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Supplementary Materials for

A customized belonging intervention improves retention of socially disadvantaged students at a broad-access university

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This PDF file includes:

Materials and Methods Detail

Overview of Procedure

Delivery of Intervention (Second Semester of Students' First Year)

We invited all students enrolled in all of the first-year writing courses at a large broad-access university to participate in the intervention in the spring semester of students' first year. The first-year writing course is a mandatory course that nearly all incoming first-year students take. Replicating past procedures *(9, 10)*, the intervention materials were presented as the results of a survey about the transition to college in which students read about upper-year students' college transition experiences. Students were randomly assigned to one of three conditions—an active control condition, a social-belonging treatment condition, and an exploratory purpose treatment condition.

In the social-belonging treatment condition, students read stories from racially diverse upper-year students that described the academic and social challenges to their sense of belonging on campus as well as various strategies they employed that helped them come to feel they belonged at the university over time. The materials represented belonging on campus as a process that develops over time, albeit in somewhat different ways for different people.

In the active control condition, students read stories from upper-year students that described students' early struggles with knowing how to study for college classes as well as some of the strategies they employed to help them develop study skills over time. The content matched the social-belonging condition in length, number of student stories, and even in describing a process of college adjustment that unfolds over time. However, it lacked the critical psychological messages about belonging in college.

Finally, we used this opportunity to reach almost the entire the first-year class to pilot a new intervention message focused on students' larger reasons or purposes for pursuing and persisting in college. Because this condition was exploratory, we do not report it in the main text (results and discussion are provided below in the Exploratory Analysis section of this SOM).

As in previous social belonging intervention trials, students were then asked to describe how their experience in college so far mirrored the upper-year students' stories. They were also asked to write a letter to a future student at their university who might doubt their belonging during the transition to college. These exercises, termed "saying-is-believing," help people internalize an idea and connect it to their own lives, increasing its impact.

Following the intervention, we conducted two longitudinal psychological assessments in the form of online surveys. Using experience-sampling methods, a daily diary survey

over 9 days immediately following the intervention was conducted; and, one-year post-intervention (in the spring semester of students' second year in college), a follow-up survey was conducted. These surveys were implemented to help us understand the psychological mechanisms by which the intervention influenced longer-term academic outcomes. Fig S1 provides a CONSORT diagram showing the enrollment, allocation, and follow-up of our study participants and how they are analyzed in the trial.

Participants and University Context

A total of 1,063 first-time college students in a large, urban, broad-access, Hispanic-serving institution in the Midwest were randomly assigned to the social-belonging treatment condition or the active control condition. This university is classified as a commuter school (any student who does not live in a campus residence hall is defined as a "commuter") with over 85 percent of the nearly 30,000 students commuting to campus.

Racial/Ethnic and Socioeconomic Diversity. Of those students who were randomly assigned to the social-belonging and active control conditions, 28 percent of students said that they were European American, 23 percent said they were Hispanic or Latino, 27 percent said that they were Asian or Asian American, 7 percent said they were mixed race, 7 percent said that they were African American, and 2 percent said they were Native American. 46 percent said that neither of their parents had obtained a college-degree and identified as first-generation college students.

Socially Disadvantaged Group Membership. Following previous research (*11, 12*) and social identity threat theory (*45*) that suggests that racial-ethnic minority students and first-generation college students contend with psychological threats regarding their academic ability, we classified all African American, Latino, Native and all first-generation college students (regardless of their racial-ethnic background) as contending with group-based disadvantage in the college context. While we did not formally preregister this decision (the study began long before pre-registration became normative), the idea that a social belonging intervention should have differential benefits for students from socially disadvantaged backgrounds follows directly from prior published research on this intervention (*11, 12*). We also wrote and submitted a formal, dated proposal that described the study design and hypotheses to our University partner when we began our initial collaboration (before the study was funded and data were collected; this proposal is available by request). Thus, the study design and the particular comparison of socially disadvantaged students (defined as Black, Latinx, Native, and first-generation students of any racial/ethnic background) in the treatment (vs. control) conditions were decided prior to data collection. In all, 57 percent of students randomly assigned to the social-belonging and active control conditions were classified as belonging to the "socially disadvantaged" group. All remaining students comprised the relatively "socially advantaged" group.

Overview of Data and Measures

This study examined data from four main sources: (1) Data collected during the intervention implementation; (2) Academic outcomes including student records data obtained from the university registrar; (3) Psychological outcomes from daily-diary data, assessed for 9 days post-intervention; and (4) Psychological outcomes from the one-year post-intervention follow-up survey.

The intervention data includes each student's randomized study condition and self-reported demographic factors (such as gender, race, and parent's education-level, which was used to assess generation status), as well as manipulation check items. We linked these data to administrative student-level data, including our primary academic outcome measures—continuous semester-to-semester enrollment and GPA for each semester for two years post-intervention—as well as the psychological outcomes from daily diary and follow-up surveys.

Academic Outcomes

Continuous enrollment: The primary academic outcome was students' continuous enrollment in each semester following the intervention obtained from university records. We used these data to construct two measures—continuous enrollment over one- and two-years post-intervention. These dichotomous variables indicated whether a student was enrolled in both the semesters (i.e., one year) and all four semesters (i.e., two years) post-intervention.

Grade Point Average (GPA): For each student in each semester, we also gathered the student's non-cumulative grade point average (GPA) from university records.

Pre-intervention College GPA: Because the randomized intervention was conducted in the second semester of students' first year in college, we use students' first-semester GPA as a measure of previous achievement and control for this baseline measure across students in all our models (except the models examining moderation by previous achievement to determine for whom the intervention was most effective) to increase the precision of the treatment estimates. Because of randomization at the student-level, we also observe balance across students' composite ACT scores and high school GPA (see Table S1). We do not control for these measures in our analyses as we observe some missing values thereby reducing our analytical sample size. Instead, we control for baseline GPA in all our models to add precision to treatment effect estimates.

Psychological Outcomes

Experience-Sampling Surveys: Daily Adversity and Daily Social and Academic Fit. Each day, as part of a daily diary survey, a randomly selected subsample of students were asked to report up to three positive and three negative events that they experienced that

day along with a short description of each event. Students used a 5-point scale to indicate how positive (neutral to very positive) or negative (neutral to very negative) each event was followed by a daily report of students' feelings of social and academic fit. Following previous research (1), we weighted each event by its student-rated emotional valence and then subtracted the number of negative events from the number of positive events to create an index of daily adversity for each participant. The daily social and academic fit measure assessed in the daily diaries were 12-items drawn from previous research (1, 6)that were applicable to students' day-to-day experiences. These items were rephrased to assess in-the-moment feelings of fit (e.g., *Right now, I feel comfortable at <school name>*). All items are provided below.

Social and Academic Fit: Students' perceived academic and social fit in college was also assessed by a one-year follow-up survey. Following previous research (3, 6)19-items assessed multiple facets of perceived fit including belonging (items 1-10), academic identification (items 11 and 12), self-efficacy (items 13-14), future academic selves (items 15-18), and perceived potential (19). As in past intervention research (Walton & Cohen, 2007; Walton, Logel, Peach, Spencer & Zanna, 2015), we preserved the original scales and then averaged across them. In other words, each of the construct subscales were averaged together and then combined into the "social and academic fit" composite measure.

Social and Academic Fit (Follow-up Survey)	$\alpha = 0.862$
Scale*: *1=Strongly disagree* *2=Disagree* *3= Somewhat disagree* *4=Neither agree nor disagree* *5=Somewhat agree* *6=Disagree* *7=Strongly agree*	
1. I feel comfortable at <school name>. 2. I belong at <school name>. 3. Other students at <school name> accept me. 4. Other students understand more than I do about what's going on at <school name>. 5. I think in the same way as do students who do well at <school name>. 6. It is a mystery to me how <school name> works (r) 7. I feel alienated from <school name> (r) 8. Students at <school name> are a lot like me. 9. I fit in well at <school name>. 10. Compared with most other students, I know how to do well at <school name>. 11. I feel confident that I have the ability to do well at <school name>. 12. I feel that I have LESS ability than others (r) 13. Being successful at <school name> is important to me.	

14. How interesting are classes at <school name> for you?
15. How much do you enjoy academic work at <school name>?
16. In the future, I could see myself doing well academically at <school name>.
17. In the future, I could see myself impressing a professor.
18. In the future, I could see myself working closely with a professor or graduate student on an independent project (e.g., research, honors or capstone thesis, etc.).
19. Now, using a percentile rank, please assess your potential to succeed at <school name>, compared with other <school name> students, by drawing an X on the line below. Marking an X at 50% means you believe you have more potential than half of <school name> students, and less potential than half. Marking 90% means you believe you have more potential than almost all <school name> students. Marking 10% means you believe you have less potential than almost all <school name> students. * *This item was measured on a continuous scale ranging from 0-100 percentile)*

The **daily diary survey** items assessing Daily Social and Academic Fit were abbreviated and worded slightly differently to measure in-the-moment, state responses as shown below. Note: the social and academic fit composites are calculated for each day (method described below), thus the alpha varies slightly across the different days of the study; hence, we report the alpha range across those 9 days in the table header below.

Daily Social and Academic Fit (Daily Diary Surveys)	Daily α's = 0.87-0.90
Scale*: *1=Strongly disagree* *2=Disagree* *3= Somewhat disagree* *4=Neither agree nor disagree* *5=Somewhat agree* *6=Disagree* *7=Strongly agree*	
1. Right now, I feel comfortable at <school name>. 2. Right now, I feel like I belong at <school name>. 3. Right now, I feel like other students at <school name> accept me. 4. Right now, I feel like other students understand more than I do about what's going on at <school name>. 5. Right now, I feel like I think in the same way as do students who do well at <school name>. 6. Right now, I feel it is a mystery to me how <school name> works (r) 7. Right now, I feel alienated from <school name> (r) 8. Right now, I feel like students at <school name> are a lot like me. 9. Right now, I feel like I fit in well at <school name>. 10. Right now, I feel like, compared with most other students, I know how to do well at <school name>.	

11. Right now, I feel confident that I have the ability to do well at <school name>.
12. Right now, I feel that I have LESS ability than others (r)

Additional exploratory measures assessed on Day 9 only (the final daily diary survey) include:

In the future, I could see myself doing well academically at <school name>.
In the future, I could see myself impressing a professor.
In the future, I could see myself working closely with a professor or graduate student on an independent project (e.g., research, honors or capstone thesis, etc.).
Being successful at <school name> is important to me.
How much do you enjoy academic work at <school name>?
How interesting are classes at <school name> for you?

Model Specifications and Results

Effectiveness of Random Assignment to Conditions

The study design consisted of a student-level, double-blind randomized control trial. There were equal probabilities of random assignment to each condition (*social-belonging treatment condition N = 521 and active control condition N = 542*). Random assignment was generally effective at the student-level across the conditions. The conditions did not differ with regard to student ACT scores, high school GPA, baseline first-semester college GPA, or other demographic characteristics. There was a slight overrepresentation of female students in the treatment condition, thus all analyses controlled for student gender. See Table S1.

Implementation Fidelity: Manipulation Checks and Completion Rates

Students completed the treatment and control conditions (i.e., responded to the manipulation check item) at equal (and high) rates (Treatment condition – 92%; Control condition – 90%, χ^2 = 1.56, P =0.46).

The social belonging intervention represented belonging as a process that grows with time. To assess whether students received this message as intended, students were asked to respond to two manipulation check questions immediately after the intervention was delivered. Students responded to the following two items using a scale ranging from *1=Strong Disagree to 7=Strongly Agree:*

1) Many people in their first year at <school name> have difficulty developing close friendships with other <school name> students.
2) At first, most people have concerns about belonging and fitting in at <school name>, but over time, those concerns get better.

These two items were standardized and averaged to form a manipulation check composite (r = .28, P < .001).

As predicted, and consistent with the treatment message, students were much more likely to agree with these core ideas in the social-belonging condition than in the active control condition. This was true for both socially advantaged students (B = 0.35, t =3.07, p=0.002) and socially disadvantaged students (B = 0.36, t =3.65, p <0.001). The group × condition interaction on the manipulation check composite was not statistically significant (B = 0.008, t = 0.05, p =0.96).

Intent to Treat Analysis

Intent-To-Treat (ITT) effects of the treatment are estimated from a multiple regression model as follows:

$$(1) \qquad Y_i = \alpha + \beta T_i + \gamma X_i + \varepsilon_i$$

In separate specifications, the dependent variable Y denotes, (1) an indicator for whether a student was continuously enrolled in the college (a) for two semesters post-intervention; (b) or four semesters post-intervention; and (2) the non-cumulative GPA in the semester(s) post-intervention. T_i denotes the treatment assignment indicator, the vector X_i denotes a vector of student-level demographic (gender) and baseline academic achievement (non-cumulative first-semester GPA; the semester prior to the intervention) and ε is a random error term. We estimate the above regressions separately for "socially disadvantaged" and "socially advantaged" students based on past research (1, 4). Our hypothesis is that disadvantaged students are more likely to benefit from the belonging treatment. We also report interactions between Group ("socially advantaged" vs. "socially disadvantaged") and Treatment (social-belonging treatment vs. active control condition) for all specifications. As treatment is randomly assigned, other baseline covariates are unnecessary to reduce omitted variables bias in the estimated treatment effects. However, we include the baseline covariates of participant gender and first semester (pre-intervention) GPA to generate more precise ITT estimates. Please see Table S14 for ITT results that do not include the baseline covariates. These results are qualitatively similar across the main outcomes of interest, as expected. In the case of continuous enrollment outcomes, given the binary nature of the dependent variable, we use a logistic regression analysis to estimate the ITT. We conduct this analysis for continuous enrollment and non-cumulative GPA at one- and two-years post-intervention. All treatment comparisons shown are with respect to the active control condition where ($T_i = 0$).

Persistence: We present results from this initial model specification in Table S2. 64 percent of disadvantaged students who were randomly assigned to the active control condition were enrolled continuously in the two years following the intervention delivery. For disadvantaged students in the social-belonging treatment condition, that number was 73 percent, a statistically significant increase (*logistic regression Odds Ratio [OR]* = 1.53, Z = 2.26, p = 0.024).

Indeed, statistically significant differences are observed in the enrollment status among disadvantaged students in the active control condition and social belonging treatment in each year after the intervention was delivered. In the first two semesters after intervention, 76 percent of disadvantaged students in the randomly assigned active control condition were enrolled continuously. For disadvantaged students who received the social belonging intervention, that number was 86 percent, a statistically significant increase *(OR* = 2.09, *Z* = 3.21, *p* = 0.001).

Treatment effect on continuous enrollment of socially disadvantaged students measured only in the second year after intervention (result not shown in table below to economize on space): 66 percent of students in the randomly assigned active control condition were enrolled continuously in the year after intervention was delivered. For students who received the social belonging intervention, that number was 75 percent, a statistically significant increase (*OR* = 1.52, *Z* = 2.20, *p* = 0.028). We do not observe statistically significant effects for socially advantaged students across the same time-period

GPA: Over the two-year assessment period, socially disadvantaged students assigned to the social-belonging treatment condition showed a marginal increase of 0.11 GPA points relative to their disadvantaged peers in the control group (*t*=1.79, *P* =0.075). This difference, though not statistically significant, represents a 73 percentage-point reduction in the raw achievement gap between disadvantaged and advantaged students. Statistically significant treatment effects were observed for socially disadvantaged students in the semester immediately following the intervention delivery (i.e., the Fall of students' Second Year in college; *B* = 0.19, *t* = 2.81, *P* = 0.005) but they did not persist for the entire year post-intervention (Second Year GPA result: *B* = 0.10, *t* = 1.65, *P* = 0.100).

Again, there was no effect for socially advantaged students, either in the semester following treatment (*B*=-0.04, *t*=-0.49, *P*=0.624; Group × Condition interaction, *B*=0.24, *t*=2.30, *P*=0.02) or over one or two years post-intervention (*B*=-0.004, *t*=-0.05, *P*=0.960; Group × Condition interaction, *B* = 0.12, *t*=1.25, *P*=0.211 and *B*=-0.04, *t*=-.52, *P*=0.605; Group × Condition interaction, *B* =0.17, *t*=1.69, *P*=0.09, respectively; see Table S3). We did observe a statistically significant group × condition interaction on GPA in the first semester immediately following the intervention (the Fall of students' Second Year in college; *t*=2.30, *P* = 0.022).

While it is mere speculation, it could be that we are observing a tradeoff between performance and persistence in these data. While the intervention had an immediate impact on students' performance in the semester following the intervention's implementation, we also know that socially disadvantaged students were statistically more likely to persist (not drop out) in the second- and third years post-intervention. This could explain why GPA effects are attenuated over time as greater numbers of lower-performing students persist over time. While both persistence and performance are important for

college students' success, persistence is what our University partners were particularly concerned with at this broad-access institution.

We also found a statistically significant treatment effect on GPA change (one semester post-intervention GPA – pre-intervention GPA) for socially disadvantaged students (B=0.15, t=2.02, P=0.04) with no effect for socially advantaged students (B=-0.09, t=-0.96, P=0.34; group × condition: B=0.25, t =2.14, P=0.03). We primarily focus on the immediate post-intervention semester GPA (Fall of students' Second Year) results for all subsequent robustness checks on GPA because this is where the GPA effect was observed.

In the randomized control condition, we observed a statistically significant achievement gap between socially advantaged and socially disadvantaged students. Socially disadvantaged students earned statistically significantly lower GPAs than socially advantaged students (Socially Disadvantaged: M = 2.54 on a 4.0 scale, SD =0.8; Socially Advantaged: M = 2.73, SD = 0.86, t = -2.30, P = 0.021). However, the social belonging treatment raised disadvantaged students' GPA by 0.19 points (*M = 2.75, SD=0.78 on a 4.0 scale*), eliminating the achievement gap in the Fall semester of students' Second Year following the Spring intervention (t=2.81, P = 0.005). There was no intervention effect for socially advantaged students (Socially Advantaged Control Condition: M=2.73, SD= 0.86; Socially Advantaged Intervention Condition: M=2.74, SD = 0.82, t = -0.12, P=0.91).

Underlying Psychological Processes

We analyzed students' self-reported psychological experiences in the daily diary surveys and one-year follow-up survey to understand the psychological impacts of the intervention. We also explore the hypothesized psychological mechanisms that may mediate the observed academic effects. As mentioned previously, study participants were invited to complete the daily diary surveys everyday (for 9 days post-intervention) and a follow-up survey one-year post-intervention (N= 559 in the daily diary surveys and N = 294 in the one-year follow-up survey; see Fig S1's CONSORT diagram). The response rates did not vary across conditions or disadvantaged/advantaged student status. However, the mediation analysis is limited by overall sample size. Thus, we exercise caution when interpreting these results. Nevertheless, the findings provide insight regarding the mediating psychological processes by which the persistence effects are obtained. We performed two analyses to elucidate the mechanisms of change.

First, replicating past research (*9, 46*) , we investigated whether students' perceptions of daily adversities affect their feelings of daily social and academic fit in college. That is, we examine whether the intervention reduces the contingency between experiencing daily adversities and lower feelings of social and academic fit in college—effectively increasing the resilience of socially disadvantaged students to daily adversities. We predicted that, relative to socially disadvantaged students in the active control condition, socially disadvantaged students in the treatment condition would show higher greater levels of resilience (i.e., greater daily social and academic fit), especially on days of high adversity.

Second, we investigated whether students' perceptions of academic and social fit in college assessed one-year post-intervention statistically mediated our primary academic outcome of interest—continuous enrollment in college. That is, does the belonging treatment delivered in students' first year of college increase students' perceptions of academic and social fit in college one-year later, thereby reducing college drop out two-years later? Results supported both hypotheses.

We estimated the association between students' reported daily adversity-levels and students' daily feelings of academic and social fit in a longitudinal repeated measures analysis. We included student fixed effects to control for unobserved student-level heterogeneity and carried out the analysis for the control and treatment groups independently. Because treatment status does not change within students, we cannot include student fixed effects and the time-invariant treatment status in the same model, so we carry out four separate regressions—(1) for the socially disadvantaged students in the social-belonging treatment condition ; (2) one for socially disadvantaged students in the active control condition; (3) for the socially advantaged students in the social-belonging treatment condition; and (4) one for socially advantaged students in the active control condition (see Table S4 and S5). Standard errors are clustered at the student-level for these four regression specifications.

Among socially disadvantaged students in the active control condition, we find that within-student variation in perceptions of daily adversities is statistically significantly (and inversely) associated with within-student variation in students' daily sense of social and academic fit (B= -0.022, t = -3.63, $p < 0.001$). On days when socially disadvantaged students in the active control condition experienced greater daily adversities, they reported lower feelings of social and academic fit in college. However, in the treatment condition, this association is statistically insignificant and close to zero (B = -0.005, t = -0.93, P = 0.351). As hypothesized, the treatment conferred greater resilience in the face of daily adversities, as feelings of fit in college did not fluctuate with daily experiences of adversity. It appears this was due to a change in the meaning students drew from the adversities—not due to a change in the perceived intensity of students' daily adversities. The average level of daily adversities faced by disadvantaged students in the control and treatment conditions did not differ (Control Condition M = 1.29; Belonging Treatment M = 1.30, t = -0.09, P = 0.926). In providing students a more adaptive way of making sense of daily adversities, the intervention helped sustain their feelings of social and academic fit on a daily basis in college in the face of everyday challenges.

We do not observe such buffering trends for socially advantaged students in either the treatment condition (B= -0.020, t = -2.51, P = 0.012) or in the active control condition (B= -0.015, t = -1.95, P = 0.052) as shown in Table S5.

In the one-year follow-up survey, socially disadvantaged students in the belonging treatment condition reported a greater sense of social and academic fit compared with

their disadvantaged peers in the control condition (Control Condition *M* =-0.09; Belonging Treatment *M* = 0.09, t = 2.07, *P* = 0.039, d = .3). Moreover, students' perceptions of their social and academic fit one-year post-treatment mediated the treatment effect on continuous enrollment two-years post-intervention. The average causal mediated effect (8) was statistically significant (*B* = .020, CI: .0001 - 0.053; see Table S6). Again, we observe null effects on the similar causal mediational pathway for socially advantaged students (see Table S7).

Additional Robustness Checks

Our findings on academic outcomes are robust to a number of different specifications—including (a) comparisons to campus-wide control groups consisting of two student cohorts who had no exposure to the intervention (i.e., those enrolled in the same first-year spring writing class in the years prior to and following the intervention implementation); (b) bounding analysis of treatment effects (that include missing value imputations and non-parametric analysis); (c) quantile regression analysis; and (d) class rank subgroup analysis.

Campus-wide Comparison Groups Analysis

Historical administrative data were obtained for two cohorts of students in two non-intervention years (N = 4,094). The first comparison cohort is comprised of students enrolled in the previous Spring's writing course (i.e., 1 year prior to the intervention cohort). The second cohort is comprised of students enrolled in the following Spring's writing course (i.e., 1 year after the intervention cohort).

First, we report comparisons on persistence and performance for socially disadvantaged students in the treatment condition and socially disadvantaged students in the campus-wide comparison cohorts (see Table S8).

Persistence: Treatment effects on continuous enrollment over two analogous semesters in students' second year of college are robust when compared with the other cohorts of students who did not receive the intervention (*OR* = 1.82, *Z* = 3.18, *p* = 0.001). Seventy-eight percent of students in the campus-wide comparison group were continuously enrolled in their second year of college. However, for students who received the social belonging treatment, that number was 87 percent—a 9 percentage point increase.

Performance: Similarly, treatment effects on disadvantaged students' analogous fall semester non-cumulative GPA when compared with the other cohorts of students who did not receive the intervention is robust as well (*B* = 0.14, *t* = 2.74, *p* = 0.006). The average non-cumulative GPA of socially disadvantaged students in the intervention year's active control condition did not differ from socially disadvantaged students in the comparison cohorts (*M* = 2.54, *SD*=0.87 vs. *M* = 2.63, SD = 0.86, respectively, *t*=1.55, *p* = 0.12). However, socially disadvantaged students who received the social-belonging treatment earned

statistically significantly higher GPAs in the Fall semester following the first year Spring writing course compared to their peers in the non-intervention years (M=2.75, SD = 0.78 vs. M = 2.62, SD= 0.86, t = 2.42, p=0.02).

The magnitude of these treatment effects on persistence among socially disadvantaged students (treatment versus active control and the campus-wide comparison group combined) is similar to the analysis reported in the main text that includes the intervention cohort only (treatment versus active control). The magnitude of these treatment effects on performance is slightly smaller than when we analyze the intervention cohort only *(0.14 GPA points versus 0.19 GPA points)*. However, the standard errors are lower. Thus, these treatment effects are estimated more precisely with stronger statistical significance (t=2.74; P = 0.006) when compared to the campus-wide cohorts, most likely due to the added power from the additional sample size. The results of these analyses provide additional robustness checks and give us more confidence in estimating unbiased average treatment effects on persistence and performance. Results are very similar when we separate the campus-wide comparison groups and analyze each cohort independently compared to intervention treatment and control (these results are reported in Tables S9 and S10).

Class Rank Analysis

We examined the intervention's effect on the percentage of students who fell in the bottom quantile of the GPA distribution (the bottom 10 percent) among the first-year class. Replicating results from previous interventions (*9, 12*) that demonstrate that disadvantaged students disproportionately fall into the lower quantiles of class rank, we found that in the control condition, 13 percent of disadvantaged students fell in the bottom GPA quantile. This percentage was reduced to 8 percent by the social belonging treatment, $\chi2(1) = 5.06, p = 0.024$. That is, the belonging treatment reduced the number of socially disadvantaged students falling in the bottom GPA quantile by 5 percentage points. There was no treatment effect on class rank among socially advantaged students, $\chi2(1) = 0.92, p=0.338$. There were no treatment effects on GPA-based class rank two-years post-intervention for either disadvantaged students ($\chi2(1) = 1.29, p = 0.26$) or advantaged students ($\chi2(1) = 0.05, p = 0.83$).

Bounding Analysis

This study, like all of its kind, can only observe the GPA of students who persisted in college. However, the social-belonging intervention increased students' propensity to persist. If the under-performing socially disadvantaged students in the social belonging intervention persisted at a higher level, the observed average GPA of students in the active control condition might be higher than in the counterfactual scenario. Therefore, the GPA treatment effect estimated from students who persisted in college might be a *lower bound* treatment effect estimate. In other words, if we expect more students to stay enrolled even if they receive lower GPAs due to the belonging treatment, the OLS estimates of treatment

effects on GPA would likely be attenuated. We perform recommended robustness checks by imputing GPA values for students who dropped-out, assuming different hypothetical scenarios had they persisted in college (*47, 48*).

In Table S11, Column 1, we impute a value of 4.0 (the highest possible GPA) and recalculate the treatment effects using the same regression specification as before. This analysis assumes that all students who had not enrolled in the semester immediately following the intervention would have earned the maximum GPA if they had persisted (a very unlikely case). In this extreme scenario, the social-belonging intervention effect on GPA for disadvantaged students in this case is attenuated from 0.19 to 0.12 and is no longer statistically significant (t = 1.61, P = 0.107).

In Table S11, Column 2, we impute a value of 0.0 (the lowest possible GPA) and recalculate the treatment effects using the same regression specification as before. This analysis assumes that all students who had not enrolled in the semester immediately following the intervention would have earned the minimum GPA of 0 if they had persisted (also a very unlikely case). In this extreme scenario, the belonging treatment effect on GPA for disadvantaged students is magnified from 0.19 to 0.27 (t = 3.15, P = 0.002). These two modeled treatment effect estimates can be interpreted as providing upper and lower bounds to the average treatment effect on GPA.

Finally, in Table S11, Column 3, we impute an average GPA value of 2.66 (the mean GPA earned by all students who were enrolled in the semester following the intervention) for all students who were not enrolled during this semester. This scenario assumes that these students would have earned an average GPA if they had persisted. In this case, we observe treatment effects of 0.17 GPA points (t= 2.80, P = 0.005). These effects are similar to the original treatment effect of 0.19 GPA points (t=2.84, P = 0.005) in which no missing value imputation was conducted and missing values were, instead, deleted list-wise. These analyses provide additional robustness to our GPA treatment effect estimate.

We also used non-parametric methods to recover bounds of the treatment effects on GPA following Lee (*48*). Using this method, we identify the number of individuals who maintained enrollment because of the treatment, and then "trim" the upper and lower tails of the outcome distribution by this number to yield alternative lower and upper bounds of the treatment effect.

When using the full intervention year sample, the average treatment effect (ATE) of the belonging treatment (without covariates) on disadvantaged students was 0.21. Note that this estimate differs slightly from the ATE of 0.19 reported in Table S3 because that model specification (in Table S3) includes baseline covariates. However, when we use the trimming procedure recommended by Lee (*48*), the lower bound of the ATE is 0.14 (Bootstrapped Standard Error = 0.085, Z = 1.65, P = 0.1) and the upper bound of the ATE is 0.33 (Bootstrapped Standard Error = 0.086, Z = 3.88, P < 0.001). Taken together, these results provide further evidence of a robust social-belonging treatment effect on non-

cumulative GPA of students, in addition to a substantial, independent effect on the probability of staying continuously enrolled. Given that students who are at the margin of dropping out and who are induced not to do so because of the belonging treatment are more likely to be from the lower part of the student GPA distribution, we interpret our uncorrected estimates (0.19) as representing a lower bound estimate of the social belonging treatment.

Quantile regression analysis

We also conducted a quantile regression analysis to (a) provide additional robustness checks on the social belonging treatment effect on GPA because quantile regressions are less affected by the outliers in the grade distribution, and (b) to provide a richer characterization of the data, allowing us to consider the impact of the social belonging treatment on the entire GPA distribution rather than merely the treatment effects on the conditional mean (see Table S12).

Given that we found a strong effect of the treatment on the lower quantile of the GPA distribution (reported in the main text), we explore the treatment effects across the various points of the distribution using quantile regression. We find that the social-belonging treatment effect differs considerably—and is strongest among students in the lower quantiles (Lowest 10 quantile B = 0.40, t = 2.58, P= 0.01). These results provide some evidence that the linear regression model may underestimate the treatment effect for lower-performing students. Thus, the social belonging treatment produces larger effects for the socially disadvantaged students falling in the lower percentiles of the GPA distribution (as hypothesized from past studies). Socially disadvantaged students in the bottom 10 percent of the GPA distribution who received the belonging treatment raised their GPA by 0.40 points compared to disadvantaged students in the control group who fell in the bottom 10 percent (t = 2.48, p=0.014). While we observe similar trends in the quantile regression results when analyzing GPA two years post-intervention, none of these effects are statistically significant at conventional levels (see Table S13). In addition to the quantile analyses reported here, reviewers requested that we report analyses for all quantiles of the GPA distribution and we have done so in Tables S12-13.

Persistence Effects among Lower- and Higher-Performing Students

Finally, we also carried out a subgroup analysis to see if the treatment induced lower- or higher-performing students (students who scored below or above average on their first semester pre-intervention GPA, respectively) to differentially persist in college post-intervention. Students' first semester pre-intervention GPA average was calculated across all students (N =1,063) in the sample (Average GPA = 2.81). We find suggestive evidence that the intervention had positive effects for *all* students on persistence, including lower-performing students (see Tables S15 and S16).

We also found that GPA gains varied with initial performance in the semester post-intervention (Condition × First-Semester GPA, *B*=-0.20, *t*=-2.13, *P*=0.034) but this result does not persist one year post-intervention (Condition × First-Semester GPA, *B*=-0.16, *t*=-1.85, *P*=0.065), or two-years post-intervention due to loss of precision (Condition × First-Semester GPA, *B*=-0.16, *t*=-1.74, *P*=0.082). Treatment effects were greatest for socially disadvantaged students who scored below the class-average GPA (Average GPA = 2.81) in the first semester (*B*=0.27, *t*=2.42, *P*=0.016). We do not observe statistically significant patterns for socially advantaged students over the same time period: one-semester post-intervention (Condition × First-Semester GPA, *B*=0.005, *t*= 0.05, *P*=0.959), or one year post-intervention (Condition × First-Semester GPA, *B*=-0.015, *t*= -0.14, *P*=0.613), or two-years post-intervention (Condition × First-Semester GPA, B=-0.05, t=-0.53, P=0.594).

Sample Student Responses to "Saying-is-Believing Exercise"

Qualitatively, we see that students who were randomly-assigned to the treatment condition internalized the core social belonging message. This is evidenced by the essay responses they wrote after engaging with the treatment materials. This suggests that the intervention was implemented with fidelity to the intended belonging message. We provide examples of students' responses below:

As a freshman, I was really nervous about going to <school name>. I didn't know where to go, who to talk to, or what to expect…Once I started talking to people in my classes, I asked them about their experience at <university>. They told me that they were scared and not used to it, just like me. It was relieving to hear. In the end, it's understandable to be nervous, shy, and even stressed when transitioning into college, but after a while it gets much better.

I believe that students feel initially unsure whether they belong at <school name> because, just like when you start kindergarten, you don't know anyone around you. Most students don't know many people or any at all in their lectures or discussion classes. Just like one person stated in the "Junior/Senior Survey," he felt like a "big fish in a small pond, to a small fish in an ocean." That is initially how I felt…as time went on, it started getting difficult and that's when I started speaking up more, asking questions. Because the way I felt is basically how almost every incoming freshman feels. Students overcome these fears – thanks to other <university> students, because we are all struggling in our own way to find ourselves through the college process…make friends, talk to your professors when you don't understand something. That's what makes you feel like you truly have become a part of <university>.

I was really anxious and intimidated to start my first semester in the fall. I was the first of my family to attend and dorm at a college, so I had no idea what to expect. Academically I thought I was going to get behind...my fellow classmates spoke in a very academic manner. I was always scared to say something stupid so I never volunteered. However, meeting with my TA regularly and asking other students for help really helped me…Some of my other fears were that I wouldn't make any friends. To my surprise I made a close relationship to at least

one person in each one of my classes and that really came in handy…Now I can speak freely in my discussion classes without fear of judgment.

Exploratory Analysis – Pilot Purpose Condition

We used the opportunity to reach the near-universe of the freshman class to pilot a new intervention message focused on students' goals and purpose for pursuing college. This condition—referred to as the pilot "purpose condition" also used stories from upper-year students. These stories emphasized that while many students experience context-specific challenges (e.g., family obligations, economic struggles) during college, students come to view surmounting these challenges as advancing their larger purpose/goals of completing college. These themes were drawn from separate qualitative pilot work with older students at the broad-access university.

Effectiveness of Random Assignment to Conditions

The study design consisted of a student-level, double-blind randomized control trial. There were equal probabilities of random assignment to each condition, such that approximately 33 percent of students were assigned to each condition (*purpose treatment condition N = 544 and active control condition N = 542*). Random assignment was generally effective at the student-level across the conditions. The conditions did not differ with regard to student ACT scores, high school GPA, baseline GPA, or other demographic characteristics. There was a slight overrepresentation of female students in the treatment condition, thus all purpose condition analyses control for student gender. See Table S1.

Manipulation Check

We also included a manipulation check for the purpose treatment condition. That intervention described how many students in their first year at the university found it motivating to keep in mind that they are working towards larger goals/purpose in life (i.e., not just graduation). Students were asked to respond to two manipulation check questions that assessed whether the purpose message was received as intended, using a scale ranging from *0=Strong Disagree, 6=Strongly Agree*. These questions were: "Many people in their first year at [university] find it motivating to keep in mind and work towards their larger goal/purpose in life." and "While many people at [university] experience obstacles and struggles, working hard to figure them out helps them to persist in school." We combined these two items to form a composite index (r = .52, P < .001). Counter to what was intended by the manipulation, students did not endorse the purpose message more in the purpose condition compared to the control condition, , This was true among both advantaged students (B = 0.02, t = 0.17, p =0.86) and disadvantaged students (B = 0.16, t = 1.81, p = 0.07). The group × condition interaction was not statistically significant (B = 0.11, t = 0.83, p =0.40). Therefore, the purpose manipulation was not successful.

Results

Even though the manipulation check analyses revealed that the purpose treatment condition failed to communicate the intended message, we carried out similar ITT analysis as described earlier comparing the purpose treatment condition with the active control condition in this study. The purpose treatment condition did not differ from the active control condition on any of the outcomes except persistence in the second year among socially disadvantaged students. However, that difference fades away after a year (see Table S17-S19).

Exploratory Analyses Requested by Reviewers

In this section, we include additional exploratory analyses requested by reviewers.

Results Disaggregated by Student Demographic Group. First, guided by past theory and empirical research on social-belonging interventions (*9, 11, 12*), we were primarily interested in examining the treatment effects on socially disadvantaged students defined as Hispanic, Black, and Native American students as well as first-generation students of any racial/ethnic background. Reviewers requested, however, that we disaggregate analyses by specific subgroups. Here, we report the treatment effects among Hispanic students, Black and Native American students, male students, female students, first-generation students, and continuing-generation students for interested readers. Overall, we found that the results are largely robust to these subgroup analyses. For example, analyses are robust among the following disaggregated subgroups: Hispanic students; Black and Native American students; first-generation students; and female students. Moreover, the results are robust when all Asian students are included in the socially disadvantaged student category, compared to the results reported in the main text where continuing-generation Asian students are categorized as socially advantaged. All of these results are reported in Tables S21-S30. However, we suggest readers interpret these exploratory analyses with caution given the smaller sample sizes as well as the risk of multiple hypothesis testing.

Demographic Balance of Response Rate to One-Year Post-Intervention Follow-up Survey. We were also asked to explore and report the demographic and prior performance characteristics of respondents to the follow-up survey (used in our exploratory mediation analyses) that assessed social and academic fit one-year post-intervention. We found balance across all baseline covariates (including gender, advantaged/disadvantaged status, high school GPA, ACT test score, and pre-intervention first semester college GPA) by treatment condition. These additional analyses give us greater confidence regarding the effectiveness of randomization on the one-year post-intervention follow-up survey (see Table S31 for these results).

Fig. S1: Study CONSORT Diagram

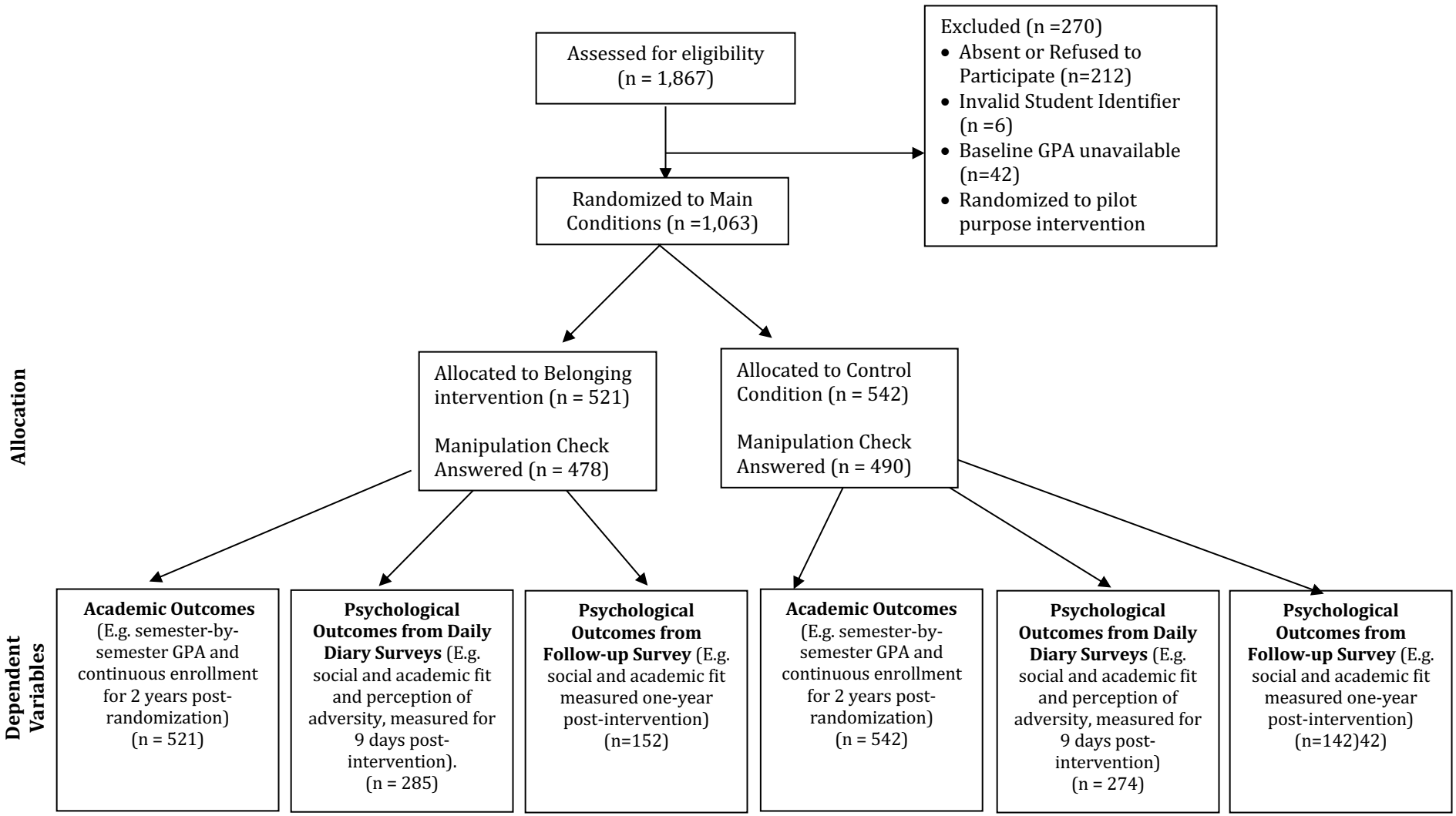
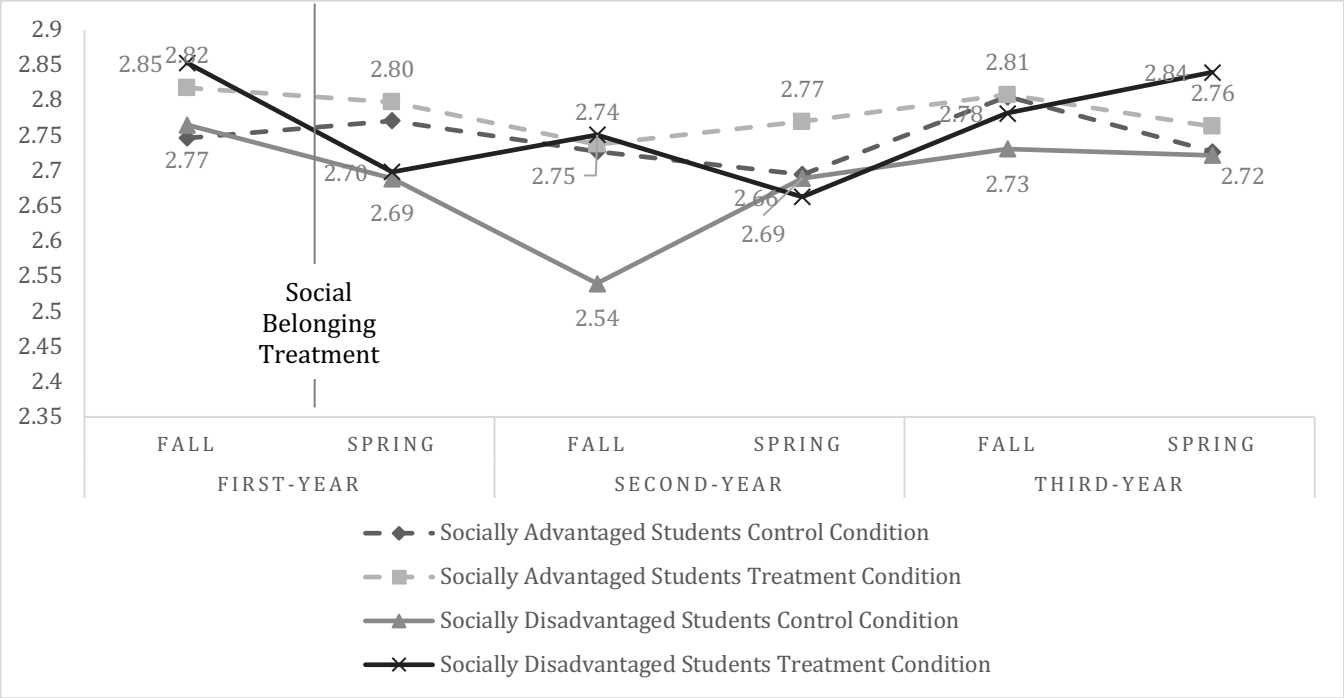


Fig. S2: Mean Non-Cumulative GPA over two years post-intervention by term, student group, and condition.



Note. Sample Size by Group and Condition - Socially Advantaged Students Control Condition (N = 243), Socially Advantaged Students Treatment Condition (N = 226), Socially Disadvantaged Students Control Condition (N = 299), Socially Disadvantaged Students Treatment Condition (N = 295).

Table S1.

Effectiveness of Random Assignment.

	Active Control Condition		*Social Belonging Condition*		*Comparison test*
	Mean	SD	Mean	SD	
Baseline GPA	2.76	0.76	2.84	0.79	t = -1.7
High School GPA (Standardized)	0.02	1.00	-0.004	1.00	t = 0.33
Composite ACT (Standardized)	0.03	1.00	0.02	1.00	t = 0.12
Gender (Female=1, Male =0)	0.51	0.50	0.59	0.50	$\chi^2 = 6.4^{**}$
Socially Disadvantaged Group Status (African American, Hispanic, Native American, and All First-Generation Students = 1, 0 otherwise)	0.56	0.50	0.57	0.49	$\chi^2 = 0.47$
Number of Observations [a]	542		521		

Note. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

[a] Sample size varies slightly across the above rows due to missing values that vary across the baseline covariates

Table S2.

ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment

Continuous Enrollment	*Socially Advantaged Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	1.22 (0.31)	1.22 (0.26)	2.09** (0.49)	1.53* (0.29)
Baseline GPA	2.04*** (0.35)	1.82*** (0.25)	2.36*** (0.35)	2.16*** (0.29)
Gender (Female =1, Male = 0)	1.04 (0.26)	0.62* (0.13)	0.71 (0.16)	0.93 (0.17)
Number of Observations	436	436	591	591

Note. Robust standard errors in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S3.
ITT Effects of Social Belonging Treatment on Students' Grade Point Average one semester, one year, and two years post-intervention

	One-Semester Post-Intervention		*One Year Post-Intervention*		*Two Years Post-Intervention*	
Non-Cumulative GPA	*Socially Advantaged Students* β (SE)	*Socially Disadvantaged Students* β (SE)	*Socially Advantaged Students* β (SE)	*Socially Disadvantaged Students* β (SE)	*Socially Advantaged Students* β (SE)	*Socially Disadvantaged Students* β (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	-0.04	0.19**	-0.004	0.10	-0.04	0.11
	(0.08)	(0.07)	(0.07)	(0.06)	(0.08)	(0.06)
Baseline GPA	0.46***	0.48***	0.47***	0.52***	0.46***	0.47***
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)
Gender (Female =1, Male = 0)	-0.04	0.03	-0.04	0.08	-0.03	0.11
	(0.08)	(0.07)	(0.08)	(0.06)	(0.08)	(0.06)
Number of Observations	375	521	375	528	377	535

Note. Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S4.
Within-Student Associations between Daily Adversity and Feelings of Social and Academic Fit for Socially Disadvantaged Students

Feelings of Daily Social and Academic Fit	*Socially Disadvantaged Students- Social Belonging Treatment Condition* β (SE)	*Socially Disadvantaged Students- Active Control Condition* β (SE)
Daily Adversity Composite Index	-0.005	-0.022***
	(0.006)	(0.006)
Number of Observations [a]	818	760

Note. Robust standard errors, clustered at the student-level, in parentheses. All specifications include student and time fixed effects.
[a] Sample size for this longitudinal within-student analysis shown in terms of students' daily responses
*p < .05. **p < .01. ***p <.001.

Table S5.
Within-Student Associations between Daily Adversity and Feelings of Social and Academic Fit for Socially Advantaged Students

Feelings of Daily Social and Academic Fit	*Socially Advantaged Students- Social Belonging Treatment Condition* β (SE)	*Socially Advantaged Students- Active Control Condition* β (SE)
Daily Adversity Composite Index	-0.020**	-0.015
	(0.008)	(0.008)
Number of Observations [a]	546	523

Note. Standard errors, clustered at the student-level, in parentheses. All specifications include student and time fixed effects.
[a] Sample size for this longitudinal within-student analysis shown in terms of students' daily responses
*p < .05. **p < .01. ***p <.001.

Table S6.
Causal Mediation of Socially Disadvantaged Students' Feelings of Social and Academic Fit on Students' Continuous Enrollment in Third Year

Causal Mediation	*Socially Disadvantaged Students Regression predicting Social and Academic Fit (Path a)* β (SE)	*Socially Disadvantaged Students Regression predicting Continuous Enrollment (Path c)* β (SE)	*Socially Disadvantaged Students Regression predicting Continuous Enrollment (Path b and c')* β (SE)
Treatment Indicator	0.19*	0.11*	0.09
(Treatment = 1, Control = 0)	(0.09)	(0.03)	(0.05)
Social and Academic Fit	-	-	0.12*
	-	-	(0.05)
Number of Observations	162	162	162

Note. Standard errors in parentheses. Results limited to the sub-sample of students who completed the optional follow-up survey one-year post-intervention. Models use OLS in all three pathways; results are qualitatively similar when we use logit/probit regressions. Standard errors are bootstrapped to calculate average causal mediated effect (Imai, Keele & Tingley, 2010), b = 0.02 [95% CI = 0.001 – 0.05].
*p < .05. **p < .01. ***p <.001.

Table S7.
Causal Mediation of Socially Advantaged Students' Feelings of Social and Academic Fit on Students' Continuous Enrollment in Third Year

Causal Mediation	*Socially Advantaged Students Regression predicting Social and Academic Fit one-year post-intervention (Path a)* β (SE)	*Socially Advantaged Students Regression predicting Continuous Enrollment (Path c)* β (SE)	*Socially Advantaged Students Regression predicting Continuous Enrollment (Path b and c')* β (SE)
Treatment Indicator	-0.12	0.03	0.03
(Treatment = 1, Control = 0)	(0.10)	(0.04)	(0.06)
Social and Academic Fit	-	-	0.02
	-	-	(0.06)
Number of Observations	128	436	128

Note. Standard errors in parentheses. Results limited to the sub-sample of students who completed the optional follow-up survey one-year post-intervention. Above models use OLS in all three pathways; results are qualitatively similar when we use logit/probit regressions. Standard errors are bootstrapped to calculate average causal mediated effect (Imai, Keele & Tingley, 2010), b = -0.003 [95% CI = -0.02 – 0.012].
*p < .05. **p < .01. ***p <.001.

Table S8.
Treatment Effects with the Inclusion of Campus-wide Comparison Groups – Both Cohorts

Continuous Enrollment and Non-Cumulative GPA	*Socially Advantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two semesters post-intervention β (SE)	*Socially Disadvantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA two semesters post-intervention β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	1.23	-0.04	-0.04	1.82**	0.14**	0.08
	(0.25)	(0.06)	(0.06)	(0.34)	(0.05)	(0.05)
Baseline GPA	2.0***	0.48***	0.48***	2.61***	0.460***	0.473***
	(0.19)	(0.03)	(0.03)	(0.13)	(0.02)	(0.02)
Gender (Female =1, Male = 0)	1.13	0.10*	0.10*	0.90	0.04	0.06*
	(0.18)	(0.05)	(0.05)	(0.08)	(0.03)	(0.03)
Number of Observations	1,003	861	863	4,037	3,440	3,488

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S9A.
Treatment Effects on Continuous Enrollment with the Inclusion of Campus-wide Comparison Group (Cohort Prior to the Intervention Cohort Only)

Continuous Enrollment	*Socially Advantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous Enrollment two years post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous Enrollment two years post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Control = 0)	1.25	1.16	1.63**	1.27
	(0.27)	(0.21)	(0.31)	(0.19)
Baseline GPA	1.9***	1.73***	2.29***	2.32***
	(0.25)	(0.19)	(0.17)	(0.15)
Gender (Female =1, Male = 0)	1.01	0.78	0.86	0.84
	(0.20)	(0.13)	(0.09)	(0.08)
Number of Observations	708	708	2,266	2,266

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S9B.
Treatment Effects on GPA with the Inclusion of Campus-wide Comparison Group (Cohort Prior to the Intervention Cohort Only)

Non-Cumulative GPA	*Socially Advantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two semesters post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two years post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two semesters post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two years post-intervention β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	-0.03	-0.05	-0.09	0.14**	0.08	0.03
	(0.07)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Baseline GPA	0.45***	0.45***	0.44***	0.44***	0.46***	0.44***
	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)
Gender (Female =1, Male = 0)	0.06	0.07	0.06	0.05	0.09**	0.11**
	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)
Number of Observations	609	611	616	1,983	2,010	2,027

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S10.
Treatment Effects with the Inclusion of Campus-wide Comparison Group (Cohort Subsequent to the Intervention Cohort Only)

Continuous Enrollment and Non-Cumulative GPA	*Socially Advantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two semesters post-intervention β (SE)	*Socially Disadvantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA two semesters post-intervention β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	1.20	-0.05	-0.02	2.05***	0.14**	0.09
	(0.26)	(0.07)	(0.06)	(0.40)	(0.05)	(0.05)
Baseline GPA	2.13***	0.49***	0.50***	2.81***	0.49***	0.50***
	(0.27)	(0.04)	(0.04)	(0.19)	(0.03)	(0.02)
Gender (Female =1, Male = 0)	1.20	0.06	0.05	0.90	0.03	0.05
	(0.23)	(0.06)	(0.06)	(0.10)	(0.04)	(0.04)
Number of Observations	731	627	627	2,363	1,978	2,006

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S11.
Bounding Analysis (GPA, 1 semester post-intervention)

Non-Cumulative GPA	*Socially Disadvantaged Students* No Missing Value Imputation β (SE)	*Socially Disadvantaged Students* Missing Value Imputation – Max GPA β (SE)	*Socially Disadvantaged Students* Missing Value Imputation – Min GPA β (SE)	*Socially Disadvantaged Students* Missing Value Imputation – Average GPA β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	0.19**	0.12	0.27**	0.17**
	(0.07)	(0.07)	(0.09)	(0.06)
Baseline GPA	0.48***	0.22***	0.62***	0.35***
	(0.05)	(0.05)	(0.06)	(0.04)
Gender (Female =1, Male = 0)	0.03	0.06	-0.05	0.02
	(0.07)	(0.07)	(0.97)	(0.07)
Number of Observations	521	591	591	591

Note. Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S12A.
Quantile Regression Analysis for GPA one semester post-intervention for Socially Disadvantaged Students (All quantiles)

Non-Cumulative GPA	OLS β (SE)	Q (0.10) β (SE)	Q (0.20) β (SE)	Q (0.30) β (SE)	Q (0.40) β (SE)	Q (0.50) β (SE)	Q (0.60) β (SE)	Q (0.70) β (SE)	Q (0.80) β (SE)	Q (0.90) β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	0.19**	0.40*	0.19	0.17	0.14	0.12	0.16*	0.18**	0.12	0.21*
	(0.07)	(0.16)	(0.16)	(0.09)	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.09)
Baseline GPA	0.48***	0.63***	0.60***	0.55***	0.45***	0.52***	0.49**	0.50***	0.47***	0.39***
	(0.05)	(0.13)	(0.09)	(0.07)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.08)
Number of Observations	521	521	521	521	521	521	521	521	521	521

Note. Standard errors in parentheses. Bootstrapped standard errors are provided in columns 2-10 for quantile regression specifications.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S12B.
Quantile Regression Analysis for GPA two years post-intervention for Socially Disadvantaged Students (All quantiles)

Non-Cumulative GPA	OLS β (SE)	Q (0.10) β (SE)	Q (0.20) β (SE)	Q (0.30) β (SE)	Q (0.40) β (SE)	Q (0.50) β (SE)	Q (0.60) β (SE)	Q (0.70) β (SE)	Q (0.80) β (SE)	Q (0.90) β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	0.11	0.16	0.12	0.08	0.14	0.12	0.10	0.10	0.14	-0.01
	(0.06)	(0.18)	(0.10)	(0.09)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.05)
Baseline GPA	0.47***	0.83***	0.73***	0.62***	0.55***	0.50***	0.44**	0.41***	0.41***	0.37***
	(0.05)	(0.12)	(0.08)	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)	(0.03)	(0.05)
Number of Observations	521	521	521	521	521	521	521	521	521	521

Note. Standard errors in parentheses. Bootstrapped standard errors are provided in columns 2-5 for quantile regression specifications.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S13A.
Quantile Regression Analysis for GPA one semester post-intervention for Socially Advantaged Students (All quantiles)

Non-Cumulative GPA	OLS β (SE)	Q (0.10) β (SE)	Q (0.20) β (SE)	Q (0.30) β (SE)	Q (0.40) β (SE)	Q (0.50) β (SE)	Q (0.60) β (SE)	Q (0.70) β (SE)	Q (0.80) β (SE)	Q (0.90) β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	-0.04	-0.03	0.02	-0.09	-0.13	-0.09	-0.07	-0.08	0	-0.11
	(0.08)	(0.28)	(0.12)	(0.11)	(0.10)	(0.08)	(0.07)	(0.08)	(0.09)	(0.06)
Baseline GPA	0.46***	0.66***	0.46***	0.38***	0.39***	0.39**	0.43***	0.43***	0.47***	0.42***
	(0.05)	(0.16)	(0.10)	(0.08)	(0.07)	(0.05)	(0.03)	(0.03)	(0.06)	(0.05)
Number of Observations	375	375	375	375	375	375	375	375	375	375

Note. Standard errors in parentheses. Bootstrapped standard errors are provided in columns 2-10 for quantile regression specifications.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S13B.
Quantile Regression Analysis for GPA two years post-intervention for Socially Advantaged Students (All quantiles)

Non-Cumulative GPA	OLS β (SE)	Q (0.10) β (SE)	Q (0.20) β (SE)	Q (0.30) β (SE)	Q (0.40) β (SE)	Q (0.50) β (SE)	Q (0.60) β (SE)	Q (0.70) β (SE)	Q (0.80) β (SE)	Q (0.90) β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	-0.04	-0.20	-0.14	-0.14	-0.03	-0.06	-0.05	0.04	0.09	0.10
	(0.07)	(0.17)	(0.13)	(0.13)	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Baseline GPA	0.46***	0.66***	0.47***	0.43***	0.46***	0.45**	0.48***	0.39***	0.43***	0.43***
	(0.05)	(0.13)	(0.11)	(0.08)	(0.06)	(0.05)	(0.05)	(0.05)	(0.08)	(0.06)
Number of Observations	377	377	377	377	377	377	377	377	377	377

Note. Standard errors in parentheses. Bootstrapped standard errors are provided in columns 2-10 for quantile regression specifications.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S14A.
Treatment Effects Without Controlling for Baseline Covariates for Socially Disadvantaged Students

Continuous Enrollment and Non-Cumulative GPA	*Socially Disadvantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous Enrollment four semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA one year post-intervention β (SE)	*Socially Disadvantaged Students* Non-Cumulative GPA two years post-intervention β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	1.98***	1.51**	0.21**	0.12	0.13
	(0.43)	(0.27)	(0.07)	(0.07)	(0.07)
Number of Observations [a]	603	603	530	538	545

Note. Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.
[a] Sample size differs slightly from tables S2 and S3 above due to missing values in some of the additional baseline covariates included in S2 and S3.

Table S14B.
Treatment Effects Without Controlling for Baseline Covariates for Socially Advantaged Students

Continuous Enrollment and Non-Cumulative GPA	*Socially Advantaged Students* Continuous Enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous Enrollment four semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Non-Cumulative GPA one semester post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA one year post-intervention β (SE)	*Socially Advantaged Students* Non-Cumulative GPA two years post-intervention β (SE)
Treatment Indicator (Treatment = 1, Control = 0)	1.27	1.26	0.01	0.05	0.02
	(0.29)	(0.25)	(0.08)	(0.08)	(0.08)
Number of Observations	460	460	395	395	397

Note. Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.
[a] Sample size differs slightly from tables S2 and S3 above due to missing values in some of the additional baseline covariates included in S2 and S3.

Table S15.
ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment among Lower-Performing Students (those with below average first-semester GPA, pre-intervention)

Continuous Enrollment	*Socially Advantaged Students* Enrollment in two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Enrollment in four semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Enrollment in two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Enrollment in four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	1.14	1.28	1.95*	1.14
	(0.39)	(0.40)	(0.65)	(0.31)
Baseline GPA	2.97***	3.07***	3.8***	2.69***
	(0.91)	(0.91)	(1.08)	(0.77)
Gender (Female =1, Male = 0)	0.90	0.55*	0.50***	0.80
	(0.31)	(0.17)	(0.16)	(0.21)
Number of Observations	208	208	259	259

Note. Robust Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S16. ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment among Higher-Performing Students (those who scored greater than or equal to average first-semester GPA, pre-intervention)

Continuous Enrollment	*Socially Advantaged Students* Enrollment in two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Enrollment in four semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Enrollment in two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Enrollment in four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	1.55	1.33	2.35*	2.01*
	(0.62)	(0.41)	(0.80)	(0.53)
Baseline GPA	0.71	0.89	1.98	3.38***
	(0.35)	(0.36)	(1.04)	(1.48)
Gender (Female =1, Male = 0)	1.32	0.72	1.03	1.06
	(0.52)	(0.23)	(0.34)	(0.23)
Number of Observations	228	228	332	332

Note. Robust Standard errors in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S17.
Effectiveness of Randomization – Pilot Purpose Condition vs. Active Control Condition

	Active Control Condition		*Pilot Purpose Condition*		*Comparison*
	Mean	SD	Mean	SD	*tests*
Baseline GPA	2.76	0.76	2.85	0.76	t = -1.94
High School GPA (Standardized)	0.02	1.00	-0.01	1.00	t = 0.40
Composite ACT (Standardized)	0.03	1.00	-0.04	1.00	t = 1.1
Gender (Female=1, Male =0)	0.51	0.50	0.60	0.50	$\chi^2 = 7.7^{**}$
Socially Disadvantaged Group Status (African American, Hispanic, Native American, and All First-Generation Students = 1, 0 otherwise)	0.56	0.50	0.61	0.49	$\chi^2 = 3.52$
Number of Observations	542		544		

Note. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table S18.
ITT Effects of Purpose Treatment on Students' Continuous Enrollment

Continuous Enrollment	*Socially Advantaged Students* Enrollment in two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Enrollment in four semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Enrollment in two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Enrollment in four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Purpose Treatment = 1, Control = 0)	1.28	1.60*	1.67*	1.18
	(0.32)	(0.37)	(0.35)	(0.21)
Baseline GPA	1.69***	1.74***	2.16***	2.04***
	(0.31)	(0.27)	(0.31)	(0.24)
Gender (Female =1, Male = 0)	0.93	0.77	0.88	0.92
	(0.24)	(0.17)	(0.18)	(0.16)
Number of Observations	419	419	621	621

Note. Robust standard errors in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S19.
ITT Effects of Purpose Treatment on Students' Grade Point Average One Semester Post-intervention

Non-Cumulative GPA	*Socially Advantaged Students* β (SE)	*Socially Disadvantaged Students* β (SE)
Treatment Indicator (Purpose Treatment = 1, Control = 0)	-0.07	-0.01
	(0.08)	(0.07)
Baseline GPA	0.47***	0.44***
	(0.06)	(0.05)
Gender (Female =1,Male = 0)	0.09	0.13
	(0.08)	(0.07)
Number of Observations	363	544

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S20.
Examples of customizations of the social belonging intervention materials in the present research**.**

We created customized intervention materials that incorporated students' specific barriers to belonging in their local context. For example, one story addressed challenges with commuting ("It's been hard to make friends and be involved on campus, and sometimes I envy students who live closer. What made a difference to me was that I found the <university> commuter resource center….I found other people who take the same route as I do, and the three of us have sort of developed our own little commuter family"). Other stories addressed worries about professors ("I thought my professors would think I was slow") and social class ("Freshmen year sometimes I felt I missed out because I didn't have the money to go out much") and how these concerns improved with time ("I started…going to office hours more…people were…much nicer…than I expected"; "I realized that almost everyone has to manage a job and school and this doesn't mean you can't have a life"). The stories were attributed to a racially diverse group of upper-year students. We provide specific examples of the customization process below.

Insight from Qualitative Focus Groups, Surveys, and Interviews	**Specific Example**	**Corresponding Revision to Intervention Content**
Many students stated during the pilot survey that they had worries about belonging because of their commuter status.	A student stated, "Most of us are commuters, so we have similar struggles and challenges in that regard. Over time I have realized that most people have a lot more in common than they think, and it sometimes takes more than 'where are you from'; or a 'what's your major' type of question to figure out, but it's worth it. Get to know people, for real."	Emphasize that friendships can happen anywhere in college but how students have to make that effort and seize opportunities. A student mentioned how they formed a "commuter family" that was used in the revised materials.
Customized Upperclassmen Story: I've always had to commute 2 hours each way to <school name>. It's been hard to make friends and be involved on campus, and sometimes I envy students who live closer. Studying is difficult -- especially when I get home late after a long day of classes. What made a difference to me was that I found the <school name> commuter resource center. There, I met a lot of [university] students who are commuters, so we share some similar struggles and challenges. Over time, I learned to use the long commute productively -- keeping busy and doing work for class. It took time to figure out the best routes, but now I've got it down. Eventually I also found other people who take the same route as I do, and the three of us have sort of developed our own little commuter family. We've even started taking some classes together. It's great to know I have friends I can hang out with on campus and on that long train ride home.		

Many students stated during the focus groups that they had financial worries.	A student stated that many students hold part-time jobs and worried about taking on debt. They also expressed concerns about falling behind on coursework when navigating work, school requirements, and deadlines.	Acknowledge that financial struggle is common for many students. Underscore that finding work-life balance is hard but possible and that many friendships can be formed at jobs as well as school.
Customized Upperclassmen Story: As excited as I was to come to <school name>, I knew that money would always be a struggle for me. My parents make enough money that I don't qualify much for grants, but my family's finances are tight so funding my education is pretty much up to me. Taking a part-time job and assuming lots of debt was -- and sometimes still is -- overwhelming. Freshmen year I sometimes felt I missed out because I didn't have the money to go out that much. As I got older, I realized that almost everyone has to manage a job and school and this doesn't mean you can't have a life. I ended up making some friends in classes and in a club I joined and even at one of my jobs. The bottom line is that we're all in this together and everyone faces obstacles, but with time you make friends along the way.		

Table S21.

Disaggregated ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment among Male and Female Students

Continuous Enrollment	*Female Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Female Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)	*Male Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Male Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)
Treatment Indicator	1.75*	1.53*	1.54	1.22*
(Treatment = 1, Active Control = 0)	(0.39)	(0.29)	(0.39)	(0.26)
Baseline GPA	2.37***	2.16***	2.06***	1.81***
	(0.36)	(0.28)	(0.35)	(0.26)
Number of Observations	568	568	455	455

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S22.

Disaggregated ITT Effects of Social Belonging Treatment on Students' GPA among Male and Female Students

Non-Cumulative GPA	*Female Students* GPA one semester post-intervention *β* (SE)	*Female Students* GPA two years post-intervention *β* (SE)	*Male Students* GPA one semester post-intervention *β* (SE)	*Male Students* GPA two years post-intervention *β* (SE)
Treatment Indicator	0.10	0.04	0.07	0.05
(Treatment = 1, Active Control = 0)	(0.07)	(0.06)	(0.08)	(0.08)
Baseline GPA	0.51***	0.50***	0.41***	0.42***
	(0.05)	(0.04)	(0.06)	(0.05)
Number of Observations	499	509	393	399

Note. Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S23.

Disaggregated ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment among Hispanic Students and Black and Native American Students

Continuous Enrollment	*Hispanic Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Hispanic Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)	*Black and Native American Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Black and Native American Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	2.21* (0.77)	1.30 (0.37)	7.46** (5.27)	6.34*** (3.50)
Baseline GPA	2.27*** (0.35)	1.93*** (0.25)	2.12 (0.90)	1.56 (0.55)
Number of Observations	240	240	96	96

Note. Robust standard errors in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S24.

Disaggregated ITT Effects of Social Belonging Treatment on Students' GPA among Hispanic Students and Black and Native American Students

Non-Cumulative GPA	*Hispanic Students* GPA one semester post-intervention *β* (SE)	*Hispanic Students* GPA two years post-intervention *β* (SE)	*Black and Native American Students* GPA one semester post-intervention *β* (SE)	*Black and Native American Students* GPA two years post-intervention *β* (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	0.20 (0.11)	0.09 (0.10)	0.24 (0.14)	0.25 (0.16)
Baseline GPA	0.40*** (0.07)	0.40*** (0.07)	0.49*** (0.10)	0.44*** (0.11)
Number of Observations	213	220	85	87

Note. Standard errors in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S25.

Disaggregated ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment among First-Generation Students and Continuing-Generation Students

Continuous Enrollment	*First-Generation Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*First-Generation Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)	*Continuing-Generation Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Continuing-Generation Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	1.90* (0.47)	1.33 (0.28)	1.45 (0.34)	1.41 (0.27)
Baseline GPA	2.37*** (0.39)	2.34*** (0.37)	2.12*** (0.33)	1.80*** (0.23)
Number of Observations	478	478	549	549

Note. Robust standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S26.

Disaggregated ITT Effects of Social Belonging Treatment on Students' GPA among First-Generation Students and Continuing-Generation Students

Non-Cumulative GPA	*First-Generation Students* GPA one semester post-intervention *β* (SE)	*First-Generation Students* GPA two years post-intervention *β* (SE)	*Continuing-Generation Students* GPA one semester post-intervention *β* (SE)	*Continuing-Generation Students* GPA two years post-intervention *β* (SE)
Treatment Indicator	0.20**	0.10	0.02	-0.01
(Treatment = 1, Active Control = 0)	(0.07)	(0.26)	(0.07)	(0.07)
Baseline GPA	0.50***	0.51***	0.45***	0.44***
	(0.05)	(0.05)	(0.05)	(0.05)
Number of Observations	418	429	459	463

Note. Standard errors in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S27.

ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment [Standard Errors Clustered at the Classroom-Level]

Continuous Enrollment	*Socially Disadvantaged Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	2.09*** (0.45)	1.53*** (0.30)	1.22 (0.30)	1.22 (0.25)
Baseline GPA	2.36*** (0.37)	2.16*** (0.27)	2.05*** (0.37)	1.82*** (0.27)
Number of Observations	591	591	436	436

Note. Robust standard errors, clustered at the classroom-level, in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table S28.

ITT Effects of Social Belonging Treatment on Students' GPA [Standard Errors Clustered at the Classroom-Level]

Non-Cumulative GPA	*Socially Disadvantaged Students* GPA one semester post-intervention *β* (SE)	*Socially Disadvantaged Students* GPA two years post-intervention *β* (SE)	*Socially Advantaged Students* GPA one semester post-intervention *β* (SE)	*Socially Advantaged Students* GPA two years post-intervention *β* (SE)
Treatment Indicator	0.19**	0.11	-0.04	-0.04
(Treatment = 1, Active Control = 0)	(0.07)	(0.07)	(0.09)	(0.08)
Baseline GPA	0.48***	0.47***	0.46***	0.46***
	(0.06)	(0.05)	(0.06)	(0.06)
Number of Observations	521	535	375	377

Note. Standard errors, clustered at the classroom-level, in parentheses.
*p < .05. **p < .01. ***p <.001.

Table S29.

ITT Effects of Social Belonging Treatment on Students' Continuous Enrollment [Classroom Fixed Effects]

Continuous Enrollment	*Socially Disadvantaged Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Disadvantaged Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous enrollment two semesters post-intervention Odds Ratio (SE)	*Socially Advantaged Students* Continuous enrollment four semesters post-intervention Odds Ratio (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	2.32** (0.66)	1.59 (0.40)	1.47 (0.49)	1.44 (0.29)
Baseline GPA	2.78*** (0.59)	2.22*** (0.35)	2.48*** (0.52)	2.20*** (0.39)
Number of Observations [a]	397	507	293	351

Note. Robust standard errors in parentheses. All models include classroom fixed effects. **p* < .05. ***p* < .01. ****p* <.001.

[a] Sample size is a bit smaller in these models with the inclusion of classroom fixed effects as only within-classroom variation in treatment versus control students are included in this analysis.

Table S30.

ITT Effects of Social Belonging Treatment on Students' GPA [Classroom Fixed Effects]

Non-Cumulative GPA	*Socially Disadvantaged Students* GPA one semester post-intervention *β* (SE)	*Socially Disadvantaged Students* GPA two years post-intervention *β* (SE)	*Socially Advantaged Students* GPA one semester post-intervention *β* (SE)	*Socially Advantaged Students* GPA two years post-intervention *β* (SE)
Treatment Indicator (Treatment = 1, Active Control = 0)	0.16* (0.07)	0.10 (0.07)	0.07 (0.09)	0.003 (0.09)
Baseline GPA	0.47*** (0.06)	0.43*** (0.05)	0.49*** (0.07)	0.47*** (0.06)
Number of Observations	521	535	375	377

Note. Standard errors in parentheses. All models include classroom fixed effects.
*p < .05. **p < .01. ***p <.001.

[a] Sample sizes are somewhat smaller in these models with the inclusion of classroom fixed effects as only within-classroom variation in treatment versus control students are included in this analysis.

Table S31.
Characteristics of Students who Responded to the One-Year Post-Intervention Follow-up Survey (Randomization Check)

	Active Control Condition		*Social Belonging Condition*		*Comparison*
	Mean	SD	Mean	SD	*tests*
Baseline GPA	2.89	0.70	2.92	0.78	t = 0.33
High School GPA (Standardized)	0.16	0.93	0.12	1.06	t = 0.30
Composite ACT (Standardized)	0.05	1.00	0.06	0.94	t = 0.10
Gender (Female=1, Male =0)	0.56	0.50	0.64	0.50	$\chi^2 = 1.55$
Socially Disadvantaged Group Status (African American, Hispanic, Native American, and All First-Generation Students = 1, 0 otherwise)	0.58	0.50	0.52	0.49	$\chi^2 = 1.00$
Number of Observations	142		152		

Note. **p* < .05. ***p* < .01. ****p* <.001. While the above table only includes characteristics of respondents, the response rates did not vary by condition by either ($\chi 2 = 1.18$, P = 0.278).

Table S32.
Daily Diary Responses Across 9 days of Experience Sampling Surveys

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9
Total Number of Respondents each day	391	466	443	437	410	410	388	180	110

Note. In total, 559 students responded to the survey over the 9-day period at least once – 274 from the Active Control Condition and 285 from the Social Belonging Treatment Condition as shown in the CONSORT diagram in Fig. S1 above.