-existing differences between first-generation and continuing-generation students. Consistent with Hypothesis 2, we found a significant overall effect of intervention condition, $F(5, 73) = 3.15, p = .013, \eta_p^2 = .177$.⁹ Below, we report the measures for which we found a

⁹ We report partial eta square (η_p^2) because there is nonindependence in the responses. However, eta square (η^2) for this effect is also .177 (calculated as $1 - \text{Wilk's lambda}$ following Styn & Ellis, 2009).

significant or marginal effect of condition in our univariate analyses. See the Supplemental Material for results of univariate analyses on the other two measures.

Diversity endorsement. We found a marginally significant main effect of condition on participants' diversity endorsement, $F(1, 77) = 3.07, p = .084, \eta^2 = .032$. As predicted, participants in the difference-education condition reported somewhat greater endorsement of diversity ($M = 6.49, SD = 0.62$) compared to participants in the control condition ($M = 6.21, SD = 1.21$).

Significance of cross-class friendships. We found a marginally significant main effect of condition on the significance of participants' cross-class friendships at school, $F(1, 77) = 3.03, p = .086, \eta^2 = .037$. As predicted, participants in the difference-education condition reported having more cross-class friends at school ($M = 8.11, SD = 4.37$) compared to participants in the control condition ($M = 6.51, SD = 4.90$).

Identity-related activities. We found a significant main effect of condition on participants' engagement in identity-related events and organizations, $F(1, 77) = 8.92, p = .004, \eta^2 = .088$. As predicted, participants in the difference-education condition reported attending more social identity-related activities ($M = 1.17, SD = 1.64$) compared to participants in the control condition ($M = 0.41, SD = 0.56$).

Discussion

We examined the long-term academic and inter/intragroup outcomes of difference-education interventions delivered during students' transition to college. We asked: (1) do the academic performance benefits of difference-education observed among first-generation students persist throughout their four years in college, and (2) does participating in the difference-education intervention improve both first- and continuing-generation students' comfort with

social group difference? Our results suggest that the answer to both of these questions is yes.

This work makes important theoretical contributions to literatures in both intervention science and intergroup relations.

Advancing psychological intervention research, our research demonstrates that teaching first-generation students a contextual theory of difference can provide long-term academic benefits. Even as they graduate and/or finish their fourth year, first-generation students who participated in a brief difference-education intervention at the start of their college careers fared better academically (i.e., earned higher grades and were more likely to attain honors) than their peers in the control condition. This suggests that the provision of a contextual theory of difference likely initiates a series of recursive processes that persist over time to shape students' long-term outcomes.

In addition, this study contributes to work on intergroup relations by providing some evidence that difference-education increases both first- and continuing-generation students' comfort with social group difference. We expanded on previous work by creating a new conceptual distinction between individuals' intergroup skills (i.e., their comfort with other people's social group differences) and intragroup pride (i.e., their comfort with their own social group memberships). We found that learning a contextual theory of difference in the intervention was associated with marginally greater intergroup skills and significantly more intragroup pride. Specifically, first- and continuing-generation students in the difference-education condition reported marginally stronger endorsement of diversity, and marginally greater significance of their cross-class friendships at school than students in the control condition. In addition, first- and continuing-generation students in the difference-education condition reported participating in more identity-relevant extracurricular activities than their peers in the control condition.

Thus, our results suggest that highlighting social class differences can lead to improved individual or intergroup outcomes. Indeed, our work shows that increasing awareness of social class differences in a way that emphasizes their contextual origins can improve first-generation students' academic achievement, as well as both first-generation and continuing-generation students' intergroup skills and intragroup pride. These findings stand in contrast to recent theoretical and empirical work, which argues that making people aware of gender differences has negative consequences for women's motivation and experiences (e.g., lower empowerment; Martin & Phillips, 2017). Taken together, these divergent findings suggest that the effect of making social group differences salient may differ depending on the social groups and/or on *how* those differences are made salient. Future work should examine whether difference-education might be a new route for acknowledging gender differences in a contextual way that does not perpetuate inequality.

Future Directions

Studies of difference-education have (a) documented academic benefits of the intervention (e.g., grades), (b) identified empowerment as one key mechanism that helps to explain these benefits (Stephens et al., 2014, Townsend et al., 2019), and (c) demonstrated how the intervention can shape responses to specific situations as part of a recursive process (Stephens et al., 2015). Given this previous research, the aims of the current paper were to examine whether the academic benefits persist until the end of college, and extend our results to a new set of outcomes: comfort with social group difference. We accomplished these two goals. Yet, we did not test the process through which these benefits were sustained throughout students' three or four years. Additional research is needed to specify the precise psychological and

behavioral pathways through which the academic and comfort with social difference benefits of difference-education accumulate and build over time.¹⁰

In addition, although these studies showcase the long-term benefits of difference-education, these academic benefits have been only been documented in relatively elite university settings. Future research should examine the effectiveness of difference-education interventions in a variety of college and university contexts. Finally, our results provide some evidence for a new category of benefits (i.e., inter/intragroup outcomes), however, we were not able to obtain as many survey respondents as we had hoped. Future work should examine the ability of difference-education to improve comfort with social group difference, in terms of both intergroup skills and intragroup pride, with a larger sample.

Difference-education effectively reduces the social class achievement gap and increases students' comfort with social group difference. Not only are these effects evident nearly four years after the intervention, they may continue to impact students' outcomes even after they graduate from college and transition to the workplace. First-generation students who received the intervention may enter the workplace with stronger resumes (i.e., higher GPAs and honors standing) than those who did not receive the intervention, and this may translate into gaining tangible benefits in the labor market (e.g., Khoo, & Ost, 2018). Additionally, equipped with a contextual theory of difference, both first- and continuing-generation students may be better prepared to connect with members of different social groups, ultimately building more diverse and effective networks.

¹⁰ We measured psychological empowerment in our survey of online intervention participants. As we report in the Supplemental Material, first-generation students in the difference-education condition showed greater empowerment than those in the control condition. However, we did not run mediation analyses.

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Appendix

Table 1. *Univariate Analysis of Variances Results for Grade Point Average (GPA) and Logistic Regression Results for Honors Standing*

	<i>Variable</i>	
	GPA	Honors Standing
	<i>F</i>	Wald χ^2
<i>Main and Interactive Effect</i>		
Condition	10.11**	14.13***
Generation	1.26	15.93***
Condition \times Generation	5.12*	5.75*
<i>Raw Means, Standard Deviations, and Percentages</i>		
	<i>M (SD)</i>	<i>Percentage</i>
FGs, Difference-education	3.48 (0.35)	46.15%
FGs, Control	3.28 (0.30)	13.46%
CGs, Difference-education	3.51 (0.32)	48.65%
CGs, Control	3.47 (0.33)	36.11%

Note. Degrees of freedom (*df*) for GPA = 1, 246, *N* for honors standing = 250. GPA = grade point average, FGs = first-generation students, CGs = continuing-generation students. Condition (0 = control, 1 = difference-education) and generation (0 = first-generation, 1 = continuing-generation).

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2. Means, standard deviation and Pearson correlation matrix for online survey measures

Variables	M	SD	1	2	3	4	5
1. Diversity endorsement	6.35	0.96	–				
2. Cross-Class friendships	7.34	4.68	.12	–			
3. Identity-related activities	0.80	1.29	.24*	.10	–		
4. Bridging differences	5.20	1.44	.51***	.25*	.22*	–	
5. Class identity	4.92	1.24	.32**	.04**	.22*	.22*	–

*p < .05, ** p < .01, *** p < .001

Table 3. *Univariate Analysis of Covariances Results for Bridging Difference, Class Identity, and Cross-class Friendships at School*

	<i>Variable</i>		
	Diversity	Cross-Class	Identity-Related
	Endorsement	Friendships	Activities
	<i>F</i>	<i>F</i>	<i>F</i>
<i>Covariate</i>			
High School GPA	1.10	0.02	0.26
Highest SAT Score	0.42	0.64	0.82
Race and Ethnicity	2.14	0.00	2.58
Gender	9.33*	0.33	9.17*
Low-income Status	1.29	1.34	0.32
Generation Status	0.23	0.31	0.02
<i>Main Effect</i>			
Condition	3.07+	3.03+	8.92*
<i>Raw Means and Standard Deviations</i>			
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Difference-education	6.49 (0.62)	8.11 (4.37)	1.17 (1.64)
Control	6.21 (1.21)	6.51 (4.90)	0.41 (0.56)

Note. Degrees of freedom (*df*) = 1, 77. High School GPA (continuous), highest SAT score (continuous), race and ethnicity (0 = disadvantaged, 1 = advantaged), gender (0 = male, 1 = female), low-income status (0 = low income, 1 = not low income), condition (0 = control, 1 = difference-education) and generation (0 = first-generation, 1 = continuing-generation).

+ $p < .10$, * $p < .05$.

Preregistered Covariates

In our preregistered analysis plan, we stated that we would include the number of STEM classes students had taken as an additional covariate. We planned to do this because first-generation students are often underrepresented in these courses, and this can be particularly threatening for them (Bozick & Ingels, 2008; Schneider, Swanson, & Riegle-Crumb, 1998). We included this covariate in our first set of analyses, however, its inclusion versus exclusion does not affect the significance level or direction of our results. Previous research on difference-education has used the other five covariates we use in this paper, but not number of STEM courses. Therefore, to increase comparability with this previous work, we elected to not include it in our final analyses.

Primary Analyses without Covariates

Academic Achievement

We examined whether the difference-education intervention improved first-generation students' academic achievement at the end of college, by examining participants' end-of-fourth year cumulative GPA and attainment of honors standing. See Table 1 for full results, means, and standard deviations.

Grade point average. A 2 intervention condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANOVA revealed a main effect for intervention condition, $F(1, 246) = 7.81, p = .006, \eta^2 = .30$, such that participants in the difference-education condition ($M = 3.50, SD = 0.33$) performed better than those in the control intervention ($M = 3.39, SD = 0.33$). In addition, there was a main effect for generation status, $F(1, 246) = 7.19, p = .008, \eta^2 = .027$, such that first-generation students ($M = 3.38, SD = 0.34$) performed more poorly than continuing-generation students ($M = 3.49, SD = 0.32$). Supporting Hypothesis 1, we found a marginal condition by generation status interaction, $F(1, 246) = 3.54, p = .061, \eta^2 = .013$. First-generation students in the difference-education condition ($M = 3.48, SD = 0.35$) earned higher end-of-college grades than first-generation students in the control condition ($M = 3.28, SD = 0.30$), $F(1, 246) = 9.36, p = .002, \eta_p^2 = .036$. Conversely, continuing-generation students in the difference-education condition ($M = 3.51, SD = 0.32$) did not differ from those in the control ($M = 3.47, SD = 0.33$), $F(1, 246) = 0.50, p = .480, \eta^2 = .002$.

In addition, there was a significant social class achievement gap in the control condition, $F(1, 246) = 10.35, p = .001, \eta^2 = .40$, such that first-generation students had lower GPAs than continuing-generation students. However, this gap was closed in the difference-education condition, $F(1, 246) = 0.32, p = .571, \eta^2 = .001$.

Honors standing. We conducted a logistic regression analysis with generation-status, intervention condition, and their interaction as predictors. We found a significant main effect of condition, such that participants in the difference-education condition (47.62%) more often obtained academic honors than those in the control (26.61%), Wald $\chi^2(1, N = 250) = 11.64, p = .001, \text{Exp}(B) = 2.54$. We also found a significant main effect of generation status, such that first-generation students (29.81%) less often obtained academic honors than continuing-generation students (42.46%), Wald $\chi^2(1, N = 250) = 4.23, p = .040, \text{Exp}(B) = 1.78$. In addition, the predicted generation status by condition interaction was significant, Wald $\chi^2(1, N = 250) = 3.97, p = .046, \text{Exp}(B) = .304$. Consistent with Hypothesis 1, that difference-education would benefit first-generation students academically, more than three times as many first-generation students

earned honors in the difference-education condition (46.15%) than in the control (13.46%), Wald $\chi^2(1, N = 250) = 12.01, p = .001, \text{Exp}(B) = 5.51$. In contrast, the intervention did not significantly impact continuing-generation students' attainment of honors standing, Wald $\chi^2(1, N = 250) = 2.33, p = .127, \text{Exp}(B) = 1.68$ (difference-education: 48.65%; control: 36.11%).

In addition, there was a significant social class achievement gap in the control condition, Wald $\chi^2(1, N = 250) = 7.39, p = .007, \text{Exp}(B) = 3.63$, such that fewer first-generation students attained honors standing than did continuing-generation students. However, this gap was reduced in the difference-education condition, Wald $\chi^2(1, N = 250) = 0.08, p = .783, \text{Exp}(B) = 1.10$.

Table 1. *Univariate Analysis of Variances Results for Grade Point Average (GPA) and Logistic Regression Results for Honors Standing*

	<i>Variable</i>	
	GPA <i>F</i>	Honors Standing Wald χ^2
<i>Main and Interactive Effects</i>		
Condition	7.81**	12.01**
Generation	7.20***	7.39***
Condition \times Generation	3.54+	3.97*
<i>Raw Means, Standard Deviations, and Percentages</i>		
	<i>M (SD)</i>	<i>Percentage</i>
FGs, Difference-education	3.48 (0.35)	46.15%
FGs, Control	3.28 (0.30)	13.46%
CGs, Difference-education	3.51 (0.32)	48.65%;
CGs, Control	3.47 (0.33)	36.11%

Note. Degrees of freedom (*df*) for GPA = 1, 246, *N* for honors standing = 250. GPA = grade point average, FGs = first-generation students, CGs = continuing-generation students. Condition (0 = control, 1 = difference-education) and generation (0 = first-generation, 1 = continuing-generation).

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Comfort with Social Group Difference

We examined whether the difference-education intervention improved both first- and continuing-generation students' comfort with social group difference by examining participants' responses on five measures: diversity endorsement, bridging difference, cross-class friendships, identity-relevant activities, and social class identity. We conducted a one-way multivariate analysis of variance (MANOVA): intervention condition (control = 0 vs. difference-education = 1). Consistent with Hypothesis 2, we found a significant effect of condition, $F(5, 79) = 2.49, p = .038, \eta_p^2 = .136$. As noted in the main text, we report partial eta square (η_p^2) because there is nonindependence in the responses. However, eta square (η^2) for this effect is the same (calculated as $1 - \text{Wilk's lambda}$ following Styn & Ellis, 2009). Below, we report the results of the univariate analyses that are reported in the main text.

Diversity endorsement. The effect of condition on participants' diversity endorsement was not significant, $F(1, 83) = 1.79, p = .184, \eta^2 = .021$. The means were in the predicted

direction: difference-education condition ($M = 6.49$, $SD = 0.62$) versus control condition ($M = 6.21$, $SD = 1.21$).

Significance of cross-class friends. The effect of condition on participants' cross-class friendships at school was not significant, $F(1, 83) = 2.53$, $p = .115$, $\eta^2 = .030$. The means were in the predicted direction: difference-education condition ($M = 8.11$, $SD = 4.37$) versus control condition ($M = 6.51$, $SD = 4.90$).

Identity-related activities. We found a significant main effect of condition on participants' engagement in identity-related events and organizations, $F(1, 83) = 7.90$, $p = .006$, $\eta^2 = .087$. As predicted, participants in the difference-education condition reported attending more social identity-related activities ($M = 1.17$, $SD = 1.64$) compared to participants in the control condition ($M = 0.41$, $SD = 0.56$).

Panel Study – Academic Outcomes

Method

Of the 134 intervention participants reported in the GPA analyses of Stephens, Hamedani, et al. (2014), eight participants had missing data for end-of-college GPA. Importantly, the missing participants were both first-generation and continuing-generation, and they were distributed across conditions. There were two first-generation and two continuing-generation students in the difference-education condition and three first-generation and one continuing-generation student in the control condition. Four participants took three rather than four years to graduate. For these students, we used their end-of-third year cumulative grades (i.e., final grades upon graduation).

Of the 126 intervention participants, 55 were first-generation (i.e., neither parent had a 4-year college degree), and 71 were continuing-generation (i.e., at least one parent had a 4-year college degree). The majority of first-generation students (63.64%) were low income (i.e., Pell recipients), compared with a minority of continuing-generation students (9.86%), $\chi^2(1, N = 126) = 40.33$, $p < .001$. Participants' race/ethnicity did not differ significantly according to their generation status. To examine racial and ethnic differences between first-generation and continuing-generation students, we created a dummy variable (0 = *disadvantaged*, 1 = *advantaged*). Given the relationship between race and academic performance in the United States (e.g., Kao, 1995; Steele, 2010), Whites and Asians or Asian Americans were classified as academically advantaged, whereas African Americans, Latinos, and Native Americans were classified as academically disadvantaged. First-generation students were not more likely to be from a disadvantaged racial or ethnic background (30.90%) than continuing-generation students (22.53%), $\chi^2(1, N = 126) = 1.12$, $p = .289$.

Results

Academic achievement. We examined whether the difference-education intervention improved first-generation students' academic achievement at the end of college, by examining participants' end-of-fourth year cumulative GPA and attainment of honors standing. We included the same set of five covariates used in the academic achievement analyses reported in the main text: high school GPA, highest SAT scores, gender (male = 0; female = 1), family income (0 = not low SES; 1 = low SES; based on Pell status), and race (disadvantaged race = 0; advantaged race = 1). For all analyses involving grades, we report raw means, rather than estimated marginal means, to make the observed differences between conditions clear. See Table 2 for full results, means, and standard deviations.

Grade point average. A 2 intervention condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA with the covariates mentioned above revealed a marginal main effect for intervention condition, $F(1, 117) = 3.25, p = .074, \eta_p^2 = .024$, such that participants in the difference-education condition ($M = 3.50, SD = 0.33$) performed somewhat better than those in the control intervention ($M = 3.42, SD = 0.33$). The condition by generation status interaction was not significant, $F(1, 117) = 2.09, p = .151, \eta^2 = .015$. However, follow-up simple effects tests examining our specific predictions revealed support for Hypothesis 1. First-generation students in the difference-education condition ($M = 3.45, SD = 0.32$) earned higher end-of-college grades than first-generation students in the control condition ($M = 3.31, SD = 0.34$), $F(1, 117) = 4.55, p = .035, \eta^2 = .033$. Conversely, continuing-generation students in the difference-education condition ($M = 3.53, SD = 0.32$) did not differ from those in the control ($M = 3.50, SD = 0.31$), $F(1, 117) = 0.75, p = .784, \eta^2 = .001$.

In addition, there was a marginal social class achievement gap in the control condition, $F(1, 117) = 3.01, p = .085, \eta^2 = .022$, such that first-generation students had lower GPAs than continuing-generation students. However, this gap was closed in the difference-education condition, $F(1, 117) = 0.04, p = .850, \eta^2 < .001$.

Honors standing. We conducted a logistic regression analysis with generation-status, intervention condition, and their interaction as predictors with the same covariates as the GPA analyses. We found a marginal main effect of condition, such that participants in the difference-education condition (30.65%) more often obtained academic honors than those in the control (20.31%), Wald $\chi^2(1, N = 126) = 3.72, p = .054, \text{Exp}(B) = 2.48$. The predicted generation status by condition interaction was not significant, Wald $\chi^2(1, N = 126) = 1.42, p = .234, \text{Exp}(B) = .299$. Consistent with Hypothesis 1, that difference-education would benefit first-generation students academically, more than twice as many first-generation students earned honors in the difference-education condition (25.00%) than in the control (11.11%), Wald $\chi^2(1, N = 126) = 4.04, p = .045, \text{Exp}(B) = 5.67$. In contrast, the intervention did not significantly impact continuing-generation students' attainment of honors standing, Wald $\chi^2(1, N = 126) = 0.87, p = .350, \text{Exp}(B) = 1.69$ (difference-education: 35.30%; control: 27.02%).

The social class achievement gap was not significant in the control condition, Wald $\chi^2(1, N = 126) = 0.97, p = .324, \text{Exp}(B) = 2.15$, or in the difference-education condition, Wald $\chi^2(1, N = 126) = 0.34, p = .559, \text{Exp}(B) = 0.64$.

Table 2. *Univariate Analysis of Covariances Results for Grade Point Average (GPA) and Logistic Regression Results for Honors Standing in Panel Study*

	<i>Variable</i>	
	GPA <i>F</i>	Honors Standing Wald χ^2
<i>Covariates</i>		
High School GPA	.636	1.02
Highest SAT Score	0.877	8.80**
Race and Ethnicity	2.251	0.21
Gender	0.293	0.01
Low-income Status	1.409	1.99
<i>Main and Interactive Effects</i>		
Condition	3.248+	4.04*
Generation	0.898	1.00
Condition \times Generation	2.088	1.42
<i>Raw Means, Standard Deviations, and Percentages</i>		
	<i>M (SD)</i>	<i>Percentage</i>
FGs, Difference-education	3.46 (0.32)	25.00%
FGs, Control	3.31 (0.34)	11.11%
CGs, Difference-education	3.53 (0.32)	35.30%
CGs, Control	3.50 (0.32)	27.02%

Note. Degrees of freedom (*df*) for GPA = 1, 117, *N* for honors standing = 126. GPA = grade point average, FGs = first-generation students, CGs = continuing-generation students. High School GPA (continuous), highest SAT score (continuous), race and ethnicity (0 = disadvantaged, 1 = advantaged), gender (0 = male, 1 = female), low-income status (0 = low income, 1 = not low income), condition (0 = control, 1 = difference-education) and generation (0 = first-generation, 1 = continuing-generation).

+ $p < .10$, * $p < .05$, ** $p < .01$.

Online Study – Academic Outcomes and Additional Survey Results

Participants

Of the 123 intervention participants reported in the GPA analyses of Townsend et al., (2019), two participants had missing data for end-of-college GPA. Data was missing either because students dropped out or had not completed college. Importantly, the missing participants were both first-generation and continuing-generation, and they were distributed across conditions: one student was first-generation and in the difference-education condition and one student was continuing-generation and in the control condition. In addition, three participants had missing grades at the end of their 2nd year in college and were not included in the GPA analyses of that paper (all continuing-generation students, one in the control condition, two in the difference-education condition). However, these students remained enrolled in college through the end of their fourth year and are included in the current data. The final sample included 124 participants from the online intervention. Fifteen participants took three rather than four years to

graduate. For these students, we used their end-of-third year cumulative grades (i.e., final grades upon graduation).

Of the 124 intervention participants, 49 were first-generation (i.e., neither parent had a 4-year college degree), and 75 were continuing-generation (i.e., at least one parent had a 4-year college degree). The majority of first-generation students (75.51%) were low income (i.e., Pell recipients), compared with a minority of continuing-generation students (18.67%), $\chi^2(1, N = 124) = 39.55, p < .001$. Participants' race/ethnicity did not differ significantly according to their generation status. To examine racial and ethnic differences between first-generation and continuing-generation students, we created the same dummy variable as above (0 = *disadvantaged*, 1 = *advantaged*). First-generation students were not more likely to be from disadvantaged racial backgrounds (44.89%) than continuing-generation students (46.67%), $\chi^2(1, N = 124) = 0.04, p = .847$.

Method: End-of-fourth Year Survey

As mentioned in the main text, our end-of-fourth year survey included five of measures of comfort with social difference. In addition, we measured participants' academic empowerment (i.e., the mediator in the online intervention study), their perception that their university appreciates difference, and the significance of participants' cross-class friendships outside of school.

Academic empowerment. To measure participants' academic empowerment, we used an 8-item measure (Townsend et al., 2019). Participants reported their agreement with these items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item is "I can do things at [university name] in a way that is right for me." We averaged responses on these items to create a composite, $\alpha = .843, M = 5.19, SD = 1.04$.

Belief that the university appreciates difference. To measure participants' belief that their university is accepting of students with different backgrounds and their own background helped them to be successful, we used four items (Stephens et al., 2014; Townsend et al., 2019). Items include: "Students with different backgrounds and experiences can find their own way of being successful at [university name]," "[University name] makes an effort to include ideas and practices that represent a wide variety of backgrounds," "There are different ways to be a successful [university name] student," and "I think that my background helped me succeed at [university name]," $\alpha = .753, M = 5.28, SD = 1.21$. Participants responded on a scale from 1 (strongly disagree) to 7 (strongly agree).

Previous research combined these items with items measuring the degree to which individuals believe that universities *should* appreciate diversity (i.e., Stephens et al., 2014). The resulting composite was described as a measure of intergroup skill. In contrast, we separate items assessing individuals' beliefs that their schools *do* value diversity (i.e., beliefs that the university appreciates difference) from items assessing individuals' beliefs that schools, in general, *should* value diversity (i.e., diversity endorsement). The former belief indicates that students perceive their own universities to be accepting and supportive of students from varying backgrounds, including their own. In contrast, the latter belief indicates that students think all colleges and universities have a responsibility to promote diversity.

Comfort with social group difference. We included all five measures of comfort with social group difference in our multivariate analyses. In the main text, we focused on the measures which showed significant or marginal condition effects in follow-up univariate analyses. Here we focus on the remaining two measures. The first, *bridging difference*, was a measure of intergroup skills and asked participants report their efforts to teach and learn about

social differences. The second, *class identity*, was a measure of intragroup pride and asked participants to report their identification with and pride in their social class group.

Bridging difference. To measure participants' attempts to bridge social group differences in college, we included two items: "During my time at [university name], I tried to educate others about my social groups (e.g., race, gender, social class background)," and "During my time at [university name], I learned about social groups (e.g., race, gender, social class background) different from my own." Participants reported their agreement with these items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). We averaged responses on these items to create a composite, $r = .521$, $M = 5.20$, $SD = 1.44$.

Class identity. To measure participants' identification with and pride in their social class group, we adapted three items from the multigroup ethnic identity measure (Phinney, 1992). Item were: "I feel a strong sense of pride about people with the same social class background as me." "I feel good about my social class background." "I feel ashamed of my social class background." Participants reported their agreement with these items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). We averaged responses on these items to create a composite, $\alpha = .748$, $M = 4.92$, $SD = 1.24$.

Cross-class friends outside of school. Finally, we examined participants' cross-class friendships outside of school, speculating that the significance of these friendships would *not* be affected by the difference-education intervention. We measured the significance of participants' cross-class friendships outside of school in the same way that we measured the significance of participants' cross-class friendships at school. We asked participants to report the number of close friends they have "outside school" who are from a different social class background from them. Participants responded using the following scale: 0 (*none*), 1 (*one*), 2 (*two through five*), 3 (*six through ten*), and 4 (*more than ten*). We then we asked participants to report the time they spend with friends from a different social class background when they are "outside school." Participants responded using the following scale: 0 (*never*), 1 (*occasionally*), 2 (*sometimes*), 3 (*quite a lot*), and 4 (*all the time*). We then multiplied across the number and time items to create a composite for significance of cross-class friends outside school. Higher scores on this measure indicate greater significance of cross-class friendships outside of school ($r = .615$, $M = 10.22$, $SD = 6.74$).

Online Study Results

Academic achievement. We examined whether the difference-education intervention improved first-generation students' academic achievement at the end of college, by examining participants' end-of-fourth year cumulative GPA and attainment of honors standing. For the academic achievement analyses, we included the same set of five covariates as mentioned in the main text and described above. For all analyses involving grades, we report raw means, rather than estimated marginal means, to make the observed differences between conditions clear. See Table 3 for full results, means, and standard deviations.

Grade point average. A 2 intervention condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA with the covariates mentioned above revealed a main effect for intervention condition, $F(1, 115) = 6.94$, $p = .010$, $\eta^2 = .048$, such that participants in the difference-education condition ($M = 3.50$, $SD = 0.35$) performed better than those in the control intervention ($M = 3.36$, $SD = 0.33$). Supporting Hypothesis 1, this main effect was qualified by a marginal condition by generation status interaction, $F(1, 115) = 3.69$, $p = .057$, $\eta^2 = .026$. First-generation students in the difference-education condition ($M = 3.50$, $SD = 0.38$) earned higher end-of-college grades than first-

generation students in the control condition ($M = 3.24$, $SD = 0.26$), $F(1, 115) = 8.62$, $p = .004$, $\eta^2 = .060$. Conversely, continuing-generation students in the difference-education condition ($M = 3.50$, $SD = 0.33$) did not differ from those in the control ($M = 3.44$, $SD = 0.35$), $F(1, 115) = 0.33$, $p = .568$, $\eta^2 = .002$.

In the control condition, although first-generation students had lower gpas than continuing generation students this social class achievement gap was not significant, $F(1, 115) = 1.80$, $p = .183$, $\eta^2 = .012$. Importantly, there was also no difference between groups in the difference-education condition, $F(1, 115) = 1.05$, $p = .308$, $\eta^2 < .007$.

Honors standing. We conducted a logistic regression analysis with generation-status, intervention condition, and their interaction as predictors with the same covariates as the GPA analyses. We found a significant main effect of condition, such that participants in the difference-education condition (64.06%) more often obtained academic honors than those in the control (33.33%), Wald $\chi^2(1, N = 124) = 11.62$, $p = .001$, $\text{Exp}(B) = 3.97$. In addition, the predicted generation status by condition interaction was significant, Wald $\chi^2(1, N = 124) = 5.77$, $p = .016$, $\text{Exp}(B) = .117$. Consistent with Hypothesis 1: more than four times as many first-generation students in the difference-education condition (70.83%) earned honors compared to those in the control (16.00%), Wald $\chi^2(1, N = 124) = 13.82$, $p < .001$, $\text{Exp}(B) = 15.79$. In contrast, the intervention did not significantly impact continuing-generation students' attainment of honors standing, Wald $\chi^2(1, N = 124) = 1.54$, $p = .214$, $\text{Exp}(B) = 1.85$ (difference-education: 60.00; control: 45.71%).

The social class achievement gap was not significant in the control condition, Wald $\chi^2(1, N = 124) = 1.99$, $p = .159$, $\text{Exp}(B) = 2.85$, or in the difference-education condition, Wald $\chi^2(1, N = 124) = 2.66$, $p = .103$, $\text{Exp}(B) = .335$.

Academic empowerment. For participants' academic empowerment, we predicted an interaction between condition and generation status. To test this, we conducted a 2 intervention condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA including our standard set of five covariates, as mentioned in the main text and described above. We report the results of this analysis, although we recognize we are underpowered. We found a marginally significant condition by generation status interaction, $F(1, 76) = 3.12$, $p = .081$, $\eta^2 = .035$. As predicted, first-generation students in the difference-education condition ($M = 5.12$, $SD = 1.14$) reported marginally greater empowerment than first-generation students in the control condition ($M = 4.50$, $SD = 1.00$), $F(1, 76) = 3.70$, $p = .061$, $\eta^2 = .041$. Conversely, continuing-generation students in the difference-education condition ($M = 3.52$, $SD = 0.32$) did not differ from those in the control ($M = 3.48$, $SD = 0.33$), $F(1, 76) = 0.17$, $p = .681$, $\eta^2 = .002$.

In addition, there was a marginal social class difference in the control condition, $F(1, 76) = 3.78$, $p = .056$, $\eta^2 = .042$, such that first-generation students reported lower empowerment than continuing-generation students. However, this gap was closed in the difference-education condition, $F(1, 76) = 0.06$, $p = .810$, $\eta^2 = .001$. See Table 3 for full results, means, and standard deviations.

University appreciation of difference. For participants' perceptions that their university appreciates difference, we predicted an interaction between condition and generation status. To test this, we conducted a 2 intervention condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA including our standard set of five covariates. We report the results of this analysis, although we recognize we are underpowered. We found no significant condition by generation status interaction on

participants' perception that their university appreciates difference, $F(1, 76) = 0.39, p = .533, \eta^2 = .004$. However, we did find a significant difference by generation status such that first-generation students ($M = 4.74, SD = 1.42$) reported believing that their university supported students with different backgrounds *less* than continuing-generations students ($M = 5.57, SD = 0.1.00$), $F(1, 76) = 4.06, p = .047, \eta^2 = .043$.

Table 3. *Univariate Analysis of Covariances Results for Grade Point Average (GPA), Academic Empowerment, and University Appreciation of Difference, and Logistic Regression Results for Honors Standing in Online Study*

	<i>Variable</i>			
	GPA	Honors Standing	Academic Empowerment	University Appreciates Difference
	<i>F</i>	Wald χ^2	<i>F</i>	<i>F</i>
<i>Covariates</i>				
High School GPA	12.14***	6.65**	0.00	4.42*
Highest SAT Score	1.15	0.56	0.34	0.51
Race and Ethnicity	0.18	0.14	0.18	0.02
Gender	1.06	1.96	0.32	0.14
Low-income Status	0.71	0.89	3.01	1.28
<i>Main and Interactive Effects</i>				
Condition	6.94	13.82***	1.62	0.79
Generation	0.05**	1.99	1.23	4.06*
Condition \times Generation	3.70+	5.77*	3.12+	0.40
<i>Raw Means, Standard Deviations, and Percentages</i>				
	<i>M (SD)</i>	<i>Percentage</i>	<i>M (SD)</i>	<i>M (SD)</i>
FGs, Difference-education	3.50 (0.38)	70.83%	5.12 (1.14)	4.88 (1.45)
FGs, Control	3.24 (0.26)	16.00%	4.50 (1.00)	4.59 (1.43)
CGs, Difference-education	3.49 (0.33)	60.00%	5.29 (1.01)	5.51 (1.00)
CGs, Control	3.44 (0.35)	45.71%	5.48 (0.91)	5.63 (0.97)

Note. Degrees of freedom (*df*) for GPA = 1, 115, *N* for honors standing = 124, *df* for academic empowerment and university appreciates difference = 1, 76. GPA = grade point average, FGs = first-generation students, CGs = continuing-generation students. High School GPA (continuous), highest SAT score (continuous), race and ethnicity (0 = disadvantaged, 1 = advantaged), gender (0 = male, 1 = female), low-income status (0 = low income, 1 = not low income), condition (0 = control, 1 = difference-education) and generation (0 = first-generation, 1 = continuing-generation).

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Comfort with social group difference. As mentioned in the main text, for we conducted a one-way MANCOVA: intervention condition (control = 0 vs. difference-education = 1). See the main text for results of the MANCOVA and of the significant and marginal univariate ANCOVAs. We report the other univariate analyses below. See Table 4 for full results, means, and standard deviations.

Bridging difference. We found no significant main effect of condition on participants' reports that they bridged social group differences, $F(1, 77) = 0.001, p = .974, \eta^2 < .001$.

Class identity. We found no significant main effect of condition on participants' pride in their social class background, $F(1, 77) = 1.73, p = .192, \eta^2 = .020$.

Significance of cross-class friendships outside of school. We conducted a one-way (condition: difference-education vs. control) ANCOVA, including our standard set of five covariates. We found no significant main effect of condition on participants' cross-class friendships outside of school, $F(1, 77) = 0.436, p = .511, \eta^2 = .005$. See Table 4 for full results, means, and standard deviations.

Table 4. *Univariate Analysis of Covariances Results for Bridging Difference, Class Identity, and Cross-class Friendships outside of School in Online Study*

	<i>Variable</i>		
	Bridging Difference	Class Identity	Cross-class Friendships Outside of School
	<i>F</i>	<i>F</i>	<i>F</i>
<i>Covariates</i>			
High School GPA	0.66	0.44	0.36
Highest SAT Score	0.03	0.30	7.24+
Race and Ethnicity	3.78+	5.16*	3.02+
Gender	3.90+	1.43	1.35
Low-income Status	0.50	0.23	2.37
Generation Status	3.25+	0.07	1.35
<i>Main Effect</i>			
Condition	0.00	1.73	0.44
<i>Raw Means and Standard</i>			
<i>Deviations</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Difference-education	5.20 (1.60)	5.06 (1.15)	5.46 (4.90)
Control	5.21 (1.25)	4.76 (1.32)	4.82 (4.33)

Note. Degrees of freedom (df) = 1, 77. FGs = first-generation students, CGs = continuing-generation students. High School GPA (continuous), highest SAT score (continuous), race and ethnicity (0 = disadvantaged, 1 = advantaged), gender (0 = male, 1 = female), low-income status (0 = low income, 1 = not low income), condition (0 = control, 1 = difference-education) and generation (0 = first-generation, 1 = continuing-generation).

+ $p < .10$, * $p < .05$.

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