Empowerment Through Difference: An Online Difference-Education Intervention Closes the Social Class Achievement Gap

Sarah S. M. Townsend[1], Nicole M. Stephens[2], Stephanie Smallets[1], and MarYam G. Hamedani[3]

Abstract

A growing body of work suggests that teaching college students a contextual understanding of difference—that students' different experiences in college are the result of participating in different contexts before college—can improve the academic performance of first-generation students (i.e., students whose parents do not have 4-year college degrees). However, only one empirical study, using an in-person panel format, has demonstrated the benefits of this intervention approach. In the present research, we conduct two studies to test the effectiveness of a new difference-education intervention administered online to individual students. In both studies, first-year students read senior students' and recent graduates' stories about how they adjusted to college. In the difference-education condition, stories conveyed a contextual understanding of difference. We found that the online intervention effectively taught students a contextual understanding of difference and closed the social class achievement gap by increasing first-generation students' psychological empowerment and, thereby, end-of-second-year grades.

On college campuses across the United States, gaps in academic performance persist between first-generation and continuing-generation college students (i.e., students whose parents do not have 4-year college degrees and those who have at least one parent with a 4-year degree, respectively; Duncan & Murnane, 2011; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Steele, 2010). In addition to financial or skill-based obstacles (Engle, 2007; Pascarella et al., 2004), first-generation students also face psychological obstacles that often result from the disconnect between the working-class cultural norms that are common among first-generation students and the largely middle- or upper-class norms that they encounter in college (Bourdieu & Passeron, 1990; Croizet & Millet, 2011; Stephens, Markus, & Phillips, 2014). This mismatch means that first-generation students rarely see themselves and their ways of being included in college settings and are relatively unfamiliar with the "rules of the game" that govern college life. As a result, first-generation students often struggle to feel a sense of social fit and empowerment on campus (Ostrove & Long, 2007; Reay, Crozier, & Clayton, 2009; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012).

Recognizing how students' previous contexts or different backgrounds matter for their experience is one strategy that can be used to create more inclusive schools and improve students' engagement and motivation (e.g., Goudeau & Croizet, 2017; Morrison, Robbins, & Rose, 2008). A new intervention approach, called *difference-education*, employs this strategy by teaching students about the contextual nature of difference. Specifically, it helps students understand that their experiences of difference in college are the result of participating in different contexts, or coming from different backgrounds, before college (Stephens, Hamedani, & Townsend, in press). By helping students to recognize how their current experiences are a product of their different prior contexts, this difference-education intervention has been shown to close the academic performance gap between first-generation and continuing-generation students (Stephens, Hamedani, & Destin, 2014; Stephens, Townsend, Hamedani, Destin, & Manzo, 2015). However, the first and only

[1]University of Southern California, Los Angeles, CA, USA
[2]Northwestern University, Evanston, IL, USA
[3]Stanford University, Stanford, CA, USA

Corresponding Author:
Sarah S. M. Townsend, Marshall School of Business, University of Southern California, 701 Exposition Boulevard, Los Angeles, CA 90089, USA.
Email: sarah.townsend@usc.edu

published study employing this approach utilized in-person panels of students who shared their stories to deliver the intervention message to groups of participants in the audience (Stephens, Hamedani, & Destin, 2014).

We theorize that difference-education can also be effective when delivered online to individuals, given the success of other social psychological interventions that provide students new "lay theories" about ability and achievement (Wilson, 2011; Yeager & Walton, 2011).[1] These other lay theory interventions (e.g., belongingness) are often conducted online and ask intervention participants to complete relatively short reading and writing tasks. Using these online methods, these interventions have been successfully delivered to individuals, enabling them to be scaled and delivered to large numbers of students (Wilson, 2011; Yeager & Walton, 2011; Yeager et al., 2016). Similar to these lay theory interventions, difference-education seeks to change students' academic outcomes by providing them with a new lay theory about social difference. In particular, difference-education provides a *contextual theory of difference*—an understanding that social differences come from participation in and adaptation to the diverse contexts that people inhabit throughout their lives.

In the present research, we conduct two studies to develop and test the effectiveness of a new online difference-education intervention. In a pilot study, we first test whether students can learn a contextual theory of difference from the online difference-education intervention. In an intervention study, we then test whether learning a contextual theory of difference from this online difference-education intervention conveys academic performance benefits, replicating the primary results of the in-person panel intervention with a longer time-scale (i.e., end-of-second-year grades vs. end-of-first-year grades). We also examine the process through which difference-education interventions work, testing whether this online intervention improves first-generation students' academic performance through the theorized psychological mechanisms of increased feelings of fit and empowerment. Finally, we examine whether the intervention produces additional psychological benefits not previously examined.

The Benefits of Teaching a Contextual Theory of Difference

We theorize that difference-education is effective because it provides students with a contextual theory of difference. A contextual theory holds that differences are not innate or essential to individual people, but instead derive from people's ongoing participation and repeated experiences in particular contexts over time (e.g., contexts that differ by race, ethnicity, or social class). Understanding that difference is contextual can help students learn that the experience of being different from others in college (a) is a normal part of having different prior experiences and coming from different contexts and (b) need not be negative or isolating but can be positive and serve as an asset. We theorize that gaining this contextual theory of difference can improve first-generation college students' academic performance by enabling them to feel like they fit in college and empowering them with the know-how and skills to succeed.

Research on multicultural or social justice education, including ethnic studies courses, is consistent with our theorizing. This work suggests that teaching students about the contextual nature of difference can make schools and classrooms more inclusive and empowering and provide academic engagement and achievement gains for disadvantaged students (e.g., Adams, Bell, & Griffin, 2007; Cabrera, Milem, Jaquette, & Marx, 2014; Gay, 2000; Paris & Alim, 2017; Sleeter, 2011). For example, ethnic studies courses have curricula that incorporate elements of histories and political struggles from groups that are traditionally underrepresented in American social studies content. By encouraging students to connect school to their experiences at home and in their communities, ethnic studies courses highlight how contextual factors, such as history, institutions, policies, and practice can shape students' experiences and outcomes.

In-Person Panel Difference-Education Intervention

The in-person panel difference-education intervention provided the first causal evidence that teaching students a contextual theory of difference can improve the academic performance of first-generation college students (Stephens Hamedani, & Destin, 2014). Specifically, this randomized controlled trial compared participants in the intervention condition with those in a control condition (see also Stephens, Townsend, et al., 2015). The difference-education intervention used contrasting real-life stories of both continuing-generation and first-generation students from diverse backgrounds. These contrasting personal narratives simulate the experience of "dialoguing about difference" (Gurin, Nagda, & Zúñiga, 2013) and help intervention participants learn a contextual theory of difference, teaching them how people's diverse backgrounds and prior life experiences shape their experiences in college in both positive and negative ways.

In both conditions of the in-person difference-education intervention study, groups of 20 to 30 incoming students listened to an eight-person panel of junior and senior students share personal stories of transitioning to college and learning how to be successful. In the difference-education condition, panelists' stories connected their experiences in college to their social class backgrounds. Specifically, the stories revealed how students' diverse social class backgrounds shaped the challenges they were likely to face in college, as well as the strengths and strategies they used to be successful. In the control condition, participants heard similar stories of the challenges panelists faced in college and the strengths and strategies they used to be successful. However, because panelists' stories did not include information about

how their social class backgrounds shaped their experiences, these stories did not communicate a contextual theory of difference.

Results of this difference-education intervention suggest that both first-generation and continuing-generation students learned a contextual theory of difference (Stephens Hamedani, & Destin, 2014) and retained this knowledge through at least their second year in college (Stephens, Townsend, et al., 2015). For example, soon after participating in the study, students in the intervention reported a greater understanding of how their different backgrounds matter in college than students in the control condition. Importantly, the difference-education intervention was also effective in closing the achievement gap between first-generation and continuing-generation students by increasing first-generation students' grade point averages (GPAs; Stephens, Hamedani, & Destin, 2014).

An Online Difference-Education Intervention

In the present research, we examine the effectiveness of an online difference-education invention for closing the social class achievement gap. Although previous work suggests this approach can be effective in improving first-generation college students' academic performance at the end of their first year in college, only one study has documented these effects (i.e., Stephens, Hamedani, & Destin, 2014). Thus, the first major contribution of this article is to replicate past effects of the difference-education intervention on academic outcomes and show that these effects persist over an extended period of time, improving the cumulative grades of first-generation college students at the end of their second year. Second, we show that an online, individually administered difference-education intervention can effectively communicate a contextual theory of difference and produce academic performance benefits, suggesting the potential scalability of the approach. Third, our research provides additional evidence for the psychological process through which difference-education produces its effects, examining feelings of fit and empowerment as potential mediators. Fourth, the present research also extends the benefits of difference-education to include psychological toughness.

Mechanisms for Difference-Education Benefits: Fit and Empowerment

We examine two key psychological processes through which we theorize that a contextual theory of difference should improve first-generation students' academic performance: fit and empowerment. First, a contextual theory of difference should foster a sense of fit among first-generation students by teaching students that difference comes from the context and that feeling different or having different experiences from other students are normal and expected parts of college life (e.g., Plaut, 2010; Plaut, Garnett, Buffardi, & Sanchez-Burks,

2011). We use the term *fit* to refer to the feeling of being accepted, recognized, welcomed, and included within a setting (e.g., Stephens, Brannon, Markus, & Nelson, 2015).[2] Second, a contextual theory of difference should also increase first-generation students' empowerment by helping them to better understand the contextual sources of their challenges (e.g., Gurin et al., 2013). We use the term *empowerment* to refer to students' feelings of preparation, efficacy, and control over their academic experience (Steele, 2010). In turn, the increased empowerment from understanding the contextual sources of their challenges should open up pathways for students to overcome the challenges they face (e.g., strengths and strategies they can leverage to succeed). This suggestion is consistent with the in-person panel study in which first-generation students were behaviorally empowered to seek out college resources (i.e., greater reported frequency of having reached out to professors or sought extra help; Stephens, Hamedani, & Destin, 2014).

Increasing Psychological Toughness With Difference-Education

We also expand the range of benefits conferred by difference-education by examining whether first-generation students who participate in the intervention gain psychological toughness. We conceptualize psychological toughness as the ability to be resilient, optimistic, and motivated in the face of challenges, a tendency that is critical for well-being and success in stressful college environments (e.g., Pritchard, Wilson, & Yamnitz, 2007; Solberg Nes, Evans, & Segerstrom, 2009). As mentioned above, the contextual theory of difference provided by difference-education helps students to better understand the contextual sources of their challenges, which should empower students to overcome those challenges. Similarly, students may feel more psychologically tough as they face those challenges. A follow-up of the initial in-person panel difference-education intervention found results consistent with this suggestion (Stephens, Townsend, et al., 2015). Specifically, first-generation students in the difference-education condition, compared with the control condition, showed more adaptive physiological coping responses during a stressful task (i.e., delivering a speech to a research assistant), suggesting that they may have been more tough or resilient.

Current Research

We present two studies below. First, we conducted a pilot study to test whether our new online difference-education intervention effectively communicates a contextual theory of difference. We predicted that both first-generation and continuing-generation students would learn this contextual theory from the online materials. Second, we conducted a randomized control trial to test whether the online difference-education intervention replicates prior work by closing

the social class achievement gap in a new university context and over an extended period of time (i.e., end-of-second-year grades vs. end-of-first-year grades). This study also tests whether the intervention produces academic benefits through the theorized processes and enhances students' psychological toughness. We predicted that the online difference-education intervention would improve first-generation students' performance by providing a greater sense of fit and empowerment and would also increase their psychological toughness, compared with their counterparts in a control condition.

Pilot Study

Before testing our primary hypotheses in an intervention study, we first conducted a pilot study to examine whether an online difference-education intervention could teach students a contextual theory of difference (i.e., that differences come from having different backgrounds or previous contexts). Given the success of other online lay theory interventions, we predicted that both first- and continuing-generation students in the difference-education condition would learn a contextual theory of difference. In addition, we examined whether difference-education would improve first-generation students' perceptions of their college experience. However, we conducted this study at the end of participants' first year in college and the evidence about the success of interventions at this time period is mixed (Walton & Cohen, 2007; Wilson, 2011; Yeager & Walton, 2011). Therefore, we were tentative in our prediction that first-generation students in the difference-education versus control condition would have a better perception of their college experience.

Participants

Across 2 consecutive academic years, we recruited 137 students attending a midsized private research university in the Midwestern United States in the final term of their first year. We determined our sample size by inviting all first year, first-generation students and a random sample of first year, continuing-generation students to participate. We conducted the study during 2 academic years to recruit enough first-generation students. Given the small population of first-generation students and our clear a priori hypothesis, our sample size accords with current recommendations (e.g., Simmons, Nelson, & Simonsohn, 2011). We excluded 13 participants because they had participated in the in-person panel difference-education intervention. Of the remaining 124 participants, 51 were first-generation students (i.e., neither parent had a 4-year college degree), and 73 were continuing-generation students (i.e., at least one parent had a 4-year college degree). Based on the primary effect in the in-person panel intervention (i.e., the improved GPAs of first-generation students in the intervention compared with control condition; $d = .700$), this study is somewhat underpowered (i.e., ~70%).

Using demographic data from official university records, we found that the majority of first-generation students (56.86%) were low income (i.e., received Pell grants), compared with a minority of continuing-generation students (17.81%), $\chi^2(1, N = 124) = 20.44$, $p < .001$. To examine racial and ethnic differences between first-generation and continuing-generation students, we created a dummy variable (0 = *disadvantaged*, 1 = *advantaged*). Given the relationship between race and academic performance in the United States (e.g., Kao, 1995; Steele, 2010), Whites and Asians or Asian Americans were classified as academically advantaged, whereas African Americans, Latinos, and Native Americans were classified as academically disadvantaged. First-generation students were more likely to be from a disadvantaged racial or ethnic background (35.29%) than continuing-generation students (17.81%), $\chi^2(1, N = 124) = 4.90$, $p = .027$.

Procedure

Participants were recruited via email and provided a link to participate in the online study. Participants read the materials and responded to the survey items in a location of their choosing. The manipulation consisted of five short profiles of junior or senior students or recent graduates. Each displayed an individual's picture, first name, class, and graduation year, along with a personal story ostensibly written by that individual. We used this format to mimic how participants in the in-person panel intervention listened to panelists' stories and we based the content of these written stories on the information presented by the panelists (Stephens, Hamedani, & Destin, 2014). Participants were randomly assigned to either the difference-education ($n = 71$) or control ($n = 53$) condition (uneven numbers are due to a glitch in random assignment software). Across conditions, the stories were of comparable length and from the same demographically diverse group of students, and first-generation and continuing-generation students were evenly distributed, $\chi^2(1, N = 124) = 0.20$, $p = .658$.

The key difference between conditions was whether the stories provided a contextual theory of difference. In the difference-education condition, the stories provided this theory by describing how students' different social class backgrounds (e.g., parents' educational attainment) shaped their college experiences in both good and bad ways. For example, illustrating how his social class background shaped his experience of obstacles in college, one first-generation student said, "Since my parents didn't go to college, they didn't feel they had room to tell me how to make my decisions . . . That definitely made things hard because I would have liked a bit of input from my parents."

Similarly, this student also illustrated how his background shaped his college experience in terms of the strengths and strategies he could leverage to succeed. Specifically, the

student went on to say, "It's really about assessing what you have, making the best of the situation, and moving forward from that instead of looking at what you could've done better up to that point." Similarly, one continuing-generation student's story linked her background (i.e., that her parents have graduate-level degrees and she attended a small private high school) to an obstacle: "It was definitely a big adjustment going into classes with 150, 300 people. It was hard to stand up for myself and get the personal attention and help that I needed." She then went on to describe a strategy for success: "All it takes is a little ingenuity to email a professor whose class is closed." As with the in-person panel intervention, a contextual theory of difference was communicated by not only linking each of the students' college experiences to their social class backgrounds, but also more holistically, in the systematic variation across students' stories.

In the control condition, students' stories provided general information about students' positive and negative experiences in college (i.e., obstacles they faced, as well as strengths and strategies they could leverage to be successful). However, this content was not connected to students' social class backgrounds. Therefore, participants did not gain a contextual theory of difference. For example, one student described the following obstacle she faced: "One challenge for me in my first year was learning how to study and figuring out how to be fully prepared by the time exams come at the end of the quarter." She then described the strengths and strategies she used to be successful, saying that she "learned that the most helpful way to study for midterms and final exams was to reread material." See the online supplemental material for additional excerpts.

Measures

Contextual theory of difference. To assess whether the online format effectively communicated a contextual theory of difference, participants responded to two open-ended prompts: "Please list three ways in which the lessons shared in these stories could help you navigate [university] in the future" and "Based on the lessons conveyed in the stories, what are the top three things you would like to share with future incoming students to help them navigate their transition to [university]?" These items are conceptually identical to those used as a manipulation check in the in-person panel intervention (Stephens, Hamedani, & Destin, 2014). To encourage participants to internalize the message, they also answered the question, "How does your story relate to the stories you just read?" (Yeager & Walton, 2011).

Perceptions of college experiences. To assess whether the online intervention could improve first-generation students' perceptions of their college experience in the same survey, participants responded to the following three self-report measures. Participants responded to all items using a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). See the

online supplemental material for a complete list of items from the pilot and intervention studies.

Social fit. On six items adapted from Walton and Cohen's (2007) measure of social fit, participants reported whether they felt that they belonged or fit in socially at their university (e.g., "I feel like I belong as a student at [university]"), α = .86, M = 5.11, SD = 1.25.

Comfort in interactions. On seven items we created, participants reported whether they felt comfortable engaging in various interpersonal behaviors in college (e.g., "I feel comfortable sharing my opinions with other [university] students"), α = .82, M = 5.26, SD = 1.01.

Value of working with others. On five items we created, participants reported whether they perceived seeking help from others as valuable for being a successful student (e.g., "Getting extra help outside of class is part of being a good student"), α = .84, M = 6.09, SD = 0.80.

Demographics. We obtained the following demographic information from the university registrar: gender, racial and ethnic background, high school GPA, whether they were receiving Pell grants (as a measure of household income), and generation status.[3]

Results

Contextual theory of difference. Using the coding scheme from in-person panel intervention, we assessed whether participants in the difference-education condition learned a contextual theory of difference by examining whether they were able to report that students' different backgrounds shape their experiences in college. Specifically, we coded whether participants mentioned that *people have backgrounds "like mine"* and *people's different backgrounds matter.* Two coders, unaware of participants' generation status and condition, coded the data (κ = .622-.838; Landis & Koch, 1977); coding disagreements were resolved through consensus. Supporting our hypothesis, participants in the difference-education condition more often mentioned that people have backgrounds like theirs and that people's different backgrounds matter than did participants in the control condition. See Table 1 for sample responses, percentages of responses in each condition and coding category, and results of chi-square analyses.[4]

Perceptions of college experiences. We performed a series of 2 (generation status: first-generation vs. continuing-generation) $\times$ 2 (condition: difference-education vs. control) univariate ANCOVAs to examine the effects of generation status, condition, and their interaction on participants' perceptions of their college experience (see Table 2). Given that students' demographic characteristics and previous academic

Table 1. Between-Condition Comparison of the Percentage of Responses Coded Within Each Coding Category.

		Chi-square analysis		
	Sample response	Difference-education condition	Control condition	χ^2 r [95% CI]
Coding category				
People have backgrounds "like mine"	It's important to understand the different scenarios and backgrounds people are coming from and to realize that (a) you're not the only one, and (b) people are not all like you either. I should acknowledge that there are people coming from similar backgrounds as me and not feel embarrassed about my financial situation.	30.98	9.43	8.28** .26 [.086, .415]
People's different backgrounds matter	Everyone comes from such a different background and has different motives for doing well. It is okay to be a first-generation college student. You will just have to figure more things out on your own, which can enhance the college experience.	39.44	3.77	21.04*** .41 [.254, .548]

Note. N = 124. Effect size is Pearson's *r* followed by 95% CI. CI = confidence interval.
**$p < .01$. ***$p < .001$.

Table 2. Univariate Analysis of Covariances Results for Perceptions of College Experiences in the Pilot Study.

	Dependent variable		
	Comfort in interactions	Social fit	Value of working with others
	F	F	F
Covariate			
High school GPA	0.56	0.02	0.08
Race and ethnicity	0.06	0.48	0.04
Gender	2.51	4.58*	1.15
Low-income status	0.90	0.07	2.92†
Main and interactive effects			
Condition	4.55*	1.00	0.06
Generation	1.47	1.18	0.01
Condition × Generation	7.49**	0.74	0.95
Raw means and standard deviations	*M (SD)*	*M (SD)*	*M (SD)*
FGs, difference-education	5.57$_a$ (1.07)	5.15$_a$ (1.47)	6.23$_a$ (0.85)
FGs, control	4.78$_b$ (1.11)	4.84$_a$ (1.28)	6.06$_a$ (0.78)
CGs, difference-education	5.26$_a$ (0.99)	5.21$_a$ (1.08)	5.96$_a$ (0.80)
CGs, control	5.38$_a$ (0.74)	5.16$_a$ (1.27)	6.16$_a$ (0.80)

Note. Degrees of freedom (*df*) for all dependent variables = 1, 116. High school GPA (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*). Within each column, means that have different subscripts differ significantly based on post hoc tests of adjusted means (*p* < .05). GPA = grade point average; FGs = first-generation students; CGs = continuing-generation students.
†$p < .10$. *$p < .05$. **$p < .01$.

performance are likely to influence their college experience, we controlled for race and ethnicity (0 = *disadvantaged*, 1 = *advantaged*), gender (0 = *male*, 1 = *female*), and high school GPA. To be consistent with data analyses from the in-person panel intervention, we also controlled for low-income status (i.e., whether students received Pell grants; 0 = *low income*, 1 = *not low income*). However, our results are largely unchanged when we exclude this covariate. Following

Lakens (2013), we report partial eta-squared effect sizes with 90% confidence intervals (CIs, in brackets) for ANCOVAs in both studies.

Contrary to our predictions, we found no significant interactive effects for participants' feelings of social fit or belief that working with others is valuable. However, consistent with our predictions, we found a significant interaction for students' anticipated comfort in interactions on campus, $F(1, 116) = 7.49$, $p = .007$, $\eta_p^2 = .061$ [.009, .141]. Although first-generation students reported significantly lower comfort than continuing-generation students in the control condition, $F(1, 116) = 6.84$, $p = .010$, $\eta_p^2 = .056$ [.007, .134], the two groups reported similar levels of comfort in the difference-education condition, $F(1, 116) = 1.12$, $p = .291$, $\eta_p^2 = .010$ [0, .058]. Importantly, this was due to an increase in comfort reported by first-generation students in the difference-education compared with control condition, $F(1, 116) = 10.37$, $p = .002$, $\eta_p^2 = .082$ [.020, 169]. Continuing-generation students' comfort did not differ by condition, $F(1, 116) = 0.23$, $p = .634$, $\eta_p^2 = .002$ [0, .035].

Discussion

Supporting our theorizing, results suggest that participants were able to learn a contextual theory of difference when they read the difference-education materials online. Compared with participants in the control condition, those in the difference-education condition were more likely to mention that other students have backgrounds like theirs and that students' different backgrounds matter. We also found some preliminary support for our secondary hypotheses that learning a contextual theory of difference would improve first-generation students' perceptions of their college experiences. Although the difference-education compared with control condition did not change participants' feelings of social fit or beliefs that working with others is valuable, it did increase first-generation students' anticipated comfort in campus interactions. One potential reason for these divergent results may be the relative malleability of these different constructs at the end of students' first year in college, when they completed the study. We speculate that general understandings such as social fit and value of working with others may accumulate based on one's experiences and, therefore, be relatively resistant to change. In contrast, more specific perceptions of concrete behavior, such as expected feelings of comfort in interactions (e.g., speaking in class), might be open to change with new information.

Intervention Study

Our intervention study had three goals. First, to replicate the initial intervention in a different university context, we examined whether our online difference-education intervention can close the social class achievement gap by improving first-generation students' grades.[5] Given that interventions should be most effective during the college transition

(Wilson, 2011; Yeager & Walton, 2011; cf. Walton & Cohen, 2007), we recruited students at the beginning of their first year. Second, we examined the *processes* through which the intervention produces its benefits. Specifically, we tested whether difference-education would increase first-generation students' social fit and empowerment compared with the control condition and whether these changes would close the achievement gap. Third, we examined whether the difference-education intervention would provide first-generation students with additional psychological benefits, indicating greater psychological toughness.

Participants

We recruited 133 participants from a large, private research university on the West coast of the United States. All participants were in the first 5 to 9 weeks of their first year. Our sample size was determined by recruiting as many first-generation students as possible from the entire population of first-generation students to participate in the "[university] Student Stories Project." To ensure that our results are due to generation status, rather than gender, race, or ethnicity, we recruited a comparable number of continuing-generation students to roughly match the gender and racial and ethnic backgrounds of the first-generation students. Again, using the effect size from the in-person panel intervention (i.e., first-generation students' improved GPA; $d = .700$), this study is somewhat underpowered by conventional standards (i.e., ~71%).

Fifty-four participants were first-generation and 79 were continuing-generation. As indicated by self-report, the majority of first-generation students (77.78%) were low income (i.e., received Pell grants), compared with a minority of continuing-generation students (17.95%), $\chi^2(1, N = 132) = 46.76$, $p < .001$. One continuing-generation student did not report whether he received a Pell grant. To maintain greater power, we included this participant in our analyses, assigning him the modal response for continuing-generation students (i.e., not a Pell grant recipient). As in the pilot study, we created a dummy variable based on participants' racial and ethnic backgrounds (0 = *disadvantaged*, 1 = *advantaged*). As a result of our matched-sample recruiting, first-generation students were *not* more likely to be from disadvantaged racial backgrounds (44.44%) than continuing-generation students (45.57%), $\chi^2(1, N = 133) = 0.02$, $p = .898$.

For GPA analyses, we also examined a campuswide control group of all other first-year students. By obtaining students' generation status from the university, we were able to compare participants' end-of-Year-2 cumulative GPAs with those of nonparticipants—that is, 295 first-generation and 2,433 continuing-generation students.

Procedure

Online intervention and Time 1 survey. As in the pilot study, participants were recruited via email and completed the

intervention materials online in a location of their choosing. The intervention materials were nearly identical to the pilot study. We made small alterations so that the stories would accurately reflect the new context (e.g., changed the names of student groups). Participants were randomly assigned to either the difference-education ($n = 68$) or control ($n = 65$) condition. First-generation and continuing-generation students were evenly distributed across conditions, $\chi^2(1, N = 133) = 0.85$, $p = .357$. Immediately following the intervention (Time 1), participants completed a series of measures to assess whether they had learned a contextual theory of difference and whether the intervention affected their expectations for their college experiences, including preliminary measures of our potential mediators: social fit and empowerment.

End-of-first-year (Time 2) survey. We conducted an end-of-first-year (Time 2) follow-up survey for which participants were recruited via email. Participants completed this survey online, which included measures of social fit and empowerment (i.e., our potential mediators) and of psychological toughness, as well as various other measures assessing participants' college experiences. The attrition rate from Time 1 was 22.56%, which did not differ by condition, control, 27.69%, versus difference-education, 17.64%, $\chi^2(1, N = 133) = 1.92$, $p = .166$, or generation status, first-generation, 22.22% versus continuing-generation, 22.78%, $\chi^2(1, N = 133) = 0.010$, $p = .939$.

Academic performance at end of second year. We obtained participants' official cumulative GPAs at the end of their second year. The attrition rate from Time 1 was 7.52%, which did not differ by condition, control, 7.69%, versus difference-education, 7.35%, $\chi^2(1, N = 133) = 0.01$, $p = .941$, or generation status, first-generation, 7.41% versus continuing-generation, 7.59%, $\chi^2(1, N = 133) = 0.002$, $p = .968$. Importantly, the GPAs of participants in the control condition were statistically equivalent to the GPAs of the nonparticipants in our campuswide control group. This was true for first-generation students (control: $M = 3.15$, $SD = 0.38$, campuswide control: $M = 3.17$, $SD = 0.53$), $F(1, 305) = 0.03$, $p = .862$, $\eta_p^2 < .000$ [0, .004], and continuing-generation students (control: $M = 3.42$, $SD = 0.38$, campuswide control: $M = 3.38$, $SD = 0.42$), $F(1, 2344) = 0.32$, $p = .569$ $\eta_p^2 < .000$ [0, .002].

Measures

Contextual theory of difference (Time 1). Using the same open-ended questions as in the pilot study, we evaluated whether students learned a contextual theory of difference and also gave participants the opportunity to internalize the message. In addition, we included a closed-ended measure on which participants reported how much the stories mentioned students' backgrounds on a scale from 1 (*not at all*) to 7 (*very often*).[6]

Mediators of academic performance (Times 1 and 2). We measured self-reported social fit and empowerment on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). We measured these at Time 1 to obtain preliminary evidence that the intervention affected students as predicted and at Time 2 to serve as mediators of academic performance.

Social fit. On three items, participants reported whether they felt that they belonged or fit in at their university, Time 1: $\alpha = .78$, $M = 5.29$, $SD = 1.35$; Time 2: $\alpha = .85$, $M = 5.10$, $SD = 1.42$. We use two items from the pilot study, and we created one additional item, "I expect that I will have to become a different person to fit in at [university name]" (reverse-coded).

Empowerment. On eight items, participants reported whether they felt academically empowered, Time 1: $\alpha = .84$, $M = 5.44$, $SD = 0.87$; Time 2: $\alpha = .89$, $M = 5.43$, $SD = 1.07$. Items measured feelings of perceived preparation (Stephens, Hamedani, & Destin, 2014), academic efficacy (Midgley et al., 2000), and learner empowerment (adapted from Frymier, Shulman, & Houser, 1996). An example item is "I can do things at [university name] in a way that is right for me."

Psychological toughness (Time 2). To assess our intervention's effects on participants' psychological toughness in college, we measured three constructs using self-report measures: psychological thriving, resilience, and psychological competence.

Psychological thriving. On seven items, participants reported how much they experienced feelings of thriving or growth in a positive direction (e.g., "engaged," "motivated") over the past 30 days on a scale from 1 (*very slightly*) to 5 (*extremely*), $\alpha = .87$, $M = 3.41$, $SD = 0.73$.

Resilience. On six items, participants reported their overall resilience (e.g., "I am able to adapt to change") on a scale from 1 (*not true at all*) to 5 (*true nearly all the time*), $\alpha = .72$, $M = 3.83$, $SD = 0.59$. We used two items from Duckworth, Peterson, Matthews, and Kelly's (2007) Grit Scale and four items from the Connor–Davidson Resilience Scale (Connor & Davidson, 2003).

Psychological competence. On two items used by Wickrama and colleagues (2013), participants reported their overall psychological competency (e.g., "How often have you felt confident about your ability to handle your personal problems?") on a scale from 0 (*never*) to 4 (*very often*), $r = .50$, $M = 2.36$, $SD = 0.88$.

Demographics. On the Time 1 survey, participants reported the same demographics as in the pilot study. We also obtained participants' high school GPA from the university.

Table 3. Univariate ANCOVAs Results for GPA and Potential Mediators in the Intervention Study.

	Variable				
	Academic performance	Academic performance mediators			
	GPA	Social fit Time 1	Empowerment Time 1	Social fit Time 2	Empowerment Time 2
	F	*F*	*F*	*F*	*F*
Covariate					
High school GPA	18.52***	1.01	1.01	0.27	0.17
Race and ethnicity	0.38	0.46	0.13	0.58	0.01
Gender	0.12	0.11	1.28	0.32	1.65
Low-income status	1.88	3.90†	0.72	1.91	0.24
Main and interactive effects					
Condition	7.75**	2.24	0.26	0.26	1.06
Generation	0.36	0.23	0.003	0.04	1.49
Condition × Generation	5.01*	3.91†	5.85*	2.08	7.12**
Raw means and standard deviations	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
FGs, difference-education	3.48$_a$ (0.40)	5.56$_a$ (1.10)	5.62$_a$ (0.62)	5.18$_a$ (1.46)	5.57$_a$ (1.08)
FGs, control	3.15$_b$ (0.38)	4.77$_b$ (1.48)	5.20$_a$ (1.05)	4.55$_a$ (1.55)	4.82$_b$ (1.37)
CGs, difference-education	3.46$_a$ (0.37)	5.32$_{a,b}$ (1.40)	5.34$_a$ (0.96)	5.12$_a$ (1.48)	5.42$_{a,b}$ (0.92)
CGs, control	3.42$_{a,b}$ (0.38)	5.47$_{a,b}$ (1.27)	5.64$_a$ (0.70)	5.43$_a$ (1.15)	5.77$_a$ (0.84)

Note. Degrees of freedom (*df*) for GPA = 1, 115, *df* for Time 1 academic performance mediators = 1, 125, *df* for Time 2 academic performance mediators = 1, 95. High school GPA (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*). Within each column, means that have different subscripts differ significantly based on post hoc tests of adjusted means (*p* < .05). GPA = grade point average; FGs = first-generation students; CGs = continuing-generation students.
†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

Results

Contextual theory of difference. We first examine our two measures of whether participants learned a contextual theory of difference (i.e., that students' different backgrounds can shape their experiences in college).

Open-ended measure. As in the pilot study, we coded whether participants mentioned that *people have backgrounds "like mine"* and *people's different backgrounds matter*. Two coders, unaware of participants' generation status and condition, coded the data (κ = .754-.939). One coded 20% of responses and the second coded 100%; we report the data from the latter. Consistent with the pilot study and our predictions, participants in the difference-education condition were more likely to mention that people have backgrounds like theirs (23.53%) and that people's different backgrounds matter (32.35%) compared with participants in the control condition, 7.69%, χ^2(1, *N* = 133) = 6.27, *p* = .012, *r* = .22, 95% CI = [.049, .374] and 6.15%, χ^2(1, *N* = 133) = 14.50, *p* < .001, *r* = .33, 95% CI = [.169, .474], respectively.

Closed-ended measure. To examine responses, we conducted a one-way ANOVA with condition as the independent variable. Consistent with our predictions and participants' open-ended responses, participants in the difference-education condition reported that the stories mentioned students' backgrounds (*M* = 5.03, *SD* = 1.16) significantly more than participants in the control condition, *M* = 3.06, *SD* = 1.16; *F*(1, 131)= 95.96, *p* < .001, η_p^2 = .423 [.317, .507].

Academic performance. To examine academic performance, we performed a 2 (generation status: first-generation vs. continuing-generation) × 2 (condition: difference-education vs. control) univariate ANCOVA predicting cumulative GPA at the end of students' second year and including the same covariates as in the pilot study (i.e., our standard set of covariates). We found a significant main effect of condition, *F*(1, 115) = 7.75, *p* = .006, η_p^2 = .063 [.010, .145] (see Table 3). As predicted, this main effect was qualified by a significant interaction, *F*(1, 115) = 5.01, *p* = .027, η_p^2 = .042 [.002, .110]. Results showed a marginally significant gap between first-generation and continuing-generation students in the control condition, *F*(1, 115) = 3.43, *p* = .067, η_p^2 = .029 [0, .091]. However, in the difference-education condition, there was no significant grade gap, *F*(1, 115) = 0.90, *p* = .346, η_p^2 = .008 [0, .054] (see Figure 1, all figures display raw means to make observed
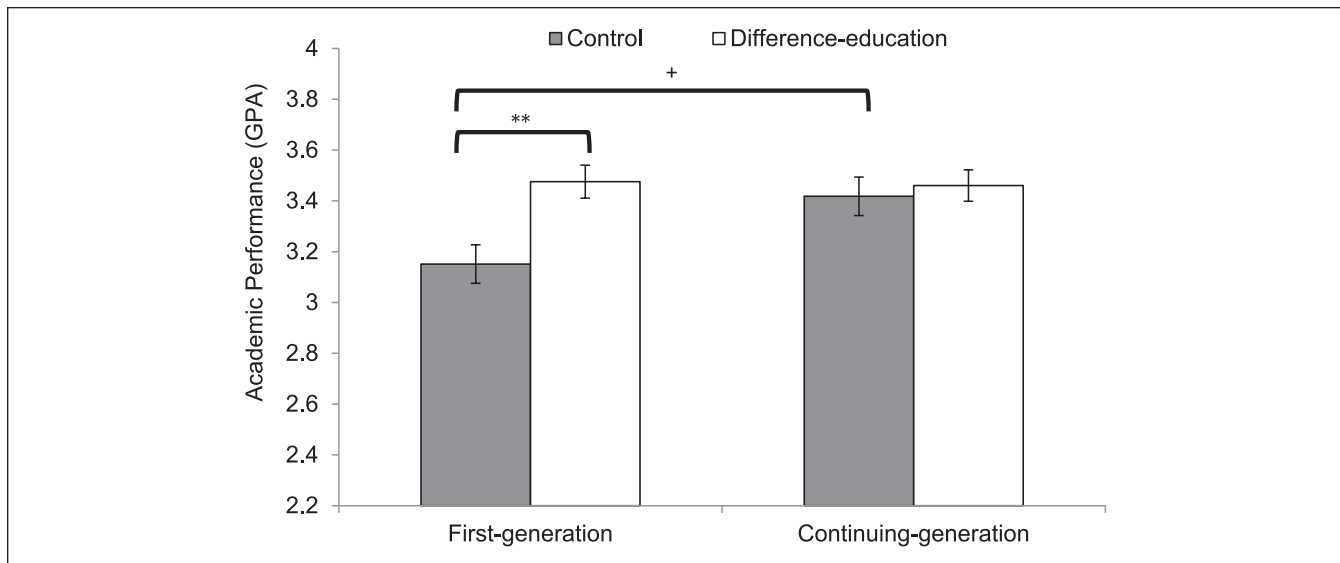
Figure 1. Cumulative GPA at the end of students' second year as a function of generation status and intervention condition (raw means displayed).
Note. Error bars represent ± 1 *SE* of the mean.
†*p* < .10. ****p* < .01.

differences clear). Importantly, first-generation students in the difference-education condition had higher GPAs than first-generation students in the control condition, $F(1, 115) = 10.64, p = .001, \eta_p^2 = .085$ [.017, .163], and in the campuswide control, $F(1, 2624) = 9.52, p = .002, \eta_p^2 = .004$ [.001, .008].[7] In contrast, continuing-generation students in the difference-education condition did not differ from those in the control condition, $F(1, 115) = 0.19, p = .661, \eta_p^2 = .002$ [0, .035], nor from those in the campuswide control group, $F(1, 2624) = 1.56, p = .212, \eta_p^2 = .001$ [0, .003].[8]

Potential mediators. To examine our potential mediators, we performed a series of 2 (generation status: first-generation vs. continuing-generation) × 2 (condition: difference-education vs. control) univariate ANCOVAs for social fit and empowerment (Times 1 and 2; see Table 3), using our standard set of covariates.

Fit and empowerment—Time 1. The univariate ANCOVAs predicting fit and empowerment immediately following the intervention (Time 1) revealed no significant main effects, but a nearly significant interaction for fit, $F(1, 125) = 3.91, p = .050, \eta_p^2 = .030$ [0, .094] and a significant interaction for empowerment, $F(1, 125) = 5.85, p = .017, \eta_p^2 = .045$ [.004, .116] (see Figure 2). Simple effects tests showed no significant differences by generation status in either the control condition, $F_{fit}(1, 125) = 0.72, p = .399, \eta_p^2 = .006$ [0, .047] and $F_{empowerment}(1, 125) = 2.09, p = .151, \eta_p^2 = .016$ [0, .070], or the difference-education condition, $F_{fit}(1, 125) = 2.56, p = .112, \eta_p^2 = .020$ [0, .077] and $F_{empowerment}(1, 125) = 2.38, p = .125, \eta_p^2 = .019$ [0, .074]. Nonetheless, among first-generation students, the difference-education condition, compared with

control, increased fit, $F(1, 125) = 5.09, p = .026, \eta_p^2 = .039$ [.002, .108], and empowerment (marginally), $F(1, 125) = 3.62, p = .060, \eta_p^2 = .028$ [0, .091]. In contrast, among continuing-generation students, neither fit nor empowerment differed by condition, $F_{fit}(1, 125) = 0.14, p = .708, \eta_p^2 = .001$ [0, .028] and $F_{empowerment}(1, 125) = 2.23, p = .138, \eta_p^2 = .018$ [0, .072].

Fit and empowerment—Time 2. The univariate ANCOVAs predicting fit and empowerment at the end of students' first year in school (Time 2) revealed no significant main effects nor a significant interaction for fit, $F(1, 95) = 2.08, p = .152, \eta_p^2 = .021$ [0, .090]. However, there was a significant interaction predicting empowerment, $F(1, 95) = 7.12, p = .009, \eta_p^2 = .070$ [.010, .162] (see Figure 3). Simple effects tests showed that, in the control condition, first-generation students reported less empowerment, $F(1, 95) = 6.03, p = .016, \eta_p^2 = .060$ [.006, .149], compared with continuing-generation students. In contrast, this social class difference was not present in the difference-education condition, $F(1, 95) = 0.52, p = .473, \eta_p^2 = .005$ [0, .054]. Importantly, these changes are due to increased empowerment among first-generation students in the difference-education compared with control condition, $F(1, 95) = 5.81, p = .018, \eta_p^2 = .058$ [.005, .146].[9] Among continuing-generation students, empowerment did not differ across conditions, $F(1, 95) = 1.68, p = .198, \eta_p^2 = .017$ [0, .082].

Moderated mediation analyses. Next, we examined whether the difference-education intervention improved first-generation students' academic performance by increasing their empowerment at Time 2. We did not examine Time 2 social fit, given the Condition × Generation status interaction was not significant. Specifically, we conducted moderated mediation analyses with
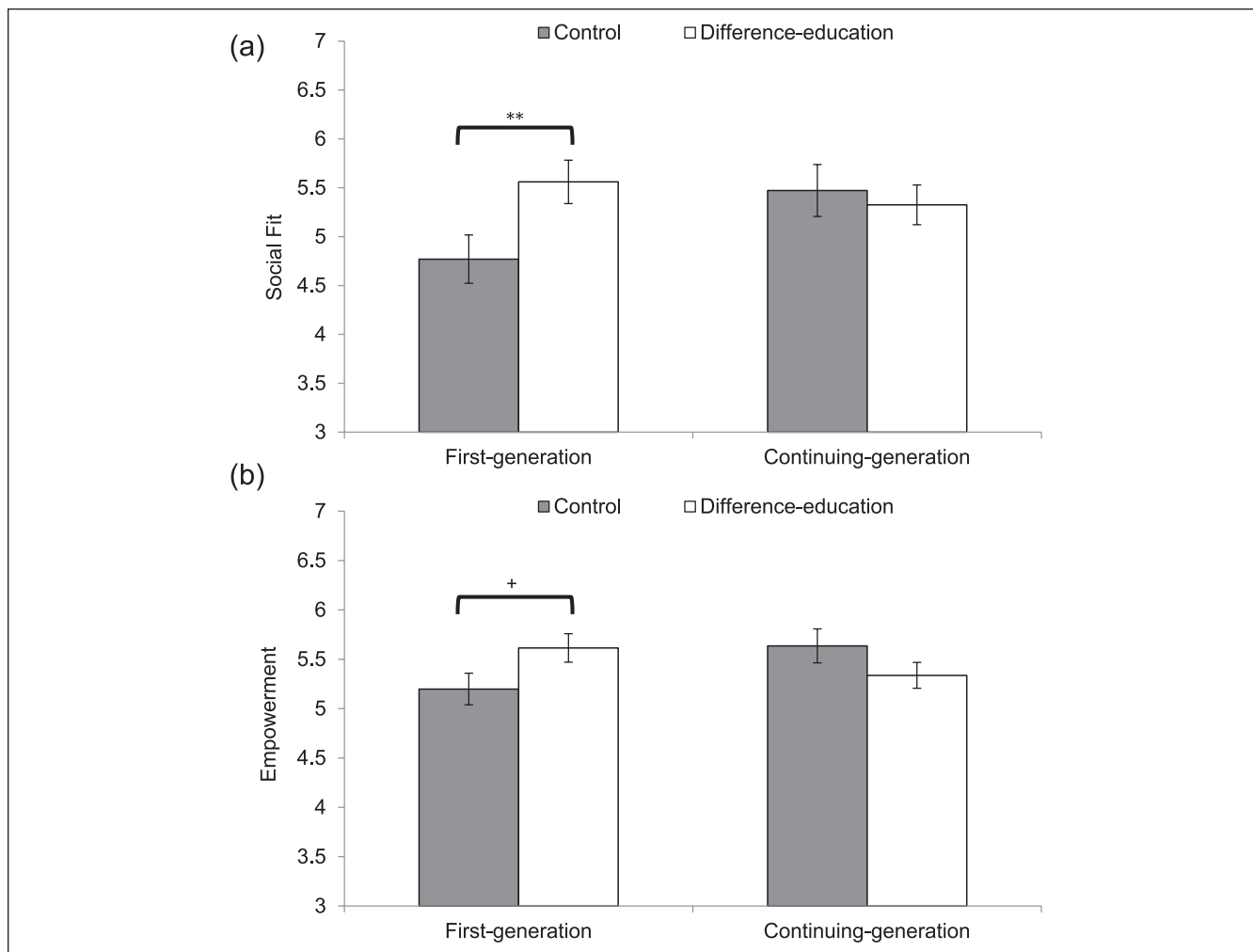
Figure 2. Social fit and empowerment at Time 1 as a function of generation status and intervention condition (raw means displayed).
Note. Error bars represent ± 1 *SE* of the mean.
†*p* < .10. *******p* < .01.

participants' empowerment as the mediator between intervention condition and academic performance with generational status as the moderator of both the direct and indirect paths (Hayes, 2013; PROCESS macro for SPSS 23, Model 8). We conducted the analysis with 20,000 bootstrap resamples, including our standard set of covariates. Results show a mediating role of empowerment, $b = -0.1545$, $SE_{boot} = .0754$, 95% CI = [−0.3456, −0.0414]. As predicted, the indirect effect was significant among first-generation students, $b = .1051$, $SE_{boot} = .0622$, 95% CI = [0.0102, 0.2579], such that those in the difference-education, compared with control, condition felt greater empowerment, which led to higher academic performance. In contrast, the indirect effect was not significant among continuing-generation students, $b = -.0494$, $SE_{boot} = .0320$, 95% CI = [−0.1283, 0.0015].

Psychological toughness—Time 2. To examine our predictions regarding improved college experiences, we conducted a 2 (generation status: first-generation vs. continuing-generation) × 2 (condition: difference-education vs. control) multivariate ANCOVA with our standard set of covariates and the three outcomes associated with psychological toughness. We found a marginal interaction, $F(3, 93) = 2.35$, $p = .078$, $\eta_p^2 = .070$ [0, .143]. Subsequently, we tested our directional predictions with univariate ANCOVAs, which showed patterns consistent with our predictions: significant interactions for psychological thriving, $F(1, 95) = 5.38$, $p = .022$, $\eta_p^2 = .054$ [.004, .141] and resilience, $F(1, 95) = 5.67$, $p = .019$, $\eta_p^2 = .056$ [.005, .144], and a marginal interaction for psychological competence, $F(1, 95) = 3.83$, $p = .053$, $\eta_p^2 = .039$ [0, .119]. Below we report the results of simple effects tests (see Table 4 for results of these ANCOVAs).

Psychological thriving. There were no differences among participants in the control condition based on generation status, $F(1, 95) = 0.89$, $p = .348$, $\eta_p^2 = .009$ [0, .065]. However, among par-
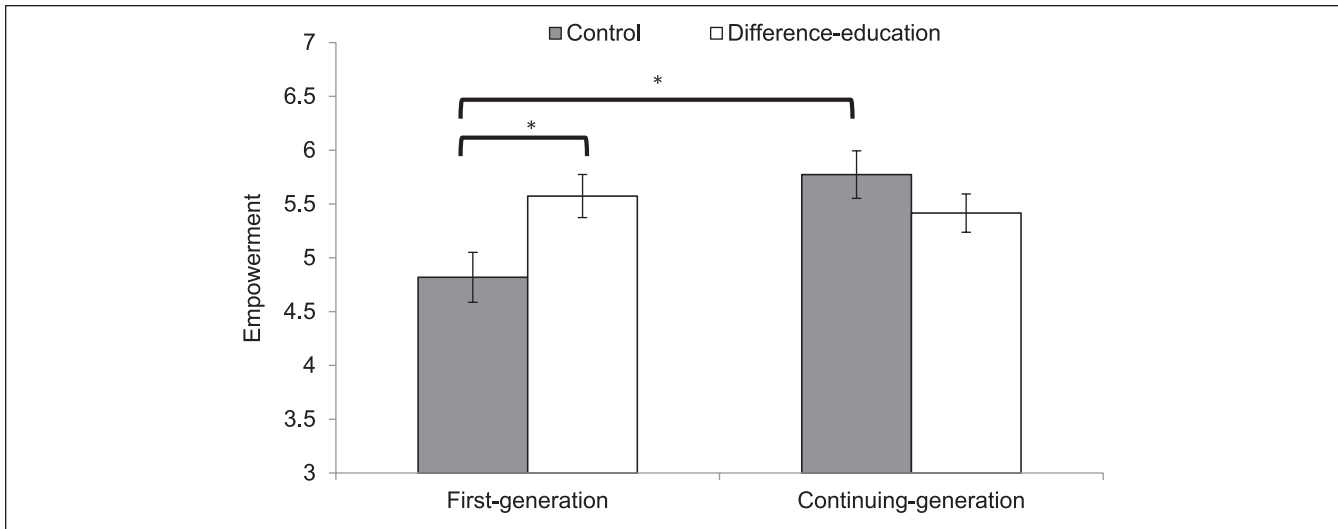
Figure 3. Empowerment at Time 2 as a function of generation status and intervention condition (raw means displayed).
Note. Error bars represent ± 1 *SE* of the mean.
*$p < .05$.

Table 4. Univariate Analysis of Covariances Results for Indicators of Psychological Toughness in the Intervention Study (Time 2).

	Psychological thriving	Resilience	Psychological competence
	F	*F*	*F*
Covariate			
High school GPA	0.32	0.82	1.82
Race and ethnicity	0.96	0.16	2.25
Gender	2.81†	0.39	0.04
Low-income status	3.72†	0.78	1.32
Main and interactive effects			
Condition	1.92	0.46	0.04
Generation	0.29	0.42	0.009
Condition × Generation	5.38*	5.67*	3.83†
Raw means and standard deviations	*M (SD)*	*M (SD)*	*M (SD)*
FGs, difference-education	3.62$_a$ (0.66)	3.91$_a$ (0.53)	2.45$_a$ (0.75)
FGs, control	3.09$_b$ (0.79)	3.55$_b$ (0.69)	2.12$_a$ (0.94)
CGs, difference-education	3.37$_{a,b}$ (0.73)	3.80$_{a,b}$ (0.52)	2.22$_a$ (1.02)
CGs, control	3.54$_{a,b}$ (0.67)	4.01$_{a,b}$ (0.58)	2.63$_a$ (0.69)

Note. Degrees of freedom (*df*) for all dependent variables = 1, 95. High school GPA (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*). Within each column, means that have different subscripts differ significantly based on post hoc tests of adjusted means (*p* < .05). GPA = grade point average; FGs = first-generation students; CGs = continuing-generation students.
†*p* < .10. **p* < .05.

ticipants in the difference-education condition, first-generation students reported marginally greater psychological thriving than continuing-generation students, $F(1, 95) = 3.91, p = .051, \eta_p^2 = .040 [0, .120]$. Importantly, these changes are due to increased reported psychological thriving among first-generation students in the difference-education compared with the control condition,

$F(1, 95) = 5.82, p = .018, \eta_p^2 = .058 [.005, .146]$. Continuing-generation students did not differ across conditions, $F(1, 95) = 0.55 p = .459, \eta_p^2 = .006 [0, .055]$.

Resilience. Among participants in the control condition, first-generation students reported marginally less resilience,

$F(1, 95)= 3.48, p = .065, \eta_p^2 = .035$ [0, .113], compared with continuing-generation students. However, these differences were not present in our difference-education condition, $F(1, 95) = 1.03, p = .313, \eta_p^2 = .011$ [0, .068]. Importantly, these changes are due to increased reported resilience among first-generation students in the difference-education compared with control condition, $F(1, 95) = 3.99, p = .049, \eta_p^2 = .040$ [0, .121]. Continuing-generation students did not differ across conditions, $F(1, 95) = 1.80, p = .183, \eta_p^2 = .019$ [0, .084].

Psychological competence. There were no generation status differences in reported psychological competence among participants in the control condition, $F(1, 95) = 1.13, p = .290, \eta_p^2 = .012$ [0, .070], nor the difference-education condition, $F(1, 95) = 1.86, p = .176, \eta_p^2 = .019$ [0, .086]. Furthermore, there was no condition difference among first-generation students, $F(1, 95) = 1.33, p = .252 \ \eta_p^2 = .014$ [0, .075]. In addition, in contrast to our predictions, there was a marginal difference among continuing-generation students such that those in the control condition reported greater psychological competence than those in the difference-education condition, $F(1, 95) = 2.86, p = .094, \eta_p^2 = .029$ [0, .103].

Additional measures and exploratory analyses. In our Time 2 survey, we also included measures related to stress and anxiety, psychological adjustment, social engagement, academic engagement, and intergroup understanding, as well as a measure of responses to common college scenarios. In the online supplemental material, we report methodological information and results for these measures; we also compare our results with those of the in-person panel intervention when measures overlapped. To further investigate the processes underlying the academic performance benefits of difference-education, we also conducted a series of exploratory, moderated mediation analyses. We used the measures on which there was a marginal or significant Generation status × Condition interaction, and the three measures of psychological toughness, as potential mediators of academic performance. The results of these exploratory analyses suggest that only empowerment was a significant, independent mediator of students' improved academic performance.[10]

Discussion

Results of the intervention study support our theorizing. Specifically, the online difference-education intervention taught students a contextual theory of difference and closed the social class achievement gap between first-generation and continuing-generation students at the end of their second year in college. Although a social class GPA gap was present in both the intervention control condition and the campuswide control, there was no gap in the difference-education condition because first-generation students had higher academic performance compared with the control conditions. Our moderated mediation analyses revealed that an increase in their empowerment, and not their social fit, partially explained their improved GPA. Interestingly, our intervention improved first-generation students' feelings of social fit immediately following the intervention; however, the size of this effect was reduced by the end of the first year in college (i.e., first-generation students in the difference-education condition vs. the control condition: $\eta_p^2 = .039$ at Time 1 vs. $\eta_p^2 = .017$ at Time 2). In contrast, the effect of the intervention on first-generation students' empowerment was greater at the end of students' first year than immediately following the intervention (i.e., first-generation students in the difference-education condition vs. the control condition: $\eta_p^2 = .028$ at Time 1 vs. $\eta_p^2 = .058$ at Time 2). Moreover, we found evidence that difference-education improves first-generation students' college experiences by affording psychological benefits not previously shown. Specifically, we found that the online difference-education intervention provided first-generation students with increased psychological toughness (i.e., psychological thriving and resilience).

Comparison with results of the in-person panel intervention. Results of the current, online difference-education intervention replicate the primary and most important findings from the initial test of difference-education in a new university context. That is, the current online difference-education intervention and the previous in-person panel intervention both successfully communicated a contextual theory of difference, as indicated by participants' open-ended reports of what they learned from the intervention. In addition, they both successfully reduced the social class achievement gap by improving first-generation students' college grades over an extended period of time in college (i.e., at the end of their first or second year).

In addition, the finding in the current research that difference-education improved first-generation students' grades by increasing their empowerment is also consistent with the mediator finding from the in-person panel study. Specifically, the current study finds evidence that the intervention improved first-generation students' grades partially through an increase in *psychological* empowerment. Stephens, Hamedani, and Destin (2014) demonstrated improved grades partially via a measure of *behavioral* empowerment (i.e., tendency to take advantage of college resources). We theorize that these two related processes likely work in tandem, with psychological empowerment fostering a willingness to take action (i.e., behavioral empowerment) and vice versa. Thus, results of these two studies converge to suggest that difference-education improves grades through some form of empowerment.

In terms of social fit, the current online study finds increased fit among first-generation students in the difference-education condition (vs. control condition) immediately after the intervention (i.e., Time 1). However, this effect was not significant at the end of students' first year (i.e., Time 2).

In contrast, in the in-person panel intervention, both continuing-generation and first-generation students showed improved social fit compared with students in the control condition at the end of the first year. We speculate that differences in the university climates (e.g., university selectivity or culture) may underlie the differing results. For example, it could be that, at the university examined in the current online study, students overall feel high levels of social fit at the end of their first year and, thus, have limited room to improve. Consistent with this, first-generation students in the control condition reported higher social fit at the end of the year compared with immediately following the intervention.

General Discussion

The present work contributes to the growing literature on social psychological interventions that seek to improve the academic outcomes of students who are underrepresented in higher education (e.g., first-generation students in selective universities). Specifically, it provides a conceptual replication of the in-person panel difference-education intervention in a different university context and with a longer time-scale (i.e., end-of-second-year grades vs. end-of-first-year grades; Stephens, Hamedani, & Destin, 2014). Importantly, the present research suggests that a contextual theory of difference can be communicated online to individual students and that, in this format, it can improve first-generation students' academic performance nearly 2 years later.

In addition, our work demonstrates one key process through which difference-education improves academic performance, that is, by increasing first-generation students' psychological empowerment. We speculate that the intervention provided an immediate boost in students' psychological empowerment, which may have led to a cascade of psychological and behavioral effects, including reaffirming empowerment even after 1 year (e.g., Wilson, 2011). As mentioned above, this builds on the previous difference-education intervention, which found that it improved first-generation students' grades by increasing their behavioral empowerment (i.e., tendency to seek campus resources). Our findings offer new insight into the psychological process underlying *why* first-generation students may have been more likely to seek such resources (i.e., psychological empowerment may have increased their behavioral empowerment).

The present research also extends the outcomes potentially improved by difference-education to include first-generation students' psychological toughness. Such psychological toughness may be essential for well-being and success in stressful contexts such as college (e.g., Pritchard et al., 2007; Solberg Nes et al., 2009). These results are consistent with the findings of a follow-up of the initial in-person panel difference-education intervention, which showed that difference-education led first-generation students to display more adaptive physiological coping responses during a stressful task (Stephens, Townsend, et al., 2015).

In addition, by demonstrating that it is possible for first-generation students to benefit from learning a contextual theory of difference in an online, individual format, our results add difference-education to the group of social psychological lay theory interventions that use online methods (Wilson, 2011; Yeager & Walton, 2011). Our research contributes to educational practice by providing a difference-education intervention that requires less time and fewer resources than the initial in-person panel intervention and suggests that difference-education has potential to be effective at scale, similar to other interventions (Yeager et al., 2016).

Limitations and Future Directions

Future research should investigate the effectiveness of difference-education interventions in a broader range of higher education contexts with different climates. Such research will help advance theory by further illuminating the process through which difference-education benefits first-generation students. For example, will improvements in first-generation students' performance be mediated through increased psychological or behavioral empowerment when institutions offer fewer of the resources of which empowered students might take advantage? It will also be important to examine less selective colleges and universities, as well as community colleges. Testing the effectiveness of our intervention approach in such contexts is practically important because the majority of first-generation students attend these types of institutions (Engle, 2007).

Finally, as is the case with other social psychological interventions, it remains unclear which specific aspect(s) of our message drive the intervention's effects. The difference-education message conveys an understanding that differences come from being exposed to and adapting to different kinds of contexts. We conveyed contextual theory of difference through stories of how people's different backgrounds shaped their experiences in college in both negative and positive ways. Future research should examine what information is necessary and sufficient to convey a contextual theory of difference and produce the intervention's benefits.

Conclusion

Universities bring together students from diverse backgrounds, but they often fail to fully leverage the benefits of that diversity. One reason is that these institutions themselves are often set up according to middle-class and European American norms. As a result, disadvantaged students, whose backgrounds diverge from this cultural standard, often experience a lack of fit and empowerment, which can undermine their opportunity to succeed. The present research suggests that students can be taught a contextual theory of difference online and that this has potential to empower disadvantaged students and, thereby, improve their academic performance.

Ultimately, difference-education can enable colleges and universities to create more inclusive and empowering environments in which students from diverse backgrounds have a greater opportunity to succeed.

Notes

1. A lay theory is a set of fundamental assumptions about the nature of the self and social world that shapes how people interpret and respond to their experiences (Molden & Dweck, 2006).
2. We selected the term *fit* to emphasize the degree of congruence between a person's psychological experience and that setting, building on research on cultural fit, person–environment fit, and person–organization fit (e.g., Chatman, 1991; Rivera, 2012; Schmader & Sedikides, 2018).
3. As the purpose of this study was to test whether students could learn a contextual theory of difference online, we did not obtain students' grades.
4. We also assessed participants' reactions to the stories (e.g., positivity) and examined whether these were affected by generation status, condition, or their interaction. When we found significant effects, we controlled for those reactions in follow-up analyses of perceptions of college experiences; doing so did not change the significance or direction of our results. See the online supplemental material for more information.
5. The two university contexts differed in several ways. One difference of interest is the percentage of first-year students who were first-generation, which was 8% in the university setting for the in-person panel intervention study and 14.2% in the university setting for the present intervention study.
6. As in the pilot study, we measured participants' reactions to the stories. We found no significant effects of generation status, intervention condition, or their interaction. See the online supplemental material for more information.
7. To allow for comparison with the in-person panel study, we used raw means to calculate Cohen's *d* effect sizes for these comparisons (see Lakens, 2013): first-generation students in the difference-education condition compared with first-generation students in the control condition, $d = .834$, and in the campuswide control, $d = .586$.
8. For analyses using the campuswide control, (a) Pell eligibility was not included as a covariate because we did not have this information for the campuswide control, (b) campuswide control students whose races were unlisted or listed as "unknown," "international," or "two or more" were coded as "1" (i.e., advantaged), as this was the modal response, and (c) 28 campuswide control students, whose high school GPAs were missing, were not included.
9. For the comparison of first-generation students in the difference-education condition with first-generation students in the control condition, Cohen's $d = .630$ (calculated using raw means).
10. Although resilience and psychological competence were significant mediators when each was the sole mediator in the analyses, in an analysis with empowerment, resilience, and psychological competence as simultaneous mediators, only the indirect effect through empowerment was significant.

Supplemental Material

Supplemental material is available online with this article.

References

Adams, M., Bell, L. A., & Griffin, P. (Eds.). (2007). *Teaching for diversity and social justice*. New York, NY: Routledge.

Bourdieu, P., & Passeron, J. C. (1990). *Reproduction in education, society and culture*. London, England: SAGE.

Cabrera, N. L., Milem, J. F., Jaquette, O., & Marx, R. W. (2014). Missing the (student achievement) forest for all the (political) trees: Empiricism and the Mexican American studies controversy in Tucson. *American Educational Research Journal*, *51*, 1084-1118. doi:10.3102/0002831214553705

Chatman, J. A. (1991). Matching people and organizations: Selection and socialization in public accounting firms. *Administrative Science Quarterly*, *36*, 459-484. doi:10.5465/AMBPP.1989.4980837

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor–Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, *18*, 76-82. doi:10.1002/da.10113

Croizet, J.-C., & Millet, M. (2011). Social class and test performance: From stereotype threat to symbolic violence and vice versa. In M. Inzlicht & T. Schmader (Eds.), *Stereotype threat: Theory, process, and application* (pp. 188-201). New York, NY: Oxford University Press.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, *92*, 1087-1101. doi:10.1037/0022-3514.92.6.1087

Duncan, G. J., & Murnane, R. J. (2011). *Whither opportunity? Rising inequality, schools, and children's life chances*. New York, NY: Russell Sage Foundation.

Engle, J. (2007). Postsecondary access and success for first-generation college students. *American Academic*, *3*, 25-48.

Frymier, A. B., Shulman, G. M., & Houser, M. (1996). The development of a learner empowerment measure. *Communication Education*, *45*, 181-199. doi:10.1080/03634529609379048

Gay, G. (2000). *Culturally responsive teaching: Theory, research, and practice*. New York, NY: Teachers College Press.

Goudeau, S., & Croizet, J.-C. (2017). Hidden advantages and disadvantages of social class: How classroom settings reproduce social inequality by staging unfair comparison. *Psychological Science*, *28*, 162-170. doi:10.1177/0956797616676600

Gurin, P., Nagda, B. A., & Zúñiga, X. (2013). *Dialogue across difference: Practice, theory, and research on intergroup dialogue*. New York, NY: Russell Sage Foundation.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Kao, G. (1995). Asian Americans as model minorities? A look at their academic performance. *American Journal of Education*, *103*, 121-159. doi:10.1086/444094

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for *t-tests* and ANOVAs. *Frontiers in Psychology*, *4*, 863. doi:10.3389/fpsyg.2013.00863

Landis, J. R., & Koch, G. G. (1977). An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*, *33*, 363-374. doi:10.2307/2529786

Midgley, C., Maehr, M. L., Hruda, L. Z., Anderman, E., Anderman, L., Freeman, K. E., . . . Urdan, T. (2000). *Manual for the Patterns of Adaptive Learning Scale*. Ann Arbor: University of Michigan.

Molden, D. C., & Dweck, C. S. (2006). Finding "meaning" in psychology: A lay theories approach to self-regulation, social perception, and social development. *American Psychologist*, *61*, 192-203. doi:10.1037/0003-066X.61.3.192

Morrison, K. A., Robbins, H. H., & Rose, D. G. (2008). Operationalizing culturally relevant pedagogy: A synthesis of classroom-based research. *Equity & Excellence in Education*, *41*, 433-452. doi:10.1080/10665680802400006

Ostrove, J. M., & Long, S. M. (2007). Social class and belonging: Implications for college adjustment. *The Review of Higher Education*, *30*, 363-389. doi:10.1353/rhe.2007.0028

Paris, D., & Alim, H. S. (Eds.). (2017). *Culturally sustaining pedagogies: Teaching and learning for justice in a changing world*. New York, NY: Teachers College Press.

Pascarella, E. T., Pierson, C. T., Wolniak, G. C., & Terenzini, P. T. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *Journal of Higher Education*, *75*, 249-284. doi:10.1080/00221546.2004.11772256

Plaut, V. C. (2010). Diversity science: Why and how difference makes a difference. *Psychological Inquiry*, *21*, 77-99. doi:10.1080/10478401003676501

Plaut, V. C., Garnett, F. G., Buffardi, L. E., & Sanchez-Burks, J. (2011). "What about me?" Perceptions of exclusion and Whites' reactions to multiculturalism. *Journal of Personality and Social Psychology*, *101*, 337-353. doi:10.1037/a0022832

Pritchard, M. E., Wilson, G. S., & Yamnitz, B. (2007). What predicts adjustment among college students? A longitudinal panel study. *Journal of American College Health*, *56*, 15-22. doi:10.3200/JACH.56.1.15-22

Reay, D., Crozier, G., & Clayton, J. (2009). "Strangers in paradise?" Working-class students in elite universities. *Sociology*, *43*, 1103-1121. doi:10.1177/0038038509345700

Rivera, L. A. (2012). Hiring as cultural matching: The case of elite professional service firms. *American Sociological Review*, *77*, 999-1022. doi:10.1111/j.1744-6570.1996.tb01790.x

Schmader, T., & Sedikides, C. (2018). State authenticity as fit to environment: The implications of social identity for fit, authenticity, and self-segregation. *Personality and Social Psychology Review*, *22*, 228-259. doi:10.1177/1088868317734080

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*, 1359-1366. doi:10.1177/0956797611417632

Sleeter, C. E. (2011). *The academic and social value of ethnic studies: A research review*. Washington, DC: National Education Association.

Solberg Nes, L., Evans, D. R., & Segerstrom, S. C. (2009). Optimism and college retention: Mediation by motivation, performance, and adjustment. *Journal of Applied Social Psychology*, *39*, 1887-1912. doi:10.1111/j.1559-1816.2009.00508.x

Steele, C. M. (2010). *Whistling Vivaldi: And other clues to how stereotypes affect us*. New York, NY: W.W. Norton.

Stephens, N. M., Brannon, T. N., Markus, H. R., & Nelson, J. E. (2015). Feeling at home in college: Fortifying school-relevant selves to reduce social class disparities in higher education. *Social Issues and Policy Review*, *9*, 1-24. doi:10.1111/sipr.12008

Stephens, N. M., Fryberg, S. A., Markus, H. R., Johnson, C. S., & Covarrubias, R. (2012). Unseen disadvantage: How American universities' focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, *102*, 1178-1197. doi:10.1037/a0027143

Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science*, *25*, 943-953. doi:10.1177/0956797613518349

Stephens, N. M., Hamedani, M. G., & Townsend, S. S. M. (in press). Difference matters: Teaching students a contextual theory of difference can help them succeed. *Perspectives on Psychological Science*.

Stephens, N. M., Markus, H. R., & Phillips, L. T. (2014). Social class culture cycles: How three gateway contexts shape selves and fuel inequality. *Annual Review of Psychology*, *65*, 611-634. doi:10.1146/annurev-psych-010213-115143

Stephens, N. M., Townsend, S. S. M., Hamedani, M. G., Destin, M., & Manzo, V. (2015). A difference-education intervention equips first-generation college students to thrive in the face of stressful college situations. *Psychological Science*, *26*, 1556-1566. doi:10.1177/0956797615593501

Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology*, *92*, 82-96. doi:10.1037/0022-3514.92.1.82

Wickrama, K. A., Ralston, P. A., O'Neal, C. W., Ilich, J. Z., Harris, C. M., Coccia, C., . . . Lemacks, J. (2013). Linking life dissatisfaction to health behaviors of older African Americans through psychological competency and vulnerability. *Research on Aging*, *35*, 591-611. doi:10.1177/0164027512449473

Wilson, T. D. (2011). *Redirect: The surprising new science of psychological change*. New York, NY: Little, Brown.

Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research*, *81*, 267-301. doi:10.3102/0034654311405999

Yeager, D. S., Walton, G. M., Brady, S. T., Akcinar, E. N., Paunesku, D., Keane, L., . . . Dweck, C. S. (2016). Teaching a lay theory before college narrows achievement gaps at scale. *Proceedings of the National Academy of Sciences of the United States of America*, *113*(24), E3341-E3348. doi:10.1073/pnas.152436011