COLLEGE STUDENTS' SENSE OF BELONGING:
DIMENSIONS AND CORRELATES

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Dabney Ingram
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I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

Deborah Jane Stipek, Primary Adviser

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

Anthony Antonio

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

Kenji Hakuta

Approved for the Stanford University Committee on Graduate Studies.

Patricia J. Gumport, Vice Provost Graduate Education

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Abstract

Colleges and universities often have significantly different graduation rates based on students' ethnicity. Systematic variation in students' sense of belonging at college may be a factor. Existing literature suggests that a better understanding of student belonging at the college level can help to improve college outcomes, particularly for racial/ethnic minorities who are often underrepresented on college campuses and may benefit from well-designed systems of support to bolster their sense of belonging. This study was designed to improve our understanding of student belonging, its components, and its correlates for a diverse group of college students.

Self-reported survey data were collected from 159 college sophomores (about a quarter of the class) from one small private and predominantly white college with graduation rates that varied by student ethnicity. Factor analysis produced three reliable and independent measures of belonging: social belonging, academic belonging, and perceived institutional support. Further investigation of this sample indicated that the general measures of college students' 'sense of belonging' found in the literature are mainly social in nature and therefore mask more nuanced associations with important variables that are revealed with separate measurement of academic belonging and perceived institutional support.

Results from a set of multivariate stepwise regression analyses suggested that student demographics (ethnicity, parent education, and gender) jointly did not explain a significant amount of variance in any measure of student belonging. Rather, institutional and interpersonal variables (e.g., students' perception of the college's commitment to diversity, students' perception of the personal relevance of the curriculum) jointly explained a significant amount of variance in all three measures of belonging, suggesting that the strongest predictors of student belonging were not fixed student attributes but other variables that can be influenced to various extents by college policies and practices.

Additional results indicated that social belonging and academic belonging were significantly and differentially associated with students' self-reported GPA, level of satisfaction with the institution, level of class participation, and frequency of meetings

with professors outside of class time. The findings suggest that while social belonging has important associations with measures of academic performance and outcomes, academic belonging is also important and distinct.

Differentiating the measurement of 'sense of belonging' into three components may be useful both for research and for guiding institutional policies and practices. It allows us to identify more precisely what facet of belonging is being measured, and how each is differentially associated with 'college experience' variables and educational outputs of interest.

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Too many students—*far* too many students—who start college never finish college. The raw numbers are staggering: every year, more than one million first-time, full-time, degree-seeking students begin their undergraduate careers at four-year colleges and universities with every hope and expectation of earning a bachelor's degree. Of those students, fewer than four in 10 will actually meet that goal within four years; barely six in 10 will make it out in six years. Hundreds of thousands of students, year after year, don't get the degree they want, work for, pay for, and truly need. These numbers represent lost opportunity on a massive scale. And the worst thing about them is that it's the same low-income and minority students who are finally able to enroll in college who are also the least likely to actually graduate. (Carey, 2005a, p. 2)

Chapter 1

Introduction, Literature Review, and Goals of the Present Study

Introduction

Although it is well documented that completing college and obtaining a bachelor's degree result in higher earnings and greater access to social capital (Carey, 2005a; Karabel, 2005; Walpole, 2007), it is also known that for some students there are many obstacles to completion, including financial constraints, academic difficulties, personal/family issues, and social-psychological challenges. One reported obstacle is discomfort with campus life and a lack of connectedness to or 'sense of belonging' at college. Existing research suggests that students' sense of belonging at college is a vital foundation for student engagement, academic achievement, persistence, and ultimately, graduation.

Few previous studies have closely examined how and under what circumstances different types of college students develop a sense of connectedness and belonging to a college campus. This study is designed to shed light on what factors are associated with college students' sense of belonging, particularly for black, Latino, and Native American students, who are often less likely to graduate from a four-year college or university than white or Asian students (Bowen & Bok, 1998; Carey, 2005a; Walpole, 2007). Hurtado and Carter (1997) write that we need to better understand "the achievement and persistence of students who have historically been excluded from education and are now part of the emerging racially and ethnically diverse groups in colleges and universities" (p. 324). They further comment that more

concrete understanding and data-based evidence of associations between student belonging and educational outputs (e.g., GPA, retention rates) is needed to expand a mostly suggestive literature. No empirical studies of college student belonging that were reviewed have comprehensively explored *both* the factors that predict belonging and the educational outputs that are associated with belonging.

To contribute to knowledge about factors affecting traditionally underrepresented minorities' achievement and persistence in college, this exploratory study has four core purposes:

1. To develop an empirically-based multidimensional conceptualization and measure of 'sense of belonging' that applies to the diverse needs and experiences of college students.
2. To determine to what extent student demographic variables (e.g., ethnicity, family income, parent education) are associated with students' sense of belonging.
3. To shed light on what interpersonal and institutional factors may help support college students' sense of belonging.
4. To explore to what extent student belonging is associated with measurable and student-anticipated educational outputs.

As colleges become increasingly diverse, it is prudent to better understand student belonging, and how different students develop (or struggle to develop) a sense of connectedness to their college community, which in turn may influence their engagement, achievement, persistence, and graduation. Several extant studies bear on the purposes of the current analysis.

Theoretical Background: The Importance of Belonging

Some theorists argue that a sense of belonging is a basic human need that facilitates and promotes favorable mental and physical outcomes. Maslow's (1954) psychological hierarchy places the need for belonging below basic needs like food and safety but above the needs for knowledge, understanding, and esteem. Baumeister and Leary (1995) later reconfirm through their extensive review of literature that "existing

evidence supports the hypothesis that the need to belong is a powerful, fundamental, and extremely pervasive motivation" (p. 497) and "the human being is naturally driven toward establishing and sustaining belongingness (p. 499)." Self-determination theory likewise views the need for relatedness as one of three fundamental psychological needs (Connell & Wellborn, 1991; Deci & Ryan, 1991). More recently, Ostrove and Long (2007) echo, "The importance of a sense of belonging for both psychological and physical well-being has been well established" (p. 363).

Students' sense of belonging has been measured and studied extensively in the context of education, predominantly in secondary schools. Findings in secondary school research suggest that school belonging is important for motivational, behavioral, and performance outcomes (Faircloth & Hamm, 2005; Goodenow, 1993, 1993a; Osterman, 2000; Roeser, Midgely, & Urdan, 1996; Smerdon, 2002).

Students' sense of belonging has more recently been examined in the context of higher education, guided primarily by Tinto's theory of student departure (1993), which identifies several critical variables, including students' social and academic integration. Hurtado and Carter (1997) and Velásquez (1999) suggest that students' *subjective* sense of belonging in college, particularly among those in the ethnic minority on college campuses, is not sufficiently addressed by Tinto's model and is needed to fully understand student retention. Research that measures students' psychological sense of belonging expands research using behavioral measures based on Tinto's theory of student departure. The present study seeks to extend our understanding of belonging, its components, and its correlates for a diverse group of college students. A focus on 'sense of belonging' can contribute to an understanding of how students make meaning of their experiences at college, and how those subjective perspectives may vary by student groups.

Research in higher education indicates that a sense of belonging plays a role in academic and social outcomes (Hausmann, Schofield, & Woods, 2007; Ostrove & Long, 2007; Walton & Cohen, 2007). Several researchers conducting studies at the post-secondary level have focused on understanding factors that affect the sense of

belonging of students in the ethnic minority on college campuses (Hurtado & Carter, 1997; Hurtado & Ponjuan, Lee & Davis, 2000; Walton & Cohen, 2007).

Given that colleges and universities serving similar types of students have very different graduation rates (www.collegeresults.org), there is an incentive to better understand the factors that could positively support academic and social success. Based on interviews with administrators at colleges with particularly high graduation rates compared to their peer institutions, Carey (2005) found that one of the three key predictors of an institution's success in retaining and graduating students was, "whether institutions focus on getting their students engaged and connected to the campus" (p. 2). He concludes from the interview study that, "The more students are connected, the less likely they are to disconnect" (p. 3). Other scholars agree that having a sense of belonging at college is associated with key educational outputs like GPA and quality of college experience (Ostrove & Long, 2007; Walton & Cohen, 2007). More outcomes of student belonging at college are reviewed below.

In sum, psychological theorists posit that having a sense of belonging is a basic human need that, if supported at the college level, could help increase retention and graduation. The following section outlines how prior research has defined and studied sense of belonging in the college context, as well as related empirical findings.

Literature Review

The following review of literature describes published definitions and measures of sense of belonging in higher education, summarizes research findings on how levels of belonging vary by individual student demographic characteristics, and reviews the predictors and educational outputs that previous research found to be associated with student belonging. While numerous studies have examined constructs broadly similar to sense of belonging (e.g., research related to Tinto's (1993) model of social and academic integration), this review focuses specifically on studies that directly measure 'sense of belonging.'

Most of the college-level empirical studies reviewed use a similar methodology. They examine contemporaneous correlations, predominantly between possible predictors and belonging, and occasionally between belonging and possible

consequences. A few studies are longitudinal with data collected twice, roughly one year apart. About half the studies found in the higher education literature rely on secondary data collected from large-scale datasets, and the other half reported new data from one or two institutions of higher education. Only one relevant study (Walton & Cohen, 2007) used an experimental design.

Defining and Measuring Student Belonging in the College Context

A review of the educational literature on sense of belonging highlights a range of definitions and measures. Widely agreed to be important, the construct of belonging is dynamic and multi-faceted. In most psychological studies 'belonging' in educational settings is conceptualized as an individual's subjective/internal perception of his/her connectedness to an institution and its social and environmental contexts; an individual feels some level of belonging in response to social interactions and environmental features. As a result, sense of belonging is highly contextualized. Furthermore, there are individual and cultural variations in how people perceive external cues and how they express and satisfy the need to belong (Baumeister & Leary, 1995).

Applying the study of belonging to the college context is complicated because college campuses have multiple contexts; for instance, social contexts with friends, academic contexts in classrooms and with professors, and institutional contexts such as student support services and curricular offerings. Hurtado, Milem, Clayton-Pedersen, and Allen (1998) note that college campuses "are complex social systems defined by the relationships between the people, bureaucratic procedures, structural arrangements, institutional goals and values, traditions, and larger socio-historical environments," (p. 10). The college environment has many sub-contexts and is also shaped by larger socio-historical forces, suggesting that a multi-faceted approach to the study of belonging in college would be appropriate.

Despite the multi-faceted nature of the college experience, most extant studies of belonging in higher education define the construct in broad terms without differentiating whether it concerns institutional, social, or academic contexts. For example, Hurtado and Carter (1997) define 'sense of belonging to campus' as "the

individual's view of whether he or she feels included in the college community" (p. 327). Maestas, Vaquera, and Zehr (2007) define sense of belonging as "students' subjective feelings of connectedness or cohesion to the institution" (p. 239), and Hoffman, Richmond, Morrow, and Salomone (2003) write, "Sense of belonging is theorized to reflect students' integration into the college system" (p. 1). These existing definitions fail to address a number of issues; for example, does feeling "included in the college community" refer to the people within the college environment or the institution? Does "integration into the college system" imply social, academic or institutional integration? A more nuanced and multifaceted definition and corresponding measures is needed to better understand factors that affect belonging and 'outcomes' of student belonging. A more differentiated approach to studying belonging may be especially useful to practitioners.

Some researchers focus on only one dimension of belonging in college: social belonging. In their study of Latinos across nine public universities, Hurtado and Ponjuan (2005) defined belonging as "students' feelings of social cohesion and group membership" (p. 239). While more specific in their definition of belonging, Hurtado and Ponjuan perhaps miss out on other dimensions of belonging that may be equally important to understand in relation to understanding student success in college.

Corresponding to these undifferentiated definitions of belonging, researchers typically use broad and nonspecific measures to assess belonging. Many use one to five survey items to measure what is termed, for the purposes of this study, 'general belonging,' such as: "I feel a sense of belonging at this college" (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005; Johnson, Alvarez, Longerbeam, Soldner, Inkelas, Leonard, & Rowan-Kenyon, 2007; Maestas et al., 2007; Ostrove & Long, 2007); "I feel like a member of this college community" (Hurtado & Carter, 1997; Johnson et al., 2007; Maestas et al., 2007); "I feel like I fit in at this college"; "I see myself as part of this college community" (Hurtado & Carter, 1997; Maestas et al., 2007; Ostrove & Long, 2007); "I feel comfortable at college"; and "College is supportive of me" (Johnson et al., 2007).

Other researchers include additional survey items that enlarge the boundaries of what comprises a general sense of belonging to include constructs like satisfaction with the institution (Johnson et al., 2007), pride in belonging to the university (Freeman, Anderman, & Jensen, 2007), and enthusiasm about the college and willingness to recommend it to others (Hurtado & Ponjuan, 2005). Hoffman et al. (2003) developed a measure of belonging that included five factors: perceived peer support, perceived faculty support/comfort, perceived classroom comfort, perceived isolation, and empathetic understanding. In other related research, belonging measures were given different labels, further demonstrating the lack of consistency of measures and terms across the literature—e.g., the 'sense of academic fit' measure used by Walton and Cohen (2007) includes items that are similar to items found in measures of general belonging but also incorporates constructs like enjoyment of academic work or potential to succeed at college. Although these aspects of the college experience measured in various studies may be correlated to a sense of belonging, the multitude of labels and facets included or excluded in measures make it difficult to compare findings across studies and build a knowledge base that is specific to feelings of belonging.

There is value in differentiating belonging from other aspects of students' psychological experience, and in identifying different facets of college belonging that can be measured meaningfully and reliably. This study proposes examining three facets or 'components' of student belonging—a sense of social belonging, a sense of academic belonging, and perceived institutional support (with the first two encompassing psychological measures of social and academic belonging, and the third reflecting students' perceptions of signals of institutional commitment to their success and belonging). If these three component parts of a sense of belonging are distinguishable and affected by different policies and practices, practitioners could tailor efforts to improve specific aspects of students' sense of belonging.

More nuanced conceptualizations of belonging drawn from the K-12 literature (rarely cited in the higher education literature) may help inform efforts to differentiate institutional, social and academic components of college belonging. For example, in

the K-12 research, scholars have pointed out that belonging constitutes a combination of social factors and contextual or institutional factors, which include academic factors. As author of the highly cited Psychological Sense of School Membership (PSSM) scale used in secondary schools to assess student belonging, Goodenow (1993) defines classroom belonging as "students' sense of being accepted, valued, included, and encouraged by others (teachers and peers) in the academic classroom setting and of feeling oneself to be an important part of the life and activity of the class." In parallel, a report summarizing existing secondary school research concludes, "a sense of belonging involves an identification with the values and goals of schooling as well as a feeling of connectedness to others in the school, both students and teachers. Thus students whose values and culture conflict with those of the institution, or who see schoolwork as meaningless, may also feel that they don't belong" (NRC, 2004, p. 43). Connell and Wellborn (1991) define the need for social belonging (or 'relatedness,' as they call it) as "the need to feel securely connected to the social surround and the need to experience oneself as worthy and capable of love and respect" (p. 51-2). Similarly, Smerdon (2002) more narrowly defines school belonging as "how students make meaning of their relationships with other school members—how they perceive, interpret, and react to them" (p. 289). She asks: do students feel that their teachers care about them? Do students feel that they fit in with other students in the school?

The more specific definitions and measures of belonging seen in the K-12 literature can help guide efforts to develop a more differentiated conceptualization of belonging applied to college students.

Summary. Looking across varying conceptualizations of belonging used in existing educational research, three core aspects of student belonging emerge, which are herein labeled *social*, *academic*, and *institutional* components of belonging. In some extant studies, only one of these aspects of belonging is measured whereas in others, a single broader ('general') definition of belonging is used, clouding which aspect of belonging is being measured.

Part of the present study is designed to empirically test the proposed three-component model and determine whether a general sense of belonging can be measured independently of the three component parts. An associated purpose of the study is to contribute a more nuanced and differentiated set of measures of student belonging. Missing from existing research is an understanding of how various components of belonging (e.g., social vs. academic belonging) may be related to one another and to a general concept of belonging, and ultimately, what factors in students' college experience affect each facet of belonging and what educational outputs may, in turn, be associated with each facet of belonging.

Drawing from this review of existing definitions of belonging, the next section summarizes research findings that address how college student belonging varies by student demographic characteristics, followed by two sections that review the correlates (associated predictors and educational outputs) of student belonging found in the higher education literature.

Effects of Demographic Characteristics on Belonging

Today selective institutions of higher learning invest extensive resources and efforts, including recruitment and financial aid initiatives, to better diversify their student bodies, both socioeconomically and ethnically. Admitting large numbers of minority students to predominantly white college campuses may require substantial changes to provide a supportive community in which all students feel they belong. As college campuses become increasingly diverse, it is important that administrators acknowledge that different groups of students may view a college campus differently (Hurtado & Carter, 1997) and weigh different components of belonging differently (Johnson et al., 2007). Each student's conception is valid and may have real consequences for the individual – potentially affecting satisfaction, effort, achievement, retention, and graduation.

In most selective colleges, middle class white and Asian students may find that they look like, dress like, share opinions with, and act like the majority of the other four-year college students around them, and thus more easily feel like they belong. Those in the majority may even take their sense of belonging for granted. In contrast,

students whose economic and ethnic backgrounds put them in the minority at a college may require well-designed systems of support to experience that same sense of belonging.

Focusing on ethnicity for a moment, Maestas, Vaquera, and Zehr (2007) argue, "For students of color, the issue of belonging or feeling a part of a campus community is often a challenging one. With the majority of [top] college institutions remaining predominantly white, students of color often feel marginalized and isolated…. The environment of the college campus has a major impact on the sense of belonging for students of color" (p. 241). "For members of socially stigmatized groups, the question, 'Do I belong?' appears to go hand in hand with the question 'Does my group belong?'" (Walton & Cohen, 2007, p. 94). Bowen and Bok (1998), after the push for recruiting and enrolling more black students from urban areas in the late 1960s and early 1970s, observed that once minority students were admitted to predominantly white institutions, instead of fitting in 'naturally' as was presumed, some black students were disillusioned, causing increased debate around what was needed to create a supportive learning environment.

Consistent with these concerns, a survey study found that white students reported a higher sense of belonging than any other ethnic group. Johnson et al. (2007) compared perceptions of belonging across a national sample of 2,967 students representing four ethnic groups (white, black, Asian, and Latino) and found that all three groups of students of color reported lower levels of belonging than the white students. Findings across studies have not been entirely consistent, however. Walton and Cohen (2007) found from a pilot survey of 34 black and Latino students (combined in one group) and 155 white students that students' reported general sense of belonging at college (measured with one item, "I belong at [college name]") did not vary significantly between the two groups. 'Belonging uncertainty' (measured with three items, e.g., "Sometimes I feel that I belong at [college name], and sometimes I feel that I don't belong" and "When something bad happens, I feel that maybe I don't belong at [college name]") did vary between the ethnic groups, though, with black and

Latino students reporting significantly higher 'belonging uncertainty' than white students.

The degree of diversity of a college campus may partly explain differences in belonging by ethnic group. In the Johnson et al. (2007) study, the participating universities were large, public, and predominantly white. Studies in secondary schools find that members of the majority ethnic group at a school report higher levels of belonging than those in the minority ethnic groups in the school (Davidson & Phelan, 1999; Goodenow, 1993a; Kester, 1994; Roeser, Eccles, & Sameroff, 1998). This finding holds true in schools that are not predominantly white. For example, in an urban school where Hispanics made up 75 percent of the school population, Hispanics expressed higher levels of school belonging than did non-Hispanics (Goodenow, 1993a). Similarly, using a national sample of high school students stratified by ethnic group, Johnson, Crosnoe, and Elder (2001) found that students reported greater attachment to schools in which there were proportionally more students of their own ethnic group. Conversely, in schools where no ethnic group had a numerical majority, there were no significant differences in student belonging by ethnic group. Some demographic contexts may exacerbate the perception of ethnic group differences (both real and imagined), which in turn may influence students' sense of belonging.

Extant research also suggests that students from low-income families tend to report a lower sense of belonging than students from more affluent families, although the evidence is not altogether consistent. Two studies at different types of institutions of higher education—one at a Hispanic-Serving Institution (58 percent white, 33 percent Hispanic, holding ethnicity and parent education constant) and one at a small liberal arts college (83 percent white, not holding demographics constant)—found that lower family income correlated with lower college belonging (Maestas et al., 2007; Ostrove & Long, 2007). In their multivariate regression models stratified by ethnic group, however, Johnson et al. (2007) found in a diverse national sample that socioeconomic status was not a significant predictor of belonging for any ethnic group. Hurtado and Ponjuan (2005) also found no socioeconomic status effect in their

sample restricted to Latinos. These differences suggest that results may vary with institutional contexts.

Students whose families have relatively low incomes are often first-generation college students, and Carey (2005) asserts: "Low-income and first-generation college students often have a harder time connecting with the institution" (p. 3). Maestas et al. (2007) found student belonging did not vary by parent education, holding ethnicity and family income constant, in their diverse sample of students. Hurtado and Ponjuan (2005) likewise found no parent education effects in their Latino sample, holding constant family income. The latter sample was limited to 370 Latinos from nine public universities so cannot be generalized to other ethnic groups. Because family income and parent education are correlated, including both variables in analyses may produce a confounding effect. Understanding better how ethnicity, income, and parent education are independently associated with belonging would help practitioners to target more precisely their efforts in support of student belonging.

Walton and Cohen's (2007) concept of 'belonging uncertainty' may help explain the lower sense of belonging found in a few studies for underrepresented minorities. A key takeaway from Walton and Cohen's (2007) work is that for those individuals who are part of a socially stigmatized group that is at higher risk for belonging uncertainty, "subtle events that confirm a lack of social connectedness have disproportionately large impacts" (p. 86). Walton and Cohen focused their studies on ethnicity, but similar challenges and uncertainty may exist for low-income and first-generation college students at colleges where they are in the minority.

Summary. Although findings are mixed, there is some evidence suggesting that ethnic minority students and students from families with relatively low incomes have a lower sense of belonging in college than white and more affluent students. These differences were, accordingly, expected in the present study. Analyses were planned to examine the independent effects of student ethnicity, family income, and parent education, how they are related to the differentiated components of belonging, and how demographics may moderate the association between belonging and its correlates.

Predictors of College Student Belonging

Existing studies have found that several institutional and interpersonal factors are significantly associated with students' sense of belonging at college. Certain predictors are more strongly associated with reported belonging for some groups of students than for others. Existing studies include a range of hypothesized predictors with occasional overlap. These predictors are organized under the following categories: initial college transitions, campus racial climate, interpersonal support, responses to social adversity, and academic support.

Initial college transition. Some hypothesized transition-related predictors of a general sense of college belonging have shown mixed results. Whereas Hurtado and Carter found their 'ease of transition' to college variable was not significantly related to reported belonging for their Latino sample, Johnson et al. (2007) found in their ethnically stratified national sample that smooth academic transitions significantly predicted belonging for Asian, Hispanic, and white students, but not for black or Multiracial students, and that smooth social transitions significantly predicted belonging for all five ethnic groups. In both studies, students' perceptions of *ongoing* social and academic support on campus (e.g., frequently interacting with professors, feeling academically and socially supported on campus) explained more of the variance in belonging than having smooth *initial* transitions. On the other hand, Ostrove and Long (2007) found the opposite, that having initially smooth academic and social adjustments to college were highly significantly correlated with general belonging. The discrepancy in these findings may in part be explained by the different measures for 'transition' and 'adjustment' used by the researchers.

Campus racial climate. Some researchers have explored the relationship between college students' perception of the campus racial climate and their reported belonging. Both Hurtado and Ponjuan (2005) and Hurtado and Carter (1997) found that Latino students who perceived a hostile climate on campus had a greatly reduced sense of belonging. Perceiving a hostile climate for diversity was the most powerful predictor of Latino students' low belonging. In contrast, Johnson et al. (2007) found that having positive perceptions of the campus racial climate (e.g., having trans-racial

friendships, feeling the campus was committed to the success of students of color, feeling professors respect students of color) was significantly positively related to reporting a general sense of belonging at college for blacks, Asians, whites, and multi-ethnic students but not for Hispanics (Johnson et al., 2007).

This discrepancy is likely in part explained by the different samples in the studies. Johnson et al. (2007) used a one-time survey of 2,967 randomly selected first-year students from 34 large public, predominantly white universities from half of the U.S. states (approximating equal representation of each ethnic group except a disproportionately low portion of Hispanics). Both studies first-authored by Hurtado had all-Latino samples: Hurtado and Ponjuan (2005) collected two sets of longitudinal survey data (first survey at the start of the first year, second survey at the end of the second year) from 370 Latinos from nine public universities as part of a national study, and Hurtado and Carter (1997) analyzed data from 272 Latino students from 127 colleges who completed three surveys longitudinally (the first survey in high school when they took the SATs, the second survey at beginning of sophomore year at college, third survey at the end of their junior year). The two latter longitudinal studies showed that perceiving a hostile campus climate (e.g., experiencing discrimination, feeling tension on campus among different student groups) negatively predicted sense of belonging the following year. Villalpando (2004) likewise found that experiencing racism and discrimination was a very significant predictor of low belonging in their Latino sample of college students.

Measures of the college environment (e.g., feeling academic and social support) used by Johnson et al. (2007) explained more of the variance in college student belonging than did students' perceptions of the campus racial climate. However, the measures of 'college environment' and 'positive perceptions of racial climate' used by Johnson et al. (2007) were not mutually exclusive thematically. The present study more clearly distinguishes these potential predictors to better isolate the potential effects on belonging.

Perhaps one indicator of a positive climate for diversity for a student in the minority on a college campus is how well a student identifies with the curriculum.

Hurtado and Ponjuan (2005) examined enrollment in courses related to oppression and race/ethnicity, or simply being enrolled in classes that enabled dialog among students from diverse backgrounds, as a predictor of students' sense of belonging. In their Latino sample, they found that these curriculum-related variables were highly related to Latino college student belonging. Further study is needed to assess the predictive power of this variable for different ethnic groups.

Johnson et al. (2007) found that when compared to other student ethnic groups, black students tended to perceive a more negative campus racial climate. This trend does not bode well for black students' sense of belonging at college. Bowen and Bok (1998) share a vignette from a black college student in a predominantly white college to portray the emotional energy devoted to social aspects of ethnicity, which students report ultimately affects academic focus:

> I was very well prepared academically, but I think that, being a black student on a largely white campus, the issues I had to deal with weren't always academic. I couldn't always focus 100% on academics as I would have wanted to; instead, there were always issues of comfort level in classes, in the dorm situation…. And then there were people who had never been in a room with a black person in their lives. And because they were uncomfortable, it made you uncomfortable…. I don't think that a black student who does well at a majority white university can afford to focus too much on those kinds of things, because you can get consumed by them. And if you allow yourself to become too involved in all of the social issues, you can't achieve well academically. (p. 83-84)

Other researchers examined similar 'racial climate' variables, such as how often students socialize with diverse students and students' individual level of support for affirmative action. Maestas et al. (2007) found both to be positive predictors of belonging in a longitudinal survey study—survey one at the start of freshman year and survey two at the end of sophomore year—with 421 students, 58 percent white and 33 percent Hispanic, from one university.

Interpersonal support. A mix of survey items and measures has been used to assess interpersonal support and interaction at college. Across all the studies reviewed, there is evidence that feeling interpersonal support both socially and academically predicts student belonging. Because researchers assess social and

academic support in different and sometimes conflated ways, it is difficult to draw practical implications regarding specific interventions.

Examples of measures of social support included in prior research as predictors of belonging are the following: whether residence hall climates were socially supportive (Johnson et al., 2007); whether students in general had a high frequency of positive interactions with both students and adults on campus (Hurtado & Ponjuan, 2005); how hard it was to make friends at college (Hurtado & Carter, 1997); how socially adjusted students felt at college (Ostrove & Long, 2007); how socially accepted they felt (Freeman et al., 2007); and whether they were a member of a fraternity on campus (Maestas et al., 2007). Some researchers included an item or two related to college racial climate as part of their measures of social support, whereas others treated racial climate as a separate variable.

Responses to social adversity. As mentioned earlier, Walton and Cohen (2007) conducted a series of experiments, one of which found that when black and white college students faced the same experimentally manipulated adverse social situation at college (having to name eight friends in their major department), black but not white students consequently questioned their level of social fit and reported lower belonging in their department. The association between experiencing this relatively minor adverse social situation and feeling lower belonging was only found among black students. Walton and Cohen argued that students typically in the minority at college and historically stigmatized in that context are more sensitive when it comes to feeling that they belong. Therefore even seemingly minor adverse situations like the one manipulated can trigger self-doubts about their social connectedness in that context. In other words, minority students have a higher 'belonging uncertainty.'

Another experiment by Walton and Cohen, which involved black and white students keeping daily diaries of their college experiences and feelings for seven days (N < 55), found that "on days of high stress, black students' sense of fit in college dropped. Almost 60 percent of the day-to-day variance in their sense of fit could be accounted for by the adversity level of their day. By contrast, white students' sense of fit was independent of the adversity level of their day" (p. 93). Both black and white

students reported the same levels of 'adversity' at college (e.g., "Everyone is going out without me, and they didn't consider me when making their plans," p. 90) but the difference was in the consequence of social adversity. Walton and Cohen's simple intervention—aimed at conveying the message that experiences of social adversity at college and doubts about belonging are common across all types of students irrespective of their ethnic background—helped mitigate the relationship for black students between experiencing adversity and feeling lower belonging. They found that black students in the intervention condition were less affected by their adversity than black students in the control group (who did not have the intervention), and as expected, there was no effect of adversity on belonging for whites in either condition. Walton and Cohen's (2007) work highlight the need to explore how the effect of potential predictors of belonging (in their case adverse social situations) may vary by ethnicity or other demographic characteristics.

Academic support. Extant research on belonging offered the following examples of measures of academic support: whether residence hall climates were academically supportive (Johnson et al., 2007); frequency of discussions about courses outside of classes (Hurtado & Carter, 1997); feeling academically adjusted at college (Ostrove & Long, 2007); feeling that professors were pedagogically caring (Freeman et al., 2007); and feeling that professors took an interest in their development (Maestas et al., 2007).

Although all measures of faculty interaction were significantly related to belonging, how researchers measured interactions with professors varied. For example, both Johnson et al. (2007) and Hurtado and Carter (1997) measured the frequency of student interactions with professors, whereas Freeman et al. (2007) and Maestas et al. (2007) measured the nature of those interactions—the level of perceived caring in the former and the level of perceived interest in the student in the latter. Some researchers report that students of color are more likely than white students to question whether their professors respect them or feel that they belong in their classes (Mina, Cabrales, Juarez, & Rodriguez-Vasquez, 2004), which in turn is associated with an overall lower level of reported belonging at college. For some traditionally

underrepresented students, finding a genuine and caring faculty mentor is significantly related to their comfort levels on campus, or serves as a protective buffer against adversity, which in turn helps them be successful in educational endeavors (Bowen & Bok, 1998; Dayton, Gonzalez-Vasquez, Martinez, & Plum, 2004; Hurtado & Ponjuan, 2005). Similarly, Hurtado and Ponjuan (2005) and Maestas et al. (2007) measured the frequency that a student participated in academic support programs on campus and both studies found it to be a significant predictor of general belonging.

With the goal of creating a differentiated measure for perceptions of 'academic belonging' that would encapsulate feeling respected and supported to succeed academically, academic-related variables that were measured separately from and found to be significantly related to general belonging were gleaned from empirical studies. Perceiving faculty interest in and caring for one's development, feeling like more than just a face in a crowded classroom, and perceiving faculty as humane and compassionate were each associated with a higher sense of general belonging (Hoffman et al., 2003; Maestas et al., 2007). Other reported faculty attributes associated with general belonging included being accessible for academic help when needed and being reliably available for support and guidance (Hoffman et al., 2003). Instead of viewing these perceived characteristics as predictors of belonging, they were used to help conceptualize and generate a measure of academic belonging.

Summary. Previous research has shown that feeling socially connected to peers at college is correlated with students' feelings of belonging at college. Likewise, perceiving a campus climate supportive of diversity has been linked with higher belonging. Which *types* of institutional factors are more or less important for *which* groups of students has not been extensively examined. Previous studies linking campus climates and belonging typically focus on one ethnic group (e.g., Latinos) rather than compare associations for different types of students within the same college environment. We also do not have a clear understanding of which predictors affect which components of belonging, or whether student ethnicity or family income moderate the association between predictor variables and belonging.

Existing literature may benefit from a study that separates individual experiences of discrimination from assessments of the overall campus racial climate to see if one is a more powerful predictor of belonging than the other. For example, it may be helpful to have one measure that focuses on students' perceptions of how committed to diversity the college seems to be (as an institutional indicator), and one measure that focuses on students' level of experience of racial incidents as individuals. It may also be useful to explore whether coming from a prior context (e.g., high school or neighborhood) that has a similar ethnic composition to the college has any bearing on reported belonging. Perhaps students from prior environments that are more demographically similar to the college may report higher college belonging than those coming from prior environments that look very different. Lastly, it would be helpful to better understand whether perceptions of the campus racial climate differentially predict social belonging, academic belonging, or perceived institutional support.

Variations in the compositions of interpersonal support measures reflect differences in conceptualizations of belonging, differences in the purposes of each study, and differences in the college contexts where studies were conducted. Making the content of measures used in studies more mutually exclusive would help pinpoint which predictors of belonging are the most salient in which contexts and for whom. The present study differentiated a measure of perceived relatedness to peers (as an interpersonal predictor) from a measure of social belonging to enable assessment of whether relatedness to peers is differentially associated with each of the three proposed facets of belonging. Because it may be more difficult for students in the minority on a college campus to find peers they can relate to, which may in turn negatively affect their belonging, the present study was also designed to explore whether ethnicity or parent education moderated the association between relatedness to peers and belonging.

Educational Output Measures Associated with Student Belonging

Many proposed outcomes of belonging in educational contexts have been studied, including mental, physical, psychological and behavioral outcomes (Connell & Wellborn, 1991; Deci & Ryan, 1991; Goodenow, 1993). Existing educational

research suggests that students' sense of belonging in both K-12 schools and colleges is a vital foundation for motivation, engagement, academic achievement and persistence (Connell & Wellborn, 1991; Goodenow, 1993; Hausmann et al., 2007; Hoffman et al., 2003; Osterman, 2000; Ostrove & Long, 2007; Walton & Cohen, 2011). Whether students feel like they belong in a learning context could influence whether they continue on a path towards academic achievement and graduation. More outcomes evidence exists in the K-12 than the college-level literature on belonging, but this review focuses on college-level research that links belonging to the specific educational outputs of retention, GPA, graduation, effort and participation, and satisfaction with the college experience.

Although many researchers refer to dependent variables as 'outcomes,' most studies involve contemporaneous correlations, precluding conclusions about causality. Some of the variables, such as academic performance (GPA), considered to be a consequence of belonging could just as likely be a cause. Also, some studies do not include possible confounding variables, such as parent education, which are likely to be associated with both belonging and desirable outputs. This section outlines literature that links belonging to educational outputs, acknowledging that a cross-sectional study, including this one, does not provide evidence on the direction of causality. Such 'outcomes' measured for the purposes of this study are labeled 'educational output measures.'

College completion is one educational output that has been given a fair amount of attention. A large body of literature addresses college retention and completion and the related effects of institutional experiences, with Tinto's (1993) theoretical model of institutional departure as a seminal framework. Because a multitude of studies have linked social and academic integration with student retention, the expectation was to find similar evidence in the belonging literature linking sense of belonging and retention and/or graduation. There is nevertheless scant empirical evidence specifically linking measures of student belonging and college graduation. A study by Hoffman et al. (2003) found in focus groups that college student belonging was associated with intentions to persist. Hausmann et al. (2007) likewise linked college

students' sense of belonging to their intentions to persist, controlling for ethnicity and other predictors of retention. Other scholars have merely speculated that belonging influences persistence and ultimately graduation based on evidence that belonging is associated with other variables that are in turn associated with persistence (e.g., Maestas et al., 2007).

Two studies showed that sense of belonging at college was highly correlated with academic performance (Ostrove & Long, 2007; Walton & Cohen, 2007), which is well known to predict persistence. Ostrove and Long (2007), reported strong associations between academic performance and belonging among 322 students (83 percent white) from one liberal arts college. In the study mentioned above, Walton and Cohen (2007, 2011) experimentally demonstrated that buffering minority students against feeling 'belonging uncertainty' subsequently improved their GPA over the next three years in comparison to a control group.

Belonging at college has also been linked empirically with desirable academic participation behaviors (e.g., making the effort to ask questions or give opinions during classes, hours spent studying) and proactively seeking academic help from professors and classmates outside of classes (Freeman et al., 2007; Hoffman et al., 2003; Walton & Cohen, 2007). Other researchers have speculated about these links without providing empirical evidence; Ostrove and Long (2007), for example, wrote that "a sense of belonging has crucial implications for college experience and performance. It is possible that feeling that one does not belong affects the extent of participation in class, willingness to seek help as needed, and other critical behaviors that influence college success" (p. 381). Note that it is also possible that such behaviors contribute to a sense of belonging. Some research, in fact, frames faculty-student interactions as a predictor rather than outcome of belonging, drawing mixed conclusions.

Hurtado and Carter (1997) found in their study that Latino students' reports of talking frequently with faculty outside class were highly correlated with their reported sense of belonging to college during that same academic year, whereas Johnson et al. (2007) found the opposite. In their study the level of interactions between students

and faculty did not significantly relate to students' sense of belonging for any ethnic group except Latino students, where that relationship was negative (i.e., a high frequency of interactions with faculty was associated with lower belonging).

Lastly, one study found that students who felt a sense of belonging at college also tended to report higher levels of satisfaction with their college experience and greater commitment to the institution (Ostrove & Long, 2007). As noted earlier, because some studies included measures of satisfaction or enjoyment as part of their measures of belonging, any discernible association between belonging and satisfaction was not provided (e.g., Hurtado & Ponjuan, 2005; Johnson et al., 2007).

Aside from the exceptions above, existing research is mostly speculative about the relationship between student belonging and desired educational outputs. Most empirical studies of college student belonging explore predictive factors of belonging rather than associated educational outputs. That being said, the one experimental study (Walton & Cohen, 2007) provides strong empirical evidence for a positive association between student belonging and GPA and other achievement-related behaviors (e.g., hours spent studying, frequency of correspondence with faculty), and achievement in turn correlates with persistence.

Summary

Most of the existing studies of college student belonging have focused more on the proposed factors that predict belonging than on the potential 'outcomes' of belonging. Of the six most relevant research studies that predominantly used multiple regression analyses, five examined *only* the association between hypothesized predictors of belonging and belonging (not between belonging and educational outputs). Among those studies, a moderate amount of the variance in measures of belonging was associated with the predictor variables included by those researchers. For example, students' social acceptance at the university and students' perception of professors' level of caring together explained 35 percent of the variance in student belonging (Freeman et al., 2007); all independent variables—ranging from background demographics to academic integration, social integration, and diversity issues—taken together explained 29 percent of the variance in student belonging

(Maestas et al., 2007); all independent variables—ranging from student demographics and selectivity of institution to perceptions of positive interactions on campus, levels of co-curricular involvement, perceptions of both social and academic transitions to college, and perceptions of the campus racial climate—taken together explained 36 percent of the variance in student belonging (Johnson et al., 2007); and, the predictor variables explored by Hurtado and Ponjuan (2005) explained 19 percent of the variance in belonging among their sample of 370 Latinos.

Two studies touched upon some of the 'outcomes' of belonging, but as Hurtado and Carter (1997) note, outcomes of belonging have not been systematically studied. No study has combined the comprehensive examination of both predictors and outcomes of belonging and examined ways in which demographic variables (e.g., ethnicity, family income, parent education) moderated associations.

The discrepancies in the effects of interactions with faculty on belonging suggest a need for examining the nature of student-faculty interactions (i.e., whether those interactions were perceived as positive or negative), not just in terms of frequency. Because frequency of student-faculty interactions is a measure of a desirable educational output (arguably indicating one indication of student effort and engagement), it is framed as an output rather than as a predictor in the present study.

The present study extends prior research on belonging in the following ways: (a) by assessing the relationships between the hypothesized components of belonging (social belonging, academic belonging, and perceived institutional support) and multiple educational outputs in the same college context across a variety of students, holding student demographic characteristics constant; and (b) by allowing the associations between the three components of belonging and each educational output to vary by demographics like ethnicity and parent education. Because the review of research that addressed predictors showed variations by student ethnicity, it is worth exploring demographics as moderators for educational outputs, as well.

The present study is designed to contribute to our understanding of how students' overall belonging – and its hypothesized components of social belonging, academic belonging, and perceived institutional support – predict the educational

outputs of expected retention,[1] GPA, intentions to graduate, hours spent studying, frequency of meetings with professors outside of class time, and satisfaction with the institution, as well as how those associations are moderated by individual student demographic characteristics.

Goals of the Present Study

This section summarizes the strategic design of the present study of belonging, including the research questions and associated hypotheses.

Advancing Conceptualization and Measurement of 'Sense of Belonging'

Drawing from existing definitions and measures of belonging in both secondary and post-secondary contexts, belonging is conceptualized in the present study as having three components: social belonging, academic belonging, and perceived institutional support. A primary goal of the study was to test empirically the proposed three-component model and determine whether a general sense of belonging can be measured independently of the three component parts (see Figure 1.1).

Figure 1.1. The Proposed Three Components of Student Belonging
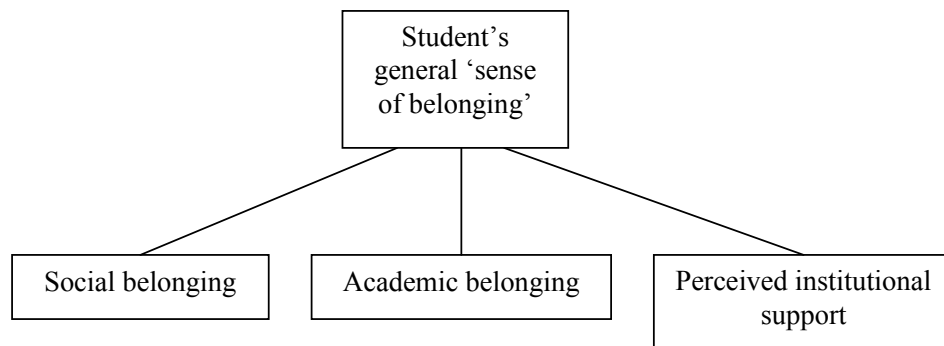
Consistent with Hurtado and Carter's (1997) definition of 'sense of belonging to campus' ("the individual's view of whether he or she feels included in the college

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[1] Because the present study was not longitudinal, actual retention and graduation rates were not measurable; instead, reported intentions to persist and expectations to graduate served as proxies.

community," p. 327), for the purposes of the present study, an undifferentiated, *general sense of belonging* is defined as feeling like a part of the college community.

The three components of belonging are defined as follows:

Social belonging: Feeling socially comfortable and connected with peers as a member of the college community (e.g., can relate to others, can be him/herself on campus, feels supported and respected by peers on campus).

Academic belonging: Feeling respected and supported to do well academically. More specifically: (a) believing that professors are caring, supportive, and respectful, and (b) feeling comfortable sharing comments and questions in classes.

Perceived Institutional Support: Feeling that institutional supports and student services (e.g., tutoring, counseling, health) are accessible on campus.

Each component was operationalized in the study to be mutually exclusive. For example, social belonging focused on peer interactions, whereas academic belonging focused on classroom comfort and interactions with professors. These two psychological measures reflected students' feelings about how strongly they felt they belonged socially and academically.

Perceived institutional support, on the other hand, was considered an implicit measure of the extent to which students felt the institution could be counted on for support when needed (i.e., by providing student services perceived as accessible, which in turn signals the institution's commitment to help them succeed). Students' perceiving that their university or college is willing to offer support when needed can be considered an aspect of belonging, much in the way that belonging to a family involves a commitment by the family to support its family members. Therefore, while perhaps not as explicitly a psychological component of belonging, perceived institutional support was considered an important part of belonging. The label, 'perceived institutional support' rather than 'institutional belonging,' was used to reflect this subtle differentiation from psychological feelings of 'belonging.'

A key purpose of this exploratory study was to lend greater precision and clarity to the concept of belonging as it applies to college students by clearly

differentiating and examining components of belonging and the relationships among them and with hypothesized correlates.

Stemming from the review of literature, the following model depicted in Figure 1.2 summarizes the present study's hypotheses concerning components and correlates of belonging.

Figure 1.2. Summary Model of Student Belonging for the Present Study
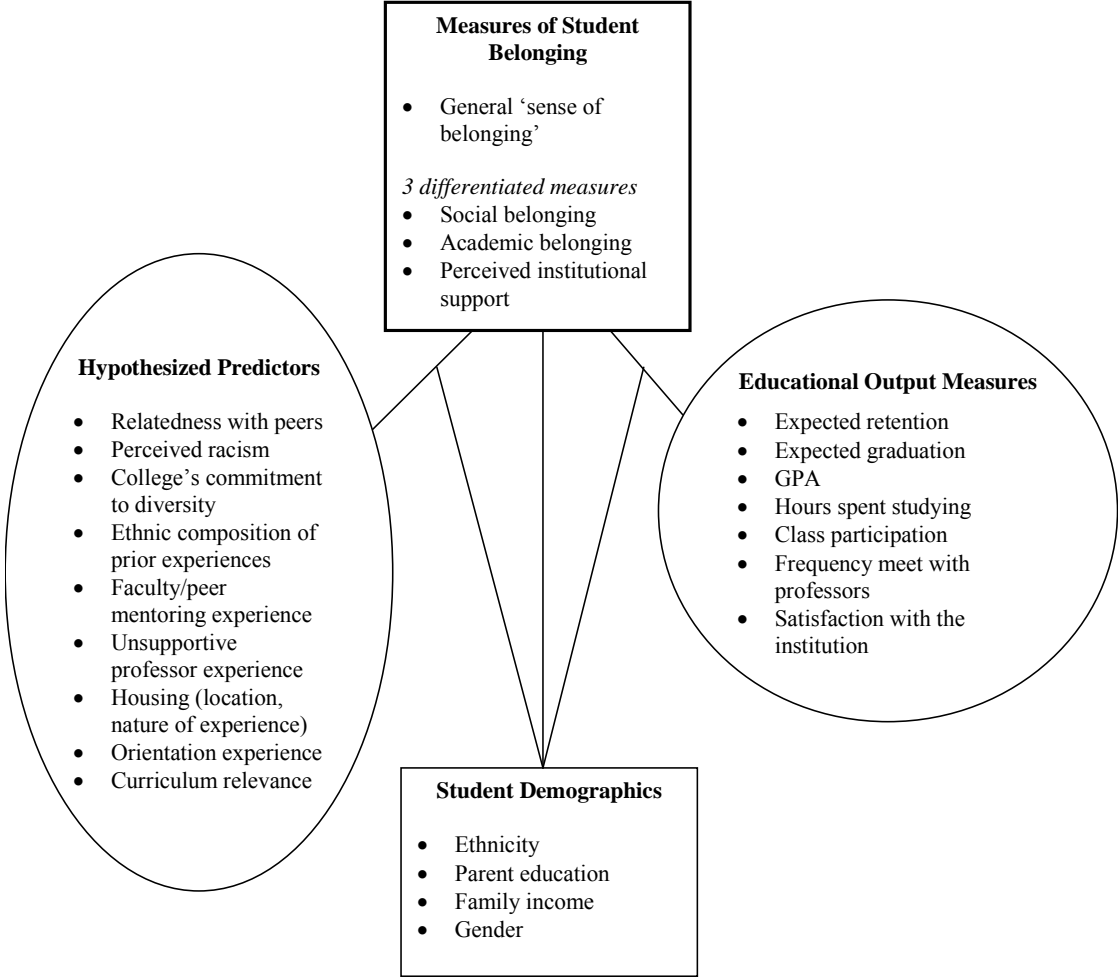
For the purposes of conceptualizing and carrying out this study, student belonging was framed as a set of variables (labeled 'Measures of Student Belonging') that have related predictors and educational outputs, with associations potentially moderated by student demographic variables. Distinguishing between what

contributes to versus what is a consequence of student belonging is not possible given the correlational design. Causal conclusions are drawn in some longitudinal studies (e.g., Hurtado & Carter, 1997), and much of the existing research discusses associations in terms of predictors and 'outcomes,' but it is also possible that what is often referred to as a 'consequence' of belonging (e.g., GPA) actually contributes to feelings of belonging. Accordingly, relational lines rather than causal arrows are used in the figure above. The purpose of assessing the associations listed is to do a preliminary examination of how the proposed components of belonging are differentially associated with the variables included. The study thus tests a potentially more nuanced measurement instrument and identifies potential predictors and associated educational outputs that might direct future research.

Research Questions and Hypotheses

Below is a summary of the research questions and hypotheses:

(1) Is the proposed three-component (social, academic, institutional) model consistent with the data? Can a 'general' sense of belonging be measured independently of the three component parts?[2]

> *Hypothesis 1:* A measure of 'general belonging' will be distinguishable but significantly correlated with measurements of its three hypothesized components: (a) Social belonging, (b) Academic belonging, and (c) Perceived institutional support.

(2) Do feelings of belonging vary systematically, depending on student ethnicity, family income, parent education, or gender?

> *Hypothesis 2:* There will be significant differences in levels of reported student belonging, with white students reporting higher levels of belonging than students of color, higher-income students reporting higher levels of belonging than lower-income students, and students

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[2] All subsequent analyses depended on the results of these initial analyses which determined the number and nature of the measures of belonging.

with higher levels of parent education reporting higher levels of belonging than students with lower levels of parent education. There were no expectations for gender but it was included as a covariate in case it was significantly associated with the variables studied.

(3) Do the hypothesized predictor variables predict certain belonging measures over and above the effects of student ethnicity and parent education? Do associations between the hypothesized predictors and belonging measures vary by ethnicity or parent education?

> *Hypothesis 3*: The following variables were expected to be positively associated with reported belonging: feeling able to relate to peers, having meaningful peer and/or faculty mentoring experiences (and conversely, not experiencing unsupportive interactions with faculty), living on campus, having a supportive housing experience, attending and finding orientation helpful for social adjustment, coming from high schools and neighborhoods with similar ethnic compositions to the college, perceiving a positive campus climate for diversity (e.g., perceiving low levels of racism and perceiving the college as committed to diversity), and finding course content to be relevant to issues of personal importance (the last two associations were expected to be especially strong for students of color).

(4) Does student belonging predict select measures of educational outputs over and above the effects of student ethnicity and parent education? Do the associations between belonging measures and selected educational outputs vary by student ethnicity or parent education?

> *Hypothesis 4*: Belonging will be positively associated with each of the measured educational outputs.

Concluding Comments

The present study is designed to extend existing research by separating highly intertwined concepts and measures. First, the present study differentiates general belonging into three components: a social component, an academic component and an institutional support component. Second, the present study examines the independent contributions of clearly delineated predictors of belonging: e.g., how much students feel they can relate to their peers, how much they perceive their college to be committed to diversity, and how many mentors they have that support their college experience. The present study, therefore, can examine evidence for very specific questions, such as whether students' perceptions of the campus racial climate are more strongly associated with their sense of social belonging or their sense of academic belonging. The central goal of the present study is to examine associations with potential predictors of belonging using a more differentiated conceptualization of belonging. Finally, the study examines the association between the three measures of belonging and a variety of educational outputs. The selected educational outputs would be of interest to college administrators concerned with college outcomes, behaviors that demonstrate student effort and engagement, and student satisfaction with their college experience.

There are no doubt general principles – qualities that promote or are even critical to support a sense of belonging – which transcend particular contexts. But it is also likely that each college must understand what aspects of their particular environment promote or undermine students' sense of belonging. For example, this study was conducted at a selective, predominantly white college campus where special attention may be necessary to understand the needs, perceptions, and experiences of students who are more vulnerable to feeling a lack of belonging. Individual colleges may be well advised to better understand the perspectives of students in relation to what they believe predicts and inhibits their sense of belonging. A more differentiated measure of student belonging could lead to more precise and practically useful understandings of how student belonging interacts with predictors, educational outputs, and demographic variables.

In closing, to improve research and practice, we need greater understanding of what helps create and sustain a sense of belonging for diverse students. Freeman et al. (2007) argue that belonging has not been studied sufficiently at the college level. This study was designed to improve our understanding of belonging, its components, and its correlates (perceived predictors and related educational outputs) by illuminating students' perspectives on their college experiences.

Chapter 2
Methods

This chapter describes the methodology used in the present study. The first three sections briefly describe the college that participated in the study, the procedures used to solicit and collect survey data, and the demographic characteristics of the survey respondents. The fourth section explains the derivation of each variable used in data analyses, including its corresponding survey questions and response scales. The chapter concludes with a table summarizing descriptive statistics for the variables used in the present study.

The College Site

The small private and selective college where survey data were collected was located approximately 20 miles outside of a major US city and had fewer than 3,000 undergraduate students. The sophomore class, from which the survey respondents were recruited, was 49 percent white, 23 percent Hispanic, 12 percent Asian, 6.4 percent black, and 1.6 percent Native American. Sixty-five percent were female and 35 percent were male. Table 2.1 summarizes graduation rates at the participating college in 2006, disaggregated for four significantly represented ethnic groups.

Table 2.1. Within-Six-Year Disaggregated Graduation Rates at the College in 2006

	Enrollment	% Graduate
Full time Undergraduate Students	[< 3,000]	66.3
Black	6.5%	55.0
Latino	19.3%	62.5
Asian	9.7%	61.1
White	53.2%	69.1

(source: www.collegeresults.org; all available data reported here)

This college was selected because its student body was majority white, it had a reasonable number of students in each minority group for analytic purposes, and its graduation rates varied by ethnic group. Conducting the study at a small private and selective college was also appealing because most prior research on belonging has been conducted at large public universities.

Procedure

In March 2009, the head of student life at the prospective college site was contacted via a formal letter of introduction and invitation to participate in the study. An introductory phone conversation took place in late March 2009, followed by a discussion with the director of institutional research. The college expressed interest in the content of the study and access was granted after several months of discussion.

A draft survey protocol was discussed with and approved by the designated contact person at the college before pilot testing. The survey instrument was then piloted on three student volunteers recruited from the college, two college students from another small college that was not involved with this study, five graduate students from the author's degree program, three external people, as well as two contacts working in the field of higher education. Pilot testers represented different demographic backgrounds. Edits were made according to their feedback. Pilot testing was important to gain feedback on the clarity of items prior to finalizing the survey questions. The purpose of piloting was to clarify any survey questions that may have been misunderstood by respondents.

The final survey draft was once again approved by the research site and then transferred to a reliable survey hosting website by college administrators to be distributed electronically to students. The online version of the survey was then pilot tested for errors in the technology, clarity of its online formatting, and ease of use. Additional edits were made accordingly.

The online survey was distributed in-house by a college administrator via email in the fall of 2009 to all 624 students in the college's sophomore class. The final response rate was 25.5 percent over the course of a month with weekly follow-up reminders. All sophomore students were invited to participate in the survey regardless of their demographic characteristics, and they were encouraged to participate with the incentive of a drawing with three possible prizes. The email distributed included a brief overview of the study and a link to the online survey (see Appendix 2).

Survey Participants

Participants included 159 college sophomores. In comparison to the ethnic and gender distributions of the sophomore class, the sample had a disproportionate number of females; Asian, Native American, and white students were over-represented while blacks and Hispanics were under-represented. Table 2.2 below shows the demographic characteristics of the sample.

Table 2.2. Sample Breakdown for each Demographic Variable (Ethnicity, Parent Education, Family Income, and Gender)

Demographic Variable	Groups	N (% sample)
Ethnicity	Asian	23 (14.5%)
	Black (B)	6 (3.8%)
	Hispanic (H)	25 (15.7%)
	Native American (N)	3 (1.9%)
	Re-coded as BHN	*34 (21.4%)*
	White	89 (56%)
	Non-responses or Other	13 (8.2%)
Parent Education	1 or both parents had a HS education or less (1)	23 (14.5%)
	1 or both parents had some college or a 2-year degree (2)	37 (23.3%)
	1 parent with a BA or higher (3)	43 (27%)
	2 parents had a BA or higher (4)	50 (31.4%)
	Non-responses	6 (3.8%)
Family Income	Less than $50,000 (1)	32 (20.1%)
	$50,000-$100,000 (2)	35 (22%)
	$100,000-$200,000 (3)	19 (11.9%)
	More than $200,00 (4)	16 (10.1%)
	Non-responses	57 (35.8%)
Gender	Female	124 (78%)
	Male	34 (21.4%)
	Non-responses	1 (.63%)

Because there were too few respondents in the three under-represented minority categories to make meaningful comparisons, subjects were categorized into three ethnic groupings: (a) white, (b) Asian, and (c) black, Hispanic and Native American. The following Table 2.3 summarizes the distribution of each ethnic grouping by gender, parent education, and family income. Notably, 71 (45%) of the survey respondents were white females.

Table 2.3. Distribution of Ethnic Groups by Gender, Parent Education, and Family Income

Ethnic Groupings	Gender N (% of ethnic grouping)	Parent Education (1-4 scale) N (% of ethnic grouping)	Family Income (1-4 scale) N (% of ethnic grouping)
White	Male: 18 (20.2%) Female: 71 (79.8%)	1: 6 (6.7%) 2: 20 (22.5%) 3: 28 (31.5%) 4: 33 (37.1%) Non-responses: 2 (2.2%)	1: 12 (13.5%) 2: 19 (21.3%) 3: 12 (13.5%) 4: 13 (14.6%) Non-responses: 33 (37.1%)
Black, Hispanic, & Native American (BHN)	Male: 10 (29.4%) Female: 24 (70.6%)	1: 13 (38.2%) 2: 9 (26.5%) 3: 3 (8.8%) 4: 8 (23.5%) Non-responses: 1 (2.9%)	1: 12 (35.3%) 2: 11 (32.4%) 3: 2 (5.9%) 4: 1 (2.9%) Non-responses: 8 (23.5%)
Asian	Male: 5 (21.7%) Female: 18 (78.3%)	1: 3 (13.0%) 2: 4 (17.4%) 3: 9 (39.1%) 4: 6 (26.1%) Non-responses: 1 (4.3%)	1: 6 (26.1%) 2: 4 (17.4%) 3: 5 (21.7%) 4: 1 (4.3%) Non-responses: 7 (30.4%)

Survey Measures and Corresponding Variables

The survey included 65 items, which were reduced for analyses to create 25 student-reported variables for the present study. The complete administered survey can be found in Appendix 1. Wherever possible, existing published survey questions or measures were used or adapted; otherwise, items were created for this study.

Variables are organized under the following headings: student demographics, measures of perceived student belonging, hypothesized predictors of belonging, and measures of educational outputs. The origins of each variable are described, including corresponding survey questions and response scales, and, where relevant, any data reduction that led to the creation of the variable is explained. No data were imputed.

Student Demographics

The survey included six questions that became the following four demographic background variables: ethnicity, family income, parent education, and gender. The wording for these background questions was taken from existing, frequently used surveys (CIRP Freshman Survey, 2006; Michigan Student Study, 1990-1994; National Survey of Student Engagement, 2007). Table 2.2 above summarizes the response

scales for each demographic variable, as well as the number of students in each response category.

       Student ethnicity. Students were asked two questions on the survey which were recoded into the ethnicity variable. The first question asked students to mark their race/ethnicity (*all* that apply) from among seven options: (1) Asian; Asian American; Pacific Islander (specify below); (2) black; African American; (3) Hispanic; Latino; Chicano (specify below); (4) Native American; American Indian; Alaskan Native; (5) white; Caucasian (non-Hispanic); (6) I prefer not to respond; (7) Other: (specify below). There was space immediately below to write in more customized ethnicity-related information. The second question asked students who had indicated more than one race/ethnicity in the prior response to mark which, if any, ethnicity they most strongly identified. The same seven response options were repeated.

       These two questions were considered simultaneously to then form the following ethnicity labels: (1) Asian, (2) black, (3) Hispanic, (4) Native American, (5) white, (9) non-responses. Ten respondents checked that they preferred not to respond, two students left the question blank and one student who was 'multi-racial' did not more strongly identify with one ethnic group. These 13 students were excluded from analyses list-wise. Most students selected one ethnic category as their ethnic group and were coded accordingly. The 23 students who marked more than one ethnic group in the first question and then selected one ethnic group in the second question as the one with which they most strongly identified were coded as a member of the ethnic group they most identified with. The coding strategy was designed to minimize the number of students who could not be discretely classified for the purposes of analyses.

       An additional five students who customized their ethnicity responses under the "other" option were coded by the author according to their responses. A student who labeled him/herself as East Indian was coded Asian; four students who coded themselves, respectively, as Arab, Iranian, Palestinian, and Portuguese were coded white.

The black, Hispanic, and Native American students were combined into one ethnic grouping of students of color, henceforth labeled 'Black, Hispanic and Native American (BHN).' The rationale for dividing students into three sub-groups—white, Asian, and BHN—was three-fold: (a) there were too few black and Native American students to allow meaningful statistical analyses of the ethnic groups separated, and BHN students tend to perform similarly and are commonly aggregated by national institutions that track educational data; (b) comparing students of color to white students was appropriate given the conceptual framing of this study; and (c) although Asians are a minority group, they often perform differently than both whites and other students of color and there was a sufficient number to include them in analyses as a separate group. For regression analyses, BHN and Asian dummy variables were created with white as the reference group.

Parent education. The survey asked students to identify the highest levels of education completed by both their mother and father (each respectively). Eight response options for each parent included: (1) *did not finish high school*, (2) *graduated from high school*, (3) *attended some college/did not receive a degree*, (4) *completed an associate's degree*, (5) *completed a bachelor's degree*, (6) *completed a graduate degree*, (7) *Not sure*, or (8) *Not applicable (N/A)*. A variable with a four-point condensed scale was created from responses to the two parallel questions (see Table 2.2).

For the handful of students who indicated a level of education (e.g., bachelor's degree) for one parent but marked unsure or N/A for the other parent, responses were coded for the one known parent only. The six students who either marked unsure or N/A for both parents or gave no response were excluded from analyses list-wise.

Family income. Four response intervals were provided on the survey to collect information about students' self-reported annual family income. A fifth response option was "I don't know/I prefer not to respond"; respondents in this category were excluded from analyses list-wise. Family income was treated as an ordinal variable and maintained the same four-point scale (see Table 2.2).

Gender. Students were asked to identify themselves as male or female; responses were then recoded to create a female dummy variable with the value zero for males and one for females.

Measures of Perceived Student Belonging

The survey included 23 items that encompassed four proposed measures of student belonging: general belonging, social belonging, academic belonging, and perceived institutional support. Details of the conceptualization of these belonging measures are provided on p. 25. Each belonging composite was a stand-alone measure; no survey questions were part of more than one composite. Twenty-one of the 23 items loaded most strongly on three rather than four factors; as a result, two survey items were eliminated and the general and social belonging items were merged into one measure of social belonging. Results from the factor analysis are described in chapter 3 but included here for ease of reference.

Below are descriptions of the original four proposed belonging measures, followed by Table 2.4 which summarizes the corresponding survey items, factor loadings, and Chronbach alphas (α). Survey responses that comprised the original general, social and academic belonging measures ranged from 1 to 5, with 1 = *strongly disagree*, 2 = *somewhat disagree*, 3 = *neither agree nor disagree*, 4 = *somewhat agree*, and 5 = *strongly agree*. Response options for the perceived institutional support measure also ranged from 1 to 5, with 1 = *very difficult* and 5 = *very easy*, as anchors. Each belonging measure was created as an unweighted average of the corresponding survey items, resulting in an ordinal scale that ranged from 1 to 5, with higher values representing greater belonging. Basic statistics for each belonging measure are summarized in Table 2.6 at the end of the chapter.

Social belonging. As a result of exploratory factor analysis, in which the original measures of general belonging and social belonging loaded on the same factor, the three items from the general belonging scale (described below) were combined in an unweighted average with the eight items from the original social belonging scale (described below) to create a single 11-item measure of social belonging that was used in subsequent analyses.

General belonging. Students' general sense of belonging was assessed by three items consistent with Hurtado and Carter's (1997) 'sense of belonging to campus' scale. Hurtado and Carter's scale (α = .94 in their 1997 study) has been used or adapted by subsequent researchers (e.g., Hurtado & Ponjuan, 2005; Johnson et al., 2007; Maestas et al., 2007).

Social belonging. Students' perceived social belonging was initially conceived of and measured with a collection of eight survey statements. Four of the items were taken from Freeman, Anderman, and Jensen's (2007) 'social acceptance' scale (α = .83 in their study), an adaptation to the college context of a subset of Goodenow's (1993a) Psychological Sense of School Membership (PSSM) scale items, originally designed for the secondary school context. One item from the 'social acceptance' scale, "I feel proud of belonging to this university", was excluded because it did not seem to measure social belonging but rather pride in affiliation with the college. The remaining four items were composed by the author but inspired by existing measures (Goodenow, 1993a; Hoffman et al., 2003; Johnson et al., 2007). For example, the statement "It has been easy for me to make friends at [College]" was adapted from a measure used by Johnson et al. (2007) to assess smooth social transitions to college.

Academic belonging. Students' perceived academic belonging was measured with a collection of five survey items (originally seven but two items were dropped as a result of factor analysis and reliability statistics) either composed by the author or adapted from existing measures. For example, "I feel comfortable contributing to class discussions" was taken from the perceived classroom comfort scale in Hoffman et al. (2003), "I would feel comfortable asking a professor for help if I did not understand course-related material" was selected from the perceived faculty support measure in Hoffman et al. (2003), and "The professors here respect me" was extracted from the professor caring scale in Freeman et al. (2007). Two items were developed by the author: "When I interact with professors at this college, I feel they care about how I'm doing" and "Professors make me question whether I should be here" (later dropped). The five items loaded on the same factor in principal component analysis

and were therefore combined as an unweighted average to produce the measure of academic belonging.

Perceived institutional support. This component of belonging was compiled from five survey items that measured student perceptions of how easy or difficult it was for students to access key non-curricular support services identified by college administrators. An additional item allowed space for students to write in a customized service and rank it according to the same scale. The five items loaded on the same factor in principal component analysis and were therefore combined as an unweighted average to produce the perceived institutional support measure of belonging.

Table 2.4. Factor Loadings and Reliability Statistics for the Belonging Measures

Factors and Survey Items	Factor loadings	α
General belonging (loaded on same factor as Social belonging)		
I see myself as a part of the college community	.76	
I feel that I am a member of the college community	.72	
I feel I belong at this college	.65	
Social belonging		.91
It has been easy for me to make friends at [college]	.82	
Other students here like me the way I am	.77	
I can really be myself at this college	.72	
Students at this college are friendly with me	.63	
Other students in this college seem interested in my opinions, ideas, and questions related to coursework	.60	
I could call another student from class if I had a question about an assignment	.58	
Students here treat me with respect	.57	
I would find it easy to join study groups with other students if I wanted to	.56	
Academic belonging		.84
I feel comfortable asking a question in class	.82	
I feel comfortable contributing to class discussions	.79	
The professors here respect me	.63	
I would feel comfortable asking a professor for help if I did not understand course-related material	.63	
When I interact with professors at this college, I feel they care about how I'm doing	.58	
Professors make me question whether I should be here *	-.56	
I prefer to study on my own *	n/a	
Perceived institutional support		.82
Ease of finding women's resource center support services	.82	
Ease of finding counseling support services	.76	
Ease of finding career planning support services	.73	
Ease of finding tutoring support services	.72	
Ease of finding health and wellness support services	.63	

n/a = did not load on this factor; * = item dropped from scale

Hypothesized Predictors of Belonging

The survey included 26 survey items that were reduced to ten hypothesized correlates of belonging; for the purposes of this study they are labeled 'predictors.' This section describes the ten hypothesized predictors. The survey items, factor loadings, and Chronbach alphas for the first three predictor variables resulting from factor analysis are summarized in Table 2.5 towards the end of the chapter. One

survey item was eliminated as a result of factor analysis. Basic statistics for each ordinal predictor variable are summarized in Table 2.6 at the end of the chapter.

Relatedness to peers. This composite was compiled from four single items adapted from pre-existing surveys or scales (Aries, 2008; Goodenow, 1993a; Michigan Student Study, 1990-1994). Students were asked to indicate on a five-point scale to what extent they disagreed or agreed with the four statements, where 1 = *strongly disagree*, 5 = *strongly agree*. After reverse-coding any negative statements, the relatedness to peers variable is the unweighted average of the four responses and ranged from 1 to 5, with higher values representing greater perceived relatedness to peers.

Perceived racism on campus. (Scale reverse-coded to range from negative to positive.) Three survey items (originally four but one was eliminated as a result of factor analysis and reliability statistics) were averaged (unweighted) to form the perceived racism variable. Survey responses were collected on a scale ranging from 1 to 5, with 1 = *strongly disagree* and 5 = *strongly agree*. After reversing the scale, the perceived racism variable ranged from 1 to 5, with higher values representing lower perceived racism. Survey items were individually adapted from preexisting surveys (Aries, 2008; Michigan Student Study, 1990-1994).

College's commitment to diversity. This composite consisted of four items created by the author and taken from the Michigan Student Study (1990-1994). Respondents were asked to what extent they agreed with the four statements, and response options ranged from 1 to 5, with 1 = *strongly disagree* and 5 = *strongly agree*, as anchors. The responses were averaged (unweighted), resulting in a five-point scale with higher values representing greater belief that the college was committed to diversity.

Prior ethnic compositions. Three survey questions measured how students described the ethnic compositions of the high school they last attended, the neighborhood(s) where they had grown up, and the general student population at [college]. Response options varied on a five-point scale, where 1 = *all or nearly all the same race as me*, 2 = *mostly the same race as me*, 3 = *roughly half the same race*

as me and half different race(s) than me, 4 = *mostly different race(s) than me*, 5 = *all or nearly all different race(s) than me*. This set of questions was adapted from existing survey items (CIRP Freshman Survey, 2006; Michigan Student Study, 1990-1994).

   With the goal being to compare how students rated the ethnic composition of both their high school and their neighborhood to how they rated the ethnic composition of their college campus, two new variables were created by comparing the aforementioned ratings. Each variable consisted of a new five-point scale which was determined by comparing how far apart ratings had been for each location (i.e., high school vs. college, and neighborhood vs. college). For example, if a student rated his or her high school as two (mostly the same race as me) and his or her college as five (all or nearly all different race(s) than me), then s/he was designated as having responses that were three ratings apart (i.e., 5 minus 2) for the new variable comparing high school composition to college composition ("Demographics of High School Vs. College"). The same technique was used for creating designations for the second variable, "Demographics of Neighborhood Vs. College." The scales used for re-coding those designations were the same for both new variables: 1 = *very different ethnic compositions* (being 4 ratings apart), 2 = *pretty different ethnic composition* (being 3 ratings apart), 3 = *somewhat different ethnic composition* (being 2 ratings apart), 4 = *pretty similar ethnic composition* (being 1 rating apart), 5 = *the same ethnic composition* (being the same rating). Referring to the example given above, the student who had ratings that were three ratings apart would have been recoded as a two (pretty different ethnic compositions) for the variable, "Demographics of High School Vs. College."

   These two new variables – each with the same five-point scale – were then merged into a composite by multiplying scores, resulting in a 1 to 25 scale with higher values representing students coming from high schools and neighborhoods that were more similar in ethnic composition to their college. This prior ethnic compositions variable was included in preliminary regressions that are in Appendix 3.

Mentors facilitated belonging. Two pairs of survey items assessed to what extent students believed professors and peer mentors helped facilitate their reported belonging. The first pair of questions focused on perceived peer mentorship. The first question asked respondents whether any student (e.g., friend, mentor) at college helped him/her adjust and feel socially comfortable at the college. Three response options were provided: 1= *none*, 2 = *one student*, or 3 = *more than one student*. If applicable, the follow-up question asked respondents to think of the student who had the most positive impact on them at college and then answer "to what extent do you feel this student has helped facilitate your feeling like you belong at [college]?" Response options ranged from 1 to 5, with 1 = *not at all,* 3 = *somewhat,* and 5 = *a lot,* as anchors. The author created these items, but the construct was inspired by a similar single item used by the Michigan Student Study (1990-1994) related to faculty mentoring (see below).

The second pair of parallel questions focused on perceived professor mentoring. The first question asked respondents whether any professor or other staff member at college helped him/her adjust and feel comfortable at [college]. Three response options were provided: 1 = *none*, 2 = *one professor or staff member*, and 3 = *more than one professor or staff member*. If applicable, the follow-up question asked respondents to think of the professor or staff member who had the most positive impact on them at college and then answer "to what extent do you feel this person has helped facilitate your feeling like you belong at [college]?" Using the same scale as the peer mentorship question, response options ranged from 1 to 5, with 1 = *not at all,* 3 = *somewhat*, and 5 = *a lot*, as anchors. This construct was adapted from a similar question included in the Michigan Student Study (1990-1994); the original question was concerned with faculty's impact on students' intellectual and/or personal development so wording was adapted for the purposes of this study.

With the goal of simultaneously capturing both the number of mentors and the effect on student belonging of that mentoring, two new variables were created – one for peer mentoring and a parallel one for professor mentoring. Both variables consisted of a new eight-point scale which simultaneously delineated responses to the

respective pair of questions, placing them on a scale in which having more mentors that had a great effect on a student's belonging was given higher scores. The new eight-point scale for both the peer mentor variable and the professor mentor variable was: 1 = *no mentor*, 2 = *one or more mentors, with a 1 or 2 for effect on belonging*, 3 = *one mentor, with a 3 for effect on belonging*, 4 = *two or more mentors, with a 3 for effect on belonging*, 5 = *one mentor, with a 4 for effect on belonging*, 6 = *two or more mentors, with a 4 for effect on belonging*, 7 = *one mentor, with a 5 for effect on belonging*, 8 = *two or more mentors, with a 5 for effect on belonging*. An example of the recoding of survey data is the following: a student who marked that he had one peer mentor who had 'a lot' of effect on his belonging would have been recoded '7' on the new 'Peer Mentor Helped Facilitate Belonging' scale. The same example would be coded similarly for a professor mentor.

These two new variables – each with the same eight-point scale – were then merged into a composite by multiplying the two scores, resulting in scale ranging from 1 to 64, with higher values representing more mentors that had a greater effect on student belonging. This mentors facilitated belonging variable was included in preliminary regressions that are in Appendix 3.

Unsupportive professor lowered belonging. (Reverse-coded to range from negative to positive.) Similar to the mentorship constructs described above, two survey questions were designed by the author to assess whether students had negative experiences with any professors which they believed lowered their sense of belonging. The first question asked students whether any professor or other staff member had made them doubt whether they belonged at the college. Three response options were provided: 1 = *none*, 2 = *one professor or staff member*, and 3 = *more than one professor or staff member*. If applicable, the follow-up question asked respondents to think of the professor or staff member who had the most negative impact on them at the college and then answer "to what extent do you feel this person has negatively influenced how much you feel like you belong here?" Response options ranged from 1 to 5, with 1 = *not at all negatively*, 3 = *somewhat*, and 5 = *very negatively*, serving as anchors.

With the goal of simultaneously capturing both the number of unsupportive professors (if any) and the extent of the effect on belonging of those unsupportive professors, a new variable was created with a new five-point scale in which more unsupportive professors that had a larger negative effect on student belonging yielded a high score. The new five-point scale was: 1 = *no unsupportive professors*, 2 = *one unsupportive professor, with a 1, 2, or 3 for negative effect on belonging, or second question left blank*, 3 = *more than one unsupportive professor, with a 1, 2, or 3 for negative effect on belonging, or second question left blank*, 4 = *one unsupportive professor, with a 4 or 5 for negative effect on belonging*, 5 = *more than one unsupportive professor, with a 4 or 5 for negative effect on belonging*. The scale was then reverse-coded, resulting in a scale that ranged from 1 to 5, with higher values representing *fewer* unsupportive professors and *lower* perceived negative effects on belonging. This unsupportive professor variable was included in preliminary regressions that are in Appendix 3.

Lives on campus. One survey question asked students to mark *all* types of accommodation that describe where they had lived during the current academic year, with on- and off-campus response options customized to the college, including residence halls, theme houses, and off-campus with parents or other relatives. Students were also able to write in a custom response. Student responses were then recoded to create a dummy variable, in which 1 = *lives on campus* (N = 133) and 0 = *lives off campus* (N = 19). The handful of students who had marked both on and off campus housing options was coded as non-responses (N = 7) and were excluded from analyses list-wise. This lives on campus dummy variable was included in preliminary regressions that are in Appendix 3.

Supportive housing. This construct was generated from two survey items created by the author. The first asks students to indicate how supportive to their feeling like they belong at college their current housing experience has been, with a five-point scale with three anchors: 1 = *extremely unsupportive*, 3 = *no effect*, and 5 = *extremely supportive*. The second asks students to rate on a five-point scale— anchored at 1=*mostly uncomfortable socially* and 5 = *mostly comfortable socially*—

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how socially comfortable they feel in their housing situation this year. Student responses to the two items were multiplied to create a composite that ranged from 1 to 25 with higher values representing housing experiences that were more supportive of student belonging and social comfort.

Orientation facilitated social adjustment. One survey item created by the author assessed the importance of orientation in students' adjustment socially to college, with response options ranging from 1 to 5, with 1 = *not important*, 3 = *important*, and 5 = *very important*, as anchors. A prior survey question asked students to mark all orientation activities/events they had attended before starting or upon arrival at the college. Those who did not attend any orientation were excluded from analyses list-wise. The orientation variable ranged from 1 to 5, with higher values representing greater social importance of orientation. This orientation variable was included in preliminary regressions that are in Appendix 3.

Curriculum relevance. A single survey question asked students, "how relevant is the course content at [college] to issues important to you?" Response options ranged from 1 to 5, with 1 = *not at all relevant,* 3 = *neutral, and* 5 = *very relevant*, as anchors, followed by space for writing in comments. This question was adapted from the Michigan Student Study's (1990-1994) student survey that asks how satisfied students have been with the relevance of the course material to issues that are important to students from their racial/ethnic background. The goal was to tap feelings about the curricular offerings with a general question suitable to students from different ethnic backgrounds. The response from this question, which ranged from 1 to 5, was used directly to measure curriculum relevance, with higher values representing greater curriculum relevance.

Measures of Educational Outputs

The following seven variables which originated from ten survey items are hypothesized correlates of belonging; for the purposes of this study they are labeled 'measures of educational outputs.' One of the seven variables was produced as a result of the factor analysis summarized below in Table 2.5. Basic statistics for each ordinal output variable are summarized in Table 2.6 at the end of the chapter.

Expectation to graduate. This single item, taken from the Michigan Student Study (1990-1994), asked participants, "how certain are you that you will complete your undergraduate education and earn a bachelor's degree?" Response options ranged from 1 to 4, with 1 = *not at all certain I will earn my degree,* 2 = *fairly certain I will earn my degree,* 3 = *completely certain I will earn my degree, but not necessarily from [this college],* and 4 = *completely certain I will earn my degree from [this college].* The response from this question was used directly to measure expectation to graduate, with higher values representing greater expectation to graduate.

Expected retention (next year). This single item measured students' expectation to continue at this institution the next year, and the question was extracted from the Michigan Student Study (1990-1994). Response options ranged from 1 to 5, with 1 = *completely certain I won't return next year,* 2 = *fairly certain I won't return next year,* 3 = *undecided,* 4 = *fairly certain I will return next year,* and 5 = *completely certain I will return next year.* Many of the students left this response blank because it was positioned directly after the question assessing how certain they were to graduate from [college], and the current question was prefaced with, "If you are NOT completely certain you will get your degree from [college]." Therefore, if students had responded on the previous question that they were 'completely certain' to earn their degree from [this college], their blank response on this question was imputed as 5 = *completely certain I will return next year.* Three blank responses were excluded from analyses (two students had responded 'fairly certain to graduate' on the previous question, and one had left the expected graduation question blank). The expected retention variable used in subsequent analyses was treated as an ordinal variable ranging from 1 to 5, with higher values representing greater expectations to return to the college next year.

GPA. This single item asked students to note a window within which their current overall GPA fit, ranging from 1 = *below 1.5,* 2 = *1.5-1.9,* 3 = *2.0-2.4,* 4 = *2.5-2.9,* 5 = *3.0-3.4,* or 6 = *3.5 or higher.* Because there were no responses for category 1

and only one response for category 2, the bottom three categories (1-3) were collapsed and data were recoded to create a four-point ordinal variable, with 1 = *below 2.5*, 2 = *2.5-2.9*, 3 = *3.0-3.4*, 4 = *3.5 or higher*. Descriptive statistics were examined to confirm the recoded scale was not problematic for statistical analyses. The resulting GPA variable ranged from 1 to 4, with higher values representing higher GPAs.

Hours spent studying. This single item, adapted from the National Survey of Student Engagement (2007), asked students, "About how many hours per week do you typically spend doing work for your classes (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, preparing for tests, and other class-related work)?" The seven response options were: 1 = *0 hours*, 2 = *1-5 hours*, 3 = *6-10 hours*, 4 = *11-15 hours*, 5 = *16-20 hours*, 6 = *21-30 hours*, and 7 = *more than 30 hours*. Hours spent studying was treated as an ordinal variable with a scale ranging from 1 to 7, with higher values representing more hours per week spent studying.

Class participation. This single survey item created for this study measured how frequently each student participated in class discussions, with responses ranging from 1 to 5, with 1 = *never*, 2 = *once a semester*, 3 = *1-2 times a month*, 4 = *once a week*, and 5 = *more than once a week*. The response from this question was used directly to measure class participation, with higher values representing greater participation.

Frequency meet with professors. This single survey item was also created for this study and measured how frequently students met with professors outside of class time, with responses ranging from 1 to 5, with 1 = *never*, 2 = *once a semester*, 3 = *1-2 times a month*, 4 = *once a week*, and 5 = *more than once a week*. The response from this question was used directly to measure frequency of meetings with professors, with higher values representing greater frequency.

Satisfaction with the institution. The four survey questions used to create this variable via factor analysis are listed in Table 2.5 below. The four survey items used measured students' reported satisfaction with the institution, including whether students would recommend their college to prospective students who they viewed as similar to them. Items were adapted from the COFHE (2007) parent and senior

surveys, altering questions to fit under the same response scales. The response scale ranged from 1 to 5, with 1 = *strongly disagree*, 2 = *somewhat disagree*, 3 = *neither agree nor disagree*, 4 = *somewhat agree*, and 5 = *strongly agree*. After reverse-coding one item, the satisfaction with the institution variable was created as an unweighted average of the corresponding survey responses.

Descriptive statistics[3] identified that the scale was not sufficiently normally distributed, so it was recoded to a four-point scale that merged the bottom two categories (1 = *strongly disagree* and 2 = *disagree*) into one category. The newly recoded satisfaction with the institution composite was not problematic for statistical analyses and ranged from 1 to 4, with higher values representing greater satisfaction with the institution.

Summary of the Principal Component Analysis for Select Correlates

As noted above, a principal component factor analysis was used to define three hypothesized predictor variables (relatedness to peers, perceived racism, and college's commitment to diversity) and one hypothesized educational output variable (satisfaction with the institution). This factor analysis used the 16 corresponding survey items and resulted in five factors with eigenvalues over 1.0, cumulatively accounting for 69.60 percent of the variance (see Table 2.5). All four proposed satisfaction with the institution items loaded most strongly on the first factor, and all four proposed college's commitment to diversity items loaded most strongly on the second factor. The latter two proposed scales—perceived racism and relatedness to peers (which each consisted of four proposed items)—were less clear-cut, with five items loading on the third factor, two on the fourth factor, and one on the fifth factor. The single item that loaded most strongly on the fifth factor, "I feel uncomfortable

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[3] The descriptive statistics of each ordinal composite variable (mean, standard deviation, mode, median, skewness, and kurtosis statistics) were reviewed to determine if they were normally distributed. Most were sufficiently normal for statistical purposes except satisfaction with the institution, which was in turn recoded from 5 to 4 scales (strongly disagree and disagree were merged into one 'disagree' group). Specific recoding was the following: category 1 (disagree) included original responses from 1.00-2.99; category 2 (neutral) included 3.00-3.49; category 3 (agree) included 3.50-4.74; and category 4 (strongly agree) included 4.75-5.00.

discussing racially sensitive topics on campus with members of other ethnic groups,"
only accounted for a modest amount of variance and was dropped from the perceived
racism scale, limiting that scale to three items. Further, by dropping that survey item,
the Chronbach alpha increased from .56 to .65.

Table 2.5. Factor Loadings and Reliability Statistics for Select Predictors and Outputs

Factors and Survey Items	Factor loadings	α
Predictor Variables		
Relatedness to peers		.65
I have a lot in common with other students here	.78	
It has been difficult for me to meet other students on campus with whom I can relate ↔	-.67	
Most students at [college] have values and attitudes different from my own ↔	-.49	
I feel very different from most other students here ↔	-.41	
Perceived racism (scale reverse-coded)		.65
People of my race/ethnicity are more likely to experience discrimination on campus than others	.75	
I sense interracial tension on campus	.70	
I feel awkward in situations at [college] in which I am the only person of my ethnic group	.69	
I feel uncomfortable discussing racially sensitive topics on campus with members of other ethnic groups *	.10	
College's commitment to diversity		.82
This college is committed to diversity	.85	
This college is committed to fostering an environment in which students of color can be successful	.81	
If there were a racial incident at [college], the college would react quickly and appropriately	.69	
The college's efforts at community building are effective	.52	
Output Variable		
Satisfaction with the institution		.91
[College] is the right school for me	.92	
I wish I were at a different college ↔	-.82	
I am glad I attend [college]	.81	
I would encourage a high school senior whose background, abilities, and interests are similar to mine to attend [college]	.78	

* = item dropped from scale; ↔ = item reverse-coded

Summary of Descriptive Statistics

For ease of reference, below is Table 2.6 summarizing the descriptive statistics for belonging, predictor, and output variables.

Table 2.6. Basic Statistics for Belonging Measures, Predictor Variables, and Educational Outputs

Variable	N	M	SD	Scale
Measures of Student Belonging				
Social belonging (with general belonging items)	158	3.82	.73	1-5
Academic belonging	158	4.10	.76	1-5
Perceived institutional support	156	3.63	.81	1-5
Hypothesized Predictors				
Relatedness with peers	158	3.24	.79	1-5
Perceived racism (reversed)	158	3.45	.94	1-5
College's commitment to diversity	158	3.51	.90	1-5
Prior ethnic compositions	153	16.84	5.96	1-25
Mentors facilitated belonging	143	28.81	23.28	1-64
Unsupportive professor lowered belonging (reversed)	154	4.37	1.13	1-5
Supportive housing	153	17.45	7.92	1-25
Orientation facilitated social adjustment	145	3.34	1.40	1-5
Curriculum relevance	156	3.77	1.02	1-5
Measures of Educational Outputs				
Expectation to graduate	158	3.68	.66	1-4
Expected retention (next year)	156	4.56	.89	1-5
GPA	158	2.92	.94	1-4
Hours spent studying	158	4.42	1.39	1-7
Class participation	154	4.48	.88	1-5
Frequency meet with professors	154	3.14	.94	1-5
Satisfaction with the institution	158	3.11	.94	1-4

Chapter 3
Results

This chapter presents the results of data analyses, organized into four sections that cover the following topics framed by the research questions: defining components of student belonging, assessing group differences in student belonging, examining variables that are hypothesized predictors of student belonging, and testing the extent to which belonging measures are associated with measures of educational outputs.

Components of Student Belonging

The first set of analyses was conducted to determine whether the proposed three-component (social, academic, institutional) model was consistent with the data, and whether a general sense of belonging could be measured independently of the three component parts.

An exploratory principal component factor analysis was conducted to determine whether it yielded factors representing the three proposed components of belonging (social, academic, and institutional), and whether the items comprising a general sense of belonging loaded on a separate factor.

The factor analysis resulted in five factors with eigenvalues over 1.0, cumulatively accounting for 63.43 percent of the variance. All three general belonging and eight social belonging items loaded most strongly on the first factor, six academic belonging items loaded most strongly on the second factor, and the five perceived institutional support items loaded strongly on the third factor. One item loaded most strongly on the fourth factor and two items loaded on the fifth factor; these three items were dropped from analysis because the two additional factors accounted for only a modest amount of the variance.[4] Table 3.1 includes all factor loadings greater than .40 on the first three factors.

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[4] The survey items dropped as a result of factor analysis were: I prefer to study on my own (loaded on factor 4); Importance of orientation in helping you adjust socially and meet friends (factor 5); and Relevance of course content to issues important to you (factor 5).

Table 3.1. Factor Loadings Based on a Principal Component Analysis with Varimax Rotation for 25 Items from the Student Survey (N = 159)

Corresponding Survey Items	Social Belonging (11 items)	Academic Belonging (5 items)	Perceived Institutional Support (5 items)
It has been easy for me to make friends at [college].	0.82		
Other students here like me the way I am.	0.77		
I see myself as a part of the college community. (GB)	0.76		
I can really be myself at this college.	0.72		
I feel I am a member of the college community. (GB)	0.72		
I feel I belong at this college. (GB)	0.65	0.41	
Students at this college are friendly with me.	0.63		
Other students in this college seem interested in my opinions, ideas, and questions related to coursework.	0.60		
I could call another student from class if I had a question about an assignment.	0.58	0.49	
Students here treat me with respect.	0.57		
I would find it easy to join study groups with other students if I wanted to.	0.56		
I feel comfortable asking a question in class.		0.82	
I feel comfortable contributing to class discussions.		0.79	
I would feel comfortable asking a professor for help if I did not understand course-related material.		0.63	
The professors here respect me.		0.63	
When I interact with professors at this college, I feel they care about how I'm doing.	0.41	0.58	
Professors make me question whether I should be here. (dropped)		*-0.56*	
Ease of finding women's resource center support services.			0.82
Ease of finding counseling support services.			0.76
Ease of finding career planning support services.			0.73
Ease of finding tutoring support services.			0.72
Ease of finding health and wellness support services.			0.63
Eigenvalues - totals after rotation	5.75	3.96	3.15
% of variance (cumulative %) - after rotation	22.99 (22.99)	15.84 (38.83)	12.59 (51.42)

Notes: The three survey items originally proposed as 'general belonging' measures are labeled '(GB)'. The item in italics was later dropped from the study to improve reliability.

Overall, the factor analysis results suggest that three components of belonging can be distinguished, but that general belonging, as measured in existing literature, cannot be differentiated from social belonging. Because all of the items that loaded on the first factor had a social quality, the factor was labeled 'social belonging.'

Chronbach alphas were computed to confirm the reliability of the three components of belonging identified in the factor analysis. One survey item

("Professors make me question whether I should be here") was deleted from the academic belonging composite because its inclusion lowered the alpha from .84 to .59. Composites of belonging were then created as an unweighted average of the items in each of the components. The following table summarizes the alphas, means, and standard deviations for each of the composites.

Table 3.2. Reliability Statistics for Belonging Composites

Composite	No. of items	α	M	SD
Social Belonging	11	.91	3.82	.73
Academic Belonging	5	.84	4.10	.76
Perceived Institutional Support	5	.82	3.63	.81

N = 156-158

Correlations were computed to assess associations among the three components of belonging (social belonging, academic belonging, and perceived institutional support). All correlations were significant ($p < .01$, N = 156-158), but were not so high as to preclude the inclusion of all three composites simultaneously in further data analyses. Social and academic belonging had the strongest correlation ($r = .62$); perceived institutional support had the weakest associations with the other two belonging measures ($r = .35$ with social belonging and $r = .37$ with academic belonging).

To summarize, the analyses revealed that a general sense of belonging can be measured independently of academic belonging and perceived institutional support, but not of social belonging. Therefore, for the purposes of this study, general belonging and social belonging measures as originally proposed were merged into one 'social belonging' measure. The three resulting subscales of social belonging, academic belonging, and perceived institutional support are reliable, and the highest correlation among the belonging composites indicates only approximately 38 percent shared variance. As a result, subsequent analyses included the three separate measures of belonging. It is worth reiterating here that social and academic belonging are psychological measures of students' feelings of belonging, whereas perceived

institutional support is designed to capture the extent to which students feel the institution is committed to their success (by, for example, providing student services perceived as accessible).

Group Differences in Student Belonging

      The next set of analyses was conducted to determine whether the three measures of belonging varied by student ethnicity, family income, parent education, or gender. Preliminary analyses were completed to assess associations among these demographic variables and identify any sampling problems. Ethnicity and gender differences in parent education and family income were assessed by one-way Analysis of Variance (ANOVA), with results presented in Table 3.3 below.

Table 3.3. Analyses of Variance in Parent Education and Family Income by Ethnicity and Gender

	Parent Education			Family Income		
	N	Mean	SD	N	Mean	SD
Asian	22	2.82	1.01	16	2.06	1.00
Black, Hispanic, & Native American (BHN)	33	2.18	1.21	26	1.69	0.79
White	87	3.01	0.95	56	2.46	1.08
Total	142			98		
F		*** 7.90			** 5.49	
Male	33	3.06	1.17	19	2.21	0.98
Female	119	2.70	1.02	83	2.18	1.07
Total	152			102		
T		† 3.06			0.01	

*† p < .10, * p < .05, ** p < .01, *** p < .001; white is the reference group for ethnicity; parent education and family income are ordinal variables, ranging from 1 to 4.*

      Table 3.3 shows that levels of parent education and family income vary by ethnic groupings, with whites consistently reporting the highest levels of parent education and family income, followed closely by Asians, and with the black, Hispanic, and Native American students group (BHN) reporting the lowest levels. Bonferroni post hoc tests were used to compare means; for parent education, statistically significant differences emerged between whites and BHNs ($p < .001$), whereas differences in means between whites and Asians were not statistically

significant and differences in means between Asians and BHNs were marginally significant ($p < .10$). For family income, statistically significant differences in means emerged between whites and BHNs ($p < .01$), but not between the other groups. No significant gender differences were found for either parent education or family income.

Family income was available for only two-thirds of the sample, and the correlation between parent education and family income was highly significant ($r = .56, p < .01$). Therefore, to maximize the sample size, parent education was used in analyses rather than family income.

With the preliminary findings above in mind, multivariate regressions with the three aforementioned independent variables (ethnicity, parent education, and gender) were conducted to determine their degree of association with each belonging scale (i.e., social belonging, academic belonging, and perceived institutional support). Non-responses were excluded from the analyses list-wise. Coefficients (*B*) are summarized in Table 3.4 below.

Table 3.4. Estimating Student Belonging Subscores as a Function of Basic Demographic Variables

	Social Belonging	Academic Belonging	Perceived Institutional Support
(Constant)	*** 4.08	*** 4.23	*** 4.18
Black, Hispanic, & Native American (BHN)	-0.18	-0.07	-0.25
Asian	-0.10	* -0.39	* -0.37
Parent Education	-0.05	-.001	*-0.15
Female	-0.01	0.02	0.02
R²	0.01	0.04	0.06
F	.43	1.29	† 2.24
N	142	142	140

*† p < .10, * p < .05, *** p < .001; white is the reference group for ethnicity*

Holding parent education and gender constant, there were no statistically significant differences in reported belonging between the BHN students and white students; however, Asian students reported lower academic belonging and perceived less institutional support than white students. Parent education was negatively related

to perceived institutional support only. Gender did not significantly predict any of the belonging measures.[5] On the whole, the independent variables included in these analyses did not jointly explain a statistically significant amount of variance in any of the belonging measures.[6]

In summary, preliminary analyses revealed differences in parent education and family income levels by ethnic group, with white students reporting the highest parent education and family income and BHN students reporting the lowest. Findings from the multivariate regressions show that when holding other variables constant, Asians reported lower academic belonging and perceived less institutional support than white students, and students who reported lower levels of parent education perceived greater institutional support. In addition, gender did not predict scores on any of the belonging measures. On the whole, student ethnicity, gender and parent education did not jointly explain a significant amount of variance in any of the belonging measures.

Predictors of Student Belonging

The next set of analyses was conducted to determine whether measures of student belonging (over and above the effects of student ethnicity and parent education) were significantly associated with the following ten hypothesized predictors of belonging: perceived relatedness with peers, perceived racism on campus, belief about whether the college was committed to diversity, prior experience in environments with ethnic compositions similar to the college, reported peer and/or professor mentorship, experience with an unsupportive professor, living on campus, housing experience, orientation experience, and whether course content was relevant

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[5] Bivariate regressions presented broadly similar findings for each independent variable with each dependent variable; the BHN and gender dummies were never significantly related to any of the belonging measures and the Asian dummy and parent education measure each produced outcomes very similar to those here in the multivariate regression.

[6] The same regression including family income as an independent variable presented outcomes that were largely the same with a few minor exceptions: (a) Adding family income roughly doubled the amount of variance explained but the R Square values were still less than .10; (b) Sample size fell to 96-97; (c) the BHN dummy became statistically significant ($p < .01$) for social belonging only and its coefficient increased to -.49; (d) Parent education variable lost its significance for perceived institutional support; (e) Family income was negatively related to academic belonging only ($B = -.18$, $p < .05$). Furthermore, when family income was run in a set of bivariate regressions, it was never significantly related to any of the three belonging measures and R Square values were less than .01 for each bivariate regression.

to issues of importance to the student. To determine whether the associations between hypothesized predictors and belonging measures varied by student ethnicity and levels of parent education, regressions with interaction terms were also generated.

First, the means, standard deviations, and correlations among the hypothesized predictors are shown in Table 3.5.

Table 3.5. Means, Standard Deviations, and Correlations among Hypothesized Predictors[7]

	Relatedness to Peers	Perceived Racism (reversed)	College Committed to Diversity	Prior Ethnic Compo-sitions	Mentors Facilitated Belonging	Unsupportive Professor Lowered Belonging (reversed)	Supportive Housing	Orientation Facilitated Adjustment	Curriculum Relevance
Relatedness to Peers		*** .48	*** .48	0.02	0.11	0.12	*** .37	*** .27	* .17
Perceived Racism (reversed)			*** .40	0.003	-0.09	0.09	* 0.16	† 0.14	*** .28
College Committed to Diversity				-0.12	** .21	† 0.14	*** .35	*** .39	** .25
Prior Ethnic Compositions					-0.04	0.06	-0.06	0.02	0.05
Mentors Facilitated Belonging						-0.14	*** .28	** .26	** .23
Unsupportive Professor Lowered Belonging (reversed)							0.08	0.07	0.10
Supportive Housing								** .23	** .24
Orientation Facilitated Adjustment									** .25
M (SD)	3.24 (.79)	3.45 (.94)	3.51 (.90)	16.84 (5.96)	28.81 (23.28)	4.37 (1.13)	17.45 (7.92)	3.34 (1.40)	3.77 (1.02)
†p < .10, *p < .05, **p < .01, ***p < .001 (2-tailed); N = 132-158									

Many of the hypothesized predictors were significantly and positively associated with one another, although the highest correlation indicates only approximately 23 percent shared variance.

The three belonging measures (social belonging, academic belonging, and perceived institutional support) were each regressed on the group of hypothesized predictors in a stepwise regression, with student ethnicity and parent education entered in the first step (Model 1, similar to the model summarized in Table 3.4 above), the ten hypothesized predictors added in the second step (Model 2), and selected interaction terms added in the third step to allow the predictor effects to vary by ethnicity (Model 3). Parent education interactions were removed from the models presented below because their inclusion added no explanatory value. Gender is not included in the regression models because it was never statistically significant in previous analyses nor when included in both simpler and more complex variations of the belonging models run prior to the models presented below. Lastly, five of the hypothesized predictor variables (prior experience in environments with ethnic compositions similar to the college, reported peer and/or professor mentorship, experience with an

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[7] The variable 'lives on campus' (which entails a yes/no response) was not included in this correlation matrix but was included in the subsequent regression model as a dummy variable.

unsupportive professor, living on campus, and orientation experience) were cut from the regressions presented in Table 3.6 because they were never statistically significant and their inclusion substantially decreased the sample size (see Appendix 3 for details). Results from the final stepwise regressions are summarized in Table 3.6.

Table 3.6. Stepwise Regressions Reporting B (SE) of each Belonging Measure on Student Ethnicity, Parent Education, Hypothesized Predictors, and Select Interaction Terms

Hypothesized Predictors	Social Belonging			Academic Belonging			Perceived Institutional Support		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
(Constant)	*** 4.06 (.20)	*** 1.10 (.25)	*** 1.07 (.31)	*** 4.27 (.20)	*** 2.67 (.38)	*** 3.13 (.46)	*** 4.20 (.21)	*** 2.76 (.40)	*** 2.15 (.53)
Black, Hispanic, Native American (BHN)	-0.14 (.16)	0.12 (.10)	0.22 (.54)	-0.07 (.16)	.11 (.15)	-.37 (.80)	-.25 (.17)	-.10 (.16)	† 1.60 (.90)
Asian	-0.09 (.17)	-0.01 (.11)	-0.67 (.62)	* -.40 (.17)	* -.37 (.17)	** -2.79 (.92)	* -.37 (.18)	* -.39 (.18)	.34 (1.04)
Parent Education	-0.05 (.06)	-0.04 (.04)	-0.04 (.04)	-0.01 (.06)	-.05 (.06)	-.06 (.06)	* -.15 (.06)	** -.18 (.06)	** -.18 (.06)
Relatedness to Peers		*** .26 (.06)	* .17 (.07)		-.12 (.09)	* -.22 (.10)		-.12 (.10)	-.08 (.12)
Perceived Racism (reversed)		-0.04 (.05)	-0.01 (.07)		.11 (.08)	.01 (.10)		-.02 (.08)	.12 (.11)
College's Commitment to Diversity		*** .40 (.05)	*** .50 (.07)		** .24 (.08)	** .32 (.10)		*** .33 (.08)	*** .38 (.11)
Supportive Housing		*** .02 (.01)	* .02 (.01)		.01 (.01)	.01 (.01)		.01 (.01)	.001 (.01)
Curriculum Relevance		** .10 (.04)	.08 (.06)		** .15 (.06)	* .19 (.09)		** .19 (.07)	.15 (.10)
Relatedness to Peers*BHN			† .30 (.16)			.24 (.24)			-.28 (.27)
Relatedness to Peers*Asian			0.12 (.17)			† .43 (.25)			-.11 (.28)
Perceived Racism (rev)*BHN			-0.03 (.13)			.27 (.19)			-.33 (.21)
Perceived Racism (rev)*Asian			-0.08 (.14)			.16 (.21)			-.12 (.24)
College Committed to Diversity*BHN			** -.33 (.12)			** -.47 (.18)			-.05 (.20)
College Committed to Diversity*Asian			-0.05 (.14)			.18 (.20)			-.08 (.23)
Supportive Housing*BHN			-0.004 (.01)			-.01 (.02)			.01 (.02)
Supportive Housing*Asian			0.03 (.02)			.03 (.02)			.02 (.03)
Curriculum Relevance*BHN			0.06 (.09)			.13 (.14)			.10 (.16)
Curriculum Relevance*Asian			0.08 (.10)			-.17 (.14)			.03 (.16)
Unadjusted R^2	0.01	0.67	0.71	0.04	0.25	0.40	0.06	0.27	0.32
Adjusted R^2	-0.01	0.65	0.67	0.02	0.21	0.31	0.04	0.22	0.22
F	0.44	*** 32.41	*** 16.00	1.79	*** 5.39	*** 4.34	* 2.91	*** 5.84	*** 3.12

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$; N = 136; White is the reference group for ethnicity

Looking first at the effect of basic demographic variables on each belonging measure (see Models 1 and 2; note that Model 1 repeats the model previously presented in Table 3.4 minus gender with very similar results), ethnicity effects were found for Asians but not for the black, Hispanic, and Native American group. Asian students reported lower academic belonging and perceived less institutional support than white students, *both* when predictors were held constant (in Model 2) and when they were not (in Model 1). Students' levels of parent education were significantly and negatively associated only with perceived institutional support, again *both* when predictors were held constant (in Model 2) and when they were not (in Model 1).

Holding ethnicity and parent education constant, four of the five hypothesized predictor variables significantly predicted at least one of the belonging scales (see Model 2). Most notable, students who rated the college's commitment to diversity relatively high reported a higher sense of belonging on *all* three belonging measures (social belonging, academic belonging, and perceived institutional support). In

addition, the more students felt they could relate to their peers, the higher their reported social belonging.[8] Students who perceived that their housing situation supported their belonging and social comfort reported higher social belonging. Lastly, students who rated course content as more personally relevant had relatively higher scores on all three belonging measures. Students' perceived racism on campus did not significantly predict any of the belonging scales.

Examining Model 3 across the three belonging measures, ethnicity moderators for two of the five predictor variables were statistically significant or marginally significant predictors of at least one belonging measure (but never perceived institutional support). Thus, the associations between hypothesized predictors and the three belonging measures usually did not vary by ethnicity with a few exceptions, more frequently between BHN and white students.

As students' feelings of being able to relate to peers increased, BHN students' reported social belonging marginally increased and Asian students' reported academic belonging marginally increased more relative to white students' (BHNs by .30 scale units and Asians by .43 scale units). In brief, for students of color, an increased feeling that they could relate to their college peers had a larger effect on reported social belonging or academic belonging than it did for white students. BHNs who perceived that the college was more highly committed to diversity tended to report lower social (.33 scale units lower) and academic (.47 scale units lower) belonging than whites with every one unit increase in their perceived level of the college's commitment to diversity.

In addition, the BHN dummy variable for perceived institutional support (1.60) was not statistically significant in the simple linear specifications (Models 1 and 2) but became marginally significant and also changed in magnitude in model 3 that allowed predictor effects to vary by ethnicity. Conversely, when moving from Model 2 to 3

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[8] To determine whether relatedness to peers was so conceptually and statistically similar to social belonging that its inclusion in the regressions reduced potentially meaningful effects on social belonging, the same set of regression analyses (from table 3.6) were repeated, but excluding the relatedness to peers variable. The results did not meaningfully change coefficients, p values, R Squares, or F values. Relatedness to peers was therefore retained as a predictor variable in order to assess whether it was differentially associated with the three dependent variables.

for perceived institutional support, the Asian dummy became insignificant, indicating that what makes Asians seem to be different from whites in Model 2 reflects different reactions to predictor variables. Lastly, the Asian dummy variable for academic belonging retained its significance across all three model specifications, but its coefficient changed substantially (to -2.79) in model 3. In general, the predictors' non-interactive coefficients were relatively stable when comparing the specifications in Models 2 and 3; exceptions were slight variations in the predictor coefficients in the social and academic belonging models for relatedness with peers and college's commitment to diversity.

On the whole, the independent variables included in Models 2 and 3 of these analyses *jointly* explained a significant amount of variance in all three belonging measures. Across the various models, the adjusted R Square values increased most dramatically from Model 1 to 2 rather than from Model 2 to 3, suggesting that the predictor variables had more of a joint effect on each of the belonging measures than the predictor interaction terms, particularly for social belonging where the adjusted R Square value increased from -.01 to .65. Two of the three adjusted R Square values, however, increased after adding the predictor interaction terms; therefore, interaction specifications contributed some explanatory power for social and academic belonging but not for perceived institutional support.

Student Belonging as a Predictor of Select Measures of Educational Outputs

The final set of analyses was conducted to determine whether students' sense of belonging predicted the following seven student-reported variables over and above the effects of student ethnicity and parent education: expected retention (next year), expectations to graduate, GPA, hours spent studying, class participation, frequency of meetings with professors outside of class time, and satisfaction with the institution. To determine whether the associations between belonging measures and selected educational outputs varied by student ethnicity and parent education, regressions with interaction terms were also generated.

First, the means, standard deviations, and correlations among the educational outputs are shown in Table 3.7.

Table 3.7. Means, Standard Deviations, and Correlations among Measured Educational Outputs

Measured Educational Outputs	Expected Retention	Expected Graduation	GPA	Hours Spent Studying	Satisfaction w/ Institution	Class Participation	Frequency Meet w/ Professors
Expected Retention		** .24	0.05	0.03	*** .31	0.13	† .13
Expected Graduation			0.03	-0.02	*** .32	† .15	0.04
GPA				** .21	0.08	*** .36	** .23
Hours Spent Studying					0.03	0.09	* .19
Satisfaction with Institution						† .15	0.08
Class Participation							*** .29
M (SD)	4.56 (.89)	3.68 (.66)	2.92 (.94)	4.42 (1.39)	3.11 (.94)	4.48 (.88)	3.14 (.94)
*†p < .10; *p < .05; **p < .01; ***p < .001; N = 154-158*							

Most of the measured educational output variables were significantly and positively associated with one another, although the highest correlation indicates only approximately 13 percent shared variance.

The seven educational output variables were regressed on the three belonging measures—social belonging, academic belonging, and perceived institutional support—in a stepwise regression, with student ethnicity and parent education entered in the first step (Model 1), belonging measures added in the second step (Model 2), and select interaction terms added in the third step to allow effects to vary by ethnicity (Model 3). Parent education interactions were not significant for any of the educational outputs or belonging scales—i.e., the relationships between measures of belonging and output measures did not vary by level of parent education—and therefore were removed from the final models presented below. Results from these stepwise regressions are summarized in Table 3.8.

Table 3.8. Stepwise Regressions Reporting B (SE) of each Educational Output Measure on Student Ethnicity, Parent Education, Belonging Measures, and Select Interaction Terms

	GPA			Satisfaction with the Institution			Expected Retention			Hours Spent Studying			Class Participation			Expectation to Graduate			Frequency Meet with Professors		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
(Constant)	*** 2.80 (.25)	** 1.93 (.60)	0.99 (.74)	*** 3.35 (.25)	-.17 (.47)	-0.63 (.59)	*** 4.67 (.25)	*** 3.70 (.58)	*** 3.70 (.73)	*** 4.14 (.39)	*** 4.39 (.98)	*** 3.82 (1.20)	*** 4.41 (.23)	*** 2.64 (.52)	** 1.82 (.64)	*** 3.73 (.18)	*** 2.74 (.44)	*** 3.24 (.55)	*** 3.30 (.26)	* 1.59 (.63)	** 2.10 (.78)
BHN	† -0.34 (.19)	† -0.34 (.19)	2.14 (1.46)	-.15 (.20)	-.04 (.15)	0.75 (1.16)	-.14 (.20)	-.06 (.18)	-0.39 (1.43)	.03 (.31)	-.06 (.31)	1.52 (2.36)	-.11 (.19)	-.10 (.17)	0.24 (1.26)	.003 (.14)	.03 (.14)	† -1.77 (1.07)	-.08 (.20)	-.04 (.20)	† -2.86 (1.52)
Asian	-0.20 (.21)	-0.04 (.21)	* 2.51 (1.26)	* -.42 (.22)	† -.30 (.17)	0.76 (1.00)	.12 (.22)	.20 (.21)	-0.29 (1.23)	.19 (.34)	.20 (.35)	1.60 (2.03)	-.19 (.21)	.04 (.19)	* 2.35 (1.09)	-.09 (.15)	-.03 (.16)	-1.32 (.93)	-.22 (.23)	-.07 (.23)	-0.33 (1.32)
Parent Education	0.09 (.07)	0.09 (.07)	0.06 (.08)	-.03 (.08)	-.01 (.06)	-0.003 (.06)	-.01 (.08)	.001 (.07)	0.01 (.07)	.07 (.12)	.04 (.12)	0.04 (.12)	.06 (.07)	.04 (.06)	0.03 (.06)	-.004 (.05)	.003 (.05)	0.02 (.06)	-.04 (.08)	-.04 (.08)	-0.07 (.08)
Social Belonging (SB)		* -.29 (.13)	-0.18 (.16)		*** .74 (.10)	*** 0.78 (.12)		† .21 (.12)	0.20 (.15)		-.18 (.21)	0.12 (.25)		† -.21 (.11)	-0.21 (.13)		.10 (.09)	0.06 (.11)		.03 (.14)	0.17 (.16)
Academic Belonging (AB)		*** .43 (.13)	** .46 (.17)		* .22 (.10)	** 0.34 (.13)		.07 (.12)	0.17 (.16)		.32 (.21)	0.32 (.27)		*** .67 (.11)	*** 0.90 (.14)		.10 (.09)	0.11 (.12)		** .35 (.14)	0.21 (.17)
Perceived Institutional Support (IS)		.06 (.10)	0.18 (.13)		-.09 (.08)	-0.15 (.11)		-.05 (.10)	-0.17 (.13)		-.20 (.17)	† -0.36 (.22)		-.06 (.09)	-0.09 (.12)		.04 (.08)	-0.08 (.10)		.02 (.11)	-0.08 (.14)
SB * BHN			-0.34 (.34)			-0.09 (.27)			0.21 (.34)			** -1.51 (.55)			0.26 (.30)			0.20 (.25)			-0.36 (.36)
AB * BHN			0.08 (.33)			-0.22 (.27)			-0.32 (.33)			0.50 (.54)			-0.28 (.29)			-0.06 (.25)			* 0.81 (.35)
IS * BHN			† -0.42 (.24)			0.13 (.19)			0.24 (.24)			0.57 (.39)			-0.05 (.21)			* 0.36 (.18)			0.21 (.25)
SB * Asian			-0.23 (.43)			0.11 (.34)			-0.16 (.42)			0.06 (.69)			0.17 (.37)			0.08 (.32)			-0.56 (.45)
AB * Asian			-0.13 (.39)			-0.35 (.31)			-0.04 (.38)			-0.31 (.63)			* -0.79 (.34)			-0.02 (.29)			0.29 (.41)
IS * Asian			-0.32 (.31)			-0.04 (.24)			0.36 (.30)			-0.14 (.50)			0.05 (.27)			0.30 (.23)			0.35 (.32)
Unadjusted R²	0.05	0.13	0.18	0.03	0.47	0.49	0.01	0.05	0.07	0.01	0.03	0.10	0.02	0.24	0.31	0.002	0.05	0.10	0.01	0.09	0.16
Adjusted R²	0.03	0.09	0.10	0.01	0.45	0.44	-0.01	0.01	-0.02	-0.02	-0.02	0.01	-0.01	0.21	0.24	-0.02	0.01	0.02	-0.01	0.05	0.08
F	† 2.33	** 3.28	** 2.32	1.26	*** 19.94	*** 9.98	0.37	1.17	0.81	0.25	0.67	1.15	0.71	*** 6.91	*** 4.57	0.11	1.22	1.17	0.39	* 2.24	* 1.93

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$; $N = 138$-142; White is the reference group for ethnicity.

Looking first at the effect of basic demographic variables, parent education was not a significant predictor of any educational outputs but it remained in the models as a covariate. Asian students reported lower satisfaction with the institution than white students, both when belonging measures were held constant (marginal significance in Model 2) and when they were not (Model 1). Lastly, the mean GPA reported by black, Hispanic, and Native American students was marginally significantly lower than for white students both when belonging measures were held constant (Model 2) and when they were not (Model 1).

Holding ethnicity and parent education constant (Model 2), social belonging and academic belonging each significantly predicted four of the educational outputs, whereas perceived institutional support did not predict any of the outputs. Students who had relatively high scores on the social belonging measure had lower GPA's and to some degree reported lower classroom participation; they had relatively higher satisfaction with the institution and were somewhat more likely to expect to return to college the next year. Social belonging was not significantly associated with hours spent studying, expectations to graduate, or frequency of meetings with professors outside of class.

Students who had relatively high scores on the academic belonging measure reported significantly higher GPAs, greater satisfaction with the institution, higher class participation, and claimed to meet relatively more often with professors outside of class. Neither hours spent studying nor expectations to graduate was significantly predicted by any of the independent variables in Models 1 or 2.

Examining Model 3 across all of the educational outputs, of the 42 interaction term coefficients included (i.e., 6 terms x 7 models), only four were statistically significant and only one more was marginally significant. Thus, the associations between belonging measures and the select educational outputs did not typically vary by ethnicity with a few statistically significant exceptions predominantly between BHN and white students. As students' reported social belonging increased, the number of hours spent studying decreased for BHNs relative to whites; BHNs with a one unit higher social belonging tended to study about 7.5 hours per week (1.51 scale

units) less than whites with the same one unit increase in social belonging. BHNs with higher reported academic belonging tended to meet with professors outside of class time with (.81 scale units) greater reported frequency than whites with the same higher level of academic belonging. BHNs with higher perceived institutional support tended to have higher expectations to graduate (by .36 scale units) and lower GPAs (.42 scale units lower which translates to approximately .25 grade points lower) than whites with the same one unit change in perceived institutional support. Lastly, Asians with higher reported academic belonging tended to report lower rates of class participation (.79 scale units lower) than whites with the same higher level of reported academic belonging.

In addition, when comparing data in Models 1 and 2 with those in Model 3, some of the ethnicity dummy variables that were not statistically significant in the simpler linear specifications (Models 1 and 2) became significant (or marginally significant) and also changed in magnitude in the models that allowed belonging effects to vary by ethnic groupings (Model 3). Examples of this change are the dummies of 2.51 and 2.35 for Asians in the GPA and class participation models, and the dummies of -1.77 and -2.86 for BHN in the expectations to graduate and frequency of meetings with professors models.

On the whole, the independent variables included in Model 2 of these analyses explained a significant amount of variance in four of the seven educational outputs: GPA, satisfaction with the institution, class participation, and frequency of meetings with professors (but not in hours spent studying, expected retention, or expectations to graduate). Ethnicity and parent education alone (Model 1) did not jointly have a significant effect on any of the educational outputs, but after adding the three belonging measures (Model 2), those four outputs' models consequently became statistically significant, and after allowing the effects of belonging measures to vary by ethnicity (Model 3), the statistical significance remained. For these four outputs' models, the R Square values increased most substantially from Model 1 to 2 rather than from Model 2 to 3, suggesting that the belonging measures have more of a joint effect on educational outputs than the belonging interaction terms, particularly for

satisfaction with the institution and class participation. Nevertheless, some adjusted R Square values increased after allowing the effects of belonging to interact with ethnicity; therefore, significant (or in one case marginally significant) interaction specifications contributed explanatory power for the following five educational outputs: GPA, hours spent studying, class participation, expectations to graduate, and frequency of meetings with professors.

Chapter 4

Discussion

A few theorists have claimed that a sense of belonging is a basic human need (Baumeister & Leary, 1995; Connell & Wellborn, 1991; Deci & Ryan, 1991; Maslow, 1954) and many researchers have proposed that it facilitates important academic and social outcomes in college (Freeman, Anderman, & Jensen, 2007; Hausmann, Schofield, & Woods, 2007; Hoffman, Richmond, Morrow, & Salomone, 2003; Ostrove & Long, 2007; Walton & Cohen, 2007, 2011). Numerous researchers have also asserted that some students are more vulnerable to questioning their sense of belonging in college contexts than others (Hurtado & Carter, 1997; Johnson, Alvarez, Longerbeam, Inkelas, Leonard, & Rowan-Kenyon, 2007; Maestas, Vaquera, & Zehr, 2007; Walton & Cohen, 2007). This study was designed to improve our understanding of belonging, its components, and its correlates for a diverse group of college students.

This chapter includes a summary and discussion of findings concerning the conceptualization and measurement of a sense of belonging, as well as significant correlates (student demographic variables, perceived predictors, and related educational outputs).

The Value of a Multidimensional Conceptualization and Measure of Belonging

Hurtado and Carter (1997) define 'sense of belonging' as "the individual's view of whether he or she feels included in the college community" (p. 327) and Maestas et al. (2007) define it as "students' subjective feelings of connectedness or cohesion to the institution" (p. 239). The most commonly used measure of 'sense of belonging' in the college context consists of three survey items that measure how connected to the college community a student feels at a global or *general* level (Hurtado & Carter, 1997; slightly adapted versions of this measure were used in research studies by Hurtado & Ponjuan, 2005; Johnson et al., 2007; and, Maestas et al., 2007).

The present study was conducted to test the hypothesis that a single general measure of belonging may overlook or mask different components of belonging. Because a college campus has multiple interrelated contexts and communities which collectively comprise a student's everyday college experience (e.g., social contexts with friends, academic contexts in classrooms and with professors, and other institutional contexts such as student services), it may be productive to conceptualize belonging multidimensionally rather than generally.

Accordingly, the first question this study sought to answer was whether a three-component measure of belonging—which separately assessed what is termed here as (1) social belonging, (2) academic belonging, and (3) perceived institutional support—was consistent with the data and whether a 'general sense of belonging' could be measured independently of the three component parts. A measure of 'general belonging' (consistent with Hurtado and Carter's (1997) 'sense of belonging to campus' measure) was expected to be distinguishable but significantly correlated with the three proposed component parts.

As hypothesized, the three measures of social belonging, academic belonging, and perceived institutional support were identified and found to be reliably and meaningfully differentiated. The first two measures captured students' psychological feelings of social and academic belonging. The third aspect, perceived institutional support, measured the extent to which students felt the institution could be counted on for support when needed, by, in this case, providing student services perceived as accessible, which in turn could be interpreted as signaling the institution's commitment to helping them succeed.

Contrary to expectations, although the measure of 'general belonging' could be differentiated from academic belonging and perceived institutional support, it was not distinguishable from social belonging. In the principal component factor analysis 'general belonging' and 'social belonging' items loaded on the same factor. They were accordingly merged into one measure of social belonging.

The high correlation found in the present study between items assessing general sense of belonging and items focused on social belonging suggest that the

widely used measure of a general 'sense of belonging to campus' is mainly social in nature. Results also suggest that there is value in conceptualizing 'sense of belonging' in the college context as multidimensional, and that differentiating dimensions in the measurement of 'sense of belonging' may be useful both for research and for guiding institutional policies and practices.

Evidence for discriminant validity of the three components of belonging provides further support for the value of differentiating components of belonging. First, some associations with predictors or educational outputs were statistically significant for only *one* of the three measures of belonging. For example, the frequency that students met with professors was significantly predicted by their academic belonging but not by the other two measures of belonging. Students' feeling that they could relate to their peers was only significantly associated with social belonging. Some variables were positively correlated with one dimension of belonging and negatively correlated with another. For example, academic belonging *positively* predicted academic variables, such as GPA and class participation, whereas social belonging *negatively* predicted GPA and class participation, although the latter finding was only marginally significant.

Measuring the individual components may help fine-tune our understanding of which facets of student belonging are predicted by particular individual, interpersonal, and institutional factors and, in turn, which facets of belonging are linked with which educational outputs of interest. A better understanding of the nuances of these associations would be helpful for practitioners endeavoring to improve college students' experiences and success.

Additional findings from the present study support the proposition that using a general measure of belonging may mask practically important associations. Regression analyses holding ethnicity and parent education constant revealed that the general measure of belonging used by Hurtado and Carter (1997) was not significantly associated with GPA ($B = .01$, $p = .95$) or class participation ($B = .12$, $p = .14$), whereas when belonging measures were differentiated into three component measures, both social and academic belonging measures were significantly or marginally

significantly related to levels of GPA and class participation, notably in the opposite direction for social belonging. In the present study, the commonly used general belonging measure did not effectively capture potential relationships that the differentiated measures revealed.

Also, when regressing frequency of meetings with professors on Hurtado and Carter's (1997) general belonging measure (again holding ethnicity and parent education constant), general belonging had a significant positive association with frequency of meetings with professors ($B = .22$, $p < .01$), whereas the same regression using differentiated measures for belonging found that only academic belonging was significantly related to frequency of meetings with professors. This specific linkage to academic belonging would go unnoticed when using only the 'general belonging' measure used by other researchers. The use of the differentiated measures identifies how different facets of belonging are associated with specific educational output measures.

Student Demographics

Studies summarized in the literature review showed mixed findings with regard to ethnic and family income differences in reported belonging. In the present study very few associations between belonging measures and demographic variables were significant.

In the college context where this study took place, Asian students reported lower academic belonging and lower perceived institutional support than their white peers, but black, Hispanic, and Native American (BHN) students reported statistically similar levels of belonging to their white peers. Perhaps related to this finding, Asian students (but not BHN students) also reported significantly lower satisfaction with the institution than white students. Recall Johnson et al. (2007) found in a diverse national sample across 34 institutions of higher education that *every* group of students of color reported lower belonging than their white peers. The juxtaposition of these findings suggests there may be something specific to this college campus context that is not meeting the needs of Asian students but is better meeting the needs of BHN students. In an informal conversation, one Asian female commented that she felt

Asians were an overlooked minority at the college. She felt administrators were more focused on other minority groups and assumed Asians would be fine. Lee and Davis (2000) echo this sentiment, arguing that college administrators often assume Asian Americans will naturally adjust to college and therefore do not need targeted supports.

Another possible explanation for Asian students' lower academic belonging and satisfaction is that Asians may have arrived at college with higher expectations about the level of academic belonging they would feel and were disappointed by their actual experiences, whereas BHN students may have come with lower expectations and were in turn pleasantly surprised to be more supported and satisfied academically. More qualitative efforts to understand the perspectives of different groups of students of color—Asians in particular—may help explain this unexpected finding.

Other than these findings related to Asian students, the relatively few significant demographic effects on belonging found may in part be a consequence of the selectivity inherent in some college admissions that results in a student body. Admission processes at the selective college that participated in this study likely reduced substantially the variance that exists in the larger population and perhaps even to some degree those found in larger public universities. The relatively skewed distribution in parent education may have limited the effect of parent education, and the qualities associated with being accepted to the college may have also limited the effect of ethnicity as a predictor of belonging. It is also possible that non-white respondents had experiences and perspectives that were atypical of other non-white students who chose not to respond to the survey. Perhaps students who chose to respond to the survey were more satisfied BHN students or less satisfied Asian students.

Lastly, another possible explanation for Asian students' lower reported feelings of academic belonging could be that culturally, Asians are expected to express wisdom and reverence in silence, rather than by speaking out (Kim & Markus, 2002). Because the academic culture of western universities and colleges rewards students who participate in their classes and speak out with their opinions, these college cultural norms may be in conflict with Asian cultural norms, thereby inherently

undermining Asian students' sense of academic belonging. As a result, even Asians who may demonstrate behaviors aligned with their college's academic norms—for example, participating in class discussions—may feel that those behaviors do not come naturally to them, which may diminish their sense of belonging.

While parent education (used instead of family income to maximize sample size) did not predict social or academic belonging, students who reported lower levels of parent education perceived significantly greater institutional support. Perhaps students' ratings of their 'perceived institutional support' reflected the degree to which students actually *utilized* institutional services (e.g., tutoring, career services). Students reporting lower levels of parent education may have been more likely to need and use institutional supports, or may be more likely to feel supports are targeted at their needs. Applying this same logic, the finding (noted immediately above) that Asians reported lower perceived institutional support than whites may be partly explained by Asians feeling that supports in place were not intended for their use, or perhaps they were less willing to utilize existing institutional supports than whites. During related informal conversations on campus, a few students commented that while the college had many helpful resources for support, students had to "go out of their way" to find them.

Finding that parent education did not predict social or academic belonging suggests that this college may be pursuing policies that counteract the associations found in some prior studies of college belonging using income not parent education (Maestas et al., 2007; Ostrove & Long, 2007). Qualitative interviews with students and administrators could help shed light on this discrepancy. For example, does the college offer social and academic supports specific to first-generation students that may bolster their feelings of belonging? During informal conversations with students, one first-generation student mentioned her appreciation for a program at the college that created a supportive peer group and provided mentoring, academic supports, and other efforts to help first-generation students adjust to and succeed in college.

While it is important to discuss significant associations between belonging and demographics, it is also worth noting that student ethnicity, gender, and parent

education did not jointly explain a significant amount of variance in any of the belonging measures, and these demographic variables accounted for less than eight percent of the variance in any measure of belonging. This suggests that other experiential and environmental factors may be more important to belonging than demographic variables. Consistent with this claim, several prior studies concluded from multivariate regression analyses that students' experiences at college predicted belonging much more significantly than student demographic characteristics (Hurtado & Ponjuan, 2005; Johnson et al., 2007; Maestas et al., 2007). The following sections address the effects of such college experiences.

Correlates of Student Belonging

The following two sections discuss variables that were significantly associated with the three measures of student belonging. These findings are summarized in Table 4.1 below. Positively associated variables are indicated with '+' and negatively associated variables with '-'; parentheses indicate marginal significance.

Table 4.1. Summary of Significant (and Marginally Significant) Associations, Holding Ethnicity and Parent Education Constant

Significant Predictors	Belonging	Significant Educational Outputs
+ college committed to diversity + relevant curriculum + relate to peers + supportive housing	Social Belonging	+ Satisfaction with institution (+) Expected retention - GPA (-) Class participation
+ college committed to diversity + relevant curriculum	Academic Belonging	+ Satisfaction with institution + GPA + Class participation + Frequency meet with professors
+ college committed to diversity + relevant curriculum	Perceived Institutional Support	

The table summarizes differential associations for academic and social belonging, and the importance of differentiating these two aspects of belonging in college.

Predictors Associated with Student Belonging

Taken together, the five predictor variables included in this study were much more strongly associated with all three belonging measures, particularly social belonging, than were the combined demographic variables.[9] Whereas only one to six percent of the variance in any belonging measure was explained by ethnicity and parent education, the R Square values increased dramatically with the inclusion of the five predictor variables—increasing the variance accounted for by 66 percentage points for social belonging (from one percent to 67 percent), by 21 percentage points for academic belonging (from four percent to 25 percent), and by 21 percentage points for perceived institutional support (from six percent to 27 percent). These findings have implications for college administrators, suggesting that once students have enrolled the strongest predictors of belonging are not demographic variables, over which college administrators then have no control, but other variables that can be influenced to various extents by college policies and practices. Administrators may have more influence over some variables, such as the relevance of the curriculum, than others, such as relationships among students, but there may be strategies that could affect peer interactions.

The strength of the associations between predictors and belonging measures did not typically vary significantly by ethnic group or by level of parent education, although ethnicity moderators (but not parent education moderators) contributed some explanatory value for social belonging and academic belonging.

The following variables that significantly predicted differentiated measures of belonging are discussed below: college's commitment to diversity, relevance of curriculum, relatedness to peers, and supportive housing.

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[9] Very similar conclusions were drawn from regressions with all ten of the originally hypothesized predictor variables; these regressions are included in Appendix 3.

College's commitment to diversity. Perceiving that the college is committed to diversity was the most strongly associated with all three facets of student belonging—social belonging, academic belonging, and perceived institutional support. This finding was stable and robust across multiple regression models.

The positive association between perceived commitment to diversity and all three facets of belonging is broadly consistent with findings from research (predominantly among students of color) examining the relationship between campus racial climates and college belonging. For example, two studies conducted with Latino students found that perceiving a hostile climate for diversity was the most powerful predictor of Latino students' low belonging (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005). Another study conducted with a large national sample representing all ethnic groups proportionately found that having positive perceptions of the campus racial climate was positively related to a general sense of belonging at college for most ethnic groups—blacks, Asians, whites, and multi-ethnic students (Johnson et al., 2007). Findings from the present study support the claim that campus climates for diversity are linked to students' levels of belonging and add more evidence that this finding is not limited to students of color. The present study extends prior research that has involved a general (and therefore mainly social) measure of belonging by showing that campus climates that support diversity are also strongly linked to both academic belonging and perceived institutional support.

This finding has practical implications for college administrators. Having students believe their college is committed to diversity indeed matters to students' sense of belonging. How to authentically support an institutional commitment to diversity is beyond the scope of this study, but some relevant ideas can be drawn from prior research. Harper and Hurtado (2007) suggest that colleges "proactively audit their campus climates and cultures" (p. 20) to assess how deliberately supportive of diversity they are from varied standpoints. Two decades worth of research on diversity at the University of Michigan (Michigan Student Study, 1990-1994) culminated in a summary of ten core ingredients for fostering campus diversity success, which included the following strategies: providing a visible and sustained

commitment from top campus leadership; hiring and promoting faculty and staff of color; communicating well-articulated visions of diversity and simultaneously having campus leaders who put these visions into practice; engaging every level of the institution so that institutional diversity is everyone's business; addressing student access, persistence, retention, disparities in graduation rates, and overall satisfaction with the campus experience; and being prompt and proactive in addressing racial incidents involving students, faculty, and staff (adapted from Wade-Golden & Matlock, 2007).

Given that students of color have been found to be more likely than white students to report perceiving racial tension at their colleges (Hurtado, 1992), it was expected that ethnicity would moderate the relationship between perceived commitment to diversity and belonging measures accordingly. Contrary to this expectation, the association between perception of the college's commitment to diversity and both social and academic belonging were stronger for white than for black, Hispanic, and Native American students (but not for Asian students). One possible and speculative explanation for this unexpected effect is that students of different backgrounds interpreted 'diversity'—when not specified as ethnic diversity in two of the four survey questions—through different prisms (e.g., religious or sexual orientation diversity that may be relevant to white students). Because negative campus climates for diversity are more often perceived in larger, public universities (Hurtado, 1992), perhaps this unexpected moderator effect is partly explained by a small campus size. Or perhaps the college attracted white students who particularly valued attending a college they believed was committed to diversity. College administrators could interpret this paradox as indicating fertile ground for change. Perhaps they have on hand a population of white students who are highly supportive of diversity and see themselves as part of a solution to historical legacies of discrimination.

Seemingly contrary to the results above, perceived racism was not a significant predictor of any measure of belonging. Recall that the mean student rating for perceived racism on a 1-5 scale was 3.44 (and the mode was 3), so low perceptions of

racism on this campus are not likely an explanation for this inconsistency. Taken together, these two sets of findings suggest that students' perceptions that the institution *at-large* is committed to diversity is a better predictor of their social, academic, and institutional belonging than their *personal* experiences of racism or discrimination on campus. This interpretation is consistent with prior research underscoring the importance of fostering a positive college campus climate for diversity (Hurtado, Milem, Clayton-Pedersen, & Allen, 1998; Hurtado & Ponjuan, 2005), but assumes that students at this college may perceive discriminatory experiences as anomalies rather than as representative of the cultural norms of their college.

Relevance of curriculum. The next most consistent predictor of student belonging, holding ethnicity and parent education constant, was the personal relevance of course content. The more students believed that the course content at their college was relevant to their interests, the greater their social belonging, academic belonging, and their perceptions of institutional support.

Personal relevance is likely to be interpreted and fulfilled differently for students, and the present findings do not provide information on what, specifically, students at this college deemed as relevant. Further research would be valuable to examine what college students from different backgrounds perceive as personally 'relevant.' Conceivably relevance varies by ethnic background or career interests. For example, Hurtado and Ponjuan's (2005) found in their exclusively Latino sample that enrolling in courses related to race/ethnicity, oppression, and/or that allowed dialog among diverse students predicted students' belonging. Presumably these race-related courses were personally relevant to their Latino sample in this case, but arguably not every student would find courses on oppression personally relevant. For example, someone studying to be a nurse may find particular science courses personally relevant to their career, whereas someone else may find Black Studies personally relevant for different reasons. Surveying student interests and offering a wide variety of courses and content may ensure personal relevance for most students.

It is worth noting that in recent history, many colleges have moved towards offering courses and majors that are less Euro-centric to meet demand.

Aside from Hurtado and Ponjuan (2005), no other studies of belonging that were reviewed included any curriculum variables. The present findings that curriculum relevance was a significant predictor of students' belonging socially, academically, and institutionally support the idea that curriculum relevance is an important variable to better understand. Perhaps students perceive the range of curricular offerings as a symbol of an institution's values, interpreting personally relevant curricula as evidence of institutional support for who they are. Or perhaps particular courses of relevance provide the opportunity to bring together peers with similar interests, and this connection contributes to students' feeling of belonging.

Relatedness to peers. Regardless of ethnicity or level of parent education, the more students felt they could relate to their peers, the higher was their reported social belonging. This result is consistent with prior research reporting that feeling interpersonal support or acceptance predicted a sense of college belonging (Freeman et al., 2007; Hoffman et al., 2003; Hurtado & Ponjuan, 2005; Johnson et al., 2007). Since the measure of college belonging used by these past studies is thematically similar to the measure of social belonging used in the present study, together the findings provide strong support for the importance of peer relatedness to students' sense of social, but not academic, belonging.

In the present study, the effect of relatedness to peers on social belonging (marginally) varied by ethnicity. As predicted, feeling that they could relate to their peers was found to be particularly important in helping students of color (in this case black/Hispanic/Native American students) feel that they belonged socially at college. Perhaps white students take it more for granted that they belong in college because their presence on college campuses has been the historical norm. Their feelings of relatedness to peers in turn may be less linked to their feelings of belonging than for students who wonder whether they belong because they do not feel like they are part of the college-going mainstream. This interpretation is consistent with Walton and Cohen's (2007) findings that black but not white students are sensitive about whether

they belong at college and therefore their sense of belonging may be more easily negatively affected by social adversity.

Knowing that peer relatedness matters for students, and particularly for students in the minority on college campuses, further research could help pinpoint how to most effectively facilitate positive peer interactions and relatedness. A recent New York Times article (February 15, 2012) touted the benefits of the Posse Foundation which sends groups (or 'posses') of highly qualified minority students to predominantly white colleges together, so they are surrounded by a peer group they can relate to and have resources for social support. One goal of the program is for these students to become leaders on college campuses who can help foster campus environments that are welcoming to students from all backgrounds.

At the college that participated in this study, some of the other predictor variables significantly predicted students' relatedness to peers and therefore may be worth further exploration. Lower student perceptions of racism on campus, higher perceptions of the college's commitment to diversity, and reporting socially supportive housing experiences each positively predicted students' perceived relatedness to peers.[10] Qualitative interviews with students could help inform how to most effectively support these positive predictors of peer relatedness.

On the other hand, neither peer mentoring efforts nor orientation programs—when included in preliminary regressions (see Appendix 3)—was associated with peer relatedness or with any form of student belonging, so therefore may not be the best strategies to support peer relatedness in this context. Other research has found mentoring efforts and orientation programs—one-time programs or extended efforts, such as freshman seminars and learning communities—to promote positive social adjustment and belonging (Hoffman et al., 2003; Maestas et al., 2007). Perhaps this discrepancy can be explained by this college's small size. One student commented that she enjoyed being a member of a small campus community because it provided her with the opportunity to bump into acquaintances she had met before in classes or elsewhere. This would not be the case at a larger university with extensive facilities.

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[10] These findings are from additional regressions not reported here that are mostly consistent with the correlations presented in Table 3.5.

In the context of this small college, perhaps the opportunities for socializing are already sufficiently above the threshold of need for most students, and mentoring and orientation programs would be superfluous. Focus group research by Harper and Hurtado (2007) found that students often "wanted and needed assistance, structure, and venues in which to meaningfully engage with racially different peers" (p. 16). Larger universities would likely have a greater need to provide such support and opportunities through orientation and mentoring programs than small colleges.

Supportive housing. Lastly, regardless of ethnicity or level of parent education, students who felt that their housing situation was socially comfortable and supported their feeling that they belonged at college tended to report higher levels of social belonging. Further research is needed to assess the reliability of this finding and also to determine what factors make different students feel comfortable in their housing situations. Some students may gain social comfort in their housing situation by living among a diverse group of students, while others may do so by living with one friend or with a small group of people with whom they can easily relate. Some students may prefer an individual sanctuary for escaping social interactions, while others may gain social comfort by living in housing that caters to a particular interest of theirs (e.g., theme housing). Perhaps allowing students to select among a variety of housing options—including off-campus housing—would promote customizable fulfillment of their social comfort.

The association between the social nature of students' housing experiences and their social belonging cannot be explained by whether students lived on or off campus, given that this housing-related variable was not significantly associated with any measure of belonging when included in preliminary regressions (see Appendix 3). The college's small size and location in a small town (where perhaps even living off campus is within close proximity) may help explain why Hurtado and Ponjuan (2005) found that living on campus was a significant predictor of belonging whereas the present study did not. Further research comparing college contexts could help determine whether the location and size of a college affects the importance of students' housing location.

The significant association between supportive housing experiences and social belonging is consistent with findings from Johnson et al. (2007) that students' perceiving their housing situation as socially supportive was positively associated with sense of belonging for each of the four main ethnic groups sampled (white, black, Hispanic, and Asian college students). They measured the 'social support' of students' housing situations with eight items that indicated student perceptions of the following: levels of appreciation for different ethnicities, religions, and sexual orientations; how helpful and supportive students seemed to be to each other; how often different students interacted with each other; how well facilitated was peer academic support; and the extent to which an intellectually stimulating environment was provided. This 'social support' measure used by Johnson et al. (2007) conflated social and academic support; this conflation of two types of support reinforces the need to differentiate measures of social and academic supports. More clearly distinguishing the measurement of social and academic supports in various contexts of the college experience (in this case housing) may help produce more meaningful implications for how best to support students' needs for, in this case, socially supportive housing.

Educational Output Measures Associated with Belonging

The fourth and final research question addressed to what extent student belonging is associated with measures of educational outputs and how those associations might be moderated by student ethnicity or parent education. Existing research that has examined or speculated about the associations between select educational outputs and students' *general* sense of belonging has produced a few consistent findings. As summarized in the introduction, general college student belonging has been associated with intentions to persist at college (Hausmann et al., 2007; Hoffman et al., 2003), higher GPA (Ostrove & Long, 2007; Walton & Cohen, 2007, 2011), academic participation behaviors (Freeman et al., 2007; Hoffman et al., 2003; Walton & Cohen, 2007), and satisfaction with the institution (Ostrove & Long, 2007). Missing from prior research efforts is evidence identifying which facets of belonging are related to which educational outputs and for whom. The present study

hypothesized that belonging measures would be positively associated with the seven educational outputs measured, which included GPA, satisfaction with the institution, expectations to persist the following year, expectations to graduate, hours spent studying, class participation, and frequency of meetings with professors.

As summarized in Table 4.1 above, in this study, holding ethnicity and parent education constant, social and especially academic belonging measures (but not perceived institutional support) significantly predicted several, but not all, educational output measures. Given the correlational design, the results do not bear on the direction of causality. For example, although the term 'outputs' is used, it is just as likely that variables such as GPA and satisfaction with the institution affect feelings of belonging as it is that feelings of belonging contribute to these two variables.

Associations between measures of belonging and educational outputs rarely varied significantly by ethnicity or by levels of parent education.

The following educational outputs that were significantly (or marginally significantly) associated with differentiated belonging measures are discussed below: satisfaction with the institution, class participation, frequency of meetings with professors, GPA, and expected retention.

Satisfaction with the institution. The present findings are consistent with previous research showing that a general sense of belonging to college is positively associated with satisfaction at the college (Ostrove & Long, 2007). Students who reported higher levels of social belonging and academic belonging tended to have greater levels of satisfaction with the institution. Nearly half of the variance in satisfaction with the institution was explained by the level of students' social and academic belonging. This very high R Square provides compelling evidence that social and academic belonging really matter for student satisfaction. Although the present study expanded on previous findings by demonstrating that academic belonging was an important predictor, social belonging was the stronger predictor. A one unit increase in social belonging increased satisfaction with the institution over three times more than a one unit increase in academic belonging.

Class participation. Of the seven output variables assessed, students' frequency of class participation was the second best predicted by belonging (after satisfaction with the institution); nearly one-quarter of the variance in class participation was explained by belonging measures. The nature of the association between belonging and class participation was partly contrary to hypotheses, though. Class participation rose as the level of social belonging declined and as the levels of academic belonging increased. Ethnicity partially moderated this association: increases in academic belonging were associated with much smaller increases in class participation by Asian students than by white students. Moreover, recall that Asian students also tended to report lower academic belonging than whites at this college.

The finding that social belonging negatively predicted class participation contradicts prior research findings for general college belonging (e.g., Hoffman et al. (2003) found that higher belonging was associated with greater classroom comfort and participation, and Freeman et al. (2007) found that class belonging and motivation to participate were associated) and should be interpreted with caution. Further research is needed to determine whether, for example, students who feel very socially connected at college are less focused on their academics and more focused on their social life, or students who do not feel academically connected seek social belonging to compensate.

Frequency of meetings with professors. Existing empirical evidence portrays a mixed relationship between students' general sense of belonging at college and their frequency of interactions with faculty—both positive (Hurtado & Carter, 1997; Walton & Cohen, 2007) and negative or not significant with results depending on the ethnic group (Johnson et al., 2007). Because the general belonging measure from prior studies is broadly similar to the social belonging measure in the present study, the current finding of no relationship between social belonging and frequency of meetings with professors contradicts evidence from the two aforementioned studies but is consistent with most of the findings from Johnson et al. (2007).

As was the case with class participation, academic belonging was positively associated with frequency of meetings with professors in the present study. It is

noteworthy that academic belonging was more strongly associated with frequently meeting with professors for the group of black, Hispanic and Native American students than for white students. Perhaps minority students needed to feel a higher level of academic belonging than white students in order to be willing to seek out interactions with professors. Or minority students might have needed more faculty attention to feel like they belonged. Future research would be useful to determine the nature and direction of this association.

GPA and retention. Students who reported lower levels of social belonging and higher levels of academic belonging tended to have significantly higher GPAs. This negative association of GPA with social belonging contradicts prior research that used a broadly similar measure of general or social belonging (Ostrove & Long, 2007; Walton & Cohen, 2007, 2011) and should be interpreted cautiously. Both Ostrove and Long's (2007) and Walton and Cohen's (2007) studies took place at single elite institutions so perhaps this discrepancy in results in fact reflects contextual differences in individual college and/or student characteristics.

In addition to reporting lower GPAs, students who reported higher social belonging were somewhat more likely to expect to return to college the next year. The latter finding is consistent with similar findings from Hausmann et al. (2007) for general college belonging. The strength of the associations in both the present study and the study by Hausmann et al. (2007) did not vary by ethnicity or parent education group.

One interpretation of the findings related to social belonging is that some academic outputs (in this case GPA) do not require a high level of social belonging. Given that social belonging is positively associated with expected retention but negatively associated with GPA, perhaps for some students who are performing poorly academically, feeling socially connected and comfortable serves as a protective buffer, helping them persist in college rather than drop out due to academic challenges.

The positive association between academic belonging and GPA highlights the importance of differentiating facets of belonging and seeking to understand the distinct associations with each facet of belonging. For example, one may speculate that the

relation between higher GPAs and academic belonging may be self-reinforcing, whereas a similar reciprocal relation is less likely to exist between GPA and social belonging.

To put the above findings related to GPA and retention in perspective, bear in mind that the three measures of belonging collectively explained only 13 percent and five percent, respectively, of the variance in GPA and expected retention; therefore, other variables are more likely explaining variance in these particular educational outputs.

Summary

The significantly associated predictors and educational outputs that emerged in this study using differentiated measures of belonging enrich our understanding of college student belonging. Whereas measures of belonging were weakly related to student demographics, they were significantly predicted by several institutional and interpersonal variables that could be addressed by administrators. Practitioners need to understand that supporting academic belonging is likely to involve different factors and policies than those targeting social belonging. For success in college, students need both. While social belonging was strongly associated with many desirable outcomes of the college experience, academic belonging was more closely and consistently linked to academic output measures. In addition, existing literature on college student belonging was also extended with the inclusion of ethnic interaction terms, some of which were significant and added some explanatory power.

The present study expanded on Tinto's behavioral model by assessing students' psychological experience of college. The finding that social and academic belonging could be meaningfully differentiated supports Tinto's differentiation of social and academic integration. Adding psychological measures may be particularly valuable for college administrators endeavoring to provide better support for students from different backgrounds. The present study found that the measure of perceived institutional support did not significantly predict any of the selected educational outputs, whereas students' feelings of social and academic belonging were important

predictors of desirable college outcomes and differentially predicted by college experience variables.

Limitations and Future Research

This exploratory study produced some findings that merit further exploration. Several issues limit the interpretation and generalizability of these findings. First, survey results were limited to a small sample of college sophomores from one small, predominantly white liberal arts college. Having a small sample constrained possible analyses and led to the combining of black, Hispanic and Native American students into one ethnicity group for analytic purposes. Disaggregating this group by ethnicity would be useful in future research. A similar disaggregation of the Asian student group would be helpful, too, given the constraints of treating Asians as a homogeneous group.

Further, exploratory findings from one selective college context may not be representative of student experiences and perspectives in other college contexts or the general public. Each institution of higher education has a distinct mission, organizational structure, and resource base from which to draw, and these differences shape students, experiences, and outcomes (Walpole, 2007). Larger studies that include many campuses have value, but they may also mask systematic differences among campuses. Ideally, larger studies would assess possible campus-related moderators, such as the size of the school and the degree of diversity in the student body. Focusing research on one college was an appropriate first step in developing measurement tools and specific hypotheses to guide larger-scale research.

Second, results were drawn solely from self-reported data collected at one time. Output measures for retention and graduation were limited to student-reported intentions to persist and graduate rather than actual documented behavior. Further research with institutionally collected data on such variables as GPA and retention, particularly using longitudinal or experimental designs, is needed to assess evidence for causal directions.

Family income was also self-reported and only two-thirds of participants in the present study reported their family income, necessitating the exclusion of income data

from most data analyses to maximize the sample size. Although quantitative analyses using parent education instead of income found that parent education was not significantly associated with social or academic belonging measures or to any educational output measures, informal conversations with students at this college revealed a perception that income did in fact affect social interactions. Two lower-income students commented that they often felt they were being left behind socially when their peers left campus to go to the cinema or to go clubbing because they did not have sufficient disposable income to fund such social outings. Quantitative analyses did not find such discrepancies, but both better collection of family income data and the addition of complementary qualitative research may elucidate potential effects of income on social belonging.

Lastly, qualitative interviews with students would be useful to inform strategies for promoting student belonging. These survey data helped highlight which predictors were significantly related to which facets of belonging for which types of students, but qualitative research could address the 'how' questions for practitioners. For example, survey data from this study found that perceiving the college was committed to diversity was a very significant predictor of students' social, academic and institutional belonging. Qualitative research could help identify what facilitates and/or impedes the perception that a college is committed to diversity. It may also be fruitful to have focus groups with students and college administrators to come up with other possible predictor variables that were not included in the present study.

Looking forward, it is possible to measure differentiated facets of student belonging and these facets of belonging are associated with some important educational outputs. This line of research merits further work in other institutional contexts. While the concept of perceived institutional support may be a helpful addition to existing higher education literature, the way it was measured needs to be refined. The measure used in this study may have assessed students' *use* of institutional supports as much as their perceptions of their existence. The perceived institutional support measure was framed as a component of belonging designed to capture students' perceptions of signals from the institution of its commitment to

supporting their college success (measured by assessing how accessible students viewed support services). Future studies of belonging should consider more of a psychological measure of actual 'institutional belonging' that perhaps encompasses, among other things, perceptions by students of whether they see themselves reflected in the images and symbols that represent their college, and whether the institution's cultural norms resonate with them or are a source of dissonance. Some indicators of institutional belonging may be unacknowledged by some students but readily apparent to other students. Bolger, Zuckerman, and Kessler (2000) conducted daily diary research that speaks to this issue, finding that transactions during times of stress that are invisibly supportive to their intended recipients (i.e., occur without the knowledge that they are receiving support) are the most beneficial. For example, students who physically 'look like' the historically traditional college-going students at a particular college may, without realizing it, be recipients of invisible belonging support, whereas those who look different may constantly confront feelings of questioning their belonging. Measures that can address this type of institutional belonging would be a useful addition and potentially more cohesive with the other psychological components of belonging found in this study.

Lastly, including a simultaneous exploration of non-academic factors (e.g., co-curricular and extracurricular experiences) is a recommended next step. The present study did not effectively measure students' level of involvement with non-academic activities and their perceptions of how their involvement affects their belonging at college. Colleges each have their own norms and values that often contribute to how participation in certain clubs, organizations, sports teams, and other extracurricular activities is socially constructed. For example, at the college where this study was conducted, being an athlete on one of their more successful teams is highly respected and valued by many members of the student population. The effect of this and other types of extracurricular roles on campus could not be effectively incorporated within the scope of this study.

Conclusions

In closing, this study identified and defined three reliable, differentiated measures of belonging, which were termed social belonging, academic belonging, and perceived institutional support. General belonging, as commonly measured by research on college student belonging (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005; Johnson et al., 2007; Maestas et al., 2007), was found to be indistinguishable from social belonging but somewhat independent of academic belonging and perceived institutional support. The three belonging measures were weakly related to fixed demographic attributes of students and much more significantly associated with several predictor variables that may be influenced by the institution; examples of these significant predictors were perceptions by students that the college was committed to diversity, perception that courses were relevant to issues of interest, level of relatedness to peers, and feeling that housing experiences were socially comfortable and supported student belonging. This study also provided empirical evidence that supports the importance of students' social and academic belonging, significantly linking social and academic facets of belonging with educational outputs like satisfaction with the institution, GPA, class participation, frequency of meetings with professors, and expected retention.

Lastly, because the existing college belonging literature has focused on general/social belonging, the resulting policy implications have focused on general/social belonging. Findings from this study show that general/social belonging is indeed important, but academic belonging is also important. The differentially significant correlates of social and academic belonging suggest that colleges would be remiss to focus only on general/social belonging given that (a) academic belonging is strongly associated with some desirable educational outputs, and (b) the determinants/predictors of academic belonging are different from those of social belonging. Therefore, the reliable measure of academic belonging developed in this study is an important contribution for future research.

Appendix 1

Survey

[The version of the survey included in this appendix is formatted slightly differently than the one that was distributed via an online application, which used radio buttons, drop-down options, etc. The identity of the college is also removed here to maintain anonymity.]

The purpose of this survey is to better understand students' perspectives and experiences at [college]; your input will help inform policies and practices for current and future students. All responses are anonymous and completely confidential so please be open and honest so we can genuinely learn from your important perspective. The survey should take you approximately 15 minutes to complete. Thank you very much for your time!

[College] Sophomore Student Survey

In order to complete this survey, you must be a sophomore and you must be at least 18 years old.

1) If you participate in any extracurricular activities at [college], for each type of activity, please (a) rank the extent to which you have been involved, and then (b) rate its importance in helping you develop friendships at [college].

	(a) Extent of involvement	(b) Rate importance
Sports	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Political activities	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Student government	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Groups and activities reflecting cultural-ethnic backgrounds	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Community service	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Tutoring/mentoring	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Religious clubs and activities	❑ Slightly involved ❑ Somewhat involved ❑ Substantially involved	❑ Not at all socially important ❑ Somewhat socially important ❑ Very socially important
Art	❑ Slightly involved ❑ Somewhat involved	❑ Not at all socially important ❑ Somewhat socially important

	☐ Substantially involved	☐ Very socially important
Performance, Music, Dance, Theater	☐ Slightly involved ☐ Somewhat involved ☐ Substantially involved	☐ Not at all socially important ☐ Somewhat socially important ☐ Very socially important
[cultural events]	☐ Slightly involved ☐ Somewhat involved ☐ Substantially involved	☐ Not at all socially important ☐ Somewhat socially important ☐ Very socially important
Newspaper/literary magazines	☐ Slightly involved ☐ Somewhat involved ☐ Substantially involved	☐ Not at all socially important ☐ Somewhat socially important ☐ Very socially important
Other: (Please specify below)	☐ Slightly involved ☐ Somewhat involved ☐ Substantially involved	☐ Not at all socially important ☐ Somewhat socially important ☐ Very socially important

Other activity: _____

2) Would others describe you as having a leadership role in any of the above organizations/activities? (e.g., team captain, first chair in orchestra, club president/executive committee member)
    ☐ Yes
    ☐ No
Please specify any leadership roles: _____

3) To what extent do the following factors make you feel more or less comfortable at [college]?

	Very uncomfortable		Neutral / No effect		Very comfortable
Your gender	☐	☐	☐	☐	☐
Your sexual orientation	☐	☐	☐	☐	☐
Your financial circumstances	☐	☐	☐	☐	☐
Your religion	☐	☐	☐	☐	☐
Your race/ethnicity	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

4) Indicate how much you feel your FINANCIAL CIRCUMSTANCES (i.e., how much money your family has relative to others) make the following easier or more difficult:

	Much more difficult		Neither more difficult nor easier		Much easier
Being taken seriously by professors	❏	❏	❏	❏	❏
Feeling comfortable socially on campus	❏	❏	❏	❏	❏
Finding like-minded friends	❏	❏	❏	❏	❏
Being included in informal activities with other students	❏	❏	❏	❏	❏
Feeling like you fit in at [college]	❏	❏	❏	❏	❏
Finding the academic support you need to do well	❏	❏	❏	❏	❏
Contributing to discussions in classes	❏	❏	❏	❏	❏

5) Indicate how much you feel like being a member of your RACIAL GROUP makes the following easier or more difficult:

	Much more difficult		Neither more difficult nor easier		Much easier
Being taken seriously by professors	❏	❏	❏	❏	❏
Feeling comfortable socially on campus	❏	❏	❏	❏	❏
Finding like-minded friends	❏	❏	❏	❏	❏
Being included in informal activities with other students	❏	❏	❏	❏	❏
Feeling like you fit in at [college]	❏	❏	❏	❏	❏
Finding the academic support you need to do well	❏	❏	❏	❏	❏

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Contributing to discussions in classes	❑	❑	❑	❑	❑

6) From your experience at [college] during the current academic year, to what extent do you agree or disagree with the following statements:

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I can really be myself at this college.	❑	❑	❑	❑	❑
I feel I am a member of the college community.	❑	❑	❑	❑	❑
I am glad I attend [college].	❑	❑	❑	❑	❑
Students at this college are friendly with me.	❑	❑	❑	❑	❑
I would feel comfortable asking a professor for help if I did not understand course-related material.	❑	❑	❑	❑	❑
It has been difficult for me to meet other students on campus with whom I can relate.	❑	❑	❑	❑	❑
Students here treat me with respect.	❑	❑	❑	❑	❑
People of my race/ethnicity are more likely to experience discrimination on campus than others.	❑	❑	❑	❑	❑
I feel comfortable contributing to class discussions.	❑	❑	❑	❑	❑
I feel very different from most other students here.	❑	❑	❑	❑	❑
When I interact with professors at this college, I feel they care about how I'm doing.	❑	❑	❑	❑	❑
I would encourage a high school senior whose background, abilities, and interests are similar to mine to attend [college].	❑	❑	❑	❑	❑
I would find it easy to join study groups with other students if I wanted to.	❑	❑	❑	❑	❑
The college's efforts at community building are effective.	❑	❑	❑	❑	❑

I feel I belong at this college.	❏	❏	❏	❏	❏
The professors here respect me.	❏	❏	❏	❏	❏
[College] is the right school for me.	❏	❏	❏	❏	❏
This college is committed to fostering an environment in which students of color can be successful.	❏	❏	❏	❏	❏
I prefer to study on my own.	❏	❏	❏	❏	❏
Most students at [college] have values and attitudes different from my own.	❏	❏	❏	❏	❏
Professors make me question whether I should be here.	❏	❏	❏	❏	❏
I sense interracial tension on campus.	❏	❏	❏	❏	❏
I see myself as a part of the college community.	❏	❏	❏	❏	❏
I have a lot in common with other students here.	❏	❏	❏	❏	❏
I feel awkward in situations at [college] in which I am the only person of my ethnic group.	❏	❏	❏	❏	❏
I could call another student from class if I had a question about an assignment.	❏	❏	❏	❏	❏
It has been easy for me to make friends at [college].	❏	❏	❏	❏	❏
This college is committed to diversity.	❏	❏	❏	❏	❏
I wish I were at a different college.	❏	❏	❏	❏	❏
Other students in this college seem interested in my opinions, ideas, and questions related to coursework.	❏	❏	❏	❏	❏
Other students here like me the way I am.	❏	❏	❏	❏	❏
If there were a racial incident at [college], the college would react quickly and appropriately.	❏	❏	❏	❏	❏
I feel comfortable asking a question in class.	❏	❏	❏	❏	❏
I feel uncomfortable discussing racially sensitive topics on campus with members of other races/ethnicities.	❏	❏	❏	❏	❏

7) What is your race/ethnicity? (mark **all** that apply)
   - ❑ Asian; Asian American; Pacific Islander (specify below)
   - ❑ Black; African American
   - ❑ Hispanic; Latino; Chicano (specify below)
   - ❑ Native American; American Indian; Alaskan Native
   - ❑ White; Caucasian (non-Hispanic)
   - ❑ I prefer not to respond
   - ❑ Other: (specify below)

   Other: _____

8) If you marked more than one race/ethnicity above, please indicate the one with which you MOST strongly identify.
   - ❑ Asian; Asian American; Pacific Islander (specify below)
   - ❑ Black; African American
   - ❑ Hispanic; Latino; Chicano (specify below)
   - ❑ Native American; American Indian; Alaskan Native
   - ❑ White; Caucasian (non-Hispanic)
   - ❑ I prefer not to respond
   - ❑ Other: (specify below)

   Other: _____

9) Of your friends at [college], what proportion is of the same race/ethnicity as you?

0%	1-25%	26-50%	51-75%	76-99%	100%
1	2	3	4	5	6

10) How would you describe the racial composition of the following places?

	All or nearly all the same race as me	Mostly the same race as me	Roughly half the same race as me and half different race(s) than me	Mostly different race(s) than me	All or nearly all different race(s) than me
High school I last attended	❑	❑	❑	❑	❑
Neighborhood(s) where I grew up	❑	❑	❑	❑	❑
The general student population at [college]	❑	❑	❑	❑	❑
Professors at [college]	❑	❑	❑	❑	❑

11) How would you describe the financial circumstances of the general student population at [college]?
   - ❑ Most are from families that have MORE money than my family
   - ❑ Most are from families that have SIMILAR amounts of money to my family
   - ❑ Most are from families that have LESS money than my family
   - ❑ I don't know

12) What is the HIGHEST LEVEL of education that your parent(s) or guardian(s) completed?

	Father (or Guardian)	Mother (or Guardian)
Did not finish high school	❑	❑
Graduated from high school	❑	❑
Attended some college/did not receive a degree	❑	❑
Completed an associate's degree (A.A., A.S., etc)	❑	❑
Completed a bachelor's degree (B.A., B.S., etc)	❑	❑
Completed a graduate degree (M.A., M.B.A., Ph.D., M.D., J.D., etc)	❑	❑
Not sure	❑	❑
N/A		

13) Please indicate your level of concern about your ability to pay for your college education.

No concern	A little concern	Some concern	A lot of concern	Huge concern
1	2	3	4	5

14) Please identify your family's annual income:
   - ❑ Less than $50,000
   - ❑ $50,000 to $100,000
   - ❑ $100,000 to $200,000
   - ❑ More than $200,000
   - ❑ I don't know / I prefer not to respond

15) How often in your day-to-day life at [college] do you think about your racial/ethnic identity?
   - ❑ Never
   - ❑ Rarely
   - ❑ Sometimes
   - ❑ Often
   - ❑ Very often

16) How often in your day-to-day life at [college] do you think about your financial circumstances (i.e., how much money your family has)?
- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Very often

17) Please mark your gender:
- ❑ Male
- ❑ Female

18) Please mark the language(s) you speak with your family. (Mark ALL that apply):
- ❑ English
- ❑ Spanish
- ❑ Mandarin/Cantonese
- ❑ Other: _____

19) What is your current overall GPA?
- ❑ Below 1.5
- ❑ 1.5-1.9
- ❑ 2.0-2.4
- ❑ 2.5-2.9
- ❑ 3.0-3.4
- ❑ 3.5 or higher

20) About how many hours per WEEK do you typically spend working at a JOB (an on- or off-campus job for pay)?
- ❑ 0
- ❑ 1-5 hours
- ❑ 6-10 hours
- ❑ 11-20 hours
- ❑ 21-30 hours
- ❑ more than 30 hours

21) About how many hours per WEEK do you typically spend doing work for your CLASSES outside of class time (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, preparing for tests, and other class-related work)?
- ❑ 0
- ❑ 1-5 hours
- ❑ 6-10 hours
- ❑ 11-15 hours
- ❑ 16-20 hours
- ❑ 21-30 hours
- ❑ more than 30 hours

22) How certain are you that you will complete your undergraduate education and earn a bachelor's degree?
- ❑ Completely certain I will earn my degree from [college]
- ❑ Completely certain I will earn my degree, but not necessarily from [college]
- ❑ Fairly certain I will earn my degree
- ❑ Not at all certain I will earn my degree

23) If you are NOT completely certain you will get your degree from [college], how certain are you that you will return to [college] NEXT YEAR? (Mark one)
- ❑ Completely certain I won't return next year
- ❑ Fairly certain I won't return next year
- ❑ Undecided
- ❑ Fairly certain I will return next year
- ❑ Completely certain I will return next year

24) If you aren't planning to return next year:
- ❑ I plan to transfer to another college
- ❑ I plan to discontinue college for now

25) Reasons you may not return to [college] include: (check ALL that apply)
- ❑ Cost
- ❑ Don't think [college] is a good fit for me
- ❑ Academic reasons
- ❑ Other: _____

26) How easy or difficult would it be or has it been for you to find useful support services at [college]? (On a scale of 1 to 5, with 1 = very difficult and 5 = very easy)

	1 Very difficult	2	3	4	5 Very easy
Tutoring	(radio boxes in each cell)				
[career resources and planning]					
Counseling					
Health and Wellness					
[women's resource center]					
Other: _____					

27) Has any student (e.g., friend, mentor) at [college] helped you adjust and feel socially comfortable at [college]?
- ❑ None
- ❑ 1 student
- ❑ More than 1 student

28) If you answered 1 or more students, think of the student who has had the most positive impact on you. To what extent do you feel this student has helped facilitate your feeling like you belong at [college]?

Not at all		Somewhat		A lot
1	2	3	4	5

How so? _____

29) What is the race/ethnicity of this student? (mark ALL that apply)
- ❑ Asian; Asian American; Pacific Islander (specify below)
- ❑ Black; African American
- ❑ Hispanic; Latino; Chicano (specify below)
- ❑ Native American; American Indian; Alaskan Native
- ❑ White; Caucasian (non-Hispanic)
- ❑ I prefer not to respond or I don't know
- ❑ Other: _____

30) What is the gender of this student?
- ❑ Male
- ❑ Female

31) Has any professor or other staff member at [college] helped you adjust and feel comfortable at [college]?
- ❑ None
- ❑ 1 professor or staff member
- ❑ More than 1 professor or staff member

32) If you answered 1 or more, think of the professor or other staff member at [college] who has had the most positive impact on you. To what extent do you feel this person has helped facilitate your feeling like you belong at [college]?

	Not at all		Somewhat		A lot
	1	2	3	4	5

How so? _____

33) What is the race/ethnicity of this person? (mark ALL that apply)
- ❑ Asian; Asian American; Pacific Islander (specify below)
- ❑ Black; African American
- ❑ Hispanic; Latino; Chicano (specify below)
- ❑ Native American; American Indian; Alaskan Native
- ❑ White; Caucasian (non-Hispanic)
- ❑ I prefer not to respond or I don't know
- ❑ Other: _____

34) What is the gender of this person?
- ❑ Male
- ❑ Female

35) How did you first connect with this person?
- ❑ In a class
- ❑ Through a mentoring program
- ❑ Was my assigned advisor
- ❑ At orientation
- ❑ Through participation in a club, organization, or extracurricular activity
- ❑ Other: _____

36) Has any professor or other staff member here made you doubt whether you belong at [college]?
- ❑ None
- ❑ 1 professor or staff member
- ❑ More than 1 professor or staff member

37) If you answered 1 or more, think of the professor or staff member who has had the most NEGATIVE impact on you. To what extent has that person negatively influenced how much you feel like you belong here?

	Not at all negatively		Somewhat		Very negatively
	1	2	3	4	5

38) How did this person negatively influence your experience? (Mark ALL that apply)
- ❑ Unfair grading
- ❑ Disrespectful
- ❑ Negative comments about my race or background
- ❑ Acted unsupportive
- ❑ Unresponsive or unavailable
- ❑ Other: _____

39) What is the gender of this person?
- ❑ Male
- ❑ Female

40) What is the race/ethnicity of this person? (mark ALL that apply)
- ❑ Asian; Asian American; Pacific Islander (specify below)
- ❑ Black; African American
- ❑ Hispanic; Latino; Chicano (specify below)
- ❑ Native American; American Indian; Alaskan Native
- ❑ White; Caucasian (non-Hispanic)
- ❑ I prefer not to respond or I don't know
- ❑ Other: _____

41) Where have you lived this academic year? (Mark ALL that describe your living arrangement)
- ❑ On-campus: [Double room]
- ❑ On-campus: [Single room]
- ❑ On-campus: [Special theme hall]
- ❑ Off-campus with non-relatives
- ❑ Off-campus with parents or other relatives
- ❑ Other: _____

42) How SOCIALLY comfortable do you feel in your housing situation this year?

Mostly uncomfortable		Neutral		Mostly comfortable
1	2	3	4	5

43) Has your current housing experience been supportive to your feeling like you belong at [college]?

Extremely unsupportive		No effect		Extremely supportive
1	2	3	4	5

44) Think back to your freshman year. Did you attend any orientation activities/events before starting or upon arrival at [college]? Mark ALL that apply: [in this version, the customized names of the orientations have been omitted to maintain anonymity]
- ❑ None
- ❑ [general orientation during the summer]
- ❑ [orientation program directed at students who may need additional support]
- ❑ [orientation weekend when students first arrive]
- ❑ Other: _____

45) If you attended orientation: Please rate the importance of orientation in helping you adjust socially and meet friends at [college].

Not important   Somewhat important   Very important   N/A

1   2   3   4   5   6

46) How relevant is the course content at [college] to issues important to you?

Not at all relevant   Somewhat relevant   Very relevant

1   2   3   4   5

Any comments? _____

47) How often do you do the following at [college]:

	Never	Once a semester	1-2 times a month	Once a week	More than once a week
Participate in class discussions	❑	❑	❑	❑	❑
Meet with professors outside of class time	❑	❑	❑	❑	❑
Study with other students outside of class time	❑	❑	❑	❑	❑

48) How strong is your relationship with your advisor? Rate the quality of your
    relationship with your current academic advisor.

No relationship   Somewhat of a relationship   A strong relationship

        1   2   3   4   5

49) How helpful is your advisor? Rate the helpfulness of your current academic advisor.
        Very unhelpful   Somewhat helpful   Very helpful

                  1   2   3   4   5

50) How accessible is your advisor? Rate the accessibility of your current academic
    advisor.
        Very inaccessible   Somewhat accessible   Very accessible

                  1   2   3   4   5

51) How interested in your success is your advisor?
        Not at all interested   Somewhat interested   Very interested

                  1   2   3   4   5

52) Are you an international student?
    ❑ Yes
    ❑ No

53) Did you transfer to [college] from another college?
    ❑ Yes
    ❑ No

54) Please use this space to make any other comments you would like about any of the
    topics raised in this survey or any other matter of concern to you.
    _____ [left unlimited space]

55) Thank you for completing this survey! To enter into a drawing that will have three
    winners (1st winner gets an iPod Nano, 2nd winner gets an iPod shuffle, and 3rd winner
    gets a $50 gift certificate to iTunes), provide your email address below. Winners will
    be contacted in mid-December. Please note: Your email address will be used solely
    for the purpose of contacting you should you win one of the prizes. Do not provide
    your email address if you do not wish to participate in the drawing. _____

*Thank you for taking the time to fill out this survey! Please remember that all of your
responses are completely confidential and anonymous.*

Appendix 2

Recruiting Emails Distributed to All Sophomores

First Email Distributed

Subject: Sophomore Survey: Please submit by Dec 1
Date: Nov 16, 2009

Dear [college name] Sophomore,

Hopefully by now you have heard about a sophomore survey that has been designed to help [college] determine how best to nurture students' feelings of inclusion and satisfaction at [college]. A link to the survey is below:

[link to survey omitted]

By completing this survey, you will share your important perspective and help [college] respond to student concerns and most effectively support your succeeding at [college].

The survey will take about **15 minutes** to complete and if you complete it by December 1, you will be eligible to win one of the prizes below. Your responses will be completely confidential and [college] staff will only see a summary of the final compiled results (no individual responses). Your input will be taken very seriously and will help inform policies and practices for current and future students.

Those who complete the survey will be entered into a drawing (optional) with three winners:

> a. 1st prize winner gets an **iPod Nano** (16 GB)
>
> b. 2nd prize winner gets an **iPod shuffle** (4 GB)
>
> c. 3rd prize winner gets a **$50 gift certificate** to iTunes

Thank you very much for your time!

Sincerely,
Dabney Ingram
PhD Candidate, Stanford University School of Education

With the support of [names and departments of two administrators at college]

[tagline of administrator who sent email omitted]

Follow-up reminder email

Subject: Sophomore Survey Deadline Extended through Friday, Dec. 4th!

Date: Nov 30, 2009

Dear [college] Sophomore,

This is a THANK YOU to those who have submitted your sophomore surveys and a REMINDER to those who haven't. Please take a moment to share your important perspective and help [college] respond to student concerns and suggestions. Please go to the following link:

[link omitted]

by Friday, December 4th, to enter a drawing to win:

a. 1st prize **- iPod Nano** (16 GB)
b. 2nd prize - **iPod shuffle** (4 GB)
c. 3rd prize - **$50 gift certificate** to iTunes

Thank you very much for your time!

Sincerely,

Dabney Ingram
PhD Candidate, Stanford University School of Education

With the support of [names and departments of two administrators at college]

[tagline of administrator who sent email omitted]

Appendix 3

Table 3.6a. Preliminary Regressions that Included All Ten Hypothesized Predictor Variables

Hypothesized Predictors	Social Belonging			Academic Belonging			Perceived Institutional Support		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
(Constant)	*** 4.11 (.22)	*** 1.32 (.36)	* 0.92 (.44)	*** 4.45 (.23)	*** 3.12 (.57)	*** 3.33 (.72)	*** 4.27 (.24)	*** 3.14 (.62)	** 2.28 (.85)
Black, Hispanic, Native American (BHN)	-0.22 (.18)	0.06 (.11)	† 1.13 (.62)	-0.17 (.18)	0.03 (.18)	0.15 (1.02)	-0.26 (.19)	-0.13 (.19)	* 2.71 (1.21)
Asian	-0.22 (.20)	-0.14 (.12)	-1.37 (.95)	** -0.56 (.20)	** -0.50 (.20)	-1.92 (1.57)	* -0.48 (.22)	* -0.49 (.21)	1.07 (1.86)
Parent Education	-0.05 (.07)	-0.05 (.04)	-0.02 (.04)	-0.04 (.07)	-0.08 (.07)	-0.06 (.07)	* -0.16 (.07)	** -0.19 (.07)	* -0.17 (.08)
Relatedness to Peers		*** 0.26 (.07)	0.11 (.08)		-0.09 (.11)	-0.13 (.13)		-0.08 (.12)	-0.04 (.15)
Perceived Racism (reversed)		-0.02 (.06)	0.03 (.07)		0.10 (.10)	-0.04 (.12)		-0.03 (.11)	0.06 (.14)
College's Commitment to Diversity		*** 0.41 (.06)	*** 0.55 (.08)		** 0.26 (.10)	* 0.30 (.13)		** 0.30 (.11)	** 0.39 (.15)
Prior Ethnic Compositions		-0.002 (.01)	0.01 (.01)		-0.003 (.01)	0.02 (.01)		0.001 (.01)	0.02 (.02)
Mentors Facilitated Belonging		0.003 (.002)	0.003 (.002)		0.01 (.003)	† 0.007 (.00)		0.003 (.003)	0.001 (.004)
Unsupportive Professor Lowered Belonging (reversed)		-0.02 (.04)	-0.02 (.05)		0.004 (.06)	0.01 (.08)		0.03 (.07)	0.01 (.09)
Lives on Campus		-0.06 (.16)	-0.01 (.15)		-0.24 (.25)	-0.26 (.25)		-0.36 (.27)	-0.33 (.29)
Supportive Housing		† 0.01 (.01)	0.01 (.01)		0.01 (.01)	0.001 (.01)		0.01 (.01)	0.004 (.01)
Orientation Facilitated Social Adjustment		-0.02 (.03)	-0.01 (.04)		-0.07 (.05)	-0.06 (.06)		-0.02 (.06)	-0.04 (.07)
Curriculum Relevance		* 0.11 (.05)	† 0.10 (.06)		* 0.15 (.07)	0.15 (.10)		† 0.14 (.08)	0.13 (.12)
Relatedness to Peers*BHN			* 0.35 (.16)			0.05 (.26)			-0.50 (.31)
Relatedness to Peers*Asian			* 0.60 (.24)			0.35 (.40)			0.25 (.47)
Perceived Racism (rev)*BHN			-0.15 (.15)			0.40 (.25)			-0.17 (.29)
Perceived Racism (rev)*Asian			-0.02 (.16)			0.08 (.27)			0.12 (.32)
College Committed to Diversity*BHN			** -0.36 (.14)			* -0.48 (.22)			-0.12 (.26)
College Committed to Diversity*Asian			-0.17 (.19)			0.48 (.31)			-0.11 (.37)
Prior Ethnic Compositions*BHN			* -0.03 (.02)			* -0.05 (.03)			-0.04 (.03)
Prior Ethnic Compositions*Asian			-0.02 (.02)			-0.01 (.04)			-0.04 (.04)
Mentors Facilitated Belonging*BHN			-0.01 (.01)			-0.01 (.01)			0.01 (.01)
Mentors Facilitated Belonging*Asian			0.01 (.01)			0.003 (.01)			0.01 (.01)
Unsupportive Professor (rev) *BHN			0.14 (.09)			0.11 (.14)			-0.17 (.17)
Unsupportive Professor (rev) *Asian			* -0.31 (.14)			-0.25 (.24)			-0.01 (.28)
Supportive Housing*BHN			0.01 (.01)			0.01 (.02)			0.02 (.03)
Supportive Housing*Asian			-0.01 (.02)			0.02 (.04)			-0.04 (.05)
Orientation*BHN			-0.13 (.08)			0.02 (.14)			-0.07 (.16)
Orientation *Asian			0.21 (.16)			-0.17 (.26)			-0.25 (.31)
Curriculum Relevance*BHN			0.04 (.10)			0.15 (.16)			0.08 (.19)
Curriculum Relevance*Asian			-0.07 (.12)			-0.27 (.20)			-0.09 (.24)
Unadjusted R^2	0.02	0.69	0.80	0.07	0.31	0.52	0.08	0.27	0.40
Adjusted R^2	-0.01	0.65	0.73	0.04	0.22	0.33	0.05	0.18	0.16
F	0.77	*** 16.90	*** 10.46	† 2.58	*** 3.35	*** 2.71	* 3.02	** 2.79	* 1.67

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$; N = 111; White is the reference group for ethnicity

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