

Running head: LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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

For Peer Review

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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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Abstract

Difference-education interventions teach people that social group difference comes from participating in and adapting to diverse sociocultural contexts (i.e., they provide a *contextual theory of difference*). At two universities, we delivered difference-education interventions during the college transition and examined long-term academic and intergroup outcomes. Nearly four years later, first-generation students who received a difference-education intervention earned higher grades and were more likely to attain honors than those in the control condition. Based on an end-of-college survey with students at one of the two universities, both first-generation and continuing-generation students showed greater comfort with social group difference compared to students in the control condition. Our results demonstrate for the first time that teaching first-generation students a contextual theory of difference can lead to long-term academic benefits that persist until graduation. This work also provides new evidence that that difference-education can improve comfort with social group difference.

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

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

For graduates of 4-year degree programs, higher cumulative grade point averages (GPAs) 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 4-year degrees) confront background-specific obstacles that can hinder their academic achievement compared to their continuing-generation peers (i.e., students who have at least one parent with a 4-year degree; e.g., Duncan & Murnane, 2011; Fiske & Markus, 2012; Phillips et al., 2020). *Difference-education* interventions can improve first-generation students' initial academic performance by providing an understanding of how people's different backgrounds and social group memberships shape their experiences and outcomes (i.e., a contextual theory of difference; Stephens et al., 2014; Stephens et al., 2019; Townsend et al., 2019). In the current paper, we extend work on difference-education in two critical ways. First, we examine whether first-generation students continue to experience the academic performance benefits of difference-education throughout their four years in college. Second, we investigate whether the intervention affects an important new outcome for both first- and continuing-generation students: comfort with social group difference.¹

Do the Academic Benefits of Difference-Education Persist Throughout College?

The social psychological literature on intervention science documents that seemingly small interventions can change students' long-term academic outcomes by giving them a new "lay theory" or way of construing their experiences in school (Blackwell et al., 2007; Cohen &

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).

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 Sherman, 2014; Wilson, 2011; Yeager & Walton, 2011). Leveraging this approach, difference-
4 education teaches students a contextual theory of difference: that social group differences come
5 from participating in and adapting to diverse sociocultural contexts (e.g., contexts that differ by
6 race, ethnicity, or social class; Stephens et al., 2019). This contextual theory can help students to
7 understand that their differences or experiences of feeling different in college are not a result of
8 personal weaknesses or deficiencies, but instead a product of their particular backgrounds or life
9 experiences before college. In addition to normalizing students' experiences of difference, a
10 contextual theory can also convey that differences can serve as an asset or strength. As a result,
11 this new theory can help students to feel that they fit in college and are empowered to succeed.
12 Supporting our theorizing, first-generation students who participated in difference-education
13 interventions achieved higher cumulative grade point averages (GPAs; Stephens et al., 2014;
14 Townsend et al., 2019) compared to first-generation students in control conditions.
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31 Although these academic benefits have been found through students' second year in
32 college, it is unclear whether they will persist until graduation. On the one hand, it is possible
33 that the effects may fade. Indeed, students often experience a transition as they begin to focus on
34 coursework in their academic major(s) as well as on their future career plans (e.g., Kelly et al.,
35 2007). This key transition might mean that the benefits of the intervention will not sustain
36 themselves over time. Recent research conducted at a large, broad-access university is consistent
37 with this possibility (Murphy et al., 2020). This work examined the benefits of belongingness
38 interventions, which are similar to difference-education interventions in that they also give
39 students a new way to understand their experiences in school. Murphy and colleagues found that
40 the initial improvements in racial-ethnic-minority and first-generation students' grades did not
41 persist.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 On the other hand, as we propose here, it is possible that the academic benefits of
4 difference-education may persist over time. “Wise interventions,” like difference-education, can
5 initiate a set of *recursive* or self-reinforcing processes, in which the newly learned lay theory
6 produces a change in experience or behavior that further reinforces or amplifies the theory
7 (Miller et al., 2017). For example, when struggling to select a major, a first-generation student
8 who has learned a contextual theory of difference may feel that they fit and can be successful in
9 college, which may improve their performance. In turn, this experience of success may then
10 reinforce their belief in a contextual theory. We theorize that difference-education interventions
11 should operate in this way, initiating these kinds of self-reinforcing processes. Accordingly, we
12 propose that the intervention’s benefits will persist throughout students’ college careers.
13
14 Consistent with this possibility, studies of other wise interventions find evidence that the benefits
15 on students’ grades persist over long periods of time (i.e., belongingness, Walton & Cohen,
16 2007; values affirmation, Tibbetts et al., 2016).

Does Difference-Education Increase Students’ Comfort with Social Group Difference?

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35 Given difference-education’s focus on normalizing difference, we also theorize that it
36 should have effects beyond students’ academic performance. We have previously theorized that
37 learning a contextual theory of difference should improve students’ intergroup outcomes, defined
38 as understanding and navigating across social group differences (Stephens et al., 2019). We
39 expand our theorizing to include individuals’ comfort with their own social group memberships
40 as well as other people’s social group differences. Specifically, we conceptualize *comfort with*
41 *social group difference* as encompassing both intergroup skills, which we define as individuals’
42 comfort with other people’s social group differences (e.g., cross-class friendships) and intragroup
43 pride, which we define as individuals’ comfort with their own social group memberships (e.g.,
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 participation in identity-relevant activities). We propose that learning a contextual theory of
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5 difference should improve both first-generation and continuing-generation students' comfort
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7 with social group difference, measured as a composite of these subthemes.
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10 We base our theorizing on research in both social psychology and education. Social
11
12 psychological research offers evidence that using a contextual (vs. an essentialist) theory of
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14 difference produces less discriminatory behavior, less intergroup conflict, and a reduced
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16 attachment to the status quo (e.g., Lee et al., 2014; Levy et al., 2001; No et al., 2008; Williams &
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18 Eberhardt, 2008). Related education research on intergroup dialogues demonstrates that teaching
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20 students about the historical and contextual nature of persistent intergroup conflicts helps to
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22 foster psychological tendencies that suggest students may be more comfortable with diversity
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24 (e.g., Gurin et al., 2013; Zúñiga et al., 2012). For example, compared to students who did not
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26 enroll in an intergroup dialogue course, those who completed one showed increases in
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28 perspective taking, understanding of their own group's history, participation in identity-relevant
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30 extracurricular activities, and positive attitudes toward diversity (e.g., Gurin et al., 2013).
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35 Initial findings from difference-education research, which sampled a range of outcomes
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37 associated with students' experiences in college, are consistent with our theorizing that
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39 difference-education increases comfort with social group difference. For example, both first- and
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41 continuing-generation students in a difference-education intervention reported greater
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43 appreciation of difference (i.e., that students with different backgrounds and experiences can find
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45 their own way of being successful at their school and that it is important to have multiple
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47 perspectives on campus; Stephens et al., 2014). Additionally, a lab study offers evidence for
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49 increased intragroup pride. In this study, students who had previously participated in a
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51 difference-education intervention gave a speech about how their backgrounds matter in college.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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Both first-generation and continuing-generation students in the intervention 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—measured as a composite of intergroup skills (e.g., cross-class friendships) and 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 two indicators of academic performance: students' cumulative GPAs and their attainment of honors (i.e., cum laude, magna cum laude, or summa cum laude). The persistence of difference-education's benefits on these two dimensions of academic performance is practically significant as they offer tangible benefits when students graduate and join the workforce. In particular, higher cumulative college GPA and attainment of honors standing are both independently associated with greater earnings (e.g., Finnie et al., 2016; Jones & Jackson, 1990; Khoo & Ost, 2018). Moreover, students may view the attainment of honors standing as an important, visible signal of success in college and a source of empowerment as they enter the workforce. To examine students' comfort with social group difference, we surveyed participants in one of the intervention studies (Townsend et al., 2019) at the end of their fourth year.

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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We tested two hypotheses. Since we theorized that students' contextual theory of difference would initiate a set of recursive processes, changing students' experiences in ways that reinforce the theory and produce further changes, 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 comfort with social group difference compared to students in the control condition (Hypothesis 2).

Method

We analyzed the end-of-college academic outcomes of students who participated in two difference-education intervention studies. Both interventions conveyed a contextual theory of difference, but one was in person and one was online (see Stephens et al., 2014 and Townsend et al., 2019 for details). In the in-person intervention, participants in the audience listened to a diverse group of junior and senior students share their stories (Stephens et al., 2014). In the online intervention, participants read a set of stories ostensibly written by a diverse group of junior and senior students and recent graduates (Townsend et al., 2019). Each university's registrar's office provided 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

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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(https://osf.io/mtwst/?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 in-person and online interventions during their college transitions. In these interventions, due to the small number of first-generation students in the population at the two selective universities, we recruited as many incoming first-generation students as possible. 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-second-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 in-person 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

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.

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 students (69.23%) were low income (i.e., Pell grant recipients), compared with a minority of
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5 continuing-generation students (14.38%), $\chi^2(1, N = 250) = 78.21, p < .001$. Due to our matched-
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7 sample recruiting, participants' race/ethnicity did not differ significantly according to their
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9 generation status. To examine racial and ethnic differences between first-generation and
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11 continuing-generation students, we created a dummy variable (0 = disadvantaged, 1 =
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13 advantaged). Given the relationship between race and academic performance in the United States
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15 (e.g., Kao, 1995; Steele, 2010), students who were White, Asian, or Asian American were
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17 classified as academically advantaged, whereas students who were African American, Latino,
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19 Pacific Islander, and Native American were classified as academically disadvantaged. First-
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21 generation students were not more likely to be from a disadvantaged racial or ethnic background
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23 (37.50%) than continuing-generation students (34.93%), $\chi^2(1, N = 250) = 1.12, p = .289$. See the
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25 Supplemental Material for demographics by intervention site.
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Academic Performance: Grade Point Average and Honors

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33 To evaluate the long-term impact of difference-education on students' end-of-college
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35 academic performance, we examined students' cumulative GPAs and whether they received
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37 academic honors (0 = no; 1 = yes).³ To retain as much data as possible in the analyses, we
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39 included 19 participants who took 3 years to graduate. For these participants, we used their end-
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41 of-third-year cumulative grades (i.e., final grades upon graduation) as their end-of-college
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43 grades. In addition, we included 24 participants who did not graduate by the spring of their
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54 ³ Universities have different GPA standards for awarding honors. In the in-person intervention, the university
55 awards honors to the top 25 percent of the students in each school (e.g., Humanities), but the GPA cutoffs are not
56 made public. In the online intervention, the university awards honors to those who achieve a minimum overall GPA
57 of 3.5 or higher. We deferred to how each university defined honors standing.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 fourth year. For these participants, we used their end-of-fourth-year grades as their end-of-
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5 college grades.⁴
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End-of-Fourth-Year Survey
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10 During the last half of the last term of their fourth year, we recruited participants in the
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12 online intervention study to complete a survey. Overall, 85 students participated (difference-
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14 education condition $n = 44$, control condition $n = 41$). Intervention participants who completed
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16 the survey did not differ from those who did not complete it in terms of generation status, study
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18 condition, family income (based on Pell grant eligibility), gender, attainment of honors standing,
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20 or cumulative GPA. They did, however, differ in terms of their racial background: students who
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22 responded to the survey were more likely to be from an academically advantaged racial
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24 background (62.35%) than those who did not respond (35.90%; $\chi^2(1, N = 124) = 7.53, p = .006$).
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28 Importantly, this does not change the interpretation of the finding that difference education
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30 increases students' comfort with social difference.
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33 The online survey included five measures of comfort with social group differences: belief
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35 that universities should acknowledge and value difference ("diversity endorsement"), attempts to
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37 bridge social group differences in school ("bridging difference"), significance of cross-class
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39 friendships at school ("cross-class friendships"), identification with and pride in one's social
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41 class group ("social class identity"), and engagement in social identity-relevant extracurricular
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43 activities ("identity-relevant activities"). We created composites for each of these measures, as
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45 described below. We then standardized each composite and averaged these together to create an
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53 ⁴ All of these students were in the online intervention and most (20) were registered for a subsequent term at the
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55 same university, indicating that they either continued their undergraduate studies or began a co-terminal graduate
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57 program. The remaining four students may have filed for graduation after the spring deadline. We assigned honors
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59 standing according to university rules and based on their end-of-fourth year cumulative GPAs. The pattern and
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significance of our academic performance results do not change when we exclude these students from the analysis.

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 overall measure of comfort with social difference. We examined condition differences on this
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5 overall measure in a one-way (intervention condition: difference-education vs. control) analysis
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7 of covariance (ANCOVA) with the covariates mentioned below. See the Supplemental Material
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9 for results of a multivariate analysis of variance including the five individual composite
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11 measures as well as separate univariate ANCOVAs on each.⁵
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15 **Diversity endorsement.** To measure participants' support for diversity efforts in higher
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17 education, we used a 6-item measure (Plaut et al., 2011). Participants reported their agreement
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19 with these items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item is:
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21 "Universities should foster environments where differences are valued." We averaged responses
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23 on these items to create a composite, $\alpha = .922$, $M = 6.35$, $SD = .96$.
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27 **Bridging difference.** To measure participants' attempts to bridge social group
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29 differences in college, we included two items: "During my time at [university name], I tried to
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31 educate others about my social groups (e.g., race, gender, social class background)," and "During
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33 my time at [university name], I learned about social groups (e.g., race, gender, social class
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35 background) different from my own." Participants reported their agreement with these items on a
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37 scale from 1 (*strongly disagree*) to 7 (*strongly agree*). We averaged responses on these items to
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39 create a composite, $r = .521$, $M = 5.20$, $SD = 1.44$.
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43 **Significance of cross-class friendships.** To measure the significance of participants'
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45 cross-class friendships at school, we asked participants to report the number of close friends they
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51 ⁵ We also measured participants' academic empowerment because difference-education has been shown to improve
52 first-generation students' empowerment. We predicted a 2 (condition: difference-education vs. control) \times 2
53 (generation status: first-generation vs. continuing-generation) interaction. Although the pattern of differences on this
54 measure was consistent with our predictions, we are unable to draw meaningful conclusions given the low power for
55 this analysis and that the interaction was marginal. We also measured participants' belief that their university
56 appreciates difference to examine the intervention's effects on students' perceptions of their school. See the
57 Supplemental Material for results of analyses on both measures.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 have “at school” who are from a different social class background than them. Participants
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5 responded using the following scale: 0 (*none*), 1 (*one*), 2 (*two through five*), 3 (*six through ten*),
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7 and 4 (*more than ten*). We then we asked participants to report how often they spend time with
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9 friends from a different social class background when they are “at school.” Participants
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11 responded using the following scale: 0 (*never*), 1 (*occasionally*), 2 (*sometimes*), 3 (*quite a lot*),
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13 and 4 (*all the time*). We then multiplied across these two items to create a composite so that
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15 higher scores indicate greater significance of cross-class friendships at school ($r = .670$, $M =$
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17 7.34 , $SD = 4.68$).⁶
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22 **Social class identity.** To measure participants’ identification with and pride in their
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24 social class group, we adapted three items from the multigroup ethnic identity measure (Phinney,
25
26 1992). An example item is: “I feel a strong sense of pride about people with the same social class
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28 background as me.” Participants reported their agreement with these items on a scale from 1
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30 (*strongly disagree*) to 7 (*strongly agree*). We averaged responses on these items to create a
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32 composite, $\alpha = .748$, $M = 4.92$, $SD = 1.24$.
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36 **Identity-relevant activities.** To measure participants’ engagement in social identity-
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38 relevant extracurricular activities, we asked them to list the university events they had attended
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40 outside of course requirements and the student clubs or organizations in which they were
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42 members. We then coded participants’ responses for whether the event or organization was
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44 relevant to a social identity group. Specifically, we asked participants to “please describe all of
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46 the non-mandatory [university name] events that you chose to attend during the current academic
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48 year” and provided them with 10 text boxes in which they were to list 10 or fewer events. On the
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50 following page, we asked participants to “please list ten of the most meaningful clubs, activities,
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55 ⁶ We also measured the significance of participants’ cross-class relationships outside of school as a comparison that
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57 should not be affected by our intervention. Results confirm this prediction, see Supplemental Material.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 and/or organizations in which you have been involved in throughout your college
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5 experience (i.e., anything outside of paid employment and classes).” Next to each of the 10 event
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7 and 10 organization text boxes, we also provided participants with space to briefly describe the
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9 event or organization, which we used to assist in our subsequent coding.
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12 Following data collection, we coded participants’ responses to both the events and
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14 organizations items for whether they were (a) related to a social group identity (i.e.,
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16 race/ethnicity, gender, sexual orientation, religion, or first-generation status), (b) unrelated to a
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18 social group identity (e.g., a Harry Potter-themed event), or (c) not an extracurricular event or
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20 organization (e.g., attending a lecture as required for a class). Two research assistants coded all
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22 participants’ responses and achieved good reliability (events responses, $\kappa = .88$, organizations
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24 responses, $\kappa = .92$). Therefore, we used one coder’s values (results are unchanged if we use the
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26 other coder’s values). Overall, participants reported attending under one identity-related event
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28 ($M = 0.74$, $SD = 1.34$) and being a member of under one identity-related organization ($M = 0.87$,
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30 $SD = 1.48$). Because these two were highly correlated, $r = .675$, $p < .001$, we created a composite
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32 measure of total engagement in identity-related activities by averaging the events and
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34 organizations totals ($M = 0.80$, $SD = 1.29$).
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40 Results

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42 We include five covariates in our analyses, all of which were used in the grade analyses
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44 in the in-person intervention study (Stephens et al., 2014). In the Supplemental Material, we
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46 report the results of our primary analyses without covariates included.⁷ To ensure that the effects
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48 resulted from the intervention rather than from preexisting differences in students’ academic
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50 skills or demographic characteristics, we controlled for high school GPA, highest SAT scores,
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55 ⁷ The interactions predicting GPA and honor standing became marginal ($p < .08$), the predicted simple effects and
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57 the univariate ANCOVA on comfort with social difference remained significant.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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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 (in-person = 0; online = 1).⁸ For the analysis of comfort with social difference, we also included generational status (first-generation student = 0; continuing-generation student = 1). We report raw, unadjusted GPA means for ease of interpretation. We report 90% confidence intervals (CIs) for the ANCOVA and MANCOVA effects (following Lakens, 2013) and 95% CIs for the logistic regression effects, both in brackets.

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 for complete results.

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

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.

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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	<i>Variable</i>	
	GPA	Honors Standing
	<i>F</i>	Wald χ^2
<i>Covariates</i>		
High School GPA	4.36*	3.43 ⁺
Highest SAT Score	2.61	3.26 ⁺
Race and Ethnicity	2.60	0.14
Gender	0.94	0.72
Low-income Status	1.35	3.09 ⁺
Intervention Delivery	0.90	0.19
<i>Main and Interactive Effects</i>		
Condition	10.11**	13.39***
Generation	1.26	0.01
Condition \times Generation	5.12*	5.19*

Note. Degrees of freedom (*df*) for GPA = 1, 240, *N* for honors standing = 250. GPA = grade point average, FGs = first-generation students, CGs = continuing-generation students. Gender (male = 0; female = 1), family income (0 = not low SES; 1 = low SES; based on Pell status), race (disadvantaged race = 0; advantaged race = 1), intervention delivery (in-person = 0; online = 1), condition (0 = control, 1 = difference-education), and generation (0 = first-generation, 1 = continuing-generation).

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

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 significant main effect for intervention condition, $F(1, 240) = 10.11, p = .002, \eta_p^2 = .040$ [.009, .088], such that participants in the difference-education condition ($M = 3.50, SD = 0.33$) performed better than those in the control intervention ($M = 3.39, SD = 0.33$). Importantly, this main effect was qualified by a significant condition by generation status interaction, $F(1, 240) = 5.12, p = .025, \eta_p^2 = .021$ [.001, .060]. A sensitivity power analysis using G*Power (Faul et al., 2007) with an alpha of 0.05 and a two-tailed test, indicated that we had 80% power to detect an effect size of $\eta^2 = .031$. As such, we were underpowered for the interaction effect ($\eta^2 = .018$), but

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 well-powered to detect our predicted simple effect ($\eta^2 = .045$). Given our somewhat low power,
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5 we also examined the data by estimating a Bayes factor using JASP (Love et al., 2019),
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7 comparing the fit of the data under the alternative hypothesis and the null hypothesis. Providing
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9 some support for our theorizing, we found $BF_{10} = 2.36$, which suggests that the data were 2.36
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11 times more likely to occur under a model including effects of our intervention, of generation
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13 status, and of an interaction between the two, rather than a model without including these.
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17 Next, to examine the simple effects, we conducted post hoc tests with Bonferroni
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19 adjustments. Supporting Hypothesis 1 and as shown in Figure 1, first-generation students in the
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21 difference-education condition ($M = 3.48$, $SD = 0.35$) earned higher end-of-college grades than
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23 first-generation students in the control condition ($M = 3.28$, $SD = 0.30$), $F(1, 240) = 12.55$, $p <$
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25 $.001$, $\eta_p^2 = .050$ [.014, .101]. Supporting our theorizing we also found $BF_{10} = 4.66$, suggesting it
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27 is over 4 times more likely to for there to be an effect of our intervention than no effect.
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30 Conversely, continuing-generation students in the difference-education condition ($M = 3.51$, SD
31
32 $= 0.32$) did not differ from those in the control ($M = 3.47$, $SD = 0.33$), $F(1, 240) = 0.52$, $p = .470$,
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34 $\eta_p^2 = .002$ [.000, .004], $BF_{01} = 5.10$. This Bayes factor suggests that it is 5 times more likely for
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36 there to be no effect (vs. an effect) of our intervention among continuing-generation students.
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41 In addition, there was a significant social class achievement gap in the control condition,
42
43 $F(1, 240) = 5.44$, $p = .020$, $\eta_p^2 = .022$ [.002, .062], such that first-generation students had lower
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45 GPAs than continuing-generation students. We also found $BF_{10} = 18.78$ suggesting that, in the
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47 control condition, it is over 18 times more likely to for there to be a social class gap in GPA than
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49 no difference. However, this gap was closed in the difference-education condition, $F(1, 240) =$
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51 0.30 , $p = .586$, $\eta_p^2 = .001$ [.000, .002]. Finally, we found $BF_{01} = 4.32$, which suggests that it is 4
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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times more likely for there to be no difference (vs. a difference) between first-generation and continuing-generation students' GPAs in the difference-education condition.

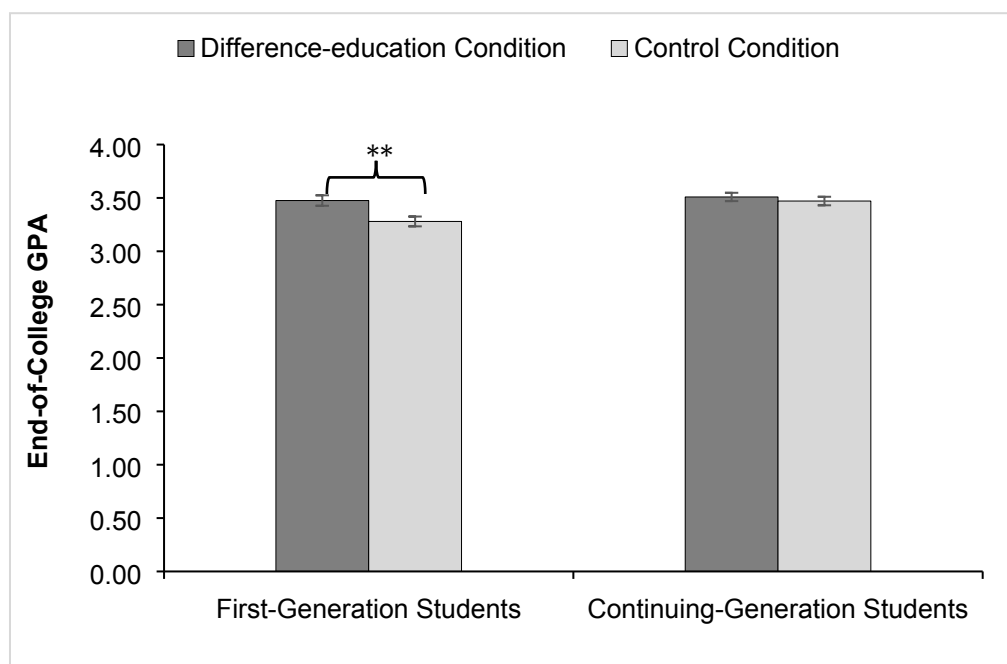


Figure 1. Mean cumulative grade point average (GPA) at the end of college as a function of generation status and intervention condition (raw means displayed). Error bars represent ± 1 standard error of the mean.

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

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 (48.41%) more often obtained academic honors than those in the control condition (28.22%), Wald $\chi^2(1, N = 250) = 13.39, p < .001$, $\text{Exp}(B) = 2.99 [1.66, 5.38]$. In addition, the generation status by condition interaction was significant, Wald $\chi^2(1, N = 250) = 5.19, p = .023$, $\text{Exp}(B) = .239 [.070, .819]$, see Figure 2. A sensitivity power analysis using G*Power with an alpha of 0.05, two-tailed test, indicated that

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 we were well-powered (i.e., 80% power to detect an effect size of *Odds ratio* = .155). To
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5 examine our specific predictions, we conducted simple slopes analyses and report Bonferroni
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7 adjusted significance levels. Consistent with Hypothesis 1, that difference-education would
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9 benefit first-generation students academically, more than three times as many first-generation
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11 students earned honors in the difference-education condition (46.15%) than in the control
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13 (15.38%), Wald $\chi^2(1, N = 250) = 15.93, p < .001, \text{Exp}(B) = 7.44 [2.70, 20.49]$. In contrast, the
14
15 intervention did not significantly impact continuing-generation students' attainment of honors
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17 standing, Wald $\chi^2(1, N = 250) = 2.42, p = .480, \text{Exp}(B) = 1.78 [0.861, 3.67]$ (difference-
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19 education: 50.00%; control: 37.50%).
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24 The social class achievement gap was not significant in the control condition, Wald $\chi^2(1,$
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26 $N = 250) = 2.29, p = 1.00, \text{Exp}(B) = 2.29 [0.83, 6.31]$, meaning that first-generation students did
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28 not attain honors significantly less than did continuing-generation students. In addition, first-
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30 generation and continuing-generation students did not differ in their attainment of honors in the
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32 difference-education condition, Wald $\chi^2(1, N = 250) = 1.69, p = .776, \text{Exp}(B) = .547 [0.22,$
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34 $1.36]$.
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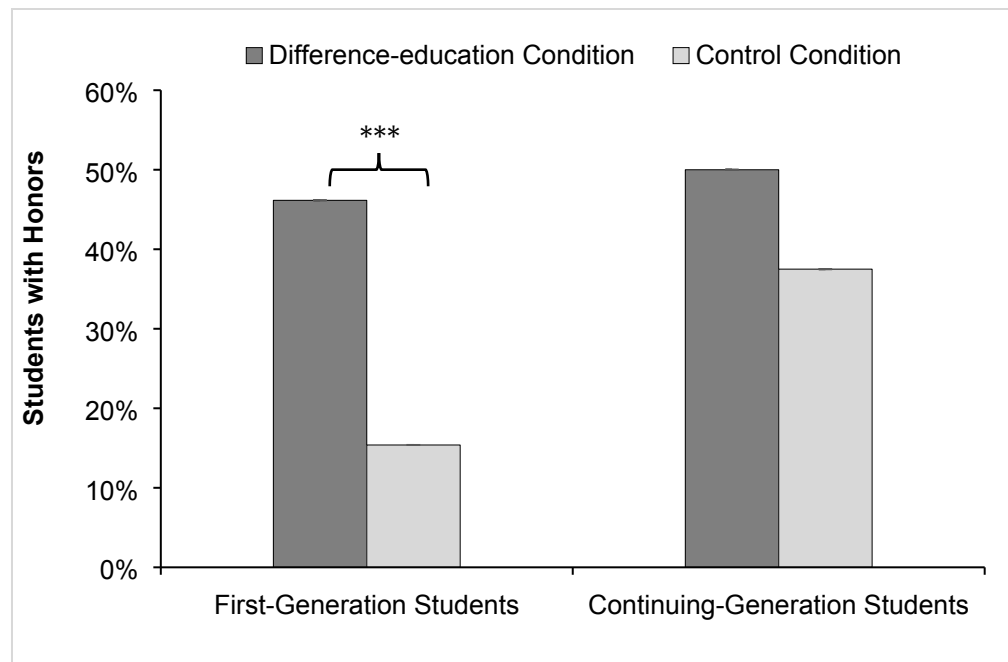


Figure 2. Percentage of students who attained honors at the end of college as a function of generation status and intervention condition.

*** $p < .001$.

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 ANCOVA: intervention condition (control = 0 vs. difference-education = 1). As mentioned above, we included our standard set of covariates 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, $F(1, 77) = 7.31, p = .008, \eta_p^2 = .087 [.013, .195]$. Unfortunately, we were not able to obtain as many survey respondents as we had hoped and a sensitivity power analysis using G*Power with an alpha of 0.05 indicated that we were under-powered (i.e., we had 80% power to detect an effect size of $\eta^2 = .086$ and our obtained effect was $\eta^2 = .071$). Given our low

power, we also examined the data by estimating a Bayes factor using JASP (Love et al., 2019). Providing some support for our theorizing, we found $BF_{10} = 1.94$, which suggests that it is almost 2 times more likely for the intervention to have affected participants' comfort with social class difference than to have had no effect.

Discussion

We examined the long-term academic and inter/intragroup outcomes of difference-education interventions delivered during students' transition to college. We asked: (a) do the academic performance benefits of difference-education observed among first-generation students persist throughout their four years in college, and (b) 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 work 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. As theorized, this suggests that the provision of a contextual theory of difference initiates a series of recursive processes that persist over time to shape students' long-term outcomes. Importantly, these persistent benefits emerged with an intervention delivered at relatively elite universities. In contrast, recent research conducted at a broad-access university found that the GPA benefits of a belongingness intervention did not

LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 persist (Murphy et al., 2020). Together, these findings suggest that the persistence of academic
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5 benefits may be moderated by the type of intervention site (i.e., relatively elite vs. more broad-
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7 access institutions) and some academic benefits may only persist in the long run in relatively
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9 elite settings.
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12 In addition, this study contributes to work on intergroup relations by providing initial
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14 evidence that difference-education conveys intergroup and intragroup benefits. Specifically, for
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16 both first- and continuing-generation students, we found that difference-education produced
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18 greater comfort with social group difference, including elements of intergroup skills and
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20 intragroup pride. We consider this evidence preliminary because we were not able to obtain as
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22 many survey respondents as we had hoped. Additional research, with a larger sample, is needed
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24 to examine the ability of difference-education to improve comfort with social group difference,
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26 and to compare relative gains in intergroup skills versus intragroup pride.
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30 31 **Implications and Future Directions**

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

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3 the academic and comfort with social difference benefits of difference-education accumulate and
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5 build over time.⁹
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8 By demonstrating benefits of educating students about social class differences, our
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10 research stands in contrast to recent work that has shown that making people aware of gender
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12 differences can have negative consequences for women's motivation and experiences (e.g., lower
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14 empowerment; Martin & Phillips, 2017, 2019). Importantly, in this work, participants learn
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16 simply that gender differences exist and are important. However, in the difference-education
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18 intervention, participants learn about the contextual origins of social class differences—that
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20 people have different experiences and outcomes as a result their different backgrounds. Taken
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22 together, these divergent findings suggest that the effect of making social group differences
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24 salient may differ depending on the social groups (e.g., race vs. social class vs. gender) and/or on
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26 *how* those differences are made salient (e.g., whether the differences are explained vs. simply
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28 highlighted). Future work should examine whether difference-education might be a new route for
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30 acknowledging gender differences in a contextual way that does not perpetuate inequality.
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36 Difference-education effectively reduces the social class achievement gap and increases
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38 students' comfort with social group difference. Not only are these effects evident nearly four
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40 years after the intervention, they may continue to impact students' outcomes even after they
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42 graduate from college and transition to the workplace. First-generation students who received the
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44 intervention may enter the workplace with stronger resumes (i.e., higher GPAs and honors
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46 standing) than those who did not receive the intervention, and this may translate into gaining
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48 tangible benefits in the labor market (e.g., Khoo, & Ost, 2018). Additionally, equipped with a
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55 ⁹ We measured psychological empowerment in our survey of online intervention participants. As we report in the
56 Supplemental Material, first-generation students in the difference-education condition showed greater empowerment
57 than those in the control condition. However, we did not run mediation analyses.
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LONG-TERM BENEFITS OF DIFFERENCE-EDUCATION

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3 contextual theory of difference, both first- and continuing-generation students may be better
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5 prepared to connect with members of different social groups, ultimately building more diverse
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7 and effective networks.
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For Peer Review

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For Peer Review

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

Preregistered Covariates and Analyses

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.

In addition, in our preregistration, we mention the possibility of three additional exploratory analyses: (a) coding the courses students took to examine differences in course-selection, (b) examining condition differences in grades by subject matter, and (c) examining the effect of time. However, we did not run these analyses. Specifically, we attempted coding to examine (a), but were unsuccessful in reliably capturing the content of courses across all those taken by participants in both schools. We did not attempt the analyses mentioned in (b) or (c).

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, $F(1, 246) = 3.54, p = .061, \eta^2 = .013$. To examine the simple effects, we conducted post hoc tests with Bonferroni adjustments. 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 (48.41 %) more often obtained academic honors than those in the control (28.22%), Wald $\chi^2(1, N = 250) = 10.65, p = .001, \text{Exp}(B) = 2.42$. We also found a significant main effect of generation status, such that first-generation students (30.77%) less often obtained academic honors than continuing-generation students (43.83%), Wald $\chi^2(1, N = 250) = 4.44, p = .035, \text{Exp}(B) = 1.79$. The predicted generation status by condition interaction did not reach significance, Wald $\chi^2(1, N = 250) = 3.20, p = .074, \text{Exp}(B) = 2.83$. To probe examine are specific prediction, we conducted simple slopes analyses and report Bonferroni adjusted significance levels. 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 (15.38%), Wald $\chi^2(1, N = 250) = 10.68, p = .004, \text{Exp}(B) = 4.71$. In contrast, the intervention did not significantly impact continuing-generation students' attainment of honors standing, Wald $\chi^2(1, N = 250) = 2.30, p = .516, \text{Exp}(B) = 1.68$ (difference-education: 50%; control: 37.50%).

In addition, there was a significant social class achievement gap in the control condition, Wald $\chi^2(1, N = 250) = 6.89, p = .036, \text{Exp}(B) = 3.30$, such that fewer first-generation students attained honors standing than did continuing-generation students. However, the social class achievement gap was not significant in the difference-education condition, Wald $\chi^2(1, N = 250) = 0.18, p = 1.00, \text{Exp}(B) = 1.17$.

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

	Variable	
	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)	15.58%
CGs, Difference-education	3.51 (0.32)	50.00%
CGs, Control	3.47 (0.33)	37.50%

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).

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

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5 **Comfort with social group difference.** We examined whether the difference-education
6 intervention improved both first- and continuing-generation students' comfort with social group
7 difference by conducting a one-way ANOVA: intervention condition (control = 0 vs. difference-
8 education = 1). Consistent with Hypothesis 2, and with the results of an ANCOVA including our
9 standard covariates, we found a significant overall effect of intervention condition, $F(1, 83) =$
10 $4.99, p = .028, \eta_p^2 = .057$ [.003, .101].
11

12 In-Person Study – Academic Outcomes

13 Method

14
15 Of the 134 intervention participants reported in the GPA analyses of Stephens,
16 Hamedani, et al. (2014), eight participants had missing data for end-of-college GPA.
17 Importantly, the missing participants were both first-generation and continuing-generation, and
18 they were distributed across conditions. There were two first-generation and two continuing-
19 generation students in the difference-education condition and three first-generation and one
20 continuing-generation student in the control condition. Four participants took three rather than
21 four years to graduate. For these students, we used their end-of-third year cumulative grades (i.e.,
22 final grades upon graduation).
23

24 Of the 126 intervention participants, 55 were first-generation (i.e., neither parent had a 4-
25 year college degree), and 71 were continuing-generation (i.e., at least one parent had a 4-year
26 college degree). The majority of first-generation students (63.64%) were low income (i.e., Pell
27 recipients), compared with a minority of continuing-generation students (9.86%), $\chi^2(1, N = 126)$
28 $= 40.33, p < .001$. Participants' race/ethnicity did not differ significantly according to their
29 generation status. To examine racial and ethnic differences between first-generation and
30 continuing-generation students, we created a dummy variable (0 = *disadvantaged*, 1 =
31 *advantaged*). Given the relationship between race and academic performance in the United
32 States (e.g., Kao, 1995; Steele, 2010), Whites and Asians or Asian Americans were classified as
33 academically advantaged, whereas African Americans, Latinos, and Native Americans were
34 classified as academically disadvantaged. First-generation students were not more likely to be
35 from a disadvantaged racial or ethnic background (30.90%) than continuing-generation students
36 (22.53%), $\chi^2(1, N = 126) = 1.12, p = .289$.
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40 Results

41 **Academic achievement.** We examined whether the difference-education intervention
42 improved first-generation students' academic achievement at the end of college, by examining
43 participants' end-of-fourth year cumulative GPA and attainment of honors standing. We included
44 the same set of five covariates used in the academic achievement analyses reported in the main
45 text: high school GPA, highest SAT scores, gender (male = 0; female = 1), family income (0 =
46 not low SES; 1 = low SES; based on Pell status), and race (disadvantaged race = 0; advantaged
47 race = 1). For all analyses involving grades, we report raw means, rather than estimated marginal
48 means, to make the observed differences between conditions clear. See Table 2 for full results,
49 means, and standard deviations.
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52 **Grade point average.** A 2 intervention condition (control = 0 vs. difference-education =
53 1) \times 2 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA with the
54 covariates mentioned above revealed a marginal main effect for intervention condition, $F(1, 117)$
55 $= 3.25, p = .074, \eta_p^2 = .024$, such that participants in the difference-education condition ($M =$
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3 3.50, $SD = 0.33$) performed somewhat better than those in the control intervention ($M = 3.42$, SD
4 $= 0.33$). The condition by generation status interaction was not significant, $F(1, 117) = 2.09$, $p =$
5 $.151$, $\eta^2 = .015$. However, follow-up post hoc tests with Bonferroni adjustments examining our
6 specific predictions revealed support for Hypothesis 1. First-generation students in the
7 difference-education condition ($M = 3.45$, $SD = 0.32$) earned higher end-of-college grades than
8 first-generation students in the control condition ($M = 3.31$, $SD = 0.34$), $F(1, 117) = 4.55$, $p =$
9 $.035$, $\eta^2 = .033$. Conversely, continuing-generation students in the difference-education condition
10 ($M = 3.53$, $SD = 0.32$) did not differ from those in the control ($M = 3.50$, $SD = 0.31$), $F(1, 117) =$
11 0.75 , $p = .784$, $\eta^2 = .001$.

12
13
14 In addition, the social class achievement gap was not significant in the control condition,
15 $F(1, 117) = 3.01$, $p = .085$, $\eta^2 = .022$, or in the difference-education condition, $F(1, 117) = 0.04$,
16 $p = .850$, $\eta^2 < .001$.

17
18 **Honors standing.** We conducted a logistic regression analysis with generation-status,
19 intervention condition, and their interaction as predictors with the same covariates as the GPA
20 analyses. We found a marginal main effect of condition, such that participants in the difference-
21 education condition (30.65%) more often obtained academic honors than those in the control
22 (20.31%), Wald $\chi^2(1, N = 126) = 3.72$, $p = .054$, $\text{Exp}(B) = 2.48$. The predicted generation status
23 by condition interaction was not significant, Wald $\chi^2(1, N = 126) = 1.42$, $p = .234$, $\text{Exp}(B) =$
24 $.299$. To examine our specific prediction, we conducted simple slopes analyses and report
25 Bonferroni adjusted significance levels. Although more than twice as many first-generation
26 students earned honors in the difference-education condition (25.00%) than in the control
27 condition (11.11%) this difference was not significant after the Bonferroni adjustment, Wald χ^2
28 $(1, N = 126) = 4.04$, $p = .180$, $\text{Exp}(B) = 5.67$. In addition, the intervention did not significantly
29 impact continuing-generation students' attainment of honors standing, Wald $\chi^2(1, N = 126) =$
30 0.87 , $p = 1.00$, $\text{Exp}(B) = 1.69$ (difference-education: 35.30%; control: 27.02%).
31 The social class achievement gap was not significant in the control condition, Wald $\chi^2(1, N =$
32 $126) = 0.97$, $p = 1.00$, $\text{Exp}(B) = 2.15$, or in the difference-education condition, Wald $\chi^2(1, N =$
33 $126) = 0.34$, $p = 1.00$, $\text{Exp}(B) = 0.64$.

Table 2. *Univariate Analysis of Covariances Results for Grade Point Average (GPA) and Logistic Regression Results for Honors Standing in In-Person 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). Items measured feelings of perceived preparation (Stephens et al., 2014), academic efficacy (Midgley et al., 2000), and learner empowerment (adapted from Frymier, Shulman, & Houser, 1996). 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. As mentioned in the main text, the online survey included five measures of comfort with social group differences: belief that universities should acknowledge and value difference ("diversity endorsement"), teaching and learning about social

group differences in school (“bridging difference”), significance of cross-class friendships at school (“cross-class friendships”), identification with and pride in one’s social class group (“social class identity”), and engagement in social identity-relevant extracurricular activities (“identity-relevant activities”). In the main text, we report condition differences on an overall measure in a one-way (intervention condition: difference-education vs. control) analysis of covariance (ANCOVA) with the covariates mentioned below. Below we report the results of a multivariate analysis of covariance including each of the five measures as well as separate, univariate ANCOVAs on each. See Table 3 for means, standard deviations, and correlations among these five measures.

Table 3. 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*	–

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

Cross-class friends outside of school. Finally, we also asked participants to report their cross-class friendships outside of school, as a filler measure. 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 how often they spend time 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 4 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 ($M = 3.36$, $SD = 0.33$). We did not find a significant condition by generation status interaction, $F(1, 115) = 3.69$, $p = .057$, $\eta^2 = .026$.

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3 However, post hoc tests with Bonferroni adjustments revealed that first-generation students in
4 the difference-education condition ($M = 3.50$, $SD = 0.38$) earned higher end-of-college grades
5 than first-generation students in the control condition ($M = 3.24$, $SD = 0.26$), $F(1, 115) = 8.62$, p
6 $= .004$, $\eta^2 = .060$. Conversely, continuing-generation students in the difference-education
7 condition ($M = 3.50$, $SD = 0.33$) did not differ from those in the control ($M = 3.44$, $SD = 0.35$),
8 $F(1, 115) = 0.33$, $p = .568$, $\eta^2 = .002$.

9
10 The social class achievement gap was not significant in the control condition, $F(1, 115) =$
11 1.80 , $p = .183$, $\eta^2 = .012$, or in the difference-education condition, $F(1, 115) = 1.05$, $p = .308$, η^2
12 $< .007$.

13
14 **Honors standing.** We conducted a logistic regression analysis with generation-status,
15 intervention condition, and their interaction as predictors with the same covariates as the GPA
16 analyses. We found a significant main effect of condition, such that participants in the
17 difference-education condition (64.06%) more often obtained academic honors than those in the
18 control (33.33%), Wald $\chi^2(1, N = 124) = 11.62$, $p = .001$, $\text{Exp}(B) = 3.97$. In addition, the
19 predicted generation status by condition interaction was significant, Wald $\chi^2(1, N = 124) = 4.81$,
20 $p = .028$, $\text{Exp}(B) = .147$. To probe examine are specific prediction, we conducted simple slopes
21 analyses and report Bonferroni adjusted significance levels. Consistent with Hypothesis 1: more
22 than four times as many first-generation students in the difference-education condition (70.83%)
23 earned honors compared to those in the control (20.00%), Wald $\chi^2(1, N = 124) = 12.51$, $p =$
24 $.002$, $\text{Exp}(B) = 12.70$. In contrast, the intervention did not significantly impact continuing-
25 generation students' attainment of honors standing, Wald $\chi^2(1, N = 124) = 1.52$, $p = .868$,
26 $\text{Exp}(B) = 1.87$ (difference-education: 62.50%; control: 48.57%).

27
28
29 The social class achievement gap was not significant in the control condition, Wald $\chi^2(1,$
30 $N = 124) = 1.27$, $p = 1.00$, $\text{Exp}(B) = 2.23$, or in the difference-education condition, Wald $\chi^2(1, N$
31 $= 124) = 2.66$, $p = .408$, $\text{Exp}(B) = .328$.

32
33 **Academic empowerment.** For participants' academic empowerment, we predicted an
34 interaction between condition and generation status. To test this, we conducted a 2 intervention
35 condition (control = 0 vs. difference-education = 1) \times 2 generation status (first-generation = 0
36 vs. continuing-generation = 1) ANCOVA including our standard set of five covariates, as
37 mentioned in the main text and described above. We report the results of this analysis, although
38 we recognize that it is underpowered. The condition by generation status interaction did not
39 attain significance, $F(1, 76) = 3.12$, $p = .081$, $\eta^2 = .035$. Subsequently, we elected to examine
40 whether the simple effects replicated findings from previous research (i.e., Townsend et al.,
41 2019). To do so, we conducted post hoc tests with Bonferroni adjustments. First-generation
42 students in the difference-education condition ($M = 5.12$, $SD = 1.14$) did not report significantly
43 greater empowerment than first-generation students in the control condition ($M = 4.50$, $SD =$
44 1.00), $F(1, 76) = 3.70$, $p = .061$, $\eta^2 = .041$, although the difference was in the predicted direction.
45 Continuing-generation students in the difference-education condition ($M = 3.52$, $SD = 0.32$) did
46 not differ from those in the control ($M = 3.48$, $SD = 0.33$), $F(1, 76) = 0.17$, $p = .681$, $\eta^2 = .002$.

47
48 In addition, there was no significant social class difference in the control condition, $F(1,$
49 $76) = 3.78$, $p = .056$, $\eta^2 = .042$, or in the difference-education condition, $F(1, 76) = 0.06$, $p =$
50 $.810$, $\eta^2 = .001$. See Table 4 for full results, means, and standard deviations.

51
52 **University appreciation of difference.** For participants' perceptions that their university
53 appreciates difference, we predicted an interaction between condition and generation status. To
54 test this, we conducted a 2 intervention condition (control = 0 vs. difference-education = 1) \times 2
55 generation status (first-generation = 0 vs. continuing-generation = 1) ANCOVA including our
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standard set of five covariates. We report the results of this analysis, although we recognize it is 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 4. *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*

	Variable			
	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***	7.72**	0.00	4.42*
Highest SAT Score	1.15	0.09	0.34	0.51
Race and Ethnicity	0.18	0.04	0.18	0.02
Gender	1.06	1.90	0.32	0.14
Low-income Status	0.71	2.08	3.01	1.28
<i>Main and Interactive Effects</i>				
Condition	6.94*	10.59**	1.62	0.79
Generation	0.05	0.16	1.23	4.06*
Condition \times Generation	3.70 ⁺	4.81*	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)	20.00%	4.50 (1.00)	4.59 (1.43)
CGs, Difference-education	3.49 (0.33)	62.50%	5.29 (1.01)	5.51 (1.00)
CGs, Control	3.44 (0.35)	48.57%	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. We also examined whether the difference-education intervention improved both first- and continuing-generation students' comfort with social group difference by looking at responses on each of the five measures we included in our composite measure (reported in the main text). Specifically, we conducted 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. We found a significant overall effect of intervention condition, $F(5, 73) = 3.15, p = .013, \eta_p^2 = .177 [.023, .259]$. A sensitivity power analysis using G*Power with an alpha of 0.05, indicated that we were adequately powered (i.e., we had 80% power to detect an effect size of $\eta^2 = .140$ for the MANCOVA and our obtained effect was $\eta^2 = .177$). We calculated eta square (η^2) as $1 - \text{Wilk's lambda}$ following Steyn and Ellis (2009). We report results of the univariate ANCOVAs below. See Table 5 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. We found a marginally significant main effect of condition on the significance of participants' cross-class friendships at school, $F(1, 77) = 3.03, p = .086, \eta_p^2 = .038 [.000, .127]$. 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 ($M = 6.51, SD = 4.90$).

Diversity endorsement. We found a marginally significant main effect of condition on participants' diversity endorsement, $F(1, 77) = 3.07, p = .084, \eta_p^2 = .038 [.000, .128]$. 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 ($M = 6.21, SD = 1.21$).

Identity-related activities. We found a significant main effect of condition on participants' engagement in identity-related events and organizations, $F(1, 77) = 8.92, p = .004, \eta_p^2 = .104 [.020, .216]$. 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 ($M = 0.41, SD = 0.56$).

Table 5. *Univariate Analysis of Covariances Results Five Measures of Comfort with Social Difference in Online Study*

	Variable				
	Bridging Difference	Class Identity	Cross-class Friendships	Diversity Endorsement	Identity- Related Activities
	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>
<i>Covariates</i>					
High School GPA	0.66	0.44	0.02	1.10	0.26
Highest SAT Score	0.03	0.30	0.64	0.42	0.82
Race and Ethnicity	3.78+	5.16*	0.00	2.14	2.58
Gender	3.90+	1.43	0.33	9.33*	9.17*
Low-income Status	0.50	0.23	1.34	1.29	0.32
Generation Status	3.25+	0.07	0.31	0.23	0.02

<i>Main Effect</i>					
Condition	0.00	1.73	3.03+	3.07+	8.92*
<i>Raw Means and Standard Deviations</i>					
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Difference-education	5.20 (1.60)	5.06 (1.15)	8.11 (4.37)	6.49 (0.62)	1.17 (1.64)
Control	5.21 (1.25)	4.76 (1.32)	6.51 (4.90)	6.21 (1.21)	0.41 (0.56)

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).

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

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, $F(1, 77) = 0.436$, $p = .511$, $\eta^2 = .005$.

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Long-Term Benefits of Difference-Education Stimulus Materials

[Panel Intervention Instructions and Student Comments]

Intervention Method

The panel sessions included two moderators (1 White male and 1 White female) and eight panelists. Of the panelists, 3 were first-generation and 5 were continuing-generation. Among first-generation panelists, 2 were White (1 male, 1 female) and one was Asian American (female). As for continuing-generation panelists, 2 were White (1 male, 1 female), 2 were African American (1 male, 1 female), and one was Middle Eastern (female). We intentionally recruited panelists who were diverse in terms of both race and ethnicity, as well as gender. The efforts to balance race, ethnicity, and gender across first-generation and continuing-generation panelists, however, were limited by the need for panelists who were skilled public speakers, willing to share their personal stories, and available for all eight sessions.

When participants arrived to the intervention session, they were first greeted and asked to sign a consent form. The consent form included a question at the end that asked participants for permission to access their official grades from the registrar's office. Afterward, they were asked to take a seat and wait for the student panel to begin. The panelists were arranged in the front of the room at a long table with microphones, while 20 to 25 participants sat in chairs in the audience. As the discussion panel began, one of the moderators explained the procedure to participants:

Welcome everyone and welcome to [university name]. We appreciate your participation in the [university name] Student Project, and hope that today's experience will be valuable for your transition to college. In this session, you will get to hear the stories and experiences of your peers. They were once first-years too, and look forward to sharing their perspective with you. There will be six questions addressed to the student panel today. Each of the speakers has prepared some thoughts and remarks to share with you. Our panel moderator, [student name], is going to ask the questions. First, the speakers will go around the room and introduce themselves. Then, they will answer a series of questions about their experiences at [university name]. Finally, we will ask you to complete a short activity and then a brief survey about what you learned. Now it's time for the speakers to introduce themselves. They will start by saying their name, year, major, and where they are from.

After the moderator gave an overview of the intervention procedure, in both conditions, the panelists took turns introducing themselves with the information noted above. Upon completing introductions, the moderator then introduced the material to be included in the session. In the difference-education condition, the moderator emphasized differences in students' backgrounds: "The speakers are excited to have you here and to share their stories with you. Students come from very different backgrounds before arriving at [university name]. These differences make [university name] an amazing

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3 place to be.” In contrast, in the control condition, the moderator did not mention
4 differences in students’ backgrounds, but instead mentioned students’ diverse interests:
5 “The speakers are excited to have you here and to share their stories with you.
6 Students’ interests span a wide range of topics and areas of study. These differences
7 make [university name] an amazing place to be.”
8
9

10 The panelists then took turns answering the six intervention questions that the
11 moderator asked the student panel. In both conditions, the student panel lasted for
12 about 45 minutes.
13

14 **In the difference-education condition, the students answered the following**
15 **questions:**

- 16
17 (1) “People come to college for many different reasons. What did coming to college
18 mean to you?”
19 (2) “Students can have a wide variety of experiences when they transition to college
20 and come from many different backgrounds. Thinking back, what was the
21 transition to [university name] like for you?”
22 (3) “Now we’d like you to share some specific challenges about coming to college.
23 Can you provide an example of an obstacle that you faced when you came to
24 [university name] and how you resolved it?”
25 (4) “Did your decision to attend [university name] affect your relationships with your
26 friends and family at home? If yes, how?”
27 (5) “What would you advise other students to do with backgrounds similar to your
28 own?”
29 (6) “What experiences that you had prior to [university name] prepared you to excel
30 in ways that you wouldn’t have anticipated at the time?”
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34 **In the control condition, the students answered the following questions:**

- 35 (1) “Trace your path for finding your major.”
36 (2) “What were some of the experiences that led you to your major and what were
37 some challenges?”
38 (3) “What has been your favorite class and least favorite so far and why?” (4) “What
39 do you do to be successful in your classes? For example, how do you plan your
40 courses and what are some strategies for being successful in those courses?”
41 (4) “How do you study for midterms and final exams? What are some challenges
42 that you encounter?”
43 (5) “What are some options that you are considering as a future career path? How
44 did you come to recognize those options? What are the advantages and/or
45 disadvantages of the different paths you are considering?”
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49 ***Difference-Education Condition Sample Responses***

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51 To illustrate how students’ stories in the difference-education condition conveyed the
52 framework for understanding how different backgrounds matter, below we included
53 sample responses from first-generation panelists and continuing-generation panelists.
54 The contrast between the examples from first-generation and continuing-generation
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3 panelists reveal that (I) students' different social class backgrounds can shape the
4 college experience in both positive and negative ways and that (II) students need to
5 utilize strategies for success that take their different social class backgrounds into
6 account.
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9 ***(I) Different Social Class Backgrounds can Shape the College Experience in Both***
10 ***Positive and Negative Ways.***
11

12 **First-generation sample responses**
13

14 I've been through a lot in my life and am sure that I'm not alone in that experience but
15 that defines everything about me. It gave me perspective that made [university name] a
16 lot easier to tackle. Midterms and papers seem hard, and they are, but at the same time
17 they just seem like another drop in the bucket and I love that perspective.
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19

20 The fact that [university name] seemed like such an improbable destination for me as a
21 public school student, and the fact that I feel like I overcame the odds to be here, has
22 prompted me to work harder and contribute more to [university name] now that I'm here.
23
24

25 I definitely feel different from other students and not necessarily having the best network
26 behind me to make the best decision about my future. And because of my background
27 and not having a network of people, family, and parents to go to and say, "What did you
28 do when you were in college? What are the best options?", I found that it was hard to
29 get the advice that I needed.
30
31

32 As far as my family goes it has caused some strain. School puts a financial strain on my
33 family and I've gotten into numerous arguments with my mother and they tend to end
34 with her telling me that we wouldn't have had to worry about everything if I had just
35 gone to a different university. That definitely makes things hard. Another thing is my
36 mom didn't go to college- so sometimes she just doesn't understand a lot of things that
37 I'm going through. So when I'm stressed, she doesn't get it. That changes things.
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41 **Continuing-generation sample responses**
42

43 I've always been really motivated to learn new things and motivated to be in school just
44 for the sake of learning so college was an obvious choice in that respect. Also everyone
45 wants to be successful in their future job and I think going to a good school, like
46 [university name], is definitely key in having success later in life in terms of occupation.
47 In terms of family background I think my parents definitely had an influence because
48 they went to college and really valued that experience.
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51 My choice to attend [university name] really was supported by everyone in my family.
52 There was no sort of imposition by my parents, "you need to go to the university of
53 Texas", or anything like that. It was like, "wherever you want to go we'll fully support you
54 in any way that we really can" and so they were very open with it. There was really no
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3 after effect with any of my friends or anything like that so it was actually a really lucky
4 situation to be in.
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6 I went to a pretty small private school. And sometimes it did feel like a bit much because
7 we were doing online searches for college as freshman so I got into high school going,
8 “Why are you having me look at colleges?”. But, it was definitely a big adjustment for
9 me going into huge classes. I was used to individual attention so being in big classes
10 were kind of hard. So I think my background of having really individual learning and a lot
11 of individual attention was definitely a challenge because in college you don’t have that
12 quite as much.
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15 I’m an only child and my family and I spend a lot of time together. So it was actually
16 really hard to say bye when they dropped me off for the first time. In fact it was the first
17 and only time I’ve seen my dad cry. It was really difficult. Also, despite going to a sort of
18 “college prep” high school, I found my existing study habits to be really lagging the
19 college rigors and so really adjusting to both academics and leaving family and being in
20 a completely new place.
21
22

23 24 ***(II) Students Need to Utilize Strategies for Success that Take Their Different*** 25 ***Social Class Backgrounds into Account.*** 26

27 **First-generation sample responses** 28

29 Once I came to [university name], I realized that I didn’t have to be strong all of the time
30 and that most people had no expectations of me besides trying my best and putting in
31 effort in classes. After that, I realized that there was no shame in struggling or asking for
32 help. It was a huge step forward in my life. Over time, being able to use my peers as a
33 resource was incredibly helpful. Seeking advice from them was a source of comfort and
34 they especially helped me with deciding what classes to take or how to deal with any
35 personal dilemmas I was having.
36
37

38 If I were to start college again I would tell my parents more about the things that I do
39 here. They don’t realize that there is more to a university than just attending classes. I
40 would have liked them to know more about all the clubs and activities that I wanted to
41 be a part of so that they would understand why I wanted to be on campus more often. I
42 wish I had allowed my freshman self to be more involved with student group activities
43 on campus, so that I would have had the opportunity to be more than just a student
44 early on. Studies are important, but I should have also considered the importance of
45 making an impact on the student body as well.
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49 **Continuing-generation sample responses** 50

51 In advising others about how to succeed, I’d tell them that they should sit in the front
52 row of classrooms. I never really thought that that mattered very much but towards the
53 end of the year I saw a lot of my previous professors throughout the year that I had
54 throughout the year and most of them remember me because I sat in the front of the
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3 room, I was engaged. Although I didn't always do the best on tests or on homework,
4 they still knew that I was doing my best in class, they knew that I was giving an effort
5 and they appreciated that. I think teachers really appreciate the students that sit in the
6 front of the class, take notes, and show that they actually want to learn.
7

8
9 It's never a bad thing to know more people, to have more connections on campus and
10 definitely, the first week or so during orientation when you're just put into this new
11 environment and everybody else is trying to find their place, try and be more outgoing. I
12 would try and be more outgoing and just try and meet as many possible people as you
13 could because it could never really hurt you. Even if you don't want to join their group
14 just having the connection can be important. To be able to say, "Oh, I know the
15 president of such and such group"- if someone comes up to you and is interested in that
16 particular thing maybe you can put them in contact with it. So it's just don't burn your
17 bridges. That's one of the lessons I've learned.
18
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20 ***Control Condition Sample Responses***

21
22 To illustrate that the stories in the control condition did not convey background-specific
23 information about how students' experiences and strategies for success can differ by
24 social class, below we included sample responses from the control condition. Instead,
25 they conveyed general content revealing that (I) students have different college
26 experiences, including both positive and negative examples, and (II) students can utilize
27 different strategies to succeed.
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30 ***(I) Students Have Different College Experiences - Both Positive and Negative.***

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32 I see my career path as coming in stages. I think that I would like to dedicate my life to
33 the field of education, in particular public education reform. As of right now, I plan on
34 being certified for English education after graduation from [university name] and
35 teaching for a few years. I feel like it would be impossible for me to make any important
36 changes in education without being immersed in it and truly knowing what I am dealing
37 with. Some interests to me are administration or curriculum design, possibly working in
38 guidance. Honestly, these options started as just thoughts. But the more time I
39 dedicated to these thoughts, the more I saw the potential of them and the more
40 comfortable I felt about these thoughts becoming my reality.
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45 My favorite class would probably be a research seminar on political history. The
46 research seminar was a combination of a great classroom setting of 12 students in
47 addition to being taught by arguably the best professor in the History department. There
48 were no exams- just one large paper at the end of the quarter and several
49 presentations. Our grades were primarily based on discussion. I took this class as a
50 sophomore with seniors writing their honors theses. Being among such bright, mature,
51 and well-read students made not only for the most intimidating but invigorating
52 classroom I have ever been in. The material was extremely specific and explains a lot of
53 what is going on in the world today.
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3 As for challenges, it was definitely frustrating choosing my major because I wasn't quite
4 sure what I wanted to pursue, but I think the system is set up in a way that makes it kind
5 of difficult to test anything out. I think the system sort of demands that you pick
6 something and stick with it. And reality is obviously quite different than that, because
7 most people—or at least a lot of people I know, don't quite know what they want to do
8 right away. So it's just difficult trying to test things out when you're sort of forced to
9 commit to stuff.
10

11
12 In terms of challenges, the quarter system makes exams and papers pile on top of each
13 other in a very short period of time. Managing them along with prior commitments to
14 work and extracurriculars becomes difficult. Stress is the major problem I face while
15 studying for exams because I start to feel really overwhelmed by how much I have to
16 get done in so little time.
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19 ***(II) Students Can Utilize Different Strategies to Succeed.***
20

21 To study for exams, I start reviewing the material a few days prior to the exam, making
22 sure that all of the reading is done, going over my notes, and touching on everything
23 mentioned on the study guide if one is provided. I go to the review session and I ask
24 questions during the review session or via email if I need further explanation. Whenever
25 I become overwhelmed, I just arrange everything I have to do in order starting with the
26 most important. I try to set aside time for each thing leading up to the exams and just
27 proceed through my list one by one instead of trying to do everything at once.
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31 To be successful in your classes, go to class and pay attention. It isn't good enough to
32 just show up, you have to actually listen to what the professor is saying and resist going
33 on Facebook or checking your email or doing work for another class. It's simple, but
34 effective. It's also really helpful to go to discussion sections, even if they are optional, or
35 meet with your TA during their office hours. I find that meeting with a TA is most helpful
36 when writing a paper because they are going to be the one reading and grading it. They
37 can usually give you an idea if you're on the right track or completely missing the point.
38 You can discuss the material and get a better sense of the direction you want to go with
39 your paper. Meeting with your professor if you don't understand something or have
40 questions is also a good idea especially before midterms and finals.
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3 **[Online Intervention Instructions and Student Profiles]**
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5
6 **[University name] Student Stories Project**
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8 Dear student,
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10 Thank you for participating in the [university name] Student Stories project. The purpose
11 of this project is to improve the college transition for incoming [university name] students
12 who come from a diverse range of backgrounds. As an incoming [university name]
13 student, your opinions and experiences are very valuable.
14
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16 The study will consist of three parts. The first will ask you to read and evaluate some
17 potential welcome materials that we have developed for incoming students. The second
18 will ask you about your perceptions of [university name]. The third and final part will ask
19 you some questions about who you are so that we can better understand the skills,
20 backgrounds, and diverse perspectives of students in this year's incoming class.
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[University Name] Student Stories

You will now have the chance to read five stories about students' [university name] experiences. These students came from very different backgrounds before arriving at [university name].

The stories reveal that these differences are part of what make [university name] such an amazing place to be. When you read the stories, please consider them carefully and think about whether and how they may be useful to share with new [university name] students.

We would like you to think about how the stories could be helpful and informative to students like you. Please use this survey as an opportunity to learn from other students and also to give back to students in the future. Based on your feedback, we will select stories to feature in the website and better understand student needs.

Please note that you will be asked for feedback about the stories after you read all five of them, so please take care to read them carefully.

Peer Review

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3 [Five difference-education student profiles were presented to participants, each
4 displayed on a separate page. Although the original materials included pictures, they
5 are not included here. Instead, we list student gender and race/ethnicity, which would
6 have been observable from the photograph.]
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10 **Erica, Junior, Class of 2014 [Asian Female]**

11 "I think **my parents definitely had an influence**. Both of my parents have Ivy League
12 educations, whether for grad school or undergrad. But I'm also really lucky because my
13 parents are supportive no matter what my choices are.
14

15 Before coming to [university name], I went to a small private school where I felt really
16 comfortable and supported. But, it was definitely a big adjustment for me going into
17 classes with 150, 300 people. **It was hard to stand up for myself and get the**
18 **personal attention and help that I needed** from my professors and TAs. As a first-
19 year, I learned that if you want to take advantage of the opportunities to get the most out
20 of your classes, you really can. **All it takes is a little ingenuity** to email a professor
21 whose class is closed and ask, 'Can I get into your class? I really want to take it.'
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3 **Nate, Senior, Class of 2013 [Hispanic Male]**

4 “Having parents who hadn’t gone to college meant **that I didn’t really know much**
5 **about what college was about.** From my understanding as a high school student,
6 college was something that a good student was supposed to do to support yourself in
7 the future. That was my main motivation- it was just something a good student was
8 supposed to do, **you were supposed to go to college.**
9

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11 I think my family wanted me to go where I was going to be happy. But I think with
12 [university name] in particular, **the big impediment was money - would we be able to**
13 **afford [university name] compared to a state school.** We didn’t realize that **many**
14 **students have to take out loans to pay for college.** Once we figured that out and
15 once I got my financial aid, it all worked out and was no longer such a big deal to my
16 dad.
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18
19 The fact that [university name] seemed like such an improbable destination for me as a
20 public school student, and the fact that I feel like I overcame the odds to be here, really
21 prompted me to work harder and contribute more to [university name] now that I’m here.
22 I think, for me, **because of the tough time I had getting here, I appreciate my**
23 **experience so much more.”**
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3 **Steven, Junior, Class of 2014 [White Male]**

4 “Attending college for me is really about **creating opportunities for yourself** as well as
5 really **getting to know who you are**. I feel as if people treat college as an opportunity
6 to get a college degree, but it’s also really about the experience of going to college
7 itself. To me, that’s really what it’s all about. And there was also a lot of family
8 motivation. Not that there was peer pressure but both of my parents are fairly well-
9 educated and **it was just sort of the expectation that I would go to college** and
10 pursue perhaps a degree beyond that.
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13 The main issue I had my first year was **learning how to be away from my family right**
14 **after my mom got really sick**. I felt like I was really missing out and not doing my fair
15 share. Luckily her treatment went well. Throughout her treatment, she was also very
16 supportive of me pursuing my own ambitions and taking full advantage of what
17 [university name] has to offer.”
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3 **Anne, Senior, Class of 2013 [White Female]**

4 “Since my parents didn’t go to college, **they didn’t feel that they had room to tell me**
5 **how to make my decisions**, as they had never been in that position. That definitely
6 made things hard because I would have liked a bit of input from my parents.
7

8
9 One thing that really helps me deal with some of these challenges is to put them into
10 context. I’ve been through **a lot of adversity in my life** and am sure that I’m not alone
11 in that but that defines how I think about myself and how I approach my life. It gave me
12 a much broader perspective that as made [university name] a lot easier to tackle.
13 Midterms and papers may seem hard, and they are, but at the same time they just
14 seem like **another drop in the bucket** and I love that perspective sometimes even if I
15 occasionally forget to look at the world through it. There’s always gonna be kids that
16 took more AP classes than you or they had better teachers, they read more books, their
17 parents could let them do more things, they went overseas more times than you. So to
18 me, it’s really about **assessing what you have, making the best of the situation, and**
19 **moving forward** from that instead of looking at what you could’ve done better up to that
20 point. I’ve done really well and have been successful and this perspective has helped to
21 achieve that.”
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3 **Chris, Senior, Class of 2013 [Black Male]**

4 “My parents went to college and **they understand the benefits of me taking that path**
5 **as well.** They gave me lots of advice and talked with me about my interests and some
6 options for future careers from a pretty young age. My family was happy that I decided
7 to choose [university name] because I’m from [city where university is located], so they
8 really **liked that I would be close to home** and that I would be able to come home to
9 visit regularly – I wouldn’t be too far if anything happened to me.
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11

12 But once I got to [university name] it was kind of a **pressure to come home too often.**
13 They also expected to know every detail of my life as a college student. It came to the
14 point where my parents and I just had to have a talk and I told them that I needed to
15 stay at school more than come home and focus on my school life. Once they realized
16 that their expectations were pulling me away from school, I was able to visit a little less
17 so that **I could more fully engage** in the experience at [university name].”
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3 [Five control condition student profiles were presented to participants, each displayed
4 on a separate page. Although the original materials included pictures, they are not
5 included here. Instead, we list student gender and race/ethnicity, which would have
6 been observable from the photograph.]
7

8
9 **Erica, Junior, Class of 2016 [Asian Female]**

10 “One challenge for me in my first years was **learning how to study and figuring out**
11 **how to be fully prepared** by the time that exams come at the end of the semester.
12 Sometimes, I get really overwhelmed with so much material to learn and remember
13 from so many weeks back. Over the semester classes cover way more information than
14 what I had been used to. I also found that it can be pretty stressful to go from not having
15 to worry much about grades in high school to college classes that are at a completely
16 different level.
17

18
19 Throughout the year, I learned that the **most helpful way to study for midterms and**
20 **final exams was to re-read material**, at least two or even three different times. I have
21 found that if you re-read the material and get those tricky questions right, **you will have a**
22 **definite advantage over a lot of other students** who don't do the reading. In
23 preparation for exams, I also like making study sheets of a list of all the major concepts I
24 need to know.”
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3 **Nate, Senior, Class of 2015 [Hispanic Male]**

4 "I applied to [university name] as a **biology major with the expectation of going to**
5 **med school one day**. That was my initial plan, but after I took a few biology classes, I
6 realized I absolutely couldn't stand the sight of blood and would probably make a pretty
7 terrible doctor. In response to that concern, I switched to political science. I'm happy
8 with political science as my major because overall I think that **it's the best fit with my**
9 **interests**.
10
11

12 My biggest challenge I have faced at [university name] is usually just **the lack of time**
13 **to do everything that I need and want to do**. I want to learn as much as I can from my
14 classes, but at the same time, I don't want to miss out on all of the new people that I
15 want to meet and all of the extracurricular activities that I want to participate in. What
16 I've learned is that **I can take a relaxed approach to my classes for most of the**
17 **semester**. But when I'm feeling pressured toward the middle or at the end of the
18 semester, **I fully devote myself to academics**."
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3 **Steven, Junior, Class of 2016 [White Male]**

4 “When I was accepted into [university name], I had a strong **desire to become a**
5 **history major**. I had always had an interest in history in high school and even before
6 that. To see if history was right for me, I took an intro history class my first semester at
7 [university name]. I thoroughly enjoyed the class, and so I took a couple more history
8 classes throughout my first year. I was even more sure about my decision after taking
9 more history classes and **declared my major at the end of second semester**
10 **freshman year**.
11
12

13 One thing that I’ve struggled with is figuring **out how to manage my time when I have**
14 **multiple assignments due at once**. When I have more than one thing due on the
15 same day, I always try to have in my head what I have coming up in my classes in the
16 next five days or so. If I have a midterm, I’ll try to get all of my other homework done so I
17 can focus for a good **two or three days on just studying for the midterm**. Since finals
18 generally cover all material from the semester, I allow for around four to five days to
19 study before the exam. I also make sure to not schedule anything else that would
20 potentially take away from my study time. This helps me to focus and avoid any
21 unnecessary distractions.”
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3 **Anne, Senior, Class of 2015 [White Female]**

4 "I have had some difficulties at [university name] figuring out **how to get the most out**
5 **of my classes**. I wanted to make sure to fully take advantage of the learning
6 experience and I wanted to make sure that I wasn't missing out. So, after being at
7 [university name] for a while, I learned that I get so much more out of my classes **if I**
8 **keep on top of things and stay organized**. For example, I try to keep up on my
9 readings, so that I don't have to cram at the end. I also go through syllabi for my classes
10 each week, and make a list of my priorities. I use these lists to make sure not to get
11 behind in my classes. This allows me to focus on learning.
12
13

14 Also, I think taking notes on readings is really valuable as you can just **consult notes**
15 **before exams instead of having to go back through all of the readings** and
16 overwhelming yourself. I find it's helpful to make streamlined versions or outlines of your
17 readings or class notes. Just going back through all of the notes and constructing a
18 master sheet can make the information easier to process."
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Chris, Senior, Class of 2015 [Black Male]

“When I first arrived at [university name], **I knew that I wanted to major in some area of engineering**. One reason why I was so interested in engineering was because the engineering field is one of the only disciplines in which you can make a considerable amount of money with only a bachelor’s degree. In the long term, I plan on going to law school to be an intellectual property lawyer and the bar exam for this field requires a technical degree.

Figuring out how to study efficiently is a skill that has taken me quite a while to learn. When I first got to [university name], **I wasted way too much time**. I tried to learn every detail for every class and to thoroughly cover all the readings. Now, I’ve figured out that learning the concepts and making sure that I understand them is most important. To get the key points for a class, **I usually attend study sessions led by professors** and take notes.”

For Peer Review

[Online Survey Dependent Measures]

Part One

Thank you for agreeing to participate in our study! For the next part of the study, we'd like to know about your perceptions of college and your college experience now that you are in your 4th year at USC.

Using the text boxes below, please describe all of the non-mandatory USC events that you chose to attend during the current academic year (i.e. Fall semester 2017 and Spring semester 2018). We understand you may not remember the exact name of the events so just try to describe it as best you can. When we say event, this includes lectures, student-led events, art exhibits, etc.

Please list all of the events you chose to attend.

	Name of Event	Short Description
Event 1:	[Text Entry]	[Text Entry]
Event 2:	[Text Entry]	[Text Entry]
Event 3:	[Text Entry]	[Text Entry]
Event 4:	[Text Entry]	[Text Entry]
Event 5:	[Text Entry]	[Text Entry]
Event 6:	[Text Entry]	[Text Entry]
Event 7:	[Text Entry]	[Text Entry]
Event 8:	[Text Entry]	[Text Entry]
Event 9:	[Text Entry]	[Text Entry]
Event 10:	[Text Entry]	[Text Entry]

Using the text boxes below, please list ten 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). Please include the full name of each organization as well as a description of the organization's function. Please list all of the activities you were involved in.

Examples: ROBOGALS, conduct STEM workshops for middle school and high school students; PsiChi, psychology honors society; Student Alumni Society, connecting students with alumni through events.

	Name of Activity	Short Description
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2		
3		
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6	Activity 1:	[Text Entry]
7	Activity 2:	[Text Entry]
8	Activity 3:	[Text Entry]
9	Activity 4:	[Text Entry]
10	Activity 5:	[Text Entry]
11	Activity 6:	[Text Entry]
12	Activity 7:	[Text Entry]
13	Activity 8:	[Text Entry]
14	Activity 9:	[Text Entry]
15	Activity 10:	[Text Entry]
16		
17		
18		

19 **Using the scale below, please rate your agreement with the following two items:**

20							
21	1	2	3	4	5	6	7
22				Neither			
23	Strongly			Agree nor			Strongly
24	Disagree			Disagree			Agree
25							
26							

27 During my time at USC, I tried to educate others about my social groups (e.g., race,
28 gender, social class background).

29 During my time at USC, I learned about social groups (e.g., race, gender, social class
30 background) different from my own.

31
32
33 **We are also interested in the friendships you made while at USC. Please answer
34 the following questions based on what is true for you:**

35					
36	None	One	Two through Five	Six through ten	More than
37	ten				
38					
39					

40 How many close friends do you have at school who are from a different social-class
41 background from you?

42 How many close friends do you have outside school who are from a different social-
43 class background from you?

44
45
46 **We are also interested in the friendships you made while at USC. Please answer
47 the following questions based on what is true for you:**

48					
49	Never	Occasionally	Sometimes	Quite a lot	All the time
50					
51					
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How often do you spend time with friends from a different social-class background as you when you are at school?

How often do you spend time with friends from a different social-class background as you outside school?

PART TWO

Now, we'd like to know more about your opinions. This information will help us to better understand the perspectives of USC students as they are in their 4th year.

First, we are interested in your opinions about USC. Using the scale below, please rate your agreement with the following statements:

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

Students with different backgrounds and experiences can find their own ways of being successful at USC.

There are different ways to be a successful USC student.

USC makes an effort to include ideas and practices that represent a wide variety of backgrounds.

Please select a "6" for this question.

I think that my background helped me succeed at USC.

Now, we would like to learn more about your opinions concerning universities, in general. Using the scale below, please rate your agreement with the following six items:

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

Universities should foster environments where differences are valued.

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.

A university education should expose students to the important differences in ideas and values that exist in the world.

At a university it's not enough for there to be diversity of student body, there should also be diversity in faculty and leadership.

1
2
3 It is important to have multiple perspectives on campus (i.e., from different cultures,
4 races, ethnicities, and social classes).
5
6
7

8
9 **Now, please consider your social class background or identity in terms of your**
10 **family's income, education, or occupational status. Using the scale below, rate**
11 **your agreement with the following statements:**
12

13	1	2	3	4	5	6	7
14				Neither			Strongly
15	Strongly			Agree nor			Agree
16	Disagree			Disagree			
17							
18							

19 I feel a strong sense of pride about people with the same social class background as
20 me.

21 I feel good about my social class background.

22 I feel ashamed of my social class background.
23
24
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26 **Finally, please tell us a little more about your experiences at USC. Using the scale**
27 **below, please rate your agreement with the following statements:**
28

29	1	2	3	4	5	6	7
30				Neither			Strongly
31	Strongly			Agree nor			Agree
32	Disagree			Disagree			
33							
34							

35 The academic experience at USC has been difficult for me.

36 I am well prepared to be academically successful as a student at USC.

37 I can do all of my classwork if I don't give up.

38 I'm certain I can master the skills taught at USC.

39 Please select a "3" for this question.

40 I'm certain I can figure out how to do the most difficult coursework.

41 I can do things at USC in a way that is right for me.

42 I have a choice about what I'm doing and learning at USC.

43 I have the power to influence my USC experience.
44
45
46

47 **What is your anticipated GPA at the time of graduation?** [TEXT ENTRY]
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54 **PART THREE**
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Demographic Information

What is your age?

[Text entry]

What is your gender? Male Female Non-binary/other

Race/Ethnicity: (check all that apply)

Black/African American

Asian/Asian-American

White/Caucasian

Latino/Hispanic

Native American

Other (specify)

What type of high school did you attend?

Private

Public

Charter

Other (please specify)

Did you receive any Federal Pell Grants?

Yes No

In what semester do you expect to graduate?

Spring 2018

Summer 2018

Fall 2018

Later than Fall 2018