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Sense of Belonging and Student Engagement: A Daily Study of First- and Continuing-Generation College Students

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Abstract

To date, most research on sense of belonging in higher education has relied upon between-person correlations (e.g., Murphy and Zirkel in Teach Coll Rec 117(12):1–40, 2015; Ostrove and Long in Rev High Educ 30(4):363–389, 2007). In the current study, first- and continuing-generation college students ($N=280$) reported their sense of belonging and their emotional and behavioral engagement in college every evening for a week. These data were used to examine both person-level and daily dynamics of sense of belonging and student engagement. With few exceptions, sense of belonging was associated with all types of student engagement at both the person and the daily levels. At the person level: replicating previous research, students with a higher sense of belonging than their peers tended to also have higher emotional and behavioral engagement. At the daily level: regardless of students' typical sense of belonging, if they experienced especially high sense of belonging on a particular day, their emotional and behavioral engagement on that same day tended to be higher than usual. For two measures of student engagement—feelings toward school and in-class engagement—first-generation college students were especially sensitive to day-to-day fluctuations in sense of belonging. There were, however, few other effects of student generation. Overall, results suggest that sense of belonging is an important resource for maintaining student engagement among all students, but especially among first-generation students. In addition, because sense of belonging operates at both person and daily levels, schools can work at both levels to improve students' belonging.

Keywords Sense of belonging · Emotional engagement · Behavioral engagement · First-generation college students · Daily diary

Introduction

Belonging is a basic human need (Baumeister and Leary 1995; Maslow 1943), and several theories suggest that a sense of belonging is critical for maintaining motivation and succeeding in institutions such as workplaces and schools (Eccles et al. 1993; Ryan and Deci 2000). A growing body of research suggests that, for college students in particular, *sense of*

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belonging—the extent to which students feel connected to their academic institutions and the people within those institutions—is associated with many positive academic outcomes (Strayhorn 2018). Indeed, research suggests that college students who have a stronger sense of belonging tend to also have more academic self-confidence, more motivation for their studies, better academic adjustment, and higher achievement (Freeman et al. 2007; Murphy and Zirkel 2015; Ostrove and Long 2007; Pittman and Richmond 2007; Walton and Cohen 2011). Not surprisingly, a robust body of higher education research has also linked a strong sense of belonging to college retention and persistence (Hausmann et al. 2007; Hausmann et al. 2009; Tinto 2012).

Most sense of belonging research, however, has relied on between-person correlations, demonstrating, for example, that the students who report the highest sense of belonging tend to be the same students who have the highest grade point averages (Anderman 2002; Faircloth and Hamm 2005; Murphy and Zirkel 2015). Observed associations between sense of belonging and achievement, therefore, may be driven by confounding variables such as academic preparation or strategies for coping with stress that independently cause both sense of belonging and achievement (Alkan 2014; Wang and Eccles 2012a). In addition, conceptualizing sense of belonging as a stable quantity that varies between students may not fully capture the phenomenon. Although there are certainly differences between students in average levels of belonging (Hurtado and Carter 1997; Pittman and Richmond 2007), *within* these students, sense of belonging can fluctuate from moment-to-moment and day-to-day (Park et al. 2012). Thus, one way to further sense of belonging research is to examine daily-level associations using data collected via daily "diary" methods—short-term longitudinal studies in which participants report their experiences every day for several days. These data more closely capture "life as it is lived," and can be used to examine the correlates of daily experiences (Bolger et al. 2003).

In the current study, college students reported their sense of belonging and daily engagement (e.g., feelings toward school and class attendance) every evening for a week. These data were used to examine person- and daily-level associations between sense of belonging and student engagement. In addition, the current study included reports from students whose parents completed college (*continuing-generation students*) and students whose parents had not attained four-year degrees (*first-generation students*) in order to examine whether the daily dynamics of sense of belonging and student engagement were similar or different among college students whose families have different educational histories.

Student Engagement

Standard measures of college achievement are grade point average (GPA) and on-time graduation, which respectively, can only be assessed once per term and at the end of students' college careers (Tinto 2012; Vuong et al. 2010). Although these global indicators of academic success are important, they are an accumulation of many daily feelings and behaviors (Finn and Rock 1997). In fact, daily actions (e.g., study habits and class attendance) are stronger predictors of college grades than students' SAT scores (Britton and Tesser 1991; Credé et al. 2010). To examine *daily* links between sense of belonging and achievement, therefore, the current study employed measures of daily student engagement.

Student engagement is a broad construct comprising several aspects of students' commitment to school, and it is strongly linked to academic achievement (Carini et al. 2006; Finn and Rock 1997; Jimerson et al. 2003; Kuh 2009). Although researchers have used varied definitions of student engagement (Taylor and Parsons 2011), there is consensus that

student engagement is multidimensional and, at least, includes emotional and behavioral components (Appleton et al. 2008; Fredricks and McColskey 2012). *Emotional engagement* refers to affective reactions to school, including positive emotions such as enjoyment of school and interest in engaging with academic challenges, as well as the absence of negative emotions such as boredom or frustration (Fredricks et al. 2004; Jimerson et al. 2003). *Behavioral engagement* refers to active participation in school, including positive conduct such as studying, as well as the absence of negative conduct such as procrastination (Fredricks et al. 2004; Jimerson et al. 2003). In addition, behavioral engagement includes behaviors that occur both in- and outside of the classroom (e.g., participating in class and completing homework; Finn 1989; Wang and Eccles 2013). Emotional and behavioral engagement are correlated, yet these two aspects of student engagement are distinct (Fredricks and McColskey 2012; Li and Lerner 2013). Furthermore, both components of engagement are required for academic success (Li 2011). Thus, this study included measures of both emotional and behavioral engagement.

Theoretical Framework

Several theories suggest that sense of belonging is a key contributor to student engagement. For example, Baumeister and Leary's (1995) "belongingness hypothesis" argues that belonging is a fundamental human motivation and, as such, it has positive affective and behavioral consequences. According to Self-Determination Theory, when an environment is constructed to facilitate belonging, people are more likely to internalize the environment's values, and therefore, feel positive about the environment and engage in behaviors that are consistent with those values (Ryan and Deci 2000). Applying the belongingness hypothesis and Self-Determination Theory to academics in particular, Eccles et al.'s (1993) Stage-Environment Fit Theory suggests that when schools meet students' developmental needs (one of which is belonging), students will have higher academic engagement, motivation, and achievement. In support of these theories, research routinely indicates that, in late adolescence and emerging adulthood, students who have a strong sense of belonging tend to also be highly engaged in school (Gillen-O'Neel and Fuligni 2013; Hausmann et al. 2009; Niehaus et al. 2016; Wang and Eccles 2012b). Furthermore, sense of belonging has been linked with both emotional (Osterman 2000; Pittman and Richmond 2007; Thomas and Galambos 2004) and behavioral engagement (Hurtado and Carter 1997; Kennedy and Tuckman 2013; Pittman and Richmond 2007; Soria and Stebleton 2012; Witkow et al. 2012).

Although Baumeister and Leary (1995) argue that "stable or chronic conditions of belongingness should produce a general abundance of positive affect," (p. 505) they also argue that belongingness is a dynamic construct in which changes in one's belongingness will produce commensurate changes in emotions. In other words, belongingness is not just a static trait that differentiates people, it is also a *state* that varies, within people, over time. Engagement, too, should not be "conceptualized as an attribute of the student, but rather a state of being that is highly influenced by contextual factors" (Sinclair et al. 2003, p. 31). Extant research, however, has primarily measured students' sense of belonging and engagement at a single point in time and examined whether those students who have a higher sense of belonging (relative to their peers) tend to also have relatively higher engagement (Fredricks et al. 2004). In other words, extant research has effectively treated belonging and engagement as traits, which only captures part of the theorized phenomenon (Ryan and Deci 2000). Consistent with the

full theoretical account of how belongingness operates, the current study conceptualizes students' sense of belonging as something that differentiates them from other students (a trait, examined with between-person analyses) *and* something that varies from day-to day (a state, examined with daily analyses).

Daily Sense of Belonging and Student Engagement

Although some studies have examined links between belonging and engagement with yearly longitudinal methods (e.g., Gillen-O'Neel and Fuligni 2013; Murphy and Zirkel 2015; Wang and Fredricks 2014), as noted above, belonging and engagement are daily occurrences, and can fluctuate significantly across time and context (Park et al. 2012; Shernoff et al. 2003). It is surprising, therefore, that so few studies have examined sense of belonging and engagement using daily methods. One notable exception is a study by Park et al. (2012), which employed experience-sampling methods with 94 ethnically diverse ninth-grade students who attended low-performing high schools. This study demonstrated that moment-to-moment fluctuations in students' sense of belonging were associated with corresponding changes in their interest in and enjoyment of academic activities. Although this study provides support for the daily link between belonging and engagement, due to its small and specific sample, this study should be replicated. Two other studies tangentially support a daily connection between belonging and engagement. These studies demonstrate that daily changes in factors that likely foster belonging (i.e., social support and identity compatibility) are associated with real-time changes in students' emotional engagement (London et al. 2011; Shernoff et al. 2017).

It is also worth noting that links between sense of belonging and student engagement at the daily level are distinct from links at the person level (Bolger et al. 2003). Indeed, there are several examples from other domains that demonstrate the independence of person- and daily effects. For example, among people of color, chronically central ethnic identity is associated with better psychological well-being at the person level—those people whose ethnic background is more closely tied to their sense of self tend to be happier than their peers whose ethnic background is less central to their identity. At the daily level, however, ethnic centrality is not associated with well-being—a day when one's ethnic background is more central than usual is not a day of especially high (or low) happiness (Kiang et al. 2006).

Furthermore, the limited research that does exist has linked daily belonging to emotional engagement, leaving unanswered the question of whether daily belonging is also linked to behavioral engagement. Sense of belonging, which is students' psychological sense of membership to their schools, is conceptually distinct from emotional engagement, which includes students' positive feelings about school (Nora and Cabrera 1993). However, given that both sense of belonging and emotional engagement are psychological variables, associations between them may be especially strong (Finn 1989; Voelkl 1997). The current study, therefore, also examined behavioral engagement (i.e., students' achievement-supporting actions) to determine whether daily changes in college students' sense of belonging are associated with corresponding changes in both their daily emotional and their daily behavioral engagement. In addition, this study also examined whether the daily dynamics of belonging and engagement function differently depending on students' family histories with education.

First-Generation College Students

As rates of college attendance continue to increase in the United States, a growing number of people will be the first in their families to attain a college degree (Ishitani 2003; National Center for Education Statistics 2016). These first-generation students have a number of skills that help them succeed in college (Jehangir 2010). For example, they have high levels of academic motivation; in fact, being a first-generation student, itself, can be a source of motivation. As one student said, "What keeps me going is that I am the first in my family [to attend college]. And I have four younger brothers and sisters that look up to me" (Orbe 2004, p. 137). Current educational systems, however, are not always set up for first-generation students' success, and despite having educational assets, these students also face unique challenges in college (Ishitani 2003; Jehangir 2010; Stebleton and Soria 2012). For example, with financial and family obligations that make it difficult to participate in extra-curricular activities and curricula that do not reflect their lived experiences, first-generation college students frequently report feeling isolated on campus (Jehangir 2010; Pascarella et al. 2004). As a result, first-generation students' college persistence and graduation rates continue to lag behind those of their continuing-generation peers (Pascarella et al. 2004).

The challenges that first-generation students face have particular implications for their sense of belonging (Seider et al. 2015; Stephens et al. 2015). Indeed, first-generation students often (but not always) report lower levels of sense of belonging than their continuing-generation peers (Spiegler and Bednarek 2013). In addition to differences in mean levels of sense of belonging, first-generation students may also experience differences in the *effects* of sense of belonging. For example, despite reporting less extra-curricular involvement and peer interaction than continuing-generation students, when first-generation students do have these components of belonging, they are especially likely to benefit (Pascarella et al. 2004). In other words, although sense of belonging may be associated with positive outcomes for all students, these associations may be particularly strong among first-generation students (Pittman and Richmond 2007).

Relevant to the current study is the hypothesis that first-generation students may be especially sensitive to *daily* fluctuations in sense of belonging (Cohen and Garcia 2008). Walton and Cohen (2007) call this phenomenon *belonging uncertainty* and describe it as a heightened sensitivity to issues of social belonging among people whose backgrounds are negatively stereotyped in a particular domain. To date, belonging uncertainty has primarily been examined among college students from racial- and ethnic-minority backgrounds (Cohen and Garcia 2008), but first-generation college students (regardless of racial background) also face negative stereotypes in higher education (Croizet and Claire 1998). As a result, whereas continuing-generation students may accept days of lower or higher belonging as part of the natural ups-and-downs of college, first-generation students may imbue these daily fluctuations with more meaning and, therefore, feel the effects of them more acutely (Walton and Cohen 2007). As evidence of this possibility, Stephens et al. (2015) demonstrated that during stressful college situations (e.g., completing a difficult test), first generation students who had not completed an intervention to reduce the effects of belonging uncertainty showed more maladaptive stress hormone reactions than their first-generation peers who had completed such an intervention. The current study, therefore, examined how the daily dynamics of sense of belonging and engagement are similar or different between first- versus continuing-generation college students.

Research Questions and Hypotheses

This study was designed to answer three questions. First, are there person-level associations between college students' sense of belonging and engagement? Consistent with previous research, I expected that students who generally have a stronger sense of belonging than their peers would, on average, also have higher emotional and behavioral engagement. However, given that both sense of belonging and emotional engagement are psychological, I expected that associations between sense of belonging and emotional engagement would be stronger than associations between sense of belonging and behavioral engagement (Raufelder et al. 2015). Second, are there daily-level associations between sense of belonging and engagement? In other words, regardless of students' typical levels of sense of belonging, if they have especially high (or low) sense of belonging on a *particular day*, do they tend to also have correspondingly high or low student engagement on that *same day*? I expected that daily sense of belonging would be linked with both emotional and behavioral engagement, but again, perhaps more strongly with emotional engagement (Park et al. 2012). Finally, do students' family histories with education moderate any associations between sense of belonging and engagement? I expected that sense of belonging would be associated with positive outcomes for all students, but that these associations would be especially strong among first-generation college students (Pittman and Richmond 2007).

Method

Participants, Recruitment, and Procedure

Participants were drawn from five colleges in Minnesota. These are all private, teaching-focused schools that serve between 2000 and 3000, primarily White undergraduate students. They all have low student:faculty ratios (9:1–12:1) and high rates of on-campus residence (88–100%). Differences between the colleges include religious affiliation (religiously affiliated or secular), location (rural, suburban, or urban areas), and selectivity (acceptance rates range from approximately 20% to over 90%; www.usnews.com 2017).

This study was approved by the schools' ethics review committees. At each school, offices of institutional research used internal data to facilitate recruitment via stratified random sample. First, the offices generated two lists of students. One list comprised students from backgrounds that are traditionally underrepresented in college. Students on this list met one or more of the following criteria: from an underrepresented ethnic group (domestic students with Latino, African American, or Native American heritage), from a lower-socioeconomic background (Pell-Grant recipients), or first-generation college attendees. The second list comprised all of the remaining, currently enrolled, full-time undergraduates at each school. Next, college officials randomly selected 85 students from each list and provided the researcher with those students' email addresses. Across the five schools, a total of 850 students were recruited as potential participants (425 traditionally-underrepresented and 425 well-represented).

Data for the current study were collected via online surveys, and included two types of measures: a one-time survey and seven daily surveys. The one-time survey asked about participants' backgrounds (e.g., parents' education); daily surveys focused on each day's experiences and emotions (e.g., sense of belonging and attendance). Throughout the first week of November 2015, students received up to four emails inviting them to participate in a "Study

of Daily Life in College." These emails contained information about the study and a link to complete the one-time survey. Altogether, 303 students completed at least part of the one-time survey (35.6% response rate). The sample sizes from each institution were: school 1 ($n=46$), school 2 ($n=62$), school 3 ($n=60$), school 4 ($n=73$), and school 5 ($n=39$); thus, response rates ranged from 25.9% to 45.3%. Within schools, there was no difference in response rates between traditionally underrepresented and well-represented students, $\chi^2(1)=2.82, p=.421$.

During the second week of November, all students who completed at least some part of the one-time survey were invited to complete the daily surveys. This week was selected because officials at each school indicated that it was a "typical" week for their students (e.g., no breaks or major exam periods). Starting on Sunday and continuing for a total of 7 days, participants were invited to log onto a webpage that linked to the daily surveys. Each day's link was only active from 8 pm to 2 am, so participants had to complete each survey toward the end of the day, and they could not complete multiple daily surveys in one sitting. Online gift cards were offered as study incentives: $11 for the one-time survey, $2 for each daily survey, and a $10 bonus for completing at least five of the seven daily surveys. Thus, participants could earn up to $35 in gift cards for completing all parts of the study. As additional incentives for the daily surveys, four $25 gift cards were raffled each day; only participants who completed that day's survey were eligible to win that day's gift cards. These incentives resulted in high rates of participation: the median number of daily surveys completed was 6 (out of 7 possible, $M=5.5, SD=1.8$).

The current study includes 1630 daily reports from the $N=280$ students who completed the one-time survey and at least three of the daily surveys. Students were distributed across the years of college—80 first years, 55 sophomores, 75 juniors, and 70 seniors—and their ages ranged from 17.8 to 24.5 ($M=20.26, SD=1.31$). Of the 280 participants, 184 (65.7%) identified as female, 92 (32.9%) identified as male, 3 (1.1%) identified as non-binary or agender, and 1 (0.4%) did not provide gender information. The racial/ethnic composition of the sample was: White ($n=201$, 71.8%), Asian ($n=29$, 10.4%), Latino ($n=11$, 3.9%), Black ($n=13$, 4.6%), and Multiracial or some other ethnicity ($n=26$, 9.3%).

Measures

Demographic Variables

All demographic information was assessed on the one-time survey. Participants reported their birthdays (used to calculate age), genders, and races/ethnicities. Participants also reported their parents' education and family incomes.

Parents' Education: First- and Continuing-Generation Status

Participants used an 11-point scale that ranged from 1 = *some elementary school* to 11 = *graduated from medical, law, or graduate school* to "indicate the highest level of education attained" by each of their parents. Participants who had more than two parents (e.g., stepparents), were asked to "report for the two parents who have been most influential" in their life. As shown in Fig. 1, participants' parents' highest level of education ranged from 2 (*completed elementary school*) to 11 (*graduated from medical, law, or graduate school*), and the median was 9 (*graduated from college*). The highest level of education attained by either parent was used to classify participants as first-generation (FG: students whose highest-educated parent had not completed a four-year college degree; $n=76$, 27.1%) or
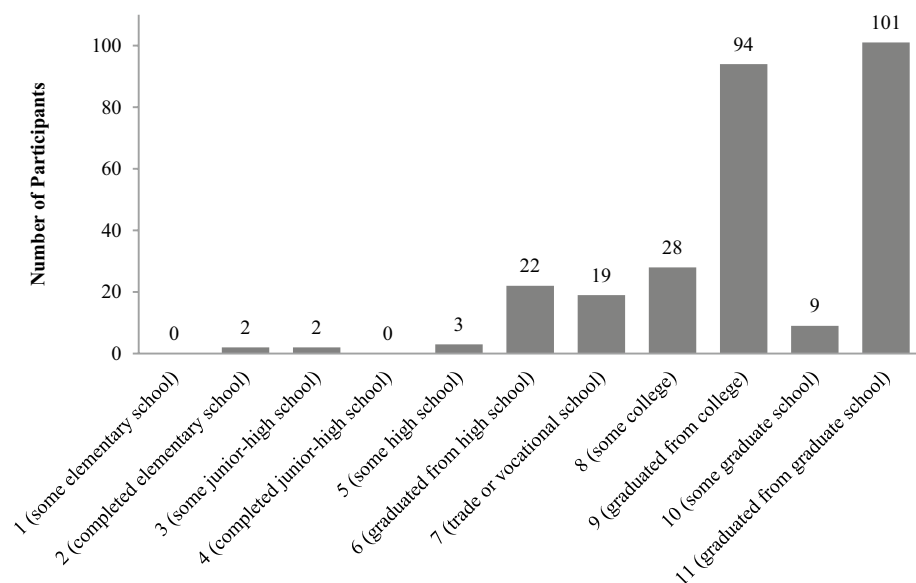
Fig. 1 Highest level of education attained by participants' most-educated parent

continuing-generation (CG: students for whom at least one parent had completed a four-year degree or higher; $n = 204$, 72.9%).

Family Income

Participants reported their family's annual income: "Please select the category that indicates your family's approximate total income for last year (2014). Please consider all sources of income, including earnings, welfare cash assistance, child support, alimonies, support from other members of your household who regularly contribute to your household, etc." There were 12 response options: $1 = less\ than\ \$10,000$ to $12 = more\ than\ \$750,000$. Responses spanned the full range (median = between $50,000 and $75,000).

Daily Sense of Belonging

On each day of the study, participants responded to three items that tapped their sense of belonging to and connection with their college. For the first two items (Mendoza-Denton et al. 2002), participants were asked to complete sentences with "the number that best describes your feelings about your college/university right now: I [$1 = do\ NOT\ fit\ in$ to $7 = definitely\ fit\ in$] at my college/university; I am [$1 = NOT\ welcome$ to $7 = very\ welcome$] at my college/university." For the last question (Goodenow, 1993), participants indicated the extent to which they "felt like a real part of my school today" ($1 = not\ at\ all$ to $7 = extremely$). For each day of the study, these three items had excellent internal reliability (αs ranged from .82 to .91). Thus, the three items were averaged as an index of each day's sense of belonging, with higher values corresponding to higher sense of belonging for that day (see Table 1 for sample means). Previous research (Mendoza-Denton et al. 2002) suggests that this measure of belonging is valid and distinct from related concepts (e.g., general feeling of well-being and general positivity toward dormmates and professors).

Table 1 Descriptives of sense of belonging and student engagement

	M (SD)	Min–max	Variance between		
			Days (L1) (%)	Individuals (L2) (%)	Colleges (L3) (%)
Sense of belonging	5.30 (1.06)	1.42–7.00	21.5	78.3	0.2
Academic self-efficacy	4.61 (1.10)	1.67–7.00	60.3	39.3	0.4
Feelings toward school	4.79 (0.94)	1.31–6.86	33.5	66.5	<0.1
In-class engagement	2.95 (0.75)	1.00–4.00	73.6	26.4	<0.1
Help-seeking	0.76 (0.52)	0.00–2.80	80.6	19.4	<0.1
Procrastination	1.76 (1.10)	0.00–7.00	67.9	32.1	<0.1

Daily Emotional Engagement

Two measures of emotional engagement were included—students' daily academic self-efficacy and their daily feelings toward school. Sample means are presented in Table 1.

Academic Self-Efficacy One daily item assessed participants' sense of self-efficacy as a student: "How much did you feel like a good student today?" (1 = *not at all* to 7 = *extremely*).

Feelings Toward School On each day of the study, participants were asked "How much did you feel each of the following today?" (1 = *not at all* to 7 = *extremely*): interested in school, positive about school, liked school, bored with school, frustrated with school, and disliked school. After reverse-coding *bored*, *frustrated*, and *disliked*, all six items had excellent internal reliability: Cronbach's alphas ranged from .82 to.89. Thus, the six items were averaged, with higher values corresponding to more positive feelings about school on that day.

Daily Behavioral Engagement

This study included three behavioral measures—engagement in class, help-seeking, and time spent procrastinating (See Table 1 for means).

In-Class Engagement On each day, participants indicated how many classes they had scheduled. Participants who had at least one class responded to four additional items: "How many classes did you attend today?" (1 = *attended all scheduled classes* and 0 = *missed one or more scheduled classes*), "You were late to a class or classes" (1 = *on time for all classes* and 0 = *late to at least one class*); "You asked a question in class" (1 = *yes* and 0 = *no*) and "You participated in a class discussion" (1 = *yes* and 0 = *no*). These four items (attended all classes, was on time for all classes, asked a question in class, and participated in a class discussion) were summed for each day. Thus, participants' daily in-class engagement could range from 0 to 4. Participants who reported having no classes scheduled for a day were assigned "missing" for that day's in-class engagement.

Help-Seeking Participants indicated whether or not they engaged in four behaviors that demonstrate seeking help outside of class: "emailed a professor or TA;" "met with a professor or TA/attended office hours;" "met with a study group;" "attended a review session"

(1 = *yes* and 0 = *no*). These four items were summed for each day; thus, participants' daily help-seeking could range from 0 to 4.

Procrastination On each day, participants indicated whether "you had homework/studying to do." Participants who indicated that they did have homework or studying obligations were asked to indicate how much time they spent "procrastinating (i.e., doing something nonessential when you should have been studying or doing school work)." Participants who indicated that they did not have any homework or studying responsibilities for that day were assigned "missing" for that day's procrastination time. On 1 day, one participant reported procrastinating for 22 h (9 standard deviations higher than the sample mean for that day). This single observation was replaced with the next most extreme value for that day (10 h).

Analytic Strategy

Data were analyzed using Hierarchical Linear Modeling (HLM; Raudenbush and Bryk 2002). HLM is a statistical technique that accounts for the interdependence of nested data and can simultaneously estimate effects at each data level. Using HLM, I first ran fully unconditional models in which key variables—sense of belonging, academic self-efficacy, feelings toward school, in-class engagement, help-seeking, and procrastination time—were entered into separate models as outcome variables with no predictors. These models indicated how variance in each outcome was distributed across the three nested levels of data: L1 (between days), L2 (between participants), and L3 (between colleges).

To examine the hypothesized associations between sense of belonging and engagement, three sets of HLMs predicted the five indicators of student engagement (academic self-efficacy, feelings toward school, in-class engagement, help-seeking, and time spent procrastinating). The first set of HLMs included only control variables as predictors: person-level (L2) equations included controls for student gender, race/ethnicity, and prior achievement (ACT scores), and daily-level (L1) equations included controls for the day of the week. These models served as baselines for comparing subsequent models. The second set of HLMs retained the control variables described above and added person-level (mean) sense of belonging and first-generation status as L2 predictors. These models replicate approaches that are most common in extant literature, indicating how average levels of student engagement differ between students with generally low versus generally high mean sense of belonging (see β_{01j} below) and how average levels of student engagement differ between FG and CG students (β_{02j}). Finally, a third set of HLMs added daily sense of belonging (L1), the cross-level interaction between daily belonging × person-level belonging, and the cross-level interaction between daily belonging x first-generation status. These models indicate whether, above and beyond between-person differences in sense of belonging, daily fluctuations in sense of belonging predict corresponding daily fluctuations in student engagement (β_{10j}). Furthermore, these analyses indicate whether daily associations between sense of belonging and engagement differ among students with generally low versus generally high mean levels of sense of belonging (β_{11j}) or among FG versus CG students (β_{12j}). The final models for all measures of student engagement were as follows:

Level 1:

$$\text{Student engagement}_{tij} = \pi_{0ij} + \pi_{1ij}\left(\text{daily sense of belonging}_{tij}\right) + \pi_{2ij} - \pi_{7ij}\left(\text{Mon}_{tij} - \text{Sat}_{tij}\right) + e_{tij}$$

(1)

Level 2:

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}(\text{mean sense of belonging}_{ij}) + \beta_{02j}(\text{FG}_{ij}) + \beta_{03j}(\text{male}_{ij}) + \beta_{04j}(\text{Asian}_{ij})$$
$$+ \beta_{05j}(\text{Latino}_{ij}) + \beta_{06j}(\text{Black}_{ij}) + \beta_{07j}(\text{Multiracial}_{ij}) + \beta_{08j}(\text{ACT}_{ij}) + r_{0ij} \tag{2}$$

$$\pi_{1ij} = \beta_{10j} + \beta_{11j}(\text{mean sense of belonging}_{ij}) + \beta_{12j}(\text{FG}_{ij}) + r_{0ij} \tag{3}$$

$$\pi_{2ij} = \beta_{20j} \tag{4}$$

$$\vdots$$

$$\pi_{7ij} = \beta_{70j} \tag{9}$$

Level 3:

$$\beta_{00j} = \gamma_{000} + u_{00j} \tag{10}$$

$$\beta_{01j} = \gamma_{010} \tag{11}$$

$$\vdots$$

$$\beta_{70j} = \gamma_{700} \tag{27}$$

As shown in Eqs. 2 and 3, π_{0ij} and π_{1ij} were allowed to vary across individuals; all other L2 model parameters were set to fixed effects. Daily sense of belonging was centered on each person's mean, and mean sense of belonging was centered on the sample's mean. Preliminary analyses also included family income as an L2 control variable. However, family income was never significant (all βs < |0.06|, all ps > .16), and none of the results reported below differed with family income in the models. Thus, this variable was not retained in final models.

Results

First- and Continuing-Generation Students

There was no difference in the percentage of males and females who were FG versus CG ($\chi^2 = 1.72$, $p = .423$). Consistent with national demographics (Fischer 2007), there were income and ethnic/racial differences between FG and CG students. FG students reported lower annual incomes (median = between \$25,000 and \$50,000; range = less than \$10,000 to between \$150,000 and \$200,000) than their CG peers (median = between \$75,000 and \$100,000; range = less than \$10,000 to more than \$750,000), $t(222.21) = 8.85$, $p < .001$. In addition, FG students were more likely than CG students to be students of color, $\chi^2(5) = 17.01$, $p = .004$. There were no differences between FG and CG participants in terms of number of daily surveys completed (FG: $M = 5.9$, $SD = 1.3$ days; CG: $M = 5.8$, $SD = 1.2$ days; $t(278) = -0.60$, $p = .551$).

To describe overall differences in sense of belonging between FG and CG students, I calculated each person's mean sense of belonging by averaging across their daily reports. An Analysis of Covariance (ANCOVA) including student generation, family income, and race/ethnicity as predictors indicated that, across the days of the study, FG students ($M = 5.11$, $SD = 1.19$) had marginally lower mean sense of belonging than their CG peers

($M = 5.37$, $SD = 1.01$, $F(1,262) = 3.04$, $p = .083$, $\eta^2 = .011$). Family income was not associated with sense of belonging, $F(1,262) = 1.94$, $p = .165$, $\eta^2 = .007$, but student race was, $F(4,262) = 5.45$, $p < .001$, $\eta^2 = .077$. Follow-up tests with the Bonferroni correction indicated that this effect was entirely driven by White students ($M = 5.45$, $SD = 1.00$) reporting higher average sense of belonging than their Black peers ($M = 4.17$, $SD = 0.96$). Average sense of belonging among Asian ($M = 5.09$, $SD = 1.12$), Latino ($M = 5.11$, $SD = 1.00$), and Multiracial ($M = 5.02$, $SD = 1.18$) participants did not differ from one another or from those of Black or White participants.

Model Building

As shown in Table 1, fully unconditional HLMs revealed that a negligible percentage of each variable's variance (less than 0.5%) was between colleges (L3). For all variables, there was significant variance at both L1 and L2, but for sense of belonging and feelings toward school, the bulk of variance was between participants (L2), whereas for academic self-efficacy, in-class engagement, help-seeking, and time spent procrastinating, the bulk of variance was between days (L1). As shown in Tables 2 and 3 (Models 1), adding L2 predictors—person-level sense of belonging and first-generation status—to HLMs significantly improved model fit (over controls only) for academic self-efficacy, feelings toward school, and in-class engagement, and it marginally improved model fit for help-seeking and time spent procrastinating. Finally, as shown in Tables 2 and 3 (Models 2), adding L1 daily-level variables resulted in significantly better model fit for all measures of student engagement. Thus, all results reported below are from the full models including: control variables, L2 between-person predictors, L1 daily predictors, and cross-level (L2 × L1) interactions.

Emotional Engagement

Academic Self-Efficacy

As shown in Table 2 (Academic Self-Efficacy, Model 2), sense of belonging was associated with higher academic self-efficacy at both L2 and L1. In other words, students who typically have higher sense of belonging than their peers tend to also have higher academic self-efficacy (L2: $\beta_{01j} = 0.60$, $SE = 0.05$, $p < .001$). In addition, regardless of students' typical sense of belonging, if they experienced especially high sense of belonging on a particular day, their academic self-efficacy on that same day tended to be higher than usual (L1: $\beta_{10j} = 0.44$, $SE = 0.08$, $p < .001$). This daily association between sense of belonging and academic self-efficacy, however, was qualified by a significant cross-level interaction with student generation (L2 x L1: $\beta_{12j} = 0.27$, $SE = 0.13$, $p = .042$). As shown in Fig. 2, days of higher-than-personal-average sense of belonging tended to be days of higher academic self-efficacy for all students, but this daily association was especially strong for FG students.

Feelings Toward School

Sense of belonging was associated with more positive feelings toward school as a main effect at both the person (L2: $\beta 0_{1j} = 0.63$, $SE = 0.04$, $p < .001$) and the daily (L1: $\beta_{10j} = 0.44$,

Table 2 Results from hierarchical linear models: person and daily predictors of emotional engagement

Fixed effect	Academic self-efficacy		Feelings toward school	
	Model 1	Model 2	Model 1	Model 2
Intercept (β_{00j})	4.13 (0.10)***	4.20 (0.10)***	4.45 (0.07)***	4.52 (0.07)***
Person level (L2)				
Mean SB (β_{01j})	0.59 (0.05)***	0.60 (0.05)***	0.63 (0.04)***	0.63 (0.04)***
FG (β_{02j})	0.02 (0.13)	0.02 (0.13)	− 0.12 (0.09)	− 0.12 (0.09)
Male (β_{03j})	0.09 (0.11)	0.11 (0.11)	0.02 (0.08)	0.02 (0.08)
Asian (β_{04j})	0.15 (0.18)	0.15 (0.18)	0.37 (0.13)**	0.37 (0.13)**
Latino (β_{05j})	− 0.10 (0.28)	− 0.09 (0.28)	0.50 (0.20)*	0.50 (0.20)*
Black (β_{06j})	− 0.48 (0.28)†	− 0.47 (0.28)†	0.12 (0.20)	0.11 (0.20)
Multi (β_{07j})	0.07 (0.19)	0.10 (0.19)	− 0.08 (0.14)	− 0.08 (0.14)
ACT (β_{08j})	− 0.02 (0.01)	− 0.02 (0.01)	0.02 (0.01)†	0.02 (0.01)†
Daily level (L1)				
Daily SB (β_{10j})	–	0.44 (0.08)***	–	0.44 (0.04)***
Mon (β_{20j})	0.52 (0.11)***	0.43 (0.10)***	0.26 (0.06)***	0.17 (0.05)**
Tue (β_{30j})	0.59 (0.11)***	0.56 (0.10)***	0.28 (0.06)***	0.24 (0.05)***
Wed (β_{40j})	0.65 (0.11)***	0.57 (0.10)***	0.41 (0.06)***	0.32 (0.05)***
Thu (β_{50j})	0.67 (0.11)***	0.60 (0.10)***	0.37 (0.06)***	0.31 (0.05)***
Fri (β_{60j})	0.77 (0.11)***	0.62 (0.11)***	0.50 (0.06)***	0.37 (0.06)***
Sat (β_{70j})	− 0.10 (0.11)	− 0.20 (0.11)†	0.45 (0.06)***	0.36 (0.06)***
Cross-level interactions (L2 × L1)				
Mean SB × daily SB (β_{11j})	–	0.00 (0.06)	–	0.00 (0.04)
FG × daily SB (β_{12j})	–	0.27 (0.13)*	–	0.01 (0.08)
Model comparison test	vs. controls	vs. Model 1	vs. controls	vs. Model 1
	χ^2 (df)	χ^2 (df)	χ^2 (df)	χ^2 (df)
	103.18 (2)***	90.23 (5)***	188.28 (2)***	242.76 (5)***

SB refers to sense of belonging. Mean SB was centered on the sample's grand mean. Daily SB was centered on each individual's mean. FG was coded such that first-generation students = 1 and continuing-generation students = 0. All models controlled for the day of the week—for most outcomes, the comparison day was Sunday, but for in-class engagement, the comparison day was Monday because this variable was only assessed on school days

$^{†}p< .1$, *$p< .05$, **$p< .01$, ***$p<.001$

$SE=0.04$, $p<.001$) levels. First-generation status was not associated with feelings toward school, neither as a main effect, nor as part of an interaction.

Behavioral Engagement

In-Class Engagement

At the person level, students with a higher average sense of belonging tended to be more engaged in-class (L2: $\beta_{01j}=0.17$, $SE=0.04$, $p < .001$). At the daily level, sense of belonging

Table 3 Results from hierarchical linear models: individual and daily predictors of behavioral engagement

Fixed effect	In-class engagement		Help-seeking		Procrastination	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Intercept β_{00j} (SE)	3.07 (0.08)***	3.08 (0.08)***	0.70 (0.06)***	0.72 (0.06)***	1.99 (0.12)***	1.95 (0.12)***
Person level (L2)						
Mean SB (β_{01j}) (SE)	0.17 (0.04)***	0.17 (0.04)***	0.06 (0.03)†	0.06 (0.03)†	− 0.13 (0.06)*	− 0.13 (0.06)*
FG (β_{02j}) (SE)	− 0.07 (0.10)	− 0.08 (0.10)	− 0.07 (0.07)	− 0.08 (0.08)	0.04 (0.15)	0.02 (0.15)
Male (β_{03j}) (SE)	− 0.11 (0.09)	− 0.11 (0.09)	− 0.02 (0.07)	− 0.02 (0.07)	0.02 (0.13)	0.02 (0.13)
Asian (β_{04j}) (SE)	− 0.37 (0.14)**	− 0.37 (0.14)**	0.20 (0.10)†	0.20 (0.10)†	0.16 (0.21)	0.17 (0.21)
Latino (β_{05j}) (SE)	0.02 (0.21)	0.06 (0.21)	0.05 (0.16)	0.06 (0.16)	0.33 (0.32)	0.33 (0.33)
Black (β_{06j}) (SE)	0.15 (0.22)	0.18 (0.22)	0.16 (0.16)	0.17 (0.16)	0.86 (0.33)**	0.85 (0.32)*
Multi (β_{07j}) (SE)	− 0.29 (0.15)*	− 0.30 (0.15)*	0.01 (0.11)	0.01 (0.11)	0.18 (0.22)	0.19 (0.22)
ACT (β_{08j}) (SE)	0.00 (0.01)	0.00 (0.01)	0.0 (0.01)	0.00 (0.01)	0.00 (0.02)	0.00 (0.02)
Daily level (L1)						
Daily SB (β_{10j})	–	0.05 (0.08)	–	0.13 (0.05)*	–	− 0.19 (0.09)*
Mon (β_{20j})	–	–	0.30 (0.07)***	0.29 (0.07)	− 0.51 (0.12)***	− 0.47 (0.12)***
Tue (β_{30j})	0.00 (0.09)	0.01 (0.09)	0.13 (0.07)†	0.11 (0.07)	− 0.42 (0.12)***	− 0.40 (0.12)***
Wed (β_{40j})	0.15 (0.08)†	0.14 (0.08)	0.23 (0.07)***	0.21 (0.07)	− 0.38 (0.12)**	− 0.34 (0.12)**
Thu (β_{50j})	− 0.02 (0.09)	− 0.03 (0.09)	0.19 (0.07)**	0.16 (0.07)	− 0.35 (0.12)**	− 0.31 (0.12)**
Fri (β_{60j})	− 0.22 (0.09)*	− 0.24 (0.09)**	− 0.14 (0.07)*	− 0.18 (0.07)*	− 0.58 (0.14)***	− 0.51 (0.14)***
Sat (β_{70j})	–	–	− 0.52 (0.07)***	− 0.55 (0.07)***	− 0.02 (0.16)	− 0.02 (0.16)

Table 3 (continued)

Fixed effect	In-class engagement		Help-seeking		Procrastination	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Cross-level interaction (L2 × L1)						
Mean SB × daily SB (β_{11j})	–	–0.05 (0.06)	–	0.07 (0.04)†	–	–0.02 (0.07)
FG × daily SB (β_{12j})	–	0.30 (0.14)*	–	–0.06 (0.08)	–	0.01 (0.16)
Model comparison test	vs. controls	vs. Model 1	vs. controls	vs. Model 1	vs. controls	vs. Model 0031
	χ^2 (df)	χ^2 (df)	χ^2 (df)	χ^2 (df)	χ^2 (df)	χ^2 (df)
	17.43 (2)***	38.55 (5)***	5.04 (2)†	34.01 (5)***	4.72 (2)†	39.77 (5)***

SB refers to sense of belonging. Mean SB was centered on the sample's grand mean. Daily SB was centered on each individual's mean. FG was coded such that first-generation students = 1 and continuing-generation students = 0. All models controlled for the day of the week—for most outcomes, the comparison day was Sunday, but for in-class engagement, the comparison day was Monday because this variable was only assessed on school days

†$p < .1$, *$p < .05$, **$p < .01$, ***$p < .001$

(a)

FG: (β = 0.71, *SE* = 0.11, *p* < .001)

CG: (β = 0.44, *SE* = 0.08, *p* < .001)

Daily Sense of Belonging

(b)

FG: (β = 0.35, *SE* = 0.12, *p* = .003)

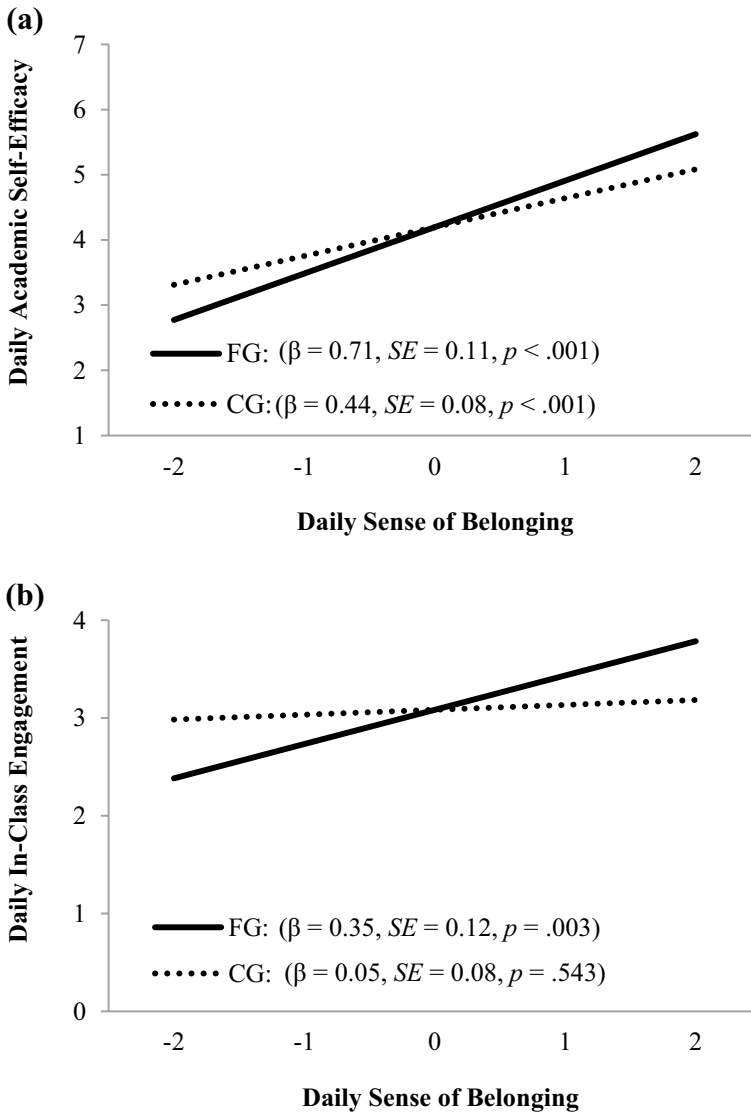CG: (β = 0.05, *SE* = 0.08, *p* = .543)

Daily Sense of Belonging

Fig. 2 Daily sense of belonging's associations with daily academic self-efficacy (**a**; top panel) and with daily in-class engagement (**b**; bottom panel). Daily sense of belonging was centered so that 0 = each individual's mean level of sense of belonging across the days of the study

was not associated with in-class engagement as a main effect (L1: $\beta_{10j} = 0.05$, $SE = 0.08$, $p = .543$); however, this daily association varied as a function of student generation (L2 × L1: $\beta_{12j} = 0.30$, $SE = 0.14$, $p = .031$). For CG students, daily sense of belonging was not associated with in-class engagement, but for FG students, days of higher-than-personal-average sense of belonging tended to be days of higher in-class engagement (see Fig. 2).

Help-Seeking

At the person level, sense of belonging was only marginally associated with higher help-seeking (L2: $\beta_{01j}=0.06$, $SE=0.03$, $p=.058$). At the daily level, days of higher-than-personal-average sense of belonging tended to be days with more help-seeking (L1: $\beta_{10j}=0.13$, $SE=0.05$, $p=.013$). First-generation status was not associated with help-seeking behaviors, neither as a main effect, nor as an interaction.

Procrastination

Sense of belonging was associated with less procrastination as a main effect at both the between-person (L2: $\beta_{01j}=-0.13$, $SE=0.06$, $p=.045$) and the daily (L1: $\beta_{10j}=-0.19$, $SE=0.09$, $p=.043$) levels. First-generation status was not associated with procrastination, neither as a main effect, nor as part of an interaction.

Discussion

The current study examined between-person *and* daily dynamics of sense of belonging and engagement among first- and continuing-generation college students. Replicating previous research (e.g., Strayhorn 2018), sense of belonging and engagement were linked at the person level: students who typically had a higher sense of belonging than their peers tended to also have higher emotional and behavioral engagement in college. In addition, sense of belonging operated at the daily level: regardless of their typical levels of belonging, if students experienced stronger-than-usual sense of belonging on a particular day, their emotional and behavioral engagement on that same day tended to be higher than usual as well. For two measures of engagement—academic self-efficacy and in-class engagement—these daily associations were especially strong among first-generation college students.

Person-Level: Average Sense of Belonging and Student Engagement

Between students, sense of belonging was associated with both measures of emotional engagement. In other words, students who typically had higher sense of belonging than their peers tended to also have higher academic self-efficacy and more positive feelings toward school. Previous research has consistently linked individual differences in sense of belonging to corresponding differences in emotional engagement (e.g., Freeman et al. 2007; Goodenow 1993; Ostrove and Long 2007; Pittman and Richmond 2007). Thus, this study is consistent with previous research in suggesting that a sense of connection with school may be an important resource that helps students maintain academic motivation (Gillen-O'Neel and Fuligni 2013; Murphy and Zirkel 2015; Strayhorn 2018).

For behavioral engagement, between-person differences in sense of belonging were significantly associated with more in-class engagement and less procrastination, but only marginally associated with more help-seeking. Thus, students' sense of belonging at school is not just associated with other psychological outcomes like motivation and feelings toward school; sense of belonging is also associated with actual achievement-supporting behaviors. However, sense of belonging was not equally associated with all behavioral outcomes (Hurtado and Carter 1997; Sidelinger et al. 2016). One theory that might clarify the difference in associations between sense of belonging and various behaviors is Finn's (1989)

hierarchical taxonomy of engagement. According to this taxonomy, academic behaviors can be hierarchically classified according to the amount of initiative they require from students. In the current study, in-class behaviors represent a low level of engagement because they primarily involve acquiescence to school rules; avoiding procrastination is a higher level because it involves students' regulating their behavior outside of "authority" supervision, and help-seeking is the highest level because it involves identifying a need and then actually reaching out to address this need. Thus, the current study suggests that mean levels of sense of belonging consistently differentiate between students in terms of lower levels of behavioral engagement, but less consistently differentiate between them in terms of the highest level out-of-class engagement.

Another possibility is that, for help-seeking in particular, mean sense of belonging is associated with it, but only in the presence of other factors (McNeely 2013). For example, sense of belonging may only be associated with help-seeking among students who are struggling with their coursework. Students who are not struggling may have low levels of help-seeking regardless of whether their typical levels of sense of belonging are low or high (Shernoff et al. 2016). Alternatively, associations between sense of belonging and behavioral engagement may vary with the academic culture of the school. As suggested by Self-Determination Theory, belongingness facilitates internalization of a group's values; thus, students with strong sense of belonging might only have higher behavioral engagement if they believe their particular schools value such behavior (Ryan and Deci 2000). Indeed, Lee and Smith (1999) found that middle school students' sense of belonging was only associated with achievement when students' schools had a culture of high academic expectations. In the current study, all of the colleges from which participants were recruited emphasized academics, but within each college, students likely had different levels of academic struggle and perceptions of the colleges' academic cultures. Future research, therefore, could measure these additional factors to determine whether they moderate the between-person associations of college sense of belonging with help-seeking.

Daily-Level: Fluctuations in Sense of Belonging and Student Engagement

The current study went beyond between-person correlations and examined *daily* associations between sense of belonging and engagement. For all students, days of especially strong sense of belonging tended to be days with higher self-efficacy, more positive feelings toward school, more help-seeking, and less procrastination. Daily sense of belonging was also associated with more in-class engagement, but only among first-generation students.

The current study's findings are consistent with the one previous study that used daily methods to examine sense of belonging and engagement—Park et al. (2012) found that daily sense of belonging and emotional engagement were linked for ninth-grade students from low-performing high schools. Thus, the current study replicated the daily connection between sense of belonging and emotional engagement with older students in a different context. In addition, the current study extends Park and colleagues' findings to behavioral engagement. Both emotional and behavioral engagement are required for academic success (Li 2011). Even if students enjoy and value school, if this emotional engagement does not translate into behavioral engagement (e.g., completing assignments), students are unlikely to achieve academic success (Li et al. 2010). At the same time, behavioral engagement, on its own, signifies willingness to comply with school rules, but not necessarily a genuine commitment to learning; without also having emotional engagement, students are unlikely

to achieve deep mastery of material or to persevere after challenges (Finn 1989; Finn and Rock 1997; Stefansson et al. 2016). Thus, day-to-day feelings of sense of belonging may be especially beneficial for academic success in college because they simultaneously support both forms of engagement.

One strength of the current study is that the daily associations cannot be attributed to individual-level "third variables" that often confound traditional correlations. In daily analyses, each participant essentially serves as their own control group (Bolger et al. 2003). In other words, these analyses control for between-person differences such as academic preparation or even typical levels of sense of belonging by comparing students to themselves—if a student feels more connected than usual, then they also have more engagement than usual. Although daily analyses address some aspects of internal validity, it is important to note that observed associations are still correlations, and causality is not established. The current study uses sense of belonging as the predictor and engagement as the outcome. This framing is consistent with Self-Determination Theory, which suggests that sense of belonging affects emotional and behavioral engagement (e.g., Ryan and Deci 2000). However, it is possible that this causality is reversed—that daily student engagement causes stronger sense of belonging. This "reversed" causality would be consistent with Finn's (1989) Participation-Identification model, which suggests that as students become more engaged at school, they develop a stronger sense of belonging. If future research measured belonging and engagement for more days or with smaller time increments (e.g., moment-to-moment measures; Martin et al. 2015), these studies would have enough power to examine temporal precedence: do changes in sense of belonging precede changes in engagement, or vice versa? Another possibility for future research would be to manipulate sense of belonging to determine whether this causes a corresponding increase in student engagement.

Although the causal relation between sense of belonging and engagement is not established, the fact that they are linked at the daily- and the person levels is, nonetheless, a significant contribution to the sense of belonging literature. Whether sense of belonging and student engagement are linked at the daily and/or the person level are distinct questions (Bolger et al. 2003). Only with longitudinal data and multi-level modeling techniques can the separate effects of person-level and daily-level belonging be discerned (Bolger et al. 2003). Prior research has primarily focused on the person level, treating sense of belonging as though it is a *trait*, a quality that some students have more of than others (Strayhorn 2018). Theories of belonging, however, posit that belonging also works dynamically—that changes in belonging *state* result in corresponding changes in students' emotions, cognitions, and behaviors (Baumeister and Leary 1995). The current study replicated previously demonstrated trait findings and further revealed that sense of belonging also works as a *state*—a quality that changes within students from day-to-day and has implications for their day-to-day academic engagement. Therefore, the current study provides support for a key part of the belongingness hypothesis that has, to date, not received as much empirical attention.

Overall, this study suggests that if students are able to maintain a strong sense of connection with their school on any particular day, this might translate into higher engagement on that same day. Although it is promising that days of higher-than-typical sense of belonging tend to be days of higher emotional and behavioral engagement, this association also means that days of lower-than-typical sense of belonging tend to be days of lower engagement. College is full of ups and downs, and one key predictor of success is how well students are able to persist in the face of these challenges (Alkan 2014). Future research, therefore, should explore the roles that factors such as achievement goals or college culture

play in the daily dynamics of sense of belonging and achievement (Krause and Freund 2016; Lee and Smith 1999).

First- and Continuing-Generation College Students

Finally, the current study examined the role that being a first- versus continuing-generation student plays in the dynamics of sense of belonging and engagement. Specifically, this study examined whether daily changes in sense of belonging were more strongly associated with academic emotions and behaviors for first-generation students than they were for continuing-generation students. This hypothesis was confirmed for two measures of engagement. For academic self-efficacy, the daily association with sense of belonging held for all students, but it was especially strong for first-generation students. For in-class engagement, the daily association with sense of belonging was only significant for first-generation students. In other words, first-generations students' daily attendance and class participation rose and fell in conjunction with their daily sense of belonging, whereas continuing-generation students' daily attendance and class participation was consistent regardless of that day's level of sense of belonging. These results suggest that daily sense of belonging may provide first-generation students with extra motivation to attend class or extra confidence to participate in the day's discussion. For continuing-generation students, no such daily boost of motivation or confidence seems to be needed; these students maintained high levels of daily in-class engagement regardless of how much sense of belonging they felt on a particular day.

Previous research has demonstrated that student populations that have historically been underserved by colleges tend to especially benefit from sense of belonging (Murphy and Zirkel 2015; Soria et al. 2013). Most of this research, however, has focused on students of color (Hausmann et al. 2009; Walton and Cohen 2007). Thus, the current study contributes to this body of literature by demonstrating that these findings also apply to students who are poised to become the first in their families to graduate from college. It is unclear, however, whether the same mechanisms are at play for family educational history as are at play for racial background. Social identity threat theories (e.g., stereotype threat) suggest that negative stereotypes are a primary cause of belonging uncertainty among students of color (Steele et al. 2002; Walton and Cohen 2007). Although first-generation college students also face negative stereotypes (Jury et al. 2017), because race and social class differ in terms of visibility and histories of oppression and collective identity, there are differences in how these identities function in people's lives (Newheiser and Barreto 2014). Future research, therefore, could explore reasons *why* first-generation college students are especially sensitive to day-to-day changes in belonging so that colleges can help all students maintain high engagement and belonging despite daily belonging fluctuations.

Although student generation moderated daily associations between sense of belonging and engagement, it is notable that there were no other effects of generation. Previous research suggests that first-generation students are at risk for lower sense of belonging and engagement (Soria and Stebleton 2012; Soria et al. 2013; Terenzini and Springer 1996). In the current study, however, first-generation students had only *marginally* lower sense of belonging than their continuing-generation peers, and for all measures of student engagement, first- and continuing-generation students were, on average, equivalent.

One possible explanation for the lack of generation effects is the type of schools that participants attended. Most research that has demonstrated differences between first- and

continuing-generation students has taken place in large, public universities (the type of institution that first-generation students are especially likely to attend; Pascarella et al. 2004; Soria et al. 2013). In contrast, recruitment schools for the current study were all small, private colleges. On the one hand, the small size and selectivity of these schools could exacerbate questions of belonging among first-generation students (Orbe 2004). On the other hand, these colleges have a number of features that may especially support first-generation students (Ishitani 2006). For example, first-generation students, whose parents may not be able to help them navigate norms of higher education, may especially benefit from the close faculty relationships that low student-faculty ratios can provide (Kim 2009; Pascarella et al. 2004). Likewise, at large universities, first-generation students often live and work off-campus, which can reduce sense of belonging and engagement (Pascarella et al. 2004; Terenzini and Springer 1996). At the colleges in the current study, all students are required to live on campus for at least part of their tenure, and most student employment is on campus. Although results from this study may not generalize to students attending other types of institutions, the inclusion of small private schools in a study of first-generation college students is an important contribution to the literature. Challenges that first-generation students face are often presumed to be internal, but many of these challenges are actually structural (Spiegler and Bednarek 2013). Future research should examine first- and continuing generation students across a wider variety of school contexts. With this type of design, school-level predictors (e.g., size, cost) could be added to models to determine their role in the dynamics of sense of belonging and academic engagement (Uekawa et al. 2007).

Limitations

A few limitations must be taken into consideration when interpreting the current study's findings. First, as mentioned above, this study's results are correlational, and the causal relation between school belonging and engagement cannot be determined. Second, are issues of generalizability. The five colleges from which participants were recruited do not represent the many types of institutions of higher education in the United States. Although recruitment from small liberal-arts colleges is a strength of the current study (because few studies are conducted in these contexts), results may not generalize to other types of institutions. In addition, within recruitment schools, this study recruited from the general campus populations (and not, for example, psychology courses), yet the response rate was relatively low. Even within schools, therefore, results may not generalize to those students who chose not to participate. Future research should replicate this study's findings.

Another limitation of the current study is the measures that were used. Although daily measures eliminate many problems with self-reported data, they are still self-reports. Future research, therefore, could determine if the same daily associations with belonging emerge with more objective measures of engagement (e.g., classroom observations or productivity monitoring software). In addition, although it is a strength that this study included both emotional and behavioral forms of engagement, five particular indicators of engagement were used, and there are many other specific measures of emotional and behavioral engagement that could have been included. For example, it would be interesting to determine whether results extend to other aspects of emotional engagement like intrinsic motivation or to other aspects of behavioral engagement like effort and attention. In particular, in addition to emotional and behavioral dimensions of engagement (Appleton et al. 2008;

Fredricks and McColskey 2012), some theories of academic engagement also include a cognitive dimension, which is related to students' investment in their studies (Fredricks et al. 2004). Given that one aspect of cognitive engagement includes students' method of coping in response to failure, it would be especially interesting to see how this form of engagement interacts with sense of belonging operates on a daily level.

Finally, this study focused on differences between students depending on their families' educational backgrounds. As discussed above, sense of belonging is especially beneficial for students who are underrepresented in postsecondary education (Walton and Cohen 2007), and the current study extended this ideas to first-generation college students. Furthermore, analyses controlled for family income and student race/ethnicity, so the findings related to student generation were not due to these confounding variables. Nonetheless, the current study was limited in that it was unable to include these other demographic characteristics as substantive variables. For example, there is evidence that being a first generation student has different implications for college students' success, depending on their racial background (Fischer 2007). In the current study, however, there were too few students of color to examine differences between first-and continuing-generation students from different races or ethnicities. As is often the case, future research would benefit from including a more racially diverse sample.

Conclusions

One major finding of the current study is that sense of belonging operates at both person and daily levels. As a result, schools can work at both levels to improve students' belonging. Several studies suggest ways to increase individual-level sense of belonging (Slaten et al. 2016; Witkow et al. 2012). It is not clear, however, whether the same strategies help with sense of belonging at the day-to-day level. More research needs to examine the daily predictors of sense of belonging.

The current study also suggests that first- and continuing-generation students do not differ in their average levels of sense of belonging or engagement, but they do differ in their reactivity to daily changes in sense of belonging—the daily connection between belonging and engagement is especially strong for first-generation college students. Thus, another implication of the current study is that it is important to identify other sources of motivation that can help students maintain high levels of engagement, even on days when they are not feeling especially connected to their college.

College students face unique developmental challenges, as attending college requires young adults to make several concurrent transitions (e.g., changes in social networks and increased independence; Arnett 2000). Furthermore, although there are many economic and social benefits of a college education, these benefits are only attained if students do well enough to graduate with a four-year degree (Tinto 2012). Both of these issues—belonging and achievement—are concerns for all students, yet they especially are concerns for first-generation college students (Lohfink and Paulsen 2005). Overall, this study suggests that sense of belonging is an important factor associated with college students' success, and success for first-generation students in particular.

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