How culturally engaging campus environments influence sense of belonging in college: An examination of differences between White students and students of color

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How Culturally Engaging Campus Environments Influence Sense of Belonging in College: An Examination of Differences Between White Students and Students of Color

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Low persistence and degree completion rates continue to plague higher education, and students of color persist at even lower rates than their White peers. Research has linked greater sense of belonging in college to increased intentions to persist to graduation. However, research on how culturally relevant and responsive campus environments facilitate or hinder belonging and subsequent graduation among racially diverse college student populations is sparse. Using linear regression techniques, the authors use survey data from 870 students at an urban public research university to examine the relationship between culturally engaging campus environments and sense of belonging among White students and students of color. Results show that culturally engaging environments explain a significant portion of the variance in the belonging outcome for both White students and students of color. Implications for research and practice are discussed.

Keywords: diversity, culture, race, campus climate, persistence

College success rates continue to be a critical concern for higher education researchers, policymakers, and practitioners. Less than 60% of first-time, full-time 4-year college students earn bachelor’s degree within 6 years of matriculation (National Center for Education Statistics, 2013). Moreover, disaggregated data reveal troubling racial and ethnic disparities. Approximately 62% of White, first-time, full-time, 4-year college students graduate within 6 years, whereas that figure is only 51% for Latina and Latino, 49% for Pacific Islander, 40% for Black, and 40% for American Indian or Alaskan Native students. Although Asian Americans have high 6-year degree completion rates in the aggregate, Southeast Asian Americans (e.g., Cambodian, Hmong, Laotian, Vietnamese) face significant challenges, with many of these populations earning baccalaureate degrees at rates that are less than half of the national average (Museus, 2013). These realities render it essential that postsecondary educators better understand how to foster success among their increasingly diverse student populations.

Existing research has linked students’ sense of belonging to increased intentions to persist toward graduation (Hausmann, Schofield, & Woods, 2007). The current study contributes to this understanding by advancing knowledge about how campus environments shape sense of belonging among White students and students of color in college. In the following section, we review existing empirical evidence on campus
environments and belonging. Then, we discuss our study of the relationship between these key elements of campus environments and sense of belonging among White students and students of color at an urban public research university.

**Campus Environments, Sense of Belonging, and Success**

Over the last two decades, sense of belonging has emerged as a key concept in college student persistence literature. *Sense of belonging* refers to students’ psychological sense of connection to their community (Hurtado & Carter, 1997). This sense of connection to community is important because people typically have a strong desire to belong to communities, and the failure to acquire a sense of belonging can have detrimental effects on their mental health and behavior (Baumeister & Leary, 1995; Hausmann et al., 2007). In 1997, Hurtado and Carter applied the concept of belonging to the study of college students. The authors borrowed the concept of individuals’ perceived sense of cohesion from sociology (Bollen & Hoyle, 1990) to create a sense of belonging scale. Hurtado and Carter (1997) examined the relationship between campus climate and sense of belonging among 287 Latino college students using structural equation modeling techniques. Controlling for gender, academic ability, and institutional selectivity, the authors found that hostile climates were negatively associated with these Latina/o students’ sense of belonging in college.

Since Hurtado and Carter’s study, other researchers have examined both the outcomes and predictors of belonging in college. Regarding the outcomes of belonging, Hausmann et al. (2007) used structural equation modeling techniques to examine a sample of 254 Black and 291 White undergraduate students at a predominantly White institution. Controlling for a range of demographic and college-level variables, the authors found that sense of belonging was a statistically significant positive predictor of intent to persist for both Black and White students. As a result, Hausmann et al. (2007) argued for the incorporation of sense of belonging as an important factor in models of student persistence. These findings underscore the value of understanding how institutions can cultivate greater sense of belonging among their students, thereby facilitating more positive persistence and degree completion outcomes.

Over the last two decades, researchers have also examined the factors that influence students’ sense of belonging in college (e.g., Freeman, Anderman, & Jensen, 2007; Hurtado & Carter, 1997; Locks, Hurtado, Bowman, & Oseguera, 2008; Nuñez, 2009). Both single institution and multi-institution studies offer evidence that environments influence belonging in college. For example, scholars have found that positive campus climates, positive cross-racial relationships, perceived faculty interest in students, and more supportive residence halls are positively associated with greater sense of belonging in college (Johnson et al., 2007; Maestas, Vaquera, & Zehr, 2007; Nuñez, 2009). In one significant contribution to the literature, Nuñez (2009) examined national survey data from a sample of 362 Latina and Latino students using structural equation modeling techniques to understand the predictors of sense of belonging. She found that perceptions of a hostile climate were negatively associated with these students’ sense of belonging in college.

Linking the concepts of culture and sense of belonging, Museus and Maramba (2011) conducted a structural equation modeling analysis of the relationship between culture and belonging among Filipino students at a predominantly White university. They found that pressure for students to sever ties with their ethnic communities and assimilate into the cultures of their campus were negatively associated with adjustment and, in turn, reduced belonging in college. In contrast, students’ continued ties with their cultural heritage was positively associated with adjustment to and belonging in college among students within their sample.

Although the aforementioned studies offer some evidence that more positive environments are associated with greater sense of belonging (Johnson et al., 2007; Maestas et al., 2007; Nuñez, 2009), and indicate that congruence between students’ home and campus cultures are positively related to belonging (Museus & Maramba, 2011), empirical studies that test the relationship between specific characteristics of campus environments and sense of belonging in college are difficult to find. Yet, such research is needed to better understand the kinds of environments that might maximize belonging among students in postsecondary education.
Differences in Environments and Belonging Between White Students and Students of Color

Extant literature also indicates that students from different racial groups experience both campus environments and sense of belonging in disparate ways (Johnson et al., 2007; Lee & Davis, 2000; Museus, Nichols, & Lambert, 2008; Rankin & Reason, 2005). For example, Rankin and Reason (2005) examined racial differences in perceptions of the campus climate among 7,347 students across 10 college campuses and found that, although White students witnessed similar rates of harassment as students of color, the latter group perceived the environment to be less racist and more accepting than their peers of color.

Similarly, Johnson et al. (2007) conducted an analysis of variance and hierarchical multiple regression analysis using a national sample of 2,967 students enrolled at predominantly White institutions to understand the relationship between a range of demographic and college level variables and belonging across racial groups. The authors found that White students reported greater levels of belonging than students of color in their sample. They also found that environmental factors influenced different racial and ethnic groups’ sense of belonging in varied ways. For example, supportive residence halls exhibited more salient influences on belonging for students of color than their White peers. In sum, evidence indicates that differences in how White students and students of color experience campus environments and belonging exist.

Culturally Engaging Campus Environments and Sense of Belonging

Existing research indicates that, although the attributes of students themselves are difficult to change, institutions can intentionally shape learning environments (Tinto, 2006). The culturally engaging campus environments (CECE; pronounced see-see) model of college success delineates the types of campus environments that educators can cultivate to allow diverse populations to thrive (Museus, 2014). The CECE model underscores nine elements of environments that can be categorized into two subcategories: indicators of cultural relevance and cultural responsiveness.

Cultural relevance refers to the degree to which learning environments are relevant to their cultural backgrounds and identities and are characterized by five indicators. First, cultural familiarity is the extent to which college students have opportunities to physically connect with faculty, staff, and peers who understand their backgrounds and experiences. Second, culturally relevant knowledge refers to the degree to which students have opportunities to learn and exchange knowledge about their own cultural communities. Third, cultural community service refers to opportunities for students to give back to and positively transform their communities via activities aimed at spreading awareness, engaging in community activism, participating in service, or engaging in problem-based research to solve problems relevant to their cultural communities. Fourth, meaningful cross-cultural engagement involves students’ level of participation in discussions about solving real social and political problems with peers from diverse backgrounds. Finally, culturally validating environments refers to the extent to which campuses value students’ cultural knowledge, backgrounds, and identities.

The last four indicators focus on cultural responsiveness, or the extent to which campus support systems effectively respond to the needs of culturally diverse student populations. First, collectivist cultural orientations refer to the extent to which campuses are characterized by values of teamwork and mutual success, rather than individualism and competition. Second, humanized educational environments refer to environ in which institutional agents care about, are committed to, and develop meaningful relationships with students. Third, proactive philosophies drive the behavior of institutional agents who go above and beyond making information, opportunities, and support available to ensuring that students have knowledge and access said information, opportunities, and support. Finally, holistic support refers to the extent to which college students have access to at least one faculty and staff member who they trust to provide the information and support that they need, or connect them to that information and support, regardless of the question or problem that they face.
The CECE model is based on a substantial body of qualitative research that suggests that these nine indicators are positively associated with belonging and other outcomes among racially diverse students (e.g., Guiffrida, 2003, 2005; Lee & Davis, 2000; Museus, 2008, 2011; Museus & Neville, 2012; Museus & Quaye, 2009; Tierney, 1999). Currently, only one study has used the CECE model to quantitatively examine the relationship between culturally engaging campus environments and sense of belonging (Museus, Yi, & Saelua, 2017). Museus, Yi, and Saelua used bivariate correlations and hierarchical linear regression techniques to examine a diverse sample of 499 students across three institutions. They found that their model explained 68–69% of the variation in the belonging outcome, all nine CECE indicators were positively correlated with sense of belonging, and five of the nine indicators were statistically significant predictors of belonging when controlling for other predictors in the regression model. Specifically, they found that cultural familiarity, cultural validation, collectivist cultural orientations, proactive philosophies, and holistic support were all positively associated with sense of belonging, while cultural community service exhibited a negative relationship with the belonging outcome. They concluded that the CECE model might be a useful framework for examining the relationship between environments and belonging. Yet, studies that statistically examine the relationship between culturally engaging campus environments and belonging for specific student subpopulations (e.g., White students and students of color) are nonexistent.

Connections Between Environment and Identity

Cultural identity theory can help explain why campus environments that reflect and respond to college students’ cultural backgrounds and identities might play a salient role in positively shaping their belonging in college. Cultural identity theory is a body of knowledge from cross-cultural psychology that elucidates how people develop a sense of belonging to various cultural groups to which they belong (Lustig, 2013). It is based on the notion that people adopt the traditions, values, norms, thinking patterns, and other characteristics of a culture (e.g., their home culture), and these cultural traits become integrated into their self-concepts.

In addition, evidence suggests that, when people migrate from one culture (i.e., to which their identity is attached) to another, they are likely to experience increased levels of alienation (Bhugra, 2004), especially if they are disconnected from the ideals and positively sanctioned ranks of the new cultural group (Lustig, 2013). This alienation can lead to a wide range of negative economic, social, and psychological consequences.

Cultural identity theory is congruent with research on diverse college students. For example, researchers have argued that incongruence between students’ precollege cultures (and therefore cultural identities) and the cultures of their campus is negatively related to their ability to find membership in their campus communities (Kuh & Love, 2000). In addition, qualitative and quantitative studies have provided evidence that, when the cultures of the campus are more congruent with students’ precollege cultures and cultural identities, students will be able to develop a greater sense of belonging within their campus communities (Museus & Maramba, 2011; Museus & Quaye, 2009). Thus, it is reasonable to hypothesize that culturally engaging environments might decrease the cultural distance between diverse students’ cultural identities and their campus cultures, thereby maximizing their sense of belonging in college.

Cultural identity theory might also suggest that White students are less likely to become alienated at predominantly White institutions because their will experience a greater alignment between the cultures within their campus environments and cultural identities. In contrast, students of color at institutions with special missions to serve their communities (e.g., Black students at Historically Black Colleges and Universities or Native American students at Tribal Colleges and Universities) might experience a greater alignment between their precollege cultures and the cultures of their campuses, and therefore might more easily establish a sense of belonging within their campus communities than other racial groups at these institutions.

Cultural identity theory, coupled with the CECE model and the concept of belonging,
provided a useful and holistic conceptual framework for the current examination.

**Purpose of the Study**

One overarching question guided the current investigation: What is the relationship between culturally engaging campus environments and sense of belonging among White students and students of color? Several additional subquestions guided the inquiry: What is the relationship between culturally engaging campus environments and sense of belonging among White students? What is the relationship between culturally engaging campus environments and sense of belonging among students of color? Do differences exist in the association between culturally engaging campus environments and belonging between the two groups?

**Method**

We used survey research methods to conduct the current study at an urban public research university on the East Coast. At the time of data collection, the undergraduate student body at the university was approximately 63% White, 6% Black, 9% Asian American, 9% Hispanic or Latino, 3% multiracial, and 11% unknown and nonresident alien.

**Data Collection**

We initially distributed the CECE 4-year college survey electronically via email to all 13,682 enrolled undergraduates at the university. Follow-up emails were distributed to all students who had not yet taken the survey approximately 1, 2, 3, and 4 weeks after the initial distribution. A total of 1,005 students completed the questionnaire, which was equivalent to a 7% response rate. Although this might be considered a relatively small response rate compared to some studies, it is important to note that researchers have challenged the problematic assumption that small samples cannot generate accurate estimates of population parameters (Groves, 2006; Massey & Tourangeau, 2013). In fact, scholars have analyzed national data and concluded that response rates are not necessarily deterministic of generalizability and, depending on institution size, sample sizes of 25–75 often generate fairly accurate estimates of institutional populations (Fosnacht, Sarraf, Howe, & Peck, 2013; Groves, 2006; Perneger, Chamot, & Bovier, 2005; Pike, 2013). Low response rates are only problematic when there is reason to believe that respondents differ from the target population on key characteristics. A comparison of the undergraduate population and our sample reveal that the racial demographics of the sample generally reflect the characteristics of the target population. The proportion of the sample represented by each racial group was within 4% of their share of the target population, except for Asian American students who were somewhat overrepresented in the sample compared to the larger population (19% to 9%, respectively).

Because of our focus on comparing White students and students of color, participants who chose not to identify with any racial group were removed from the dataset, resulting in a final sample of 870 students. The sample included more women (53%) than men (44%), with 3% identifying as another gender or not responding to this item. White students constituted the largest racial group (59%) in the sample, followed by Asian American (19%), Latino (12%), Black (8%), multiracial (3%), Native American (2%), and Pacific Islander (less than 1%) students. The sample was diverse socioeconomically, with 17% of the sample reporting parents who earn between $0–30,000, 27% of students with parents earning between $30,001–60,000, 24% of students with parents earning $60,001–90,000, and 33% of students with parents earning over $90,000 annually. Participants reported an average age of 22 and average high school grade-point average (GPA) of 3.1–3.5. Respondents had completed, on average, 41–50 credits prior to the spring semester during which they took the survey and were enrolled in an average of 13 credits during this term.

The survey instrument included questions about demographic information (e.g., race, age, sex, parent education, parent income, etc.), academic preparation (i.e., high school grade point average), and status in school (i.e., how many college credits the participant had completed), and 29 survey items that measured the

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1 Percentages may add up to more than 100% because respondents were allowed to select more than one racial category.
nine CECE indicators and the sense of belonging scale.

Variables

Control variables that were entered into the equation included age, gender, parental income, parental education level, academic preparation, college GPA, living situation, enrollment intensity, and status in undergraduate career. Age was a 13-point continuous variable that measures participants’ age at the time of the survey (ranging from age 18–30 and over). Female was also dummy-coded (1 = male, 2 = female). Parent income was a single continuous item that measures the annual family income reported by participants in increments of $10,000 (i.e., from “$0-$10,000” to “Over, $100,000”). Parent education was an 8-point scale measuring the highest level of education completed be either parent or guardian (1 = no high school and 8 = doctoral degree or equivalent). High school GPA was a continuous measure of students’ grade point average in high school. College GPA was a continuous measure of students’ grade point average at the university that participated in the study. Living situation was measured as distance living from campus (1 = on campus, 2 = within walking distance to campus, 3 = farther than walking distance to campus). Enrollment intensity was a continuous variable measuring the number of credits the respondent was taking. The completed credits variable was a continuous measure of how many total college credits respondents had completed before the semester that the survey was taken. Finally, two variables measuring the number of hours worked per week on and off campus, in increments of 5, were included as controls (from 1 = 0 hr to 8 = over 30 hr). 

Table 1 displays the variable definitions, alpha scores, and numerical codes for the key independent variables (i.e., the variables that represent the CECE indicators) and the dependent sense of belonging variable in detail. Each of the nine CECE indicators was measured by between two and six survey items. The outcome was self-reported sense of belonging, measured by three-item scale.

Data Analysis

Missing values analysis indicated that less than 5% of data on variables included in the analysis were missing. Variables associated with parental education (39%) and college GPA (20%) yielded the largest amounts of missing data, and less than 5% of data were missing from all other variables. Analyses of chi-squares and t tests to examine whether missing values were associated with demographic variables (e.g., race, gender, age, parental education) indicate that the data on these variables were missing at random.

We imputed missing values using an expectation maximization (EM) algorithm. EM is an efficient method of dealing with data that are missing at random compared and produces less biased estimates than other methods (e.g., list-wise deletion, pairwise deletion, mean imputation, regression imputation; Schafer & Olsen, 1998). Previous research has demonstrated that the CECE scale has high content and construct validity (Museus, Zhang, & Kim, 2016). Based on this prior analysis, we constructed nine latent factors that were each measured using two and six survey items. We examined the reliability of each of the nine latent constructs. Specifically, we conducted reliability analyses and computed alpha reliability scores for each of the nine factors. The resulting alpha reliability coefficients associated with the nine CECE indicators ranged from .83 to .93 (see Table 1). We also created a single belonging factor, measured by three survey items (α = .93).

Then, we disaggregated the sample into two subgroups: 516 White and 354 non-White students. In the non-White subsample, 46% were Asian American, 21% were Black, 29% were Latino, 8% were multiracial, 6% were Native American, and less than 1% were Pacific Islander. Next, we analyzed the descriptive statistics of the two subgroups. Then, we examined the relationships between the CECE indicators and the sense of belonging outcome for these two subsamples. First, we computed bivariate correlations for the CECE indicators and sense of belonging for White students and students of color. Then, we controlled for background, precollege, and college-level variables and utilized linear regression techniques to evaluate the predictive power of culturally engaging environments on belonging for these two subsamples. It is worth noting that we used hierarchical linear regression techniques by entering the control variables into the regression equation first,
Table 1
Key Variable Names, Alpha Scores, Definitions, and Numerical Codes

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Variable definitions and codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
</tr>
<tr>
<td>Sense of belonging ($\alpha = .93$)</td>
<td>A latent variable that was constructed using three items measuring students’ sense of belonging to their campus cultures, including the following: The extent to which students (a) see themselves as part of the campus community; (b) feel that they belong on campus; and (c) feel a strong sense of connection to the campus community. Each survey item was coded 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree.</td>
</tr>
<tr>
<td><strong>Key independent variables</strong></td>
<td></td>
</tr>
<tr>
<td>Cultural familiarity ($\alpha = .89$)</td>
<td>A latent variable constructed using six indicators of the extent to which students were able to connect with people from similar backgrounds: The extent to which (a) it is easy to find people on campus with similar backgrounds as me; (b) I frequently interact with people from similar backgrounds as me on campus; (c) there is sufficient space for me to connect with people from my community; (d) it is easy to find people on campus who understand me; (e) it is easy to find people on campus who understand my struggles; and (f) people on campus are generally willing to take the time to understand my experiences. Each survey item was coded: 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree.</td>
</tr>
<tr>
<td>Culturally relevant knowledge ($\alpha = .92$)</td>
<td>A latent variable comprised of three indicators that measure the extent to which students had opportunities to learn and exchange knowledge about their own cultural communities: The extent to which (a) there are enough opportunities to learn about the culture of my own community; (2) there are enough opportunities to learn about my own cultural community’s history; and (c) There are enough opportunities to gain knowledge about my own cultural community. Each survey item was coded 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree.</td>
</tr>
<tr>
<td>Cultural community service ($\alpha = .92$)</td>
<td>A latent variable that was constructed using three items measuring the extent to which students had opportunities to give back and positively transform their cultural communities: The extent to which (a) there are enough opportunities to help improve the lives of people in my cultural community; (b) there are enough opportunities to give back to my cultural community; and (c) there are enough opportunities to positively impact my cultural community. Each survey item was coded 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree.</td>
</tr>
<tr>
<td>Cross-cultural engagement ($\alpha = .91$)</td>
<td>A latent variable that was comprised of three survey items that measure the extent to which students had opportunities to engage in meaningful discussions with people from different cultures to solve real social and political problems across: The extent to which (a) there are enough opportunities to discuss important social issues with people from different cultural backgrounds; (b) there are enough opportunities to discuss important political issues with people from different cultural backgrounds; and (c) there are enough opportunities to discuss important diversity-related issues on campus. Each survey item was coded 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree.</td>
</tr>
<tr>
<td>Cultural validation ($\alpha = .91$)</td>
<td>A latent variable that was constructed using three indicators measuring the extent to which students feel like they are valued by the campus community: The extent to which (a) people on campus value knowledge from my cultural community; (b) my cultural community is valued on campus; and (c) people on campus value the experiences of people in my cultural community. Each survey item was coded 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree.</td>
</tr>
</tbody>
</table>

*(table continues)*
and then adding the CECE indicators into the equation and rerunning the analysis. This process allowed us to determine how much of the variance in the sense of belonging outcome was attributable to the CECE indicators specifically through the $R^2$ change that resulted from the addition of the indicators.

**Limitations**

Before proceeding with the overview of the results of the current analysis, we note at least three limitations of our study. First, our sample included 870 students at a single institution, and findings should not be generalized beyond this campus. Second, some groups (e.g., multiracial, Native American, and Pacific Islander students) were not sufficiently represented in our sample to analyze each racial group of color separately. Nevertheless, we deemed the current analysis worthwhile given that previous research has demonstrated that examination of differences between White and non-White students can yield valuable insight into how these two groups experience educational institutions in disparate ways (e.g., Locks et al., 2008; Rankin & Reason, 2005). Finally, our data did not include information that allowed us to include and examine some additional contextual variables, such as predisposition to achieve a sense of belonging in college, that might moderate college students’ access to culturally engaging environments or the ways in which they experience them.

**Results**

In this section, we present the results of our analysis. First, we discuss the bivariate correlations for the two subsamples. Then, we provide an overview of the results that
emerged from our regression analysis of the two subgroups.

**Descriptive Statistics**

Means and standard deviations for the two sub-samples are displayed in Table 2. These descriptive statistics show that the most appreciable differences across groups were in reported parental income and education, with parents of participants of color making approximately $20,000 less and exhibiting lower levels of educational attainment on average than parents of their White peers. White students had slightly higher mean high school and college GPAs, reported number of credits being taken in the current semester, and hours worked off campus. On average, students of color were marginally more likely to identify as a woman, have more completed credits, and have more hours worked on campus than White students, and participants of color were slightly older and lived father from campus compared to their White peers.

White participants reported higher scores on eight of the nine CECE indicators. The largest differences were related to cultural community service, with White students (4.64) exhibiting greater access to opportunities to give back to their communities than students of color (3.00). The second largest difference was related to cultural familiarity, with White students (3.72) being more likely to report finding it easy to connect with people who are from similar backgrounds and understand them than students of color (3.48). White students (4.17) were also more likely to view the campus community as collectivist than students of color (4.01). In addition, White students exhibited higher mean scores on the culturally relevant knowledge, cross-cultural engagement, cultural validation, humanized educational environments, and holistic support scales, but these differences were relatively small (.10 or smaller) in magnitude. The mean sense of belonging score was also slightly higher for students in the White sample (3.17) than for students of color (3.12) as well. These differences in experiences with the environment and belonging are congruent with our expectations, given that the institution that served as the site for this study is relatively racially diverse (e.g., with over one third of the undergraduate student body being comprised of people of color) but still predominantly White.

<table>
<thead>
<tr>
<th>Variable</th>
<th>White students</th>
<th>Students of color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>4.63</td>
<td>5.10</td>
</tr>
<tr>
<td>Gender</td>
<td>1.55</td>
<td>1.57</td>
</tr>
<tr>
<td>Parental annual income</td>
<td>8.02</td>
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</tr>
<tr>
<td>Parental education</td>
<td>5.23</td>
<td>4.12</td>
</tr>
<tr>
<td>High school GPA</td>
<td>7.06</td>
<td>6.91</td>
</tr>
<tr>
<td>College GPA</td>
<td>7.93</td>
<td>7.75</td>
</tr>
<tr>
<td>Living situation</td>
<td>1.87</td>
<td>1.97</td>
</tr>
<tr>
<td>Enrollment intensity</td>
<td>14.35</td>
<td>14.19</td>
</tr>
<tr>
<td>Completed credits</td>
<td>5.62</td>
<td>6.34</td>
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<tr>
<td>Work hours (on campus)</td>
<td>2.29</td>
<td>2.41</td>
</tr>
<tr>
<td>Work hours (off campus)</td>
<td>3.42</td>
<td>3.31</td>
</tr>
<tr>
<td>Cultural familiarity</td>
<td>3.72</td>
<td>3.48</td>
</tr>
<tr>
<td>Culturally relevant knowledge</td>
<td>3.26</td>
<td>3.20</td>
</tr>
<tr>
<td>Cultural community service</td>
<td>4.64</td>
<td>3.00</td>
</tr>
<tr>
<td>Cross-cultural engagement</td>
<td>3.56</td>
<td>3.51</td>
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<td>Cultural validation</td>
<td>3.38</td>
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<td>Collectivist cultural orientations</td>
<td>4.17</td>
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<td>Humanized educational environments</td>
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<td>3.99</td>
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<td>Proactive philosophies</td>
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<td>3.91</td>
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<tr>
<td>Holistic support</td>
<td>3.47</td>
<td>3.38</td>
</tr>
<tr>
<td>Sense of belonging</td>
<td>3.17</td>
<td>3.12</td>
</tr>
</tbody>
</table>

*Note.* GPA = grade-point average.
(63%). In contrast, institutions that are relatively racially homogenous might witness more substantial differences in how students experience the environment and belonging across racial groups.

**Bivariate Correlations**

Tables 3–4 include the bivariate correlation coefficients for White students and students of color, respectively. Bivariate correlation coefficients are measured on a scale from 0–1 and indicate the strength of the relationship between the two variables (i.e., association between each CECE indicator and sense of belonging). The tables also include indications of whether each coefficient is statistically significant and the corresponding significance level. The correlation statistics indicate that all nine CECE variables are positively correlated with sense of belonging across both samples, and these relationships are all significant at the .001 level. However, the salience of these relationships varied between the two samples. Among White students, cultural familiarity ($r = .67$) was most strongly correlated with sense of belonging, followed by holistic support ($r = .61$), collectivist cultural orientations ($r = .60$), cultural validation ($r = .56$), cultural community service ($r = .50$), culturally relevant knowledge ($r = .47$), cross-cultural engagement ($r = .45$), humanized educational environments ($r = .45$), and proactive philosophies ($r = .45$; see Table 3). In contrast, for students of color, holistic support ($r = .59$) was most strongly correlated with sense of belonging, followed by cultural familiarity ($r = .58$), collectivist cultural orientations ($r = .57$), cultural validation ($r = .47$), cross-cultural engagement ($r = .46$), proactive philosophies ($r = .44$), humanized educational environments ($r = .43$), and culturally relevant knowledge ($r = .42$), and cultural community service ($r = .42$; see Table 4).

### Regression Analysis

The results of the regression analyses are shown in Table 5. For the White student model, the $R^2$ was .61 and the adjusted $R^2$ was .60, indicating that the model explained approximately 60–61% of the variation in sense of belonging for White students (see Table 5). The $R^2$ change statistic indicates that the CECE indicators alone accounted for approximately 51% of the variance in belonging for the White sample. For the students of color model, the $R^2$ was .53 and the adjusted $R^2$ was .51, indicating that the regression model explained approximately 51–53% of the variation in sense of belonging for student of color in the sample. The $R^2$ change statistic suggests that the CECE indicators accounted for approximately 50–51% of the variance in belonging for students of color. In sum, the model explained a substantial

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<td>3. Culturally relevant knowledge</td>
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<td>4. Cultural community service</td>
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<td>5. Cross-cultural engagement</td>
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<td>7. Collectivist cultural orientations</td>
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<td>9. Proactive philosophies</td>
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<td>10. Holistic support</td>
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* indicates statistical significance at the .05 level. ** indicates statistical significance at the .01 level. *** indicates statistical significance at the .001 level.
portion of the variance in the belonging outcome, and the CECE indicators explained the vast majority of this variance in the sense of belonging outcome for both White students and participants of color in our study.

Table 5 also displays the standardized regression coefficients (i.e., beta weights), standard errors, and corresponding $p$ values. The standardized coefficients represent the standard deviation change in the dependent variable for each standard deviation change in the independent variable, holding all other predictor variables in the regression equation constant. And, $p$ values that are below .05 suggest statistical significance. Herein, we focus on the results of the regression model for the two disaggregated subsamples.

For the White student sample, regression statistics for the model show that, controlling for other factors, living farther away from campus ($\beta = -.16$) was negatively associated with sense of belonging for White students, and the relationship was statistically significant at the .001 level. In the students of color sample, controlling for other factors in the final model, the regression statistics indicate that off campus work hours ($\beta = -.10$) was negatively associated with sense of belonging for students of color at the .05 level. None of the remaining control variables were statistically significant for either sample that we analyzed.

With regard to the CECE predictors, for the White sample, four of the nine indicators exhibited positive statistically significant relationships with sense of belonging. Holistic support ($\beta = .29, p < .001$) exhibited the strongest positive relationship with belonging, followed by cultural familiarity ($\beta = .26, p < .001$), collectivist cultural orientations ($\beta = .21, p < .001$), and cultural validation ($\beta = .10, p < .05$). Regression coefficients associated with culturally relevant knowledge, cultural community service, cross-cultural engagement, humanized educational environments, and proactive philosophies were all insignificant at the .05 level.

For the students of color sample, three of the nine indicators exhibited positive and statistically significant relationships with sense of belonging (see Table 5). Holistic support exhibited the strongest positive relationship with sense of belonging ($\beta = .32, p < .001$), followed by cultural familiarity ($\beta = .29, p < .001$) and collectivist cultural orientations ($\beta = .27, p < .001$). The regression coefficients associated with the culturally relevant knowledge, cultural community service, cross-cultural engagement, cultural validation, humanized educational environments, and proactive philosophies indicators were all insignificant at the .05 level.

**Post-Hoc Analysis**

In the preceding analysis, the bivariate relationships between all 9 CECE indicators and sense of belonging were positive and statisti-
cally significant, but several of the indicators became unrelated to belonging when incorporated into the regression equation. These findings suggest that there might be shared variance between some of the CECE indicators that is not explained by the regression. To examine these relationships further, we conducted a post hoc analysis. Specifically, we removed a single CECE indicator from the regression equation and reran the model. Then, we replaced the missing variable, removed another indicator, and reran the analysis again. We repeated this process for each indicator in the model.

The post hoc analysis produced a few noteworthy observations. First, when we removed cultural familiarity from the model, cultural validation became statistically significant at the .001 level for White ($\beta = .17$) participants. When we removed collectivist cultural orientations from the model, cultural validation became statistically significant at the .01 level for White students ($\beta = .21$). Finally, when we removed holistic support from the regression model, and proactive philosophies became statistically significant for both White students ($\beta = .09, p < .001$) and students of color ($\beta = .13, p < .01$). All alternative models that we ran produced only slight reductions (e.g., less than a .05 change) in the $R^2$ and adjusted $R^2$ statistics.

The findings might indicate that cultural familiarity and collectivist cultural orientations are associated with greater sense of belonging in college partly because of the ways in which they function to validate students’ cultural identities. Statistically speaking, it is possible that cultural validation mediates the relationships between these indicators (collectivist orientations cultural familiarity) and belonging. Similarly, the post hoc analysis might suggest that institutional agents who provide holistic support positively impact students’ sense of belonging partially because they provide students with proactive support. In statistical terms, it is possible that proactive philosophies mediate the relationship between holistic support and sense of belonging in college. Future studies can use techniques—such as structural equation modeling—that allow researchers to examine more
complex (e.g., mediating) relationships among predictor variables to help better understand these relationships.

Given the strong correlations among the CECE indicators and the results of our post hoc analysis, it is important to note that the collinearity diagnostics indicated that multicollinearity was not a problem. All tolerance statistics were .40 or above and all VIF statistics were between 1.0–2.6, indicating that high levels of multicollinearity were not present in the data.

Discussion

At least three major conclusions can be drawn from the current study. First, this investigation provides some evidence that the CECE model may be a useful conceptual lens for studying the impact of campus environments on the outcomes of both White students and students of color. Previous research has empirically established a relationship between more positive campus environments and greater belonging in college (Johnson et al., 2007; Maejstas et al., 2007; Nuñez, 2009). Researchers have also provided evidence that congruence between students' precollege and campus cultures can be related to greater belonging (Museus & Maramba, 2011), and that culturally engaging campus environments specifically are associated with more positive sense of belonging among students in general (Museus, Yi, & Saelua, 2017). To date, however, quantitative analyses of the relationships between culturally engaging campus environments and belonging among different racial groups are nonexistent. The current study offers such an analysis to expand on existing knowledge. The CECE indicators explained a significant portion of variance in the sense of belonging outcome for both White students and students of color, suggesting a strong relationship between the CECE indicators and belonging for both groups.

Second, the current findings suggest that there might be more similarities than differences in the ways that White students and students of color experience culturally engaging campus environments. Existing scholarship indicates that there are significant differences in the ways in which White students and students of color experience their campus environments and belonging in college (Johnson et al., 2007; Lee & Davis, 2000; Museus et al., 2008; Rankin & Reason, 2005). Previous studies, however, have not examined racial differences in how students experience culturally engaging campus environments. Our findings show that White students at our participating institution, which is relatively diverse, report more positive experiences with the environment and belonging in college. However, our results indicate that culturally engaging campus environments are salient predictors of belonging for both White students and students of color. In addition, three CECE indicators were positively associated with belonging for both White students and students of color in the sample. These results suggest that access to environments characterized by cultural familiarity, collectivist cultural orientations, and holistic support might be especially important in providing the conditions to maximize belonging among students in college regardless of racial background.

Third, although similarities across subsamples were more pronounced than differences, one discrepancy between racial subgroups was the varied relationship between cultural validation and sense of belonging between the groups. Cultural validation was not related to sense of belonging for students of color but was positively associated with belonging for White students at the .05 level. However, when we deleted cultural familiarity from the regression equation and reran the analysis, cultural validation became statistically significant at .001 for both students of color and White students. This might be an indication that the importance of cultural familiarity is that it provides students—especially students of color—with validation that people from their communities and backgrounds are valued by their respective campuses.

Finally, because the ways in which culture influences the experiences of White students is rarely discussed, it is important to consider what the CECE model might mean for this population. It might be argued that culture is more salient for minoritized populations who often must navigate dominant cultures that are incongruent with their precollege cultures and cultural identities. In addition, both cultural identity theory and existing higher education research suggest that these students might be more likely to become alienated at predominantly White institutions (Kuh & Love, 2000;
Lustig, 2013; Museus & Quaye, 2009). At the same time, cultural identity might become more salient for White students as the representation of students of color increases because they could be more likely to experience greater incongruence between the cultures of their campus and their precollege cultures and cultures of origin. Future studies that examine how the salience of CECE indicators might vary for White students across different institutional contexts could help shed light on such hypotheses.

In addition, the term culture can be interpreted and understood in many different ways. College students who fill out the CECE 4-year college survey are asked about how their campuses reflect and respond to their cultural communities, and researchers have found that White students identify with a wide range of cultural communities that are salient to them (Museus & Chang, in press). For example, although some White students might most saliently identify with low-income or middle-class White communities, sometimes they identify most significantly with their church communities, queer communities, athletic communities, military communities, communities in their academic majors, the neighborhood where they grew up or live, and other communities to which they are connected. Given the diverse types of cultural communities that are most salient to students, it is important for campuses seeking to maximize belonging among diverse populations to consider which communities are most salient to their students and then determine how they are ensuring that their campus environments engage these cultural identities meaningfully. The findings also provide some initial evidence that cultural inclusivity can be understood as important for all college students and should therefore be a critical element of discussions about cultivating conditions for all students to thrive in college.

Implications for Research and Practice

This study has several important implications for future research and practice. First, regarding future scholarship, research on the relationship between culturally engaging campus environments and sense of belonging should be conducted with larger sample sizes that permit parallel analyses across specific racial groups of color (e.g., across Asian American, Black, Latino/a, Native American, and Pacific Islander populations). Although the current study sheds important light on similarities and differences between White students and students of color, it is possible that the relationship between culturally engaging campus environments and belonging differs across groups of color. Therefore, such analyses are warranted.

Second, we echo earlier calls to generate research on the impact of culturally engaging campus environments on college students’ sense of belonging within different types of institutions (e.g., larger and small, public and private, 4-year and 2-year, and predominantly White and minority serving institutions; Museus, Yi, & Saelua, 2017). These inquiries can produce insight into whether, and the extent to which, the influence of culturally engaging campus environments on sense of belonging varies across institutional contexts (e.g., whether the salience of culturally engaging campus environments varies between predominantly White and minority serving institutions) and their effects on students from different racial groups. It is also important for future empirical inquiries to illuminate how important contextual variables (e.g., living conditions, employment situations, field of study, etc.) might moderate the ways in which college students experience culturally engaging environments and how these types of environments impact outcomes, such as belonging, in college.

Third, the findings in this study provide preliminary indications of the relevance of culturally engaging campus environments not just for students of color but also White students. Although extant literature that discusses the importance of culture in college students’ experiences and outcomes generally focuses on students of color (e.g., Kuh & Love, 2000; Museus & Quaye, 2009; Museus & Maramba, 2011), the current investigation provides some indication that culturally relevant and culturally responsive campus environments might also positively shape the experiences of White students. Given the current heightened racial and political tensions on college campuses in recent years, it may be pertinent to continue exploring aspects of culture and its relationship to White students’ experiences on college campuses. Doing so might lead to new conversations about
the importance of focusing on cultural inclusion for all students.

Our post hoc analysis suggests that complex relationships might exist among aspects of culturally engaging campus environments. Future studies can advance knowledge of campus environments and belonging by utilizing techniques (e.g., structural equation modeling) that allow for the in-depth examination of such relationships. Such examinations might shed light on whether, and to what degree, some indicators of culturally engaging campus environments exhibit indirect effects on belonging through other indicators in the CECE model.

With regard to implications for practice, this study suggests that the CECE model and cultural identity theory might be useful tools for educators aiming to create environments that meet the needs of their racially diverse populations. Educators can use the CECE model to structure spaces, curricula, policies, programs, initiatives, and events that are relevant and responsive to the identities of all students regardless of their racial backgrounds, and cultural identity theory can be used to explain why such efforts are valuable. The CECE model and Survey can also be utilized to conduct assessments of programs and practices, which can aid educators in better understanding their existing campus environments and better equip them with valuable information to understand how campus environments impact their students’ success. The use of such information and data-driven decision-making are critical elements of efforts to create environments in which all students can thrive.

Specifically, the findings suggest that college educators should prioritize providing students with culturally familiar spaces, or spaces to connect with people who share their backgrounds and understand them. Ethnic studies programs, offices of diversity and inclusion, multicultural centers, and cultural centers often play a critical role in creating such spaces for students, and all institutions should establish and support the development of such programs and offices. Ethnic student organizations also create these types of spaces for students on campuses across the nation, and it is critical that educators support the designation and growth of such units on their campuses. Faculty and staff can also host speaker series, workshops, and conferences that are focused on topics tailored to the diverse communities from which they come.

Postsecondary institutions must also convey clear messages that validate students and affirm that their cultural communities are valued by their institutions. For example, campus leaders can make efforts to integrate issues that are relevant to the communities from which students come into their campus speeches and statements. When leaders take such opportunities to acknowledge the relevance of various cultural communities, they can send salient signals to those communities that they are indispensable to the campus. College faculty can integrate field trips that allow students to learn from and with members of their cultural communities into their coursework while multicultural and student affairs officers can foster dialogue about issues that are relevant to their students’ diverse communities so that these populations are more centered in the intellectual discussions that take place in curricular and cocurricular spaces on campus.

The findings suggest that it is critical for college educators to promote collectivist cultures on campus. Faculty members should create collectivist classroom cultures that focus on mutual success by clarifying these values at the beginning of the course, periodically reinforcing them, and intentionally integrating group projects and study groups into their curriculum. In addition, where possible, multicultural and student affairs professionals should structure cocurricular opportunities around the formation and development of teams that can focus on examining, understanding, and addressing shared problems to achieve common goals.

Finally, the findings indicate that college educators serving diverse undergraduates should make efforts to provide holistic support and serve as their conduit to broader campus support networks. Assuming such responsibility does not require faculty and staff to solve all their students’ problems or answer all their students’ questions. Rather, effectively providing holistic support requires educators to develop an awareness of various resources across their campuses, take the time to understand the complex challenges that students might face, and connect these students with the supports that they need.

Despite the significant resources that have been invested in efforts to foster success among diverse college students in recent decades, over-
all graduation rates remain low and racial disparities in educational attainment linger (National Center for Education Statistics, 2013). Higher education scholars have argued that the persistence of these racial inequalities is partially a result of higher education focusing its diversity efforts on creating temporary boutique programs that serve limited numbers of diverse students, rather than transforming the larger systems that create these disparities. Moving forward, it is critical that higher education researchers, policymakers, and practitioners shift their focus to transforming the larger campus environments of postsecondary institutions to optimally serve all students regardless of their racial backgrounds. Doing so is necessary to achieve long-lasting change and racially equitable outcomes.

References


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