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A Conceptual Model on the Impact of Matterring, Sense of Belonging, Engagement/Involvement, and Socio-Academic Integrative Experiences on Community College Students' Intent to Persist

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A Conceptual Model on the Impact of Mattering, Sense of Belonging,
Engagement/Involvement, and Socio-Academic Integrative Experiences on
Community College Students' Intent to Persist

By
Esau Tovar

A dissertation submitted to the Faculty of Claremont Graduate University in partial fulfillment
of the requirements for the degree of Doctor of Philosophy in Education.

Claremont Graduate University
2013

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APPROVAL OF THE REVIEW COMMITTEE

This dissertation has been duly read, reviewed, and critiqued by the Committee listed below, which hereby approves the manuscript of Esau Tovar as fulfilling the scope and quality requirements for meriting the degree of Doctor of Philosophy.

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Abstract

A Conceptual Model on the Impact of Mattering, Sense of Belonging, Engagement/Involvement, and Socio-Academic Integrative Experiences on Community College Students' Intent to Persist

By
Esau Tovar

Claremont Graduate University: 2013

Community colleges continue to experience high levels of student attrition and low degree/certificate completion rates. Given extant literature, there appears to be a need to reexamine how interactions between students and the institution, and students and institutional agents are taking place, with the aim of identifying institutional practices that deleteriously or positively impact degree completion and thus guide colleges to develop action plans to improve conditions for student success.

This study examined how factors such as institutional commitment to students, mattering, sense of belonging, interactions with diverse peers, perceptions of the campus climate, engagement/involvement, socio-academic integrative experiences, and goal commitment collectively affected community college students' intent to persist to degree completion. The proposed model tested the tenability of seven propositions examining how the above constructs interact to influence intent to persist.

The sample consisted of 2,088 multiply diverse community college students. The conceptual model was grounded on Astin's (1991) Input-Environment-Outcome model and was tested in the context of structural equation modeling. Multiple group invariance analyses for race/ethnicity were conducted. The conceptual model explained 28% of the variance on intent to persist for Asian students, 21% for White students, and 19% for Latino/a students.

Results indicated that transition support from family/friends exerted the highest effect on intent to persist across all racial/ethnic groups, followed by engagement/involvement, perceptions of mattering, interactions with diverse peers, GPA, goal commitment, and socio-academic integrative experiences, albeit varying by group. This study was the first in the literature to empirically demonstrate a causal effect between institutional commitment to students and perceptions of mattering. Mattering, in turn, exerted a moderate to strong influence on engagement/involvement, socio-academic integrative experiences, sense of belonging, and indirectly on intent to persist. Evidence in support of an omnibus “student development and success” construct, as alluded to by Wolf-Wendel, et al. (2009) is also presented. Of import to these findings is that while this construct explained a significant proportion of the variance for engagement/involvement, belonging, mattering, and interactions with diverse peers, the individual factors exerted an independent effect on intent to persist. Implications for theory, research, and practice are also discussed.

Dedication

To the institutional agents (instructors and counselors) who made a difference in my life.

Thank you for making me feel like I mattered!

Acknowledgements

Acknowledging all the individuals who ever had an impact on my educational journey—professors, counselors, family members, and friends—would likely take many pages, but I will keep it short. I am very grateful to you all for your support, in whatever form it came. While I always dreamed of earning a college degree, the challenges and opportunities presented along the way were many. Who would have thought that after completing only middle school and dropping out, I would one day earn a Ph.D.? I certainly did not envision it.

I realize that acknowledgements are typically reserved for individuals. Nevertheless, in my case, I would like to start by recognizing community colleges as a whole. It was only at a community college that I could have started my quest for a higher education, and this could have happened only in the United States. Lacking a high school diploma/GED did not prove an impediment to furthering my education thanks to a community college in my backyard—Los Angeles Mission College. I personally believe in the community college mission, and I am grateful that so many students like me get a “second chance” at making our educational dreams a reality. It is for this very reason that I have proudly chosen to work within the community college system.

I am very grateful to my dissertation committee members—Daryl G. Smith, David Drew, and William Perez—for your ongoing support and guidance. I was also privileged from your teaching. Dr. Smith, you were the first professor at Claremont Graduate University from whom I took a course. After reviewing the list of reading assignments for each week (hundreds of pages each time), I thought I would simply not make it. I sometimes thought of “giving up.” Yet, I took three courses from you. You challenged me intellectually and pushed me to leave my comfort zone with respect to my coursework and research. I was fortunate to collaborate with

you on a project culminating in the publication of a co-authored journal article. Thank you! I am also beholden to you for instilling in me a greater appreciation for the value of professional involvement, and of the need to contribute to our community of scholars.

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CHAPTER 1

INTRODUCTION

Colleges and universities across the nation continue to face ever-increasing demands for accountability and for the effective use of limited public resources dedicated to educating millions of students in the country. Public policy advocates, governmental agencies, and academic researchers have issued calls for greater attention to the shortage of individuals with a college credential (e.g., degree, certificate) who are needed to meet the needs of an expanding knowledge-based national and international economy (Lumina Foundation for Education, 2010; Organization for Economic Co-operation and Development, 2011; Santiago & Reindl, 2000). It has been noted that without a significant increase in degree attainment, the United States will experience a shortage of approximately 16 million degrees of the number required to meet the country's workforce needs of 2025 (National Center for Higher Education Management Systems and Jobs for the Future, 2007).

If the United States is to remain competitive, and if individuals are to reap the benefits associated with a middle-class life, such as cognitive gains, higher earnings over a lifetime, increased civic engagement, reduced unemployment, reduced crime rates, better health (Pascarella & Terenzini, 2005), it will be crucial that a minimum of 60% of Americans attain some form of postsecondary education in the coming years (Lumina Foundation for Education, 2010). Many now recognize that "A bachelor degree is no longer considered a *potential* stepping-stone to a better life. Rather, it is now fully acknowledged as a *gatekeeper* to myriad social and individual benefits" (Cabrera, Burkum, La Nasa, & Bibo, 2012; original emphasis). Additionally, numerous studies synthesized by Pascarella and Terenzini (2005) attest to the many benefits associated with college attendance and degree completion.

According to the 2010 issue of the *Digest of Education Statistics* (Snyder & Dillow, 2011), the percentage of high school completers (including those with a GED) attending college rose from 45.1% in 1960 to 70.1% in 1999. The same report notes that the percentage of students attending college increased by 38% between 1999 and 2009, while the percentage of students at community colleges alone rose by 36.8%. Albeit significant differences by race/ethnicity have been observed. Community college students accounted for 36.5% of the 19.1 million students attending degree-granting institutions in fall 2008. The *Digest* also notes that the percentage of students over the age of 24 increased by a phenomenal rate of 43% in the same period, surpassing that of their traditional-age counterparts who experienced a 27% growth rate. This trend is expected to continue well into 2020 (Hussar & Bailey, 2011), and it is likely to be impacted by the prolonged economic crisis facing the country (Betts & McFarland, 1995; Levine, 2004, October 29; Smith, 2011).

If the United States is to reach what the Lumina Foundation has termed "the big goal" (Lumina Foundation for Education, 2010), that is, increase to 60% the number of adults possessing a postsecondary certificate or degree by 2025, colleges and universities, along with governmental and public policy organizations must all work together to improve college outcomes. Specifically, they must find ways to ensure that every adult attending college leaves with a "high quality" credential that will enable him/her to compete in today's economy. This will be particularly challenging for community colleges whose students traditionally experience a variety of barriers to degree attainment (Cohen & Brawer, 2008; Kim, Sax, Lee, & Hagedorn, 2010). However, a confluence of events and recent developments in the areas of student engagement, learning outcomes, and a renewed focus on finding solutions to boost student retention and graduation rates via policies and practices that impact student transition and

academic experiences—all under the direct control of college administrators, student services personnel, and faculty—can help facilitate this ambitious goal (Center for Community College Student Engagement, 2012; Lumina Foundation for Education, 2010; Tinto, 2012a).

Statement of the Problem

During the fall 2009, 7.1 million students attended a public community college in in the United States (Snyder & Dillow, 2011). Nearly 1.3 million were freshmen students. Despite this record-breaking number, degree attainment remains substantially low. Community colleges serve as the entry point into higher education for many impacted groups including traditionally underrepresented ethnic minorities like Black and Latino students, low-income, and first-generation college students (Almanac of Higher Education 2011, 2011; Cabrera et al., 2012; Cohen & Brawer, 2008). In contrast to four-year college students, those attending public community colleges tend to be African American or Latino, attend on a part-time basis and more varied daytime/evening basis, work a significant number of hours per week, commute, have family responsibilities such as child care, and have lower degree aspirations (Bean & Metzner, 1985; Cohen & Brawer, 2008; Crisp & Mina, 2012; Nora & Crisp, 2012; Skomsvold, Radford, & Berkner, 2011). Additionally, community college students are often unprepared for college-level coursework as evidenced in their reading, writing, and mathematics skills. Several recent studies have noted that the vast majority of students attending community colleges are in need of remediation in one or all areas above (Attewell, Lavin, Domina, & Levey, 2006; Bailey, Jeong, & Cho, 2010; Snyder & Dillow, 2011). Taken together, the above characteristics place public community college students at greater risk of not succeeding academically (Tovar & Simon, 2006) or of increasing the probability of students dropping out of college before completing a certificate or degree, and thus require institutional assistance to support their success.

Four decades of student retention research has shown that the vast majority of students who dropout of college will do so within their first-year of college (Horn, Berger, & Carroll, 2004; Tinto, 1993; Wood, 2012), but stopout and dropout occur throughout the college years. Recent statistics compiled by ACT (American College Testing, 2011) noted that the national first-to-second year retention rate for public community colleges was 55.4%. Federal statistics put this figure at 60% for full-time students and 40.1% for part-time students across the nation (Snyder & Dillow, 2011). By contrast, the first-to-second year retention rate for students at public four-year institutions was 73.3%.

Moreover, the retention rates for traditionally underrepresented students, including African American, Latino, American Indian/Alaskan Native, and East Asian students have been reported as lower than those of White and Asian students. In fact, a recent six-year nationwide longitudinal analysis of a 2005 cohort of students attending college glaringly noted that retention and withdrawal rates for underrepresented students at public two-year institutions differed markedly from their White and Asian counterparts, and especially from students at four-year institutions (Skomsvold et al., 2011, Table 2.1-C). The study showed that approximately half of all Latino (53.3%) and Black (49.0%) students starting at a public community college had stopped attending higher education altogether, but fewer White (44.4%) and Asian (31.5%) students at the same institutions had stopped attending. The corresponding dropout percentages at four-year institutions were 24.1%, 29.4%, 21.7%, and 13.9%, respectively.

With respect to graduation rates, the *Digest of Education Statistics* reported that 20.6% of first-time, full-time degree-seeking students attending public community colleges comprising the 2005 cohort obtained an associate degree or certificate within 150% of the expected "normal time," or three years (Snyder & Dillow, 2011). This percentage differed markedly by

race/ethnicity: 29.9% non-resident aliens, 25.8% for Asian/Pacific Islanders, 22.9% for Whites, 18.2% for American Indian/Alaskan Native, 15.6% for Hispanics, and 12.1% for Blacks. The study showed that women graduated at a slightly higher rate than males (21.2% vs. 19.9%). Yet another cohort-based longitudinal study (Skomsvold et al., 2011) tracking students who started attending public community colleges in 2003-04 found that only 22.9% had received a certificate or an Associate's degree at any institution in the United States by spring 2009, six years later—regardless of institution of origin. Graduation rates for Whites (25.4%) and Asian (21.3%) students were significantly higher than those of Blacks (19.9%) and Latinos (17.7%).

While the statistics above certainly portray degree attainment in a negative light, examining this data over time demonstrates that the number of Black and Latino students receiving an associate degree/certificate at public community colleges in the United States increased by 77% and 101%, respectively, between 1998 and 2009 (Hussar & Bailey, 2011); far outpacing graduation rates for students of other races/ethnicities (e.g., 28% for Whites and 48% for Asian/PI). Yet, completion rates for these students lag behind.

Importance of the Study

One potential means to address this degree/credential shortcoming is for colleges to re-examine, how and to what degree, interactions between students and the institution, and students and institutional agents are taking place. This examination may enable institutions to identify specific interactions, curricular, or co-curricular activities that deleteriously impact degree completion. Concomitantly, such examination may also identify specific factors or practices within the institution's control that may enhance the probability of students completing a degree/certificate. While previous studies have attempted to do this to varying degrees, via the development of college impact and persistence-based models that examine how factors such as

student characteristics, finances, involvement, engagement, and integration impact student retention, these models have not been a panacea to our completion agenda. Design and methodological limitations frequently hamper their generalizability across sectors and college student populations. Moreover, the collective impact of constructs such as those noted above (i.e., mattering, sense of belonging, involvement, engagement, integration)—among others—has not been studied purposefully or extensively at either community colleges or four-year institutions; nor have their findings conclusively ascertained how these concepts interact to impact student outcomes.

Purpose of the Study

This study seeks to examine how factors such as institutional commitment to students, mattering, sense of belonging, interactions with diverse peers, perceptions of the campus climate, engagement/involvement, socio-academic integrative experiences, and goal commitment collectively impact community college students' intention to persist. Whereas much has been written independently about each of these areas of the literature, the constructs are frequently poorly identified, measured, or are often reported to be one and the same, or simply to be closely associated. In an effort to further this literature, this study also examines if engagement/involvement, sense of belonging, mattering, perceptions of the campus climate, and peer relationships might form part of an overarching construct.

Overview of the Conceptual Model

At the heart of the model, is the proposition that perceived institutional commitment to students directly or indirectly impacts student perceptions of mattering to the college, sense of belonging, institutional engagement/involvement, socio-academic integrative experiences, goal (educational) commitment, and ultimately intent to persist. Following this omnibus proposition,

six additional sub-propositions are also integrated in the model as discussed in Chapter 3. The conceptual model depicted in Figure 1 (below) is grounded on the Input-Environment-Outcome model (Astin, 1991b, 1993). The I-E-O model posits that various college outcomes (O), such as student persistence, are mediated by students' pre-college characteristics and experiences (I), as well as, their actual experiences while in college (E). As way of introduction, four variables compose the "inputs" in the model: college transition support from family and friends, financial concerns, gender, and unit load; seven latent variables and three indicator variables take the place of aspects of the "environment:" institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate, mattering to college, sense of belonging, engagement/involvement, socio-academic integrative experiences, length of college attendance, goal commitment, and grade point average. A single variable encompasses the "outputs" in the model: intention to persist.

While no conceptual framework or theory will likely account for the experiences of every student attending college, the conceptual model in Figure 1 seeks to explore its relevance to community college students by accounting for various input and environment variables on their intentions to persist. The works discussed in the literature review (Chapter 2), theoretically support the interrelationships modeled in Figure 1—directly or indirectly. The hypothesized directionality of construct impact depicted in the model is based on the works reviewed. Straight, single-arrow lines denote hypothesized causal relationships among the constructs. The model is tested in the context of structural equation modeling and multiple group invariance analyses for ethnicity, namely Asian, Latino, and White.

Figure 1. A Conceptual Model on the Impact of Mattering, Sense of Belonging, Engagement/Involvement, and Socio-academic Integrative Experiences on Intent to Persist

Five research questions and five directional hypotheses encompassing this study are briefly summarized below. These are described in full-detail in Chapter 3.

Research Question 1 and 1.1 concern the evaluation of the goodness of fit for a measurement model for institutional commitment, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, and socio-

academic integrative experiences. Moreover, they address the respecification and analysis of the model and a multiple group invariance analysis for race/ethnicity.

Research Question 2 and 2.1 address the assessment of goodness of fit for a structural model derived from the measurement model above, supplemented by other control variables and the outcome variable, intent to persist. These also investigate how the structural model differs by race/ethnicity by conducting a multiple group invariance analysis. Based on this model, five directional hypotheses are proposed, which examine how institutional commitment, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, and socio-academic integrative experiences interact to predict several intermediate outcomes and intent to persist.

Lastly, Research Question 4 investigates if the constructs of engagement/involvement, sense of belonging, mattering, perceptions of the campus climate, and peer relationships might form part of an omnibus construct.

Organization of the Dissertation

Chapter 1 presented an introduction to a “crisis” currently facing the nation; namely, the significant shortage of individuals with college degrees sufficient to meet our economic needs. The chapter also elaborated upon the significance of the study described in this manuscript, presented the research questions and hypotheses guiding it, and provided an overview of a conceptual model. Chapter 2 presents a comprehensive literature review supporting and guiding the study. Chapter 3 discusses the methodology employed, including a full explanation of the conceptual model being tested, research methods, and research design. Chapter 4 then discusses the results of all analyses conducted. Lastly, Chapter 5 presents a summary of findings, conclusions, a discussion of limitations, and implications for theory, research, and practice.

CHAPTER 2

LITERATURE REVIEW

Various areas of the literature that bear directly on the success of college students, particularly on their retention and persistence to degree completion are reviewed below. While I intended to craft a literature review focusing on community college students, the fact remains that theoretical models and serious empirical research devoted exclusively to community college students is not extensively available. Given this, the literature review incorporates relevant works descriptive of four-year college students and institutions, and to the extent possible, it supplements these works with available community college literature. This section reviews a number of theories and research studies that provide general support for the transition experiences of entering college students and the interactions they have with members of the college community and institutional support services with the ultimate aim of facilitating student retention and graduation. These include several theoretical models and research studies on college student persistence, socio-academic integrative experiences, college engagement/involvement, sense of belonging, and interpersonal mattering.

Student Retention and Persistence to Degree

To understand the degree to which college student retention is a concern for higher education, it is important that we understand how it is framed in the literature and in practice; to know the language researchers employ to describe complex processes leading to retention and persistence decisions; and to understand the meaning of terms like retention and persistence, dropouts, stopouts, and transfers. Any review of the literature will readily demonstrate how these terms are used in specific contexts, in specific institutional settings, systems, or to denote the completion of degree programs.

Definition of Retention and Persistence

Common to most theoretical models are “classic” constructs such as academic and social integration or involvement (now called engagement) in academic, co-curricular, and extra-curricular activities, but how these have evolved or been defined over time has been the subject of contention (Barnett, 2006, p. 5; Wolf-Wendel, Ward, & Kinzie, 2009).

Oftentimes the terms retention and persistence are used interchangeably, and in other occasions, the terms can mean very different things (Hagedorn, 2012; Porter, 2003; Seidman, 2012). As Hagedorn (2012) points out, there is relative agreement in definition for a student who is a *persister*, that is, one who continues to attend college until completing a degree; while one who is a *non-persister*, is one who departs college without completing a degree and never returns.

Students who leave college are also often referred to as *dropouts* (Hagedorn, 2012) or *leavers* (Tinto, 2012b), but this presupposes that students leave college never to return either to the institution of origin or at any other college or university at any time. As noted by Alexander Astin “the term ‘dropout’ is imperfectly defined: the so-called dropouts may ultimately become non-dropouts and vice versa.... A ‘perfect’ classification of dropouts versus non-dropouts could be achieved only when all of the students had either died without ever finishing college or had finished college” (Astin, 1971, p. 15). Hence, it is important to acknowledge, as many researchers have done, that students sometimes *stopout* of college for a period of time, or *transfer* to another institution with the intent to complete a degree or program of study (Berger, Ramirez, & Lyon, 2012; Hagedorn, 2012; Horn & Carroll, 1998; Mortenson, 2012; Spady, 1971; Tinto, 2012b). Hagedorn points out that in producing its many reports, the National Center for Education Statistics “differentiates the terms by using ‘retention’ as an institutional measure and

‘persistence’ as a student measure. In other words, institutions retain and students persist” (2012, p. 85).

In addition to persistence, the term *retention* is also used in the higher education literature to provide an account of the number of students remaining at an institution, a program, a major, or a course for a specific period of time (e.g., first to second semester, first to second year, semester) (Hagedorn, 2012).

Hagedorn (2012) also points out that an additional distinction important to measuring student degree attainment is *graduation*. This is particularly important given that some students will start and finish their studies at a single institution, yet others may dropout from one, and then attend another (or more) college(s), where they may ultimately complete a degree.

Hagedorn notes that in the latter case, the institution of origin may count this student as a dropout or non-persister, but the second institution as a persister or a graduate.

Given the complexity and the longitudinal nature of assessing persistence to degree completion for students moving to institutions other than where they originally started, relatively few studies have attempted to follow student cohorts across the higher education spectrum. However, a few have been reported in the literature, no doubt facilitated by improvements in data collection and tracking systems such as those available through select NCES databases and the National Student Clearinghouse (e.g., Jones-White, Radcliffe, Huesman, & Kellogg, 2010; Porter, 2003; Schoenecker & Reeves, 2008; Skomsvold et al., 2011).

Responding to shortcomings in methodology and problems associated with institution-specific retention definitions, researchers advocate for colleges/universities and policymakers to move instead to utilize measures of persistence covering the entire higher education system (Adelman, 2006; Cabrera et al., 2012). To continue to focus on year-to-year persistence as a

measure of success “leads institutions to view student success through a very short-term lens.... This change in policy would also recognize the increasingly transient nature of today’s college student population” (Cabrera et al., 2012, p. 194).

As used in this review, retention, persistence, and graduation will generally be used as described above, and I will describe the context of how the term is employed in describing data, models, etc.

Student Retention Theories and Conceptual Models

With the rapid increase of postsecondary institutions and students attending college following World War II, and later during the uprise of the civil rights movement during the 1950’s and 1960s, college administrators began to systematically monitor enrollment in an attempt to understand why so many students left college without completing a degree (Berger et al., 2012; Cohen & Brawer, 2008; Spady, 1970, 1971). However, as Spady noted, research on college student retention conducted until the late 1960s had been atheoretical and primarily descriptive, philosophical, or predictive in nature. Even well into the 1980s, this was the case for community college students (Bean & Metzner, 1985). Noting the absence of theoretically-driven research, Spady (Spady, 1970, 1971) and Bean and Metzner (1985) called upon researchers, and also took it upon themselves to synthesize existing literature to better understand the undergraduate student experience and address the attrition problem (Berger et al., 2012). These authors went on to present theoretical models on college student retention, with other researchers soon following.

In response to the ever-present "problem" of student attrition, as evidenced in the statistics presented above, numerous theoretical and conceptual frameworks have been proposed and advanced over the course of the past four decades to explicate "why" attrition occurs at two-

year and at four-year colleges and universities (Bean, 1980, 1982; Bean & Eaton, 2000; Bean & Metzner, 1985; Nora, Barlow, & Crisp, 2005; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1980; Spady, 1970, 1971; Swail, Redd, & Perna, 2003; Tinto, 1975, 1993). Likewise, a number of authors and educational consultants have proposed approaches of "how" to effectively address it, albeit their approaches differ (Barnett, 2006, 2010; Bensimon, 2006, 2007; Center for Community College Student Engagement, 2012; Crockett, 1999; Dixon-Rayle & Chung, 2007; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Levitz, Noel, & Richter, 1999; McClenney & Marti, 2006; Price & Tovar, In Press; Seidman, 2005, 2012; Swail et al., 2003; Tinto, 2000, 2006, 2012a, 2012b; Yi, 2007). Described below are some of the most prominent student retention conceptual and theoretical models described in the higher education literature.

Spady's Sociological Model of the Dropout Process. For the first time in the history of higher education, Spady (1970, 1971) introduced and empirically tested a sociological model thought to explain the dropout process of students at institutions of higher education. According to Spady, the decision to dropout rests on the interaction between student and the college environment. Spady recognized the crucial role that student attributes (including background characteristics, interests, skills, abilities) play in student preparation for and successful adaptation to the academic and social systems of the college, and how these interactions in turn impacted academic performance and college retention. Furthermore, he observed that student retention would be facilitated to the degree to which students adapted to the normative culture of the institution and they engaged in activities conducive to social integration. His 1971 study partially corroborated these propositions, albeit "extrinsic reward structures" such as grades played a determining role for men and their decision to withdraw, while commitment to the institution and their social integration played a decreased role. For women, on the other hand,

the decision to remain at the institution was directly impacted by institutional commitment followed by academic experiences.

Tinto's Theory of Individual Student Departure. Without doubt, it is Vincent Tinto's interactionalist theory of student departure (Tinto, 1975, 1993) that has received the most attention since it was first introduced to higher education circles (Bensimon, 2007; Berger & Braxton, 1998; Braxton, 1999). Because of its relative importance and frequent use and critique by educational researchers and practitioners, his formulations will be reviewed in greater detail below. This review will focus primarily on Tinto's revision of his theory as discussed in his 1993 book, *Leaving College: Rethinking the Causes and Cures of Student Attrition*, albeit, I will subsequently note how his views have also changed over time, as a result of critiques and new developments.

Tinto's theory of student departure from college has as its foundation the works of Spady (1970, 1971), Arnold Van Gennep's (1960) study of the rights of passage associated with group membership (1960), and Emile Durkheim's theory on suicide (1951).

Van Gennep's work (1960), based on social anthropology, centers on three stages which individuals must undergo if an "orderly transmission of the beliefs and norms of the society to the next generation of adults and/or new members" is to take place (Tinto, 1993, p. 92). Each of the stages is marked by a change in patterns and interactions between individuals and group members. These are, (1) the stage of separation (separation of individual from previous associations); (2) the stage of transition (where the individual begins to interact with those from the new group); and (3) the stage of incorporation (where the individual takes on new patterns of interaction with members of the new group). Consistent with Van Gennep's postulations, Tinto believed college students must undergo a series of changes if they are to become integrated into

the college environment, thereby becoming successful members of the college community.

Tinto applied these changes to a longitudinal process that ultimately accounts for student persistence and the "time-dependent process of student departure" (1993, p. 94).

Applying Van Gennep's stages, Tinto proposed that individuals attending college must separate from past associations (high school, family, local residence), and in doing so may cause psychological distress and perceived isolation. This is particularly characteristic for many students moving away from their home and their families to attend college. Support or opposition expressed by family members, Tinto contended, may influence how a given student may transition into college life. Separation may be marked by a rejection of values instilled upon the individual by family members or peers. Tinto argued that the transition period between high school graduation and matriculation in college is demarcated by a period where new college students must experience change between old and new. This period is facilitated or hampered by the degree to which differences between old lifestyles and the norms and behaviors of the new institution differ, and by how well the individual prepared for the transition ("getting ready"). Tinto believed that students who withdraw from college are generally those who had a difficult time making a smooth transition or were generally not ready for the demands of college. According to Tinto, the last stage of incorporation had as its main task the integration of the student into college life. This is a time when finding a place within existing college communities or groups within the campus must take place. The student must find others similar to him/herself, and ultimately feel a sense of belonging to the institution.

Using suicide as an analogy for departure or withdrawal from college, Tinto also relied on Durkheim's (1951) work to elaborate upon his college student persistence model. According to Tinto, Durkheim classified suicidal behavior into four categories: altruistic, anomie, fatalistic,

and egotistical. From these suicidal typologies, egotistical suicide, "which arises when individuals are unable to become integrated and establish membership within the communities of society," best explains individual departure from college (Tinto, 1993, p. 101). Tinto believed that the analogy of egotistical suicide "highlights the ways in which the social and intellectual communities that make up a college come to influence the willingness of students to stay at that college" (Tinto, 1993, p. 104).

Combining Van Gennep (1960) and Durkheim's (1951) works, Tinto's model of student departure (1975 and 1993) relied heavily on the integration of students into the academic and social systems of the college. The academic system, Tinto noted, was primarily concerned with the formal education of students (i.e., intellectual integration); whereas, the social system was concerned with the interactions (membership) among students, faculty, and staff (i.e., social integration). Tinto also recognized that both academic and social integration are invariably interwoven and that the level of integration into one system needed not be the same as the other (Tinto, 1993). Tinto's model also attempted to account for the time of the departure and whether or not external forces and external choices led the individual to leave college. Individual dispositions, as demonstrated in student expectations and motivations—measured by intentions and institutional and goal commitments—affect the decision to withdraw, as well.

In presenting the model, Tinto (1993) discussed its aims. First, he indicated that the model was longitudinal in nature and it successfully accounted for departure at individual institutions—explaining the “how” and “why” of departure. Second, the model focused on the longitudinal process by which *voluntary* withdrawal took place, not on instances such as when students are dismissed owing to poor academic performance (e.g., academic probation). Third, he noted the model was longitudinal and interactional in that individual interactions (or lack

thereof) with individuals or systems at the college would account for leaving college. The model attempted to explain how these interactions—social or academic—led individuals possessing certain characteristics to leave college, yet those with others stayed. Tinto stated that the model argues that individual departure from institutions can be viewed as arising out of a longitudinal process of interactions between an individual with given attributes, skills, financial resources, prior educational experiences, and dispositions (intentions and commitments) and other members of the academic and social systems of the institution. The individual's experience in those systems, as indicated by his/her intellectual (academic) and social (personal) integration, continually modifies his or her intentions and commitments. Positive experiences—that is, integrative ones—reinforce persistence through their impact upon heightened intentions and commitments both to the goal of college completion and to the institution in which the person finds him/herself.... Negative or malintegrative experiences serve to weaken intentions and commitments, especially commitment to the institution, and thereby enhance the likelihood of leaving (Tinto, 1993, p. 113).

Tinto acknowledged that the model recognized that the academic and social communities comprising colleges were also interwoven with other external communities to which the college student belongs, which are comprised of their own set of values and norms. It also accounted for the fact that for many students, attending college was just one commitment among many others. These "external" commitments were said to influence the degree to which students committed to their educational goals and plans, thus limiting colleges in their ability to provide assistance.

Tinto recognized that persistence at a college might also be influenced by the level of academic and social “fit” between the student and the institution. Students’ perceptions of college faculty and staff commitment to their success may play a role in accounting for this fit. If these perceptions were positive, Tinto noted, the student would likely increase his/her commitment to the institution; thus, decreasing the chances of dropping out of college. Additionally, the greater the interaction with other students, as well as with faculty and staff, and the greater the number of memberships on campus, the more likely the student was to persist. Tinto cautioned though, that

membership in a local community is a necessary minimum condition for persistence, it is not a sufficient one. Persistence also depends on the centrality of that community in the system of the college.... the closer one’s community is to the center of the system, the stronger the forces which bind the individual to the institution (p. 123).

As he recently noted, perceiving that they belong at the institution, to perceive themselves as wanted and a part of the college community, will highly influence students’ decisions to persist or to dropout (Tinto, 2012b).

Critiques of Tinto’s model. While Tinto’s model of student departure promotes academic and social integration experiences, inside and outside the classroom, as cornerstones to student retention and persistence, the model’s validity has been called into question or criticized since it was first introduced (Tinto, 1975, 1987). Critics contend that the model places significant onus on the student, while de-emphasizing the role of the institution and institutional agents—faculty, staff, administrators—in promoting or impeding student success and retention (Bensimon, 2007). Additionally, researchers have noted that Tinto's model does not sufficiently

account for the experiences of impacted groups such as traditionally underrepresented ethnic minorities, first-generation to college, and low-income students, or students attending commuter institutions and community colleges (Bean & Metzner, 1985; Bensimon, 2006, 2007; Cejda & Hoover, 2010; Rendón, Jalomo, & Nora, 2000; Tierney, 1992).

Researchers have called into question the very idea that for students to become integrated into the academic and social realms of the college that they must renounce their former communities (Rendón et al., 2000; Tierney, 1992) and assimilate to the prevailing dominant White college culture. Tierney explicitly noted that Tinto “has misinterpreted the anthropological notions of ritual, and in doing so he has created a theoretical construct with practical implications that hold potentially harmful consequences for racial and ethnic minorities” (1992). He further observed that Tinto never questioned who becomes integrated and how; and most importantly, that Tinto ignored the infinite possibilities for why individuals may not become integrated, including those driven by institutions; for example, “an institution’s inability to operate in a multicultural world” (p. 615).

Rendon, Jalomo, and Nora (2000) further argued that,

The assumption that minority students must separate from their cultural realities and take the responsibility to become incorporated into colleges' academic and social fabric in order to succeed (with little or no concern to address systemic problems within institutions or to the notion that minority students are often able to operate in multiple contexts) becomes central to the critique. (p. 585).

Other researchers have critiqued the fact that most research on Tinto’s theory has been conducted on four-year college students and it has greatly emphasized the impact of out-of-the-classroom experiences, including student involvement in clubs and activities, special programs,

and one-to-one interactions with faculty either during office hours, or by becoming involved in faculty-sponsored research projects, for example (Bailey & Alfonso, 2005). Clearly, these opportunities for interaction are either limited or not available at institutions such as community colleges (Barnett, 2010). However, in recent years Tinto himself has come to acknowledge the limitations of his model. He has come to recognize that "the process of student retention" differs by institutional type and that breaking connections to students' former communities (e.g., home) is not necessary to successfully transition and succeed in college (Tinto, 2006, p. 4).

Responding in part to the assumptions researchers and practitioners often make in applying theoretical or conceptual models to college students, Tinto noted recently that individuals often "make assumptions to simplify what would otherwise be very complex analyses" (Tinto, 2012b, p. 254), particularly in the case of constructs such as academic and social integration that have been operationalized in very different forms across studies (e.g., Barnett, 2006, 2010; Bean, 1982; Bean & Eaton, 2000; Berger & Braxton, 1998; Braxton, 1999; Braxton & Hirschy, 2005; Braxton & Lien, 2000; Braxton & McClendon, 2001; Butcher, 1997; Cabrera, Castaneda, Nora, & Hengstler, 1992a; Cabrera, Nora, & Castaneda, 1993; Crisp & Nora, 2010; Deil-Amen, 2011; Hagedorn, Maxwell, & Hampton, 2001; Hoffman, Richmond, Morrow, & Salomone, 2002; Hurtado & Carter, 1997; Karp, Hughes, & O'Gara, 2010; Kraemer, 1997; Nora et al., 2005; Nora & Cabrera, 1993; Nora & Crisp, 2012; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1980; Rendón, 1994; Rendón et al., 2000). In sum, the operationalization of such constructs is often simplified for the ease of data collection and analysis.

Despite criticisms portrayed in the literature, researchers continue to promote many of the elements associated with Tinto's model and it has been pointed out that researchers frequently

disregard alternative theoretical frameworks such as sense of belonging and validation theory that purportedly speak to the experiences of all students (including nontraditional and underserved students) and that may mediate their decisions to remain or leave college (Barnett, 2006, 2010; Bensimon, 2007; Hurtado & Carter, 1997; Rendón, 1994, 2002; Rendón et al., 2000). In recent years, for example, research has substantiated the key role that institutional agents play in facilitating or impeding student success, both in and out-of-the classroom (Barnett, 2010; Bensimon, 2007; Braxton & McClendon, 2001; Cejda & Hoover, 2010; Deil-Amen, 2011; Karp et al., 2010; Lundberg & Schreiner, 2004; Stanton-Salazar, 1997). Deil-Amen (2011) and Cejda and Hoover (2010) found that for community college students, student-faculty interactions of both an academic and social nature served as vehicles to imparting important information to students, increased their comfort in college, and were precursors to student retention. The importance of these interactions as perceived by students is that they occur concomitantly. These "socio-academic integrative moments" transpire during events or activities when students interact with institutional agents and their peers (Deil-Amen, 2011). Barnett further contends that in defining integration, that Tinto operationalized it in part as college students' "sense of 'competent membership,' (p. 208), resulting from, among other factors, student interaction with faculty and staff" (Barnett, 2010, p. 197), and it "connote[s] both a sense of possessing the knowledge and skills needed for success in the college environment (competence) as well as sense of belonging or being a part of the college community" (p. 200). Tinto himself has expressed that with respect to students' decisions to remain or leave college, that these decisions are not strictly based on the number and type of interactions they have with institutional agents, but rather "how they understand and draw meaning from those interactions" (2012b, p. 253). Such meaning-making will impact student retention decisions.

Bean and Metzner's Conceptual Model of Nontraditional Undergraduate Student

Attrition. Recognizing that much of the literature on college student retention focused primarily on traditional college-age, residential, full-time students, and that literature on commuter and non-traditional college students was primarily descriptive, Bean and Metzner (1985) proposed a conceptual model based on an extended review of the literature thought to describe the dropout process for non-traditional college students. As defined, by Bean and Metzner, non-traditional students encompass those older than 24 years of age, commuters, those who attend college part-time, and are primarily concerned with the academic offerings of the institutions, not their social systems. Bean and Metzner contend that four sets of variables account for students' decisions to withdraw from their institutions. These are: background characteristics such as students' age, enrollment status, previous academic performance; academic variables, such as students' study habits, academic advising experiences, major certainty, and course availability; environmental variables such as finances, employment, family responsibilities, encouragement/support; and a variety of psychological outcomes stemming from college attendance, including the perceived utility of a college degree, satisfaction with their institution, overall goal commitment, and the degree of stress experienced while attending college. Bean and Metzner noted that these sets of variables would have a direct impact on students' decision to withdraw from college, as well as an indirect impact, mediated through intentionality to leave college. Empirical study of their model on commuter, nontraditional students has found that retention is mediated by students' academic performance (i.e., grades), number of credit hours completed, absenteeism, previous academic performance, number of hours employed, goal commitment, but not by social factors (Bers & Smith, 1991; Metzner & Bean, 1987).

Moving Away From Retention Theory to Practice

Given the hundreds of studies conducted on college student retention and the many theories and conceptual models found in the extant literature, researchers, public policy think-tanks, and educational organizations have begun to recognize the need to “translate our research and theory into effective practice” (Tinto, 2006, p. 2), particularly given that retention and graduation rates have remained stagnant for several years (Mortenson, 2012). Much has been learned over the past four decades about the nature of college student attrition, albeit imperfectly, either as a result of poor methodology, small sample sizes, construct under-representation, etc. Together, these shortcomings may limit the generalizability of findings across institutional types and student populations. Nonetheless, researchers recognize, in one way or another, the need to synthesize findings and pose from these potential solutions for institutions to follow (e.g., Bensimon, 2006, 2007; Center for Community College Student Engagement, 2012; Crockett, 1999; Dixon-Rayle & Chung, 2007; Kuh et al., 2008; Levitz et al., 1999; McClenney & Marti, 2006; Price & Tovar, In Press; Seidman, 2005, 2012; Swail et al., 2003; Tinto, 2000, 2006, 2012a, 2012b; Yi, 2007).

Over the course of the years, Tinto (2006) pointed out, we have learned that breaking connections to past associations is not conducive to student retention, and that in many instances, such connections are in fact essential (Cabrera et al., 1992a; Hurtado & Carter, 1997; Rendón, 1992; Rendón et al., 2000). Research also demonstrates that integration is impacted to a great degree by institutional settings and of the importance of student classroom-based interactions with their peers and high-impact pedagogy (Pike, 2012; Price & Tovar, In Press). Moreover, researchers now recognize that the first-year of college is critical to student retention, as are the opportunities for students to interact with teaching faculty, especially in the classroom (Tinto,

2001), alongside with counselors and advisors (Bean & Metzner, 1985; Bensimon, 2007; Deil-Amen, 2011; Price & Tovar, In Press; Stanton-Salazar, 1997) . Most recently, the Center for Community College Student Engagement at the University of Texas, Austin, advocated for community colleges to front-load and make mandatory the use of essential academic and student support services to increase the probability of degree completion (Center for Community College Student Engagement, 2012).

Among leading advocates for moving from research to practice are Vincent Tinto—arguably the best known scholar on the subject of student retention—and Alan Seidman, founding and current editor-in-chief of the *Journal of College Student Retention*. Both Tinto (Tinto, 2012a, 2012b) and Seidman (Seidman, 2012) propose separate, but related and complimentary, models of practice to positively impact college student retention.

It is Tinto’s (Tinto, 2012a, 2012b) contention that colleges and universities are in need of models of “institutional action” that will provide college administrators, practitioners, and faculty with guidelines to put in place effective policies, procedures, and programs that will support students as a whole, and particularly those with the greatest need. However, Tinto ascertains that these models have largely been missing from the literature. In proposing his “framework for institutional action,” Tinto noted the need to move away from “blaming the victim” when students do not succeed (2012b, p. 254).

Tinto believes there are a minimum of four essential conditions that lay the groundwork for student success (including retention). These are: expectations, support, assessment and feedback, and involvement.

Briefly, Tinto indicates that colleges and universities must consistently and persistently communicate to students our expectations “for what will be required to succeed in college”

(Tinto, 2012b, p. 255). This may encompass detailing for students how much and what type of personal effort it will require of them to complete coursework successfully, and in turn, degree requirements. These expectations may be communicated in a variety of ways or settings, such as through orientation programs, formal and informal advising interactions, and in the classroom. Key to students rising to these expectations will be the degree to which they feel validated by the institution.

With respect to support, Tinto specifically noted that this may be offered in terms of academic, social, and financial support, especially during the crucial first-year of college. The importance of providing early support rest in the fact that this may lead students to experience success early in their college career, and thus, increase the probability of future success (Tinto, 2012a). Examples of academic support include providing developmental reading, writing, and mathematics courses; tutoring, study groups, and supplemental instruction. Social support may be offered through counseling interventions to facilitate college transitions, through mentoring, and interactions with key individuals at the institution, including faculty, staff, and other students.

The third condition for student success proposed by Tinto is assessment and feedback. Consistent with Chickering and Gamson's principles of good practice (1987), Tinto noted that frequent and timely feedback to students is key to their success and academic development. This may begin early on as students apply and matriculate in college: require that students complete diagnostic assessment in reading, writing, and mathematics so students may quickly start their developmental education sequence if test scores indicate such a need. Tinto also promotes the use of classroom-based assessments such the one-minute paper to quickly assess students'

understanding of topics/materials discussed in the class and remediate unclear points quickly. Moreover, the use of early alert or early warning systems may also be used.

Lastly, the last essential condition for student success is involvement or engagement in educationally beneficial activities during the first year of college. However, opportunities for involvement should lead “to forms of social and academic membership and the resulting ‘sense of belonging’” at their institution (Tinto, 2012a, p. 66). In the context of the classroom, engagement in specific pedagogies such as collaborative learning or problem/project-based learning may help promote student success and retention to a greater degree than traditional Socratic lectures. This may also be accomplished through students’ participation in learning communities and service learning activities.

Clearly, creating the conditions above necessitates careful planning, institutional commitment, human and financial resources. Furthermore, the timely delivery of interventions or participation in programs is crucial, and may require that institutions devote significant resources during the first-year of college (Tinto, 2012a, 2012b).

While Tinto promotes the creation of policies, activities, and programs that are reflective of four conditions that in his view lead to student success and retention, Alan Seidman’s contribution to a model of practice rests in the creation of his “formula for success” (Seidman, 2012). The formula is based on his belief that college student retention can be effected by the early identification of students with the greatest risk of not succeeding academically, and with the subsequent provision of early, intense, and continuous intervention. Like Tinto, Seidman recognizes that institutions must front the financial resources necessary to put in place multiple support programs and services, in- and out-of-the-classroom, “but the payoff will result in enhanced term-to-term retention and graduation rates” (2012, p. 269).

Like Tinto, Seidman also recognizes the importance of assessing students' reading, writing, and mathematics skills early on, and then provide them with early intervention, while the student is still enrolled in high school or as soon as he/she starts college. With respect to the intensity of the intervention, Seidman notes that it must be "intense or strong enough to effect the desired change.... [and] The student must demonstrate that he/she has mastered the skill(s) or social factor(s)" prescribed by the institution (Seidman, 2012, p. 273) until such time as change is effected.

College Student Engagement/Involvement and its Effect on Educational Outcomes

The study of student engagement has gained considerable attention over the last decade, primarily in response to demands from the public, from legislators and accreditors, for colleges and universities to demonstrate the link between college attendance and successful student outcomes.

Definition of Engagement

Engagement, as described by Kuh (Kuh, 2001, 2009) is characterized as the amount of time and effort that students place in their involvement in educationally beneficial practices that promote their learning and development. Engagement also refers to the efforts that institutions place in investing and in promoting these activities to effect student success and academic attainment (Kuh, 2009; McClenney, 2004; McClenney, Marti, & Adkins, 2006). “Engagement is about two elements: what the student does and what the institution does. Engagement is about two parties who enter into an agreement about the educational experience” (Wolf-Wendel et al., 2009, p. 413).

Student engagement, as is currently conceptualized, is rooted in the works of Pace on "quality of effort" (Pace, 1980, 1984), Astin's theory of student involvement (Astin, 1984), and it largely reflects Chickering and Gamson's (1987) seven principles of effective educational practice in undergraduate education. With respect to involvement theory, Astin proposed that involvement referred to the amount of physical and psychological energy college students invest to academic endeavors such as studying, participation in student clubs and organizations, formal and informal interactions with faculty, peers, and other college staff members. Furthermore, Astin proposed that involvement occurs on a continuum; has a qualitative and a quantitative character; student learning is directly proportional to the amount and quality of involvement in

programs; and lastly, the effectiveness of policies and programs promoted by institutions may be judged by their “capacity” to positively impact student involvement (Astin, 1984).

Like in the case of retention and persistence research, it is not uncommon that researchers and practitioners often confuse the meaning and measurement of engagement and involvement constructs. However, as noted recently by Wolf-Wendel, Ward, and Kinzie (2009) each of these concepts “add[s] something unique and important to understanding student development and success” (p. 408); albeit they acknowledged that it is important to understand how these concepts (along with integration) have changed or have been reframed over time. Relying on elite interviews with the key proponents of the constructs, the authors found that from the theory proponents’ perspectives, there are few differences between involvement and engagement, and are “temporal representations of pretty much the same thing” (quoting George Kuh; Wolf-Wendel et al., 2009, p. 417), but engagement is also “more powerful” (p. 418), more encompassing. A key difference is that in the case of engagement, it assigns greater responsibility to institutions in facilitating student success.

Propagation of the Engagement Construct

Given its prominence in educational circles, the construct of engagement has been promulgated significantly via the development of a few student engagement surveys administered nationally (and in select countries), including the National Survey of Student Engagement (NSSE) and the Community College Survey of Student Engagement (CCSSE). These instruments are composed of dozens of items ingrained in the higher education literature that correlate highly with educational outcomes (e.g., learning, retention, persistence, grades); are reflective of institutional practices and student and faculty behaviors; and provide colleges and universities with “actionable” data to improve the college student experience (Kuh, 2001;

McClenney, 2007; McCormick & McClenney, 2012). As noted by Kuh and colleagues (Kuh, Kinzie, Schuh, Whitt, & Associates, 2005), high levels of engagement are required to effect student success in college.

According to the leading proponents of the surveys, the CCSSE and NSSE were originally developed to provide faculty and administrators with information pertinent to effective educational practices bearing directly on student learning and retention (Kuh, 2001; McClenney, 2007; McCormick & McClenney, 2012). Moreover, the instruments are designed to permit institutions to conduct "relative comparisons" for groups of students within and outside the institution. For example, a recent study by Sontam and Gabriel (2012) assessed engagement differences across CCSSE measures by gender and race with the impetus to identify student groups that might benefit from institutional assistance. It should be noted that the survey developers have consistently acknowledged that the five benchmarks of effective educational practice constituting them have been described as "summative indices" of select variables, not of latent constructs (McCormick & McClenney, 2012). Hence some of the calls questioning the construct validation of the instruments (Campbell & Cabrera, 2011; Dowd, Sawatzky, & Korn, 2011; Nora, Crisp, & Matthews, 2011a; Porter, 2003) have been noted by the survey developers and others, as inappropriate (McCormick & McClenney, 2012; Pike, 2012).

Benchmarks associated with the CCSEE are: active and collaborative learning, student effort, academic challenge, student-faculty interaction, and support for learners. Similarly those for the NSSE are: level of academic challenge, active and collaborative learning, student faculty interaction, supportive campus environment, and enriching educational experiences.

Student Engagement at the Community College

Consistent with the intent described above, and with efforts to establish a connection between student engagement behaviors and educational outcomes such as graduation rates, research on the CCSSE has been conducted using single-institution datasets (e.g., Akin, 2009; Balog & Search, 2006; Reynolds, 2007; Schuetz, 2008; Sontam & Gabriel, 2012), as well as, multiple-institution, multi-state, or national datasets (e.g., Lynch Ervin, 2010; McClenney, 2007; McClenney & Marti, 2006; Price & Tovar, In Press; Roman, Taylor, & Hahs-Vaughn, 2010). Furthermore, the Center for Community College Student Engagement at the University of Texas at Austin regularly analyzes and disseminates findings on student engagement to the public at-large. Taken altogether, these studies highlight the important role that student engagement in educationally effective practices plays on outcomes such as retention, persistence, grade point average, and in some instances on degree completion.

Focusing on community college student engagement outcomes, a multi-year study encompassing CCSSE benchmark scores for students enrolled across the Florida Community College System (reported in McClenney & Marti, 2006) found a moderate effect of student engagement as measured by the five benchmarks on GPA—accounting for well over 30% of the variance, and after controlling for a variety of background variables. Likewise, small effects were found for the active collaborative learning benchmark on course completion rates. With respect to associate degree attainment, the study also found small effects for the active collaborative learning, student effort, and the support for learners benchmarks. The active and collaborative learning benchmark also significantly predicted persistence to the following term and to the second year. What is particularly notable in this study is a set of conditional effects showing that increased levels of engagement significantly improved GPA for academically

under-prepared students, but not for college-ready students, and for African American students. Similarly, conditional effects for African American students were found on GPA and on course completion rates for both African American and Latinos.

A second national study comprising 24 community colleges participating in the Achieving the Dream Initiative (2002-2004) found that three of the CCSSE's five benchmarks (active and collaborative learning, academic challenge, and student-faculty interaction), positively correlated with degree or certificate attainment.

In summarizing findings from three independent studies sponsored by CCSSE, McClenney and Marti (2006) observed that the benchmarks most closely associated with degree/certificate attainment were active and collaborative learning, academic challenge, student-faculty interaction (with bivariate correlations ranging from .07 to .11). All, but the support for learners benchmark, significantly correlated with cumulative GPA. Lastly, persistence to second term and to second year of college was most closely impacted by active and collaborative learning, followed by faculty-student interaction, and support for learners.

Most recently, Price and Tovar (In Press) explored the relationships between student engagement as measured by the CCSSE and institutional graduation rates. The study was based on 261 community colleges throughout the United States that administered CCSSE in 2007 and that reported graduation rates via IPEDS in 2009 (Integrated Postsecondary Education Data System). Correlational and multiple regression analyses reinforced the importance of student engagement as a predictor of college completion, particularly, the active and collaborative learning and support for learners benchmarks; albeit, the regression models accounted for only eight percent of the variance in graduation rates after controlling for a variety of institutional characteristics.

With respect to single-institution studies, Sontam and Gabriel (2012), found differences in reported levels of engagement by gender and race. Specifically, their studies showed that females were much more likely to report being engaged in educationally beneficial practices, as compared to males at the institution. For example, females were more likely to expend more time and energy in endeavors pertaining to their coursework, whereas males were less likely to participate in activities that might support their learning and to spend the required time to their studies. Moreover, African American students, in comparison to students of other races/ethnicities were also more likely to be engaged in educationally beneficial activities and to find the academic environment more intellectually challenging and stimulating, just as they were more likely to expend more time to their academic studies. An important conclusion drawn from this study is that in the case of African American students, who often report feeling marginalized, less accepted, and held to lower expectations from faculty, is that they in fact report engaging with greater frequency and depth in activities that support their learning and development (Sontam & Gabriel, 2012).

Lastly, consistent with recent calls for colleges and universities to move from a research agenda to institutional practice (Seidman, 2012; Tinto, 2012a, 2012b), the Center for Community College Student Engagement began to refocus its efforts in communicating to stakeholders which high-impact activities and practices have the greatest potential for boosting student achievement (Center for Community College Student Engagement, 2012), and thus increasing degree completion. Some of these activities include mandatory assessment/placement, orientation, and academic planning on the front end; curricular restructuring of developmental education, participation in first-year experience seminars, student success courses, use of tutoring and supplemental instruction, and experiential learning, to name a few.

Sense of Belonging

Definition of Sense of Belonging

The construct of sense of belonging (SB) while not foreign to higher education has been studied minimally and only with select college student populations. Introduced by Hurtado and Carter (1997) to the higher education literature, but grounded in the works of Bollen and Hoyle (1990), sense of belonging has been defined as an individual's sense of identification or positioning in relation to a group within or to the college community that may yield cognitive and affective responses. Sense of belonging also characterizes a person's perceived belief of indispensability within a social system and that he or she is recognized and accepted as a member of that community (Anant, 1966). It also entails a need for frequent and ongoing relational interactions to feel him/herself a part of something greater, a motivation sufficient to drive behavior (Baumeister & Leary, 1995).

The Measurement of Sense of Belonging

In the context of college research, items pertaining to sense of belonging have been embedded in measures of institutional fit, institutional quality, institutional commitment or commitment to college (Bean, 1985; Bean & Metzner, 1985; Cabrera et al., 1992a; Cabrera et al., 1993; Nora & Cabrera, 1993), as well as in independent measures (Hoffman et al., 2002; Hurtado & Carter, 1997; Hurtado et al., 2007; Hurtado & Ponjuan, 2005; Johnson et al., 2007b; Tovar & Simon, 2010). It is likely that these practices stem from methodological and practical decisions researchers make when designing and carrying out their research studies. Moreover, the dimensionality of the sense of belonging construct has remained an issue of debate for some time. Sense of belonging has been operationalized as a unidimensional construct (Hausmann, Schofield, & Woods, 2007; Hausmann, Ye, Schofield, & Woods, 2009; Hurtado & Carter, 1997;

Locks, Hurtado, Bowman, & Oseguera, 2008; Maestas, Vaquera, & Zehr, 2007) and as a multidimensional construct (France, Finney, & Swerdzewski, 2010; Hoffman et al., 2002; Tovar & Simon, 2010). As a unidimensional construct, Hurtado and Carter noted that the measure of perceived sense of belonging they used was well “suited to understand a variety of collective affiliations, formed in large environments that can contribute to an individual’s sense of belonging to the larger community” (1997, p. 328). As a multidimensional construct, sense of belonging has been proposed to reflect specific student-faculty relationships, student-peer relationships, and student-classroom interactions (France et al., 2010; Hoffman et al., 2002; Tovar & Simon, 2010). Tinto has recently noted that sense of belonging results from the interactions students have with a variety of communities encompassing college settings and, in turn, how supportive these experiences are perceived by students (Tinto, 2012a); “it is how you see your connections on campus vis-à-vis other groups. Students need to feel connected in ways that do not marginalize or ghettoize.... They need to feel welcomed not threatened” (as quoted in Wolf-Wendel et al., 2009, p. 424).

Research on Sense of Belonging in College Settings

Most research conducted to date on sense of belonging has focused on the experiences of select racial/ethnic minorities in navigating the college culture and to a lesser extent on its purported link to college student persistence. Some studies have examined how the campus racial climate affects students' sense of belonging at their institutions, particularly for students of color (Johnson et al., 2007a; Nuñez, 2009; Strayhorn, 2008). In examining the antecedents of Latino college students' sense of belonging, Hurtado and Carter (1997) found that perceptions of a hostile racial climate on the second year of college, directly and negatively impacted Latinos' perception of belonging in their junior year. The authors noted that "Latino students are less

likely to feel part of the campus community if they perceive racial tension or have experienced discrimination" (p. 337). These experiences have the potential to hinder their academic and social development. However, they noted that early, positive transition experiences, as well as memberships in socially and religiously-oriented campus organizations can facilitate and enhance belonging in the later years.

In a related study, Locks, Hurtado, Bowman, and Osegura (2008) assessed how sense of belonging was influenced by the quality of peer relationships associated with diversity on campus for White students and students of color. Results suggested that frequent and positive interactions with diverse students were positively associated with a higher sense of belonging. Perceived racial tension, on the other hand, negatively impacted belonging. The study also found an indirect, but positive effect between the number of hours students spent socializing per week on sense of belonging, mediated through positive diverse peer interactions. Similar findings were reported by Hurtado, Han, Saenz, Espinosa, Cabrera, and Cerna (2007) for White and underrepresented minority science and non-science students. The value of experience with diversity was also found to be significant in a study by Maestas, Vaquera, and Muñoz Zehr (2007). Specifically, socializing with students different from themselves and holding positive perceptions toward affirmative action significantly accounted for a portion of the variance on sense of belonging. Additionally, the authors found that being socially involved in a fraternity or sorority, holding a leadership role in a student organization, faculty expressing interest in students' development, and living on campus, were all predictors of sense of belonging.

Similarly, Strayhorn (2008) found that grades, hours spent studying per week, and interactions with diverse peers predicted sense of belonging among Latino students attending

four-year institutions. The same was true for white students, albeit hours reported studying negatively predicted belonging.

Sense of Belonging, Student Persistence, and the Classroom Experience

Sense of belonging has also been referred to in select college persistence literature to account for students' decisions to remain or stopout from college. Haussman, Ye, Schofield, and Woods (2009) contended that students' "subjective sense of belonging" to the institution is conceptually and empirically distinct from "behavioral indicators of participation" (p. 650), such as academic and social integration, advanced by various researchers including Spady (1971), Tinto (Tinto, 1987, 1993), and Cabrera and colleagues (Cabrera et al., 1992a; Cabrera et al., 1993). Hausmann et al., specifically noted that "when students become integrated into the social and academic systems of the university, they develop a psychological sense of belonging to the university community" (p. 650). This statement directly contradicts recent arguments advanced by Vincent Tinto who has noted that students' sense of belonging, not integration, may better explicate how college students make meaning of the interactions they have with the academic and social systems of the college and how students' perceived sense of belonging, in turn influences retention and persistence decisions; in fact, Tinto explicitly advocates for abandoning the often misunderstood, misused, and mismeasured concept of "integration" in retention research (as reported in Wolf-Wendel et al., 2009).

As noted earlier, some authors contend that sense of belonging is inextricably linked to college student retention, and in some instances, it has been described as critical in retaining students (Hoffman et al., 2002; Hurtado & Carter, 1997; Rhee, 2008), especially students of color (Maestas et al., 2007). Hausmann, Ye, Schofield, and Woods (2009) sought to determine if an intervention designed to increase African American and White students' sense of belonging

would impact their level of commitment to college and persistence. Their study found that the intervention was only effective in increasing White students' sense of belonging. However, sense of belonging was found to have a direct and positive effect on commitment to college, and an indirect effect on both intention to persist and on actual persistence for both groups. This said, their results clearly indicated that while belonging significantly contributed to the total variance in either intentionality to persist or to persistence, there were other factors that most significantly accounted for these outcomes, including encouragement from family and friends, institutional commitment, GPA, goal commitment, and academic development. Nonetheless, the authors concluded that in designing interventions aimed to impact student persistence, systematically "bolstering sense of belonging" (p. 667) may indeed impact students' behavior.

With respect to the influence of curricular and classroom-based student-peer, student-faculty interactions, some studies have cited antecedents and correlates of belonging. The authors of the Sense of Belonging Scales (SOBS; Hoffman et al., 2002), for example, found that students enrolled in a learning community reported higher degrees of perceived belonging compared to freshmen students enrolled in a freshman experience seminar across sub-measures. Specifically, learning community students reported higher levels of support from peers and faculty, reported greater comfort in the classroom environment, and perceived the faculty as empathetic and understanding. Authors attributed the higher scores to the increased attention students received from the learning community faculty and peers.

In a study seeking to assess the influence of classroom-level belonging on campus-wide belonging, Freeman, Anderman, and Jensen (2007) found that specific instructor characteristics such as demonstrating warmth and openness toward students, soliciting student participation during class, and instructor organization positively impacted students' perceptions of class-level

belonging. In turn, perceptions of class belonging, feeling accepted by the university community, and instructor pedagogical caring predicted students' university-level belonging. As the authors noted, it would seem that students' "sense of social acceptance" from faculty and peers accounted for much of the variance in perceived belonging.

A Need for Further Elaboration

As evident in the works described above, the literature on sense of belonging is evolving, but in need of further elaboration. With respect to measurement, the dimensionality of the construct has been called into question, albeit emerging evidence supports a multidimensional construct (France et al., 2010; Hoffman et al., 2002; Tovar & Simon, 2010). While the body of literature is not yet extensive, it has quickly clustered around ethnic minority students' experiences with the racial campus climate. It is interesting to note that the vast majority of these studies have focused on the experiences of Latino and African American students, in comparison to those of White students. Largely absent from this research are other non-White students (i.e., Asian, American Indian/Native American).

While much has been written about the purported link between sense of belonging and student retention, there is relatively little empirical evidence to substantiate this connection. Hoffman et al., (Hoffman et al., 2002) noted that they found "strong evidence for the utility of a Sense of Belonging instrument and its ability to add to the discipline's general knowledge about the factors that contribute to student persistence in college" (p. 251), yet no evidence was presented in support of this claim. Given the recognition by leading higher education scholars such as Tinto and Hurtado (Hurtado & Carter, 1997; Tinto, 2006, 2012a, 2012b) that sense of belonging, rather than integration, may better explain the experiences of college students' decisions to persist to degree completion, additional research will need to be conducted, and may

examine how sense of belonging and persistence are interconnected. It will be especially important to determine if differential levels and type of belonging experiences to specific others, or to the college in general will exercise an influence on students' decisions to remain at the college (Hurtado & Carter, 1997; Tovar & Simon, 2010).

Mattering

Mattering, like sense of belonging, is part of the umbrella of relatedness constructs, and while it was introduced well over 30 years ago, it has not yet been studied extensively (France, 2011; Hagerty, Williams, Coyne, & Early, 1996). In short, mattering is our subjective perception and interpretation that we make a difference to others in our lives; that is, when others notice our presence and validate our actions, we in fact matter. In the context of higher education, researchers and particularly practitioners, consistently promote the value and impact of mattering on college student success and retention (Schlossberg, 1989).

Definition of Mattering

Initially introduced by sociologists Morris Rosenberg and Claire McCullough (1981), the construct of mattering was described as a form of external validation of an individual by others, both at the interpersonal level and the societal level (Rosenberg, 1985; Rosenberg & McCullough, 1981). The interpersonal form of mattering refers to mattering to specific others in our lives, such as our parents, siblings, friends, professors, fellow students. On the other hand, at the societal level, mattering is manifested in our perceptions of indispensability within given social institutions such as one's community, church, our government, university, or to society at-large.

According to Rosenberg and McCullough(1981), mattering consists of three distinct elements: (1) attention—the feeling that one commands the interest or notice of others—our presence and our absence; (2) importance—the belief that others care about what we think, want, and have to say, or that we serve as their ego-extension—the feeling that others are proud of our successes, saddened by our failures; and lastly, of (3) dependence—the realization that others depend or rely on us or our efforts. Subsequent to its introduction by Rosenberg and

McCullough, and based on an examination of adults in transition in the college setting, Schlossberg (1989) proposed that mattering also encompassed a fourth element—appreciation—the feeling that we are appreciated for our efforts from significant others and those in authority. Schlossberg, Lynch, and Chickering (1989) described mattering as “the beliefs people have, whether right or wrong, that they matter to someone else, that they are the object of someone else’s attention, and that others care about them and appreciate them” (p. 21). Schlossberg and colleagues noted that to the degree that people perceive they do not matter, they will feel marginalized or disconnected. Moreover, this sense of insignificance may lead to existential meaninglessness and social isolation for some people and individuals may question their very existence and engage in self-destructive behavior (Elliott, Colangelo, & Gelles, 2005; Marshall, 2001; Schlossberg, 1989). In contrast, those who perceive a sense of social purpose and meaning for their life are more likely to feel significant to key people in their lives (Marshall, 2001), including to individuals in a college setting (Elliott et al., 2005; France, 2011; France & Finney, 2010; Schlossberg, 1989; Schlossberg et al., 1989; Tovar, Simon, & Lee, 2009).

Mattering has also been described as a “powerful source of social integration” (Rosenberg & McCullough, 1981, p. 165) that is consistently reinforced by our inter-dependence with others, and others with us. It arises from the number and quality of interactions we have with those significant to us, whether we are the object of praise or criticism (Marshall, 2001; Tovar et al., 2009). Rosenberg and McCullough (1981) also noted that mattering can act as a motive, sufficient to guide behavior.

Mattering and the Self-Concept

Mattering has also been described as being part of the self-concept and that it exercises an influence on our psychological well-being (Dixon-Rayle, 2006; Dixon-Rayle & Chung, 2007;

Dixon-Rayle & Myers, 2004; Dixon & Kurpius, 2008; Elliott, 2009; Elliott et al., 2005; Elliott, Kao, & Grant, 2004; Josselson, 1998; Rosenberg, 1985; Rosenberg & McCullough, 1981), especially during the period of adolescence, young adulthood, and senescence. As will be noted below, a low self-concept and a low sense of interpersonal and societal mattering has been associated with depressive symptoms, anxiety, low self-esteem, suicide ideation, and generalized psychological distress. According to France (2011), “a characteristic of a healthy self-concept is high feelings of mattering.” In reference to mattering as a component of our self-concept, Elliott (2009) goes on to state that

the extent to which we believe we matter to others is learned in the socialization process that teaches us how to be human beings. Different people, with different socialization experiences, may find themselves at different points along the mattering continuum. Some may believe that they matter a great deal. They have experienced the attention, investment and reliance from others. Others may have learned from the significant others in their lives that they are nearly superfluous in this world. It is the placement along this dimension that helps to account for differences in behavior (p. 17).

According to Elliott (2009), there are two specific learned socialization processes that impact the understanding of the self, and, in turn, influence our perceptions of mattering to others. These processes are reflected appraisals and social comparisons. Reflected appraisals are characterized by the reactions we observe in others toward us, how we make meaning of these reactions, and how we internalize these and “make them our own” (Elliott, 2009, p. 18). Elliott posits these reflected appraisals account for the strongest source of mattering. The second socialization process impacting mattering, and thus, our self-concept consists of the social

comparisons we draw upon in contrasting ourselves to others and how we internalize these comparisons. For example, a college student may notice that she/he is seldom called upon by an instructor to offer her/his input in classroom discussions, while most other students are frequently engaged by the instructor.

Lastly, Josselson (1998) postulated that mattering is an aspect of identity stemming from interpersonal interactions that result in validation from others to create a sense of certainty about our identity. In other words, without that connection with others, there would not be a sense of mattering or complete sense of self or realized self. “To know that in some way we are a significant part of the lives of those around us is essential to the way we value ourselves and understand our place in the social order” (Elliott et al., 2005, p. 224).

The Study of Mattering

Despite the fact that the construct of mattering was introduced to the literature just over 30 years ago, it has garnered relatively little attention as evidenced in the number of works published in social science, health science, and higher education peer reviewed journals. The study of mattering has primarily focused on aspects of psychological and physical wellness (e.g., Corbière & Amundson, 2007; DeForge, Belcher, O'Rourke, & Lindsey, 2008; Elliott et al., 2005; Elliott et al., 2004; Josselson, 1998; Lewis & Taylor, 2009; Marcus, 1991; Powers, Myers, Tingle, & Powers, 2004; Raque-Bogdan, Ericson, Jackson, Martin, & Bryan, 2011; Schieman & Taylor, 2001; Taylor & Turner, 2001), life and job satisfaction (e.g., Connolly & Myers, 2003; Corbière & Amundson, 2007; Goodman, Schlossberg, & Anderson, 2006), the adolescent experience (e.g., Dixon-Rayle, 2005; Dixon-Rayle & Myers, 2004; Dixon, Scheidegger, & McWhirter, 2009; Dixon & Tucker, 2008; Elliott, 2009; Mak & Marshall, 2004; Marshall, 2001, 2004; Marshall & Lambert, 2006; Rosenberg & McCullough, 1981), and to a lesser degree on

college students and student outcomes (e.g., Butcher, 1997; Dixon-Rayle & Chung, 2007; Dixon & Kurpius, 2008; France, 2011; France & Finney, 2010; Gibson & Myers, 2006; Gonzalez, 1989; Gruber, Kilcullen, & Iso-Ahola, 2009; Hawk & Lyons, 2008; Isaacson, 2009; Kodama, 2002; Marshall, Liu, Wu, Berzonsky, & Adams, 2010; Myers & Bechtel, 2004; Phillips, 2005; Schlossberg, 1989; Tovar et al., 2009). Moreover, the number of attempts devoted to the development and validation of mattering-related measures have been few (Elliott et al., 2004; Marcus, 1991; Marshall, 2001; Rosenberg & McCullough, 1981), including those devoted to assessing the unique experiences of college student populations (France, 2011; France & Finney, 2010; Schlossberg, LaSalle, & Golec, 1990; Tovar et al., 2009). Additionally, with the exception of mattering measures introduced within the last 10 years, the construct validity of the earlier works has been questioned, especially in light of scant supportive evidence on their development (Elliott et al., 2004; France, 2011; Tovar et al., 2009).

In the sections that follow, I first discuss some psychologically-oriented works that examine how mattering impacts relationships to significant others, and the association between mattering, self-esteem, stress, depression, suicidal ideation, among other forms of psychological distress. I will then elaborate on works pertaining to higher education settings and student outcomes.

Psychological Correlates of Mattering

At its most basic level, the quality and type of interactions individuals hold with others, along with their gender socialization, and ease of transitioning through various stages of development, will likely impact the mattering experience. In a series of studies conducted by Marshall (2001, 2004) and Marshall and colleagues (Mak & Marshall, 2004; Marshall & Lambert, 2006; Marshall et al., 2010), researchers consistently found that females perceived

themselves as mattering more to their parents, friends, and to their romantic partners, in comparison to men in the studies. Moreover, regardless of gender, adolescent and young adults perceived themselves mattering more to their mothers than their fathers. Adolescents, in comparison to young adults, perceived they mattered more to their friends than their fathers.

Having a sense of purpose for life and of relatedness to others was strongly connected with perceived mattering, as well. Mak and Marshall (2004) noted that “mattering facilitates a feeling of ‘we-ness’ that serves to socially locate individuals and reduce [feelings of] marginality and isolation” (p. 481). Marshall (2004) found that mattering to parents and friends exercised an additive effect (positive or negative) to the psychological well-being of American and Canadian youth in her study. On the one hand, having a positive mattering experience resulted in adolescents engaging in decreased levels of “problematic interpersonal behaviour,” (p. 599). In contrast, perceiving that they did not matter resulted in more frequent and more serious forms of socially undesirable behavior. These findings corroborate the early works of Rosenberg and McCullough (1981), who despite not having constructed an empirically validated measure of mattering, found low to moderate correlations between mattering to parents and various forms of youth delinquency (ranging in type, frequency, and seriousness), including theft and vandalism. Of import to this literature review are also Rosenberg and McCullough’s findings establishing low to moderate correlations with psychological symptomatology, including depression, worry, somatic symptoms, and anxiety, with low levels of perceived mattering. This was particularly the case for low socioeconomic status adolescents, compared to those from middle class, and especially those from more affluent backgrounds, who reported significantly higher levels of mattering.

Given the significant importance of adolescence in establishing our self-identity and self-esteem, researchers have emphasized the need for significant others to systematically create and support interventions that will enhance perceptions of mattering during adolescence, including at home and at school (Dixon-Rayle, 2005; Dixon-Rayle & Myers, 2004; Dixon et al., 2009; Dixon & Tucker, 2008; Elliott, 2009; Rosenberg & McCullough, 1981). Recent findings from Marshall and Lambert's study (2006), suggests that mattering is not a global and stable trait, but rather it is malleable, subject to how individuals make meaning of the interactions they have with others. Thus, it stands to reason that carefully designed interventions by school counselors, by concerned teachers and parents can go a long way in facilitating adolescent development.

Other research conducted with adult populations has also found associations between low levels of mattering and psychological distress. For example, in a community-based study assessing the impact of personal resources (coping mechanisms to environmental stressors) held by individuals, DeForge and colleagues (DeForge et al., 2008) sought to identify which of these mechanisms predicted depressive symptoms in adults. The authors found that individuals with the greatest number of depressive symptoms were those who had low self-esteem, lower levels of perceived belonging and mattering to those around them—even after holding constant a variety of demographic characteristics. The authors noted that by providing support services that enhance personal resources, chronic stressors could be alleviated. In a similar line of research, Lewis and Taylor (2009) noted that individuals whose social resources are strong, and characterized by high levels of support from family and friends, and possessing a strong religious orientation, was associated with high levels of mattering. The authors found this was especially true for African American adults who participated in this community-based study, in comparison

to White adults. The authors attributed this finding to the notion that African Americans tended to report higher levels of religiosity and formal membership in religious organizations.

Yet another study by Raque-Bogdan and colleagues (Raque-Bogdan et al., 2011) supported the need for individuals' reassurance from others and a capacity for self-reinforcement. This was demonstrated by significant findings noting that mattering mediates the relationship between adult attachment orientations (i.e., anxiety, avoidance) and mental health. The authors specifically noted that high levels of anxiety and avoidance were negatively associated with perceptions of mattering to others, likely owing to dissatisfaction or worry pertaining to their relationships with others.

Lastly, in examining the relationship between mattering and suicidal ideation in early- to mid-adolescent youth, Elliott, Colangelo, and Gelles (2005) found that the likelihood for suicide ideation decreased significantly for individuals with a strong sense of mattering to others in their lives. However, this was mediated by self-esteem and the degree of depression experienced. The authors found that as mattering decreased so did self-esteem; and in turn, the likelihood for depression increased, and thus, thoughts of suicidal ideation. This was especially true for younger men and women.

Mattering and the College Student

Nancy Schlossberg first brought to the attention of college practitioners and researchers the construct of mattering in 1989 (Schlossberg, 1989). Schlossberg's contribution to the mattering literature stemmed from her work with adults in transition. Based on this work, and a series of interviews conducted with adult students over the age of 25, Schlossberg introduced the element of appreciation to the mattering construct, thereby expanding Rosenberg and McCullough's (1981) pioneering works on the subject. Schlossberg also noted that to the degree

that individuals perceive they do not matter to significant others or to their colleges and universities, they will feel marginal or peripheral to the campus community. She further noted this would be particularly the case for individuals undergoing transitions, from one role to another, such as students who are just entering college.

Schlossberg further noted that mattering had the potential to influence how and to what degree college students became involved and engaged at their colleges, and asserted that individuals from different gender, role status, and social positioning would likely experience mattering differently. Given the assertion that mattering is a motive with the potential to guide behavior (Rosenberg & McCullough, 1981; Schlossberg, 1989), Schlossberg and colleagues (Schlossberg et al., 1989) postulated that “institutions that focus on mattering and greater student involvement will be more successful in creating campuses where students are motivated to learn, where their retention is high, and ultimately, where their institutional loyalty for the short- and long-term future is ensured” (p. 14). France (2011) also has noted that the relationship between mattering and involvement may be recursive in nature. Both Schlossberg’s and France’s contentions remain an empirical question in need of investigation. To date, not a single study has been published in a peer reviewed journal investigating this, or its purported link to college student persistence, satisfaction, or other student outcomes. However, a few doctoral dissertations (Isaacson, 2008; Kent, 2004; Sumner, 2012; Wicker, 2004) have attempted to establish this link with mixed results; albeit these findings can be attributed to a great degree to poorly designed studies using relatively few participants, thus making it difficult to yield statistically significant findings; or to studies utilizing instruments lacking construct validity (e.g., Schlossberg’s Mattering Scales for Adult Students in Postsecondary Education; (Schlossberg et al., 1990). Despite of this lack of evidence, college practitioners continue to

espouse the face value of mattering on college student outcomes (Clark, 2012; MacKinnon-Slaney, 1994).

In a related line of research, Laura Rendón introduced her theory of validation to higher education in 1994 (Rendón, 1994). Neither her 1994 study, nor her subsequent work on the subject (Rendón, 2002, 2006; Rendón et al., 2000) acknowledges the work of Schlossberg in influencing her thinking on her theory despite the many parallels found in their propositions that both mattering or validation influence college students' involvement; or the notion that students in transition have difficulty connecting to their university (especially nontraditional students); or that interventions designed to foster a sense of mattering or validation can impact student success; or the influential and affirming role that institutional agents plays in student adjustment and learning. In a recent article describing how validation theory has been utilized in research and practice over the years since its introduction, Rendón Linares and Muñoz (2011) acknowledged that Schlossberg's mattering and marginality theory closely reflected elements of interpersonal validation, including the need for "attention, caring, feeling needed and appreciated, and identifying with others" (p. 23).

Regardless of how Schlossberg and Rendón conceptualized their works on mattering/marginality and validation, respectively, both scholars have made significant and positive contributions to theory development and academic research. In fact, one may argue that Rendón's work compliments and extends Schlossberg's propositions significantly, particularly in that they speak to the experiences of traditionally underrepresented college students and those that feel marginalized from higher education communities. Numerous higher education scholars have recognized Rendón's contributions to the literature, even when her validation theory has not garnered the kind of attention of the likes of Vincent Tinto, for example, in explicating why

college students stop attending college or why they may experience difficulties (e.g., Barnett, 2010, 2011; Crisp & Nora, 2010; Dowd et al., 2011; Gildersleeve, 2011; Hurtado, Cuellar, & Guillermo-Wann, 2011; Nora, Urick, & Quijada Cerecer, 2011b; Rendón Linares & Muñoz, 2011; Tinto, 2012a).

According to Rendón (1994), it was the active interest that someone at the college took upon marginalized students, that “affirmed them as being capable of doing academic work and that supported them in their academic endeavors and social adjustment” (p. 44) that led to their being successful while at college. It was this interest and proactive aid on the part of an institutional agent that fostered their success. Rendón further asserts that “validation has helped these kinds of students to acquire a confident, motivating, ‘I can do it’ attitude, believe in their inherent capacity to learn, become excited about learning, feel a part of the learning community, and feel cared about as a person, not just as a student” (Rendón Linares & Muñoz, 2011, p. 15).

Rendón (1994) posits that validation or validating experiences encompass(es) the following elements: (1) it is enabling, confirming, and supportive; (2) it fosters student learning; (3) it facilitates the process of student development; (4) occurs in-and-out of the classroom; and (5) it has a greater potential to effect student development when offered early in the college student experience. Rendón (2002) further asserts that validating experiences may be of two types: academic and interpersonal, generally carried out by caring institutional agents who are expected to act upon first, without students seeking these validating opportunities.

With respect to involvement, Rendón (2006) noted that it differs from validation in the following way:

The notion of involvement leans toward students taking the initiative to get engaged on a campus that offers services and programs for students to get

involved. However, validation does not assume students can form connections on their own and asks college faculty and staff to take the initiative in reaching out to students to assist them to learn more about college, believe in themselves as learners, and have a positive college experience (p. 5).

Like students who perceive they do not matter to their colleges and universities or to institutional agents, students who have experienced “invalidating” experiences are more likely not to become involved or engaged at the college, nor to partake of programs and services designed to facilitate their success (Rendón, 2006). Furthermore, as Tovar, Simon, and Lee (2009) noted, how students relate to institutional agents such as counselors, professors, and other college personnel can, in fact, positively affect students interpersonally and academically. They may do this by demonstrating directly how important students are to them individually, or to the college, and how they rely on them to contribute to the successful experiences of the class or to other students. They further discuss how a thoughtful instructor will readily make students aware that their contributions are valued, even when these are not always of the best quality; they will communicate their appreciation to the student for having the courage to participate. In short, if students perceive they matter (or feel validated), they will be more likely to participate; they will become part of the “we”—participative classroom culture—versus the “they”—observer classroom culture. Also as noted by several other scholars, faculty may instill in students a sense of mattering and facilitate their learning by listening to them, eliciting their input, and recognizing their achievements—regardless of how small they may be (Huff, 2009; Hult Jr., 1979; Rendón Linares & Muñoz, 2011; Schieferecke, 2009; Wentzel, 1997). Similarly, within the context of counseling, the relationship between the student and counselor or advisor in the co-curricular environment also has the potential to positively impact the student. Being attended

to and having students' specific needs met is likely to foster a greater sense of mattering and connection to the institution (Tovar et al., 2009).

Research on mattering with college students continues to slowly propagate. Much of this research supports findings from the adolescent and older adult studies previously discussed. For example, Dixon-Rayle and Chung (2007) sought to determine, if and how, perceptions of mattering among freshmen college students were associated with perceived support from their college friends and their families, as well as their academic stress. The examination of social support from significant others and college stress follows several scholars' assertions that family and friends can play a significant role in college student transition and adjustment (Bean & Eaton, 2000; Bean & Metzner, 1985; Cabrera et al., 2012; Hagedorn et al., 2001; Rendón, 1992; Rendón et al., 2000; Tinto, 1993). Dixon-Rayle and Chung's study found that perceived social support from family and friends, positively predicted levels of mattering to college friends. In turn, perceptions of mattering to college friends also predicted mattering to the institution, a finding consistent with previous studies (Rosenberg & McCullough, 1981; Schieman & Taylor, 2001). Moreover, Dixon-Rayle and Chung's findings illustrated how perceptions of mattering influenced academic stress among college students, particularly for female students who experienced higher stress levels. Thus, these findings lend further support to the notion that institutional support, and support from faculty, counselors, and other college students may help increase feelings of mattering and to decrease the seriousness of academic stressors.

Also consistent with previous studies suggesting that feelings of mattering arise "from social exchanges that promote a sense of belonging, identity, and commitment" (Taylor & Turner, 2001, p. 311), and from perceived support from institutional agents (Dixon-Rayle & Chung, 2007; Rendón, 2002), Tovar et al., (Tovar & Simon, 2010; Tovar et al., 2009) found that

matter to the college, to faculty, counselors, and other students, moderately correlated with various aspects of sense of belonging at their college; including perceived peer support, perceived faculty support/comfort, perceived classroom comfort, empathetic faculty understanding, and decreased feelings of isolation. The study also found that Asian students generally reported lower levels of mattering in comparison to African American students who reported higher levels of mattering. The study did not investigate the potential reasons for this development.

In an earlier study, Tovar, Simon, and Fujimaki (2008) examined the impact of pre-college student characteristics, transition to college experiences, academic factors, and socio-academic integrative experiences on American and international students' perceptions of mattering to their college (a two-year institution). Collectively, these clusters of variables accounted for 47% and 42% of the variance in college mattering, respectively. Of importance to this review of the literature, and consistent with Dixon-Rayle and Chung's (2007) previous findings, college transition support from family, friends, and the institution, positively predicted mattering to the college for both American and international students. The study also found that socio-academic integrative experiences accounted for the largest proportion of mattering. For American students, the ability to relate to diverse students was reported as the largest predictor, followed by the degree of perceived relatedness to instructors, the number of times students met with instructors outside of class, the degree of relatedness to counselors, number of hours engaged on campus activities, holding discussions of a personal nature with instructors, the number of times they met with counselors, and hours spent studying. For international students, only three predictors were statistically associated with perceived mattering to their college. These included the degree of relatedness to diverse students, the number of hours engaged on

campus activities, and the degree of relatedness to instructors. Given these findings, Tovar et al., (2008) concluded that students' perceptions of mattering are substantially enhanced based on the quality, and in some cases, the quantity of interactions they have with individuals at the college including instructors, counselors and diverse students. The authors further noted that the single most important predictor of mattering to the college for American and international students was their ability to relate to individuals different from themselves—race, ethnicity, gender. These findings also reinforced the positive impact of diversity among college students as evidenced in a growing body of literature (as reviewed by Pascarella & Terenzini, 2005). This is especially important considering that international students frequently experience a variety of acculturative stress when coming to the United States, and interactions with other students can facilitate their transition and adjustment (Pedersen, 1991; Poyrazil, Kavanaugh, Baker, & Al-Timimi, 2004). Moreover, the findings also lend support to the notion that early socialization with diverse students enhances sense of belonging to their college (Hausmann et al., 2007). Lastly, Tovar and colleagues' findings suggest that high levels of relatedness to institutional agents, evidenced in how available, close, and friendly they are toward students, and how often they meet with them to discuss matters that extend beyond the classroom, substantially and positively mediate perceptions of mattering to the college.

Similarly, in a study seeking to validate the psychometric properties of a measure assessing students' sense of validation, Hurtado et al. (2011) found racial differences in students' perceptions of academic and personal validation at 14 institutions, including two and four-year institutions. Specifically, they noted that White students, in comparison to students of color, reported higher levels of interpersonal validation, and much higher in academic (classroom-based) validation. Given this, the authors noted that institutions have an obligation to quickly

assess students' experiences in the classroom environment, especially when "prejudiced faculty and staff" (p. 67) may influence the alienation of underrepresented students, and then identify key supportive agents who may counteract the effects of negative, non-validating experiences.

Mattering and Student Persistence

As noted earlier, Schlossberg (Schlossberg, 1989; Schlossberg et al., 1989) and Dixon-Rayle and Chung (2007) contend that mattering and student retention/persistence are intricately interrelated. This claim has also been made of validation by various researchers (Barnett, 2006, 2010, 2011; Hurtado et al., 2011; Nora et al., 2011b; Rendón, 1994). However, their works do not provide empirical evidence to support this claim. Relatively few studies have sought to undertake this line of research. Chief among these is Kent (2004), whose doctoral dissertation provided some evidence supporting the above hypothesis. Kent sought to determine if contextualized perceptions of mattering of adult university students over the age of 25 had an effect on their persistence, for males and females, and students enrolled in the arts and sciences and those in health/performing-visual arts/business programs. While Kent does not explicitly state in her study that her research encompassed junior and senior-standing students, this appears to be the case considering that Kent defined "persisters" as students who completed their first baccalaureate degree in "Year Two," of what likely refers to the span of her study. Kent utilized Schlossberg's Mattering Scales for Adults in Postsecondary Education (MSAPE), which as has been noted earlier, has been criticized for lacking evidence of construct validity (France, 2011; France & Finney, 2010; Tovar et al., 2009). Despite these limitations, Kent reported that students who persisted to degree completion had higher scores in four of the five mattering subscales encompassing the MSAPE. Namely, administration, interactions with peers, multiple roles, and interactions with faculty; albeit, there were no statistically significant differences by

gender and program of study. As may be discerned from subscale titles, these assessed the importance of the interactions of college students with either the campus environment or with specific others. Kent concluded her findings provided evidence of how specific college policies and practices that support and enhance college persistence, as evidenced in the mattering scores obtained by persisters and non-persisters. However, she also questioned if the MSAPE truly measured perceptions of mattering.

In the case of validation, Elizabeth Barnett's research provides some evidence of the association between academic validation and community college students' intention to persist to the following semester. Barnett reported that students reporting higher levels of validation from faculty were also more likely to express higher levels of intention to persist, especially students of color and older students (Barnett, 2006, 2010, 2011). However, this relationship appeared to be mediated by students' sense of integration at the institution. Barnett defined "integration" as a "sense of 'competent membership resulting from... student interaction with faculty and staff'" (Barnett, 2011, p. 197). While Barnett's studies provide limited support on the influence of academic validation on students' intent to persist, no study has yet provided empirical evidence of its influence on actual student retention or persistence.

Conclusion: Summary of the Literature

Four bodies of literature were reviewed in some detail above. These included empirical and theoretical works on college student retention and persistence, engagement/involvement, sense of belonging, and mattering/validation. Each of these areas of the literature has been studied across institutional settings and with students of varying characteristics. While hundreds of studies related to college student persistence and involvement have been published over the last 40 years since Spady, Tinto, and Astin published their seminal works (Astin, 1984; Spady, 1970, 1971; Tinto, 1975), many of these studies are both methodologically sophisticated and well designed, while others are rather limited in design, sophistication, and generalizability. Other areas of the literature such as sense of belonging, engagement, and mattering/validation are relatively new and only begun to attract scholarly attention since the late 1980s (Hurtado & Carter, 1997; Kuh, 2001; McClenney, 2004; Rendón, 1994; Schlossberg, 1989); thus, the number of studies available remain limited.

Common to all areas of the literature topics reviewed, is the contention that students who go on to persist from their first-to-second year of college or through degree completion are those students who had successful transition experiences from high school to college; those who found support from family, friends, and the institution itself during the crucial first few weeks of college. Moreover, it is those students who find a place for themselves in a college environment free of hostility, where they interact with diverse peers, with supportive and engaging faculty and other institutional agents who provide the moral, emotional, social, and academic support needed to succeed in college that have the greatest probabilities to complete their educational endeavors.

Obviously, students' ability to engage, to become involved, to remain committed to their educational goals, and to partake of all the support resources available at the institution is of

utmost importance. The ability to cope with myriad stressors and to seek assistance from those “in the know,” will also enhance their opportunities for success. The works reviewed above also noted the responsibility for institutions to anticipate, design, and front-load during the first-year of college, in particular, various resources designed to engage students academically, socially, and emotionally. Without carefully designed resources and direct outreach to students, many will simply not develop a sense of belonging to their institution; poor interactions and invalidating experiences with institutional agents and with the college environment itself will increase the likelihood for withdrawal.

While the works discussed above have studied the impact of integration, involvement, sense of belonging, validation, and mattering on select student outcomes, this literature review uncovered that not a single study to date, has attempted to study the collective impact of these constructs on students’ intention to persist or actual persistence. Hence, there is an opportunity to engage in academic research to address this shortcoming in the higher education literature, and this dissertation undertakes this initial step. The works discussed in this literature review, directly and indirectly support the inter-relationships among these and other constructs with persistence, as illustrated in Figure 1 (Chapter 3).

CHAPTER 3

METHODOLOGY

Chapter 3 discusses in full detail the methodology employed in this study. It begins by describing the source of the data and sampling procedure; it then presents the conceptual model; it discusses several conceptual model propositions, the variables encompassing the model, and the hypothesized directionality of each path. Following this elaboration, the research questions and corresponding hypotheses guiding this study are noted. Lastly, it discusses additional details concerning the research methodology characterizing the study, including the research design and data analyses conducted.

Data Source

Data for this study came from an archival database held by the author. These data stem from a sabbatical research study conducted in the spring of 2007. The purpose of the original study was to assess the factorial validity of the *College Mattering Inventory* (Tovar et al., 2009) and later the *Sense of Belonging Scales* (Tovar & Simon, 2010). Data collection took place after securing approval from two institutions' research review boards: a large public community college (Carnegie category: associate level, public, urban serving, single campus) and a public university (Carnegie category: master's level, large, urban). Only data for the community college were utilized in this study. Data for the study was formatted in an SPSS file consisting of approximately 276 variables covering such areas as mattering, sense of belonging, relatedness, interactions with counselors and instructors, involvement in student activities and academics, transition to college experiences, and multiple demographic variables. Only variables noted in Table 1 and select demographic variables were extracted to form a working file for the present study.

Sampling

Following approval from the Institutional Research Board at the community college, the Institutional Research office generated a database of 7,500 randomly selected, currently enrolled students 18 years of age or older. The database contained e-mail addresses and select demographic characteristics. E-mail invitations were sent on behalf of the researcher by the Information Technology office to these students asking them to participate in a 45-minute online survey during week 11 of a 16-week semester. The email included instructions on how to partake in the survey, namely “clicking” on the URL provided in their email. Students were informed in the email, and later in the survey, that participation was voluntary. Students were offered the opportunity to enter a drawing for an iPod Shuffle, as incentive to participate. Two e-mail reminders were sent one week apart. A total of 2,347 (31.3%) students responded to the survey request. However, only 2,200 (93.7%) students completed the survey sufficiently enough and answered several validity check items to render their responses suitable for the study. Those deemed incomplete generally did not provide responses to more than 10-15% of the survey items, or answered the validity check items in a manner that did not conform to instructions (e.g., “*Answer #4 for item M50*”), leading the researchers to believe responses were randomly provided.

Conceptual Model

While the works discussed in the literature review (Chapter 2) have studied the impact of integration, involvement, sense of belonging, validation, and mattering on select student outcomes and student populations in a variety of models, not a single study has been published to date attempting to study the collective impact of these constructs on students’ intention to persist or actual persistence at either two-year or at four-year institutions. Moreover, no other study has

attempted to examine if constructs such as engagement/involvement, sense of belonging, mattering, perceptions of the campus climate, and peer relationships might form part of an overarching construct. This study attempts to address these important gaps in the community college literature and examines the inter-relationship among these and other constructs on intent to persist.

The conceptual model as depicted in Figure 1, is grounded on Astin's Input-Environment-Outcome (I-E-O) college impact model (Astin, 1991a, 1993). The I-E-O model posits that various college outcomes (O), such as student persistence, are mediated by students' pre-college characteristics and experiences (I), as well as, their actual experiences while in college (E). By using the I-E-O framework, this study acknowledges the impact that pre-college student characteristics and students' interactions with the college environment have on student outcomes. Critics of higher education research have noted that researchers do not always state how concepts such as involvement, engagement, integration, and sense of belonging are used in their research—that is, they do not explicitly state how these concepts are “viewed” in the context of inputs, environment, or outcomes; this study utilizes these constructs as reflections of the college environment, as originally intended by those introducing the concepts (Wolf-Wendel et al., 2009).

Accordingly, four variables serve as “inputs” in the model—college transition support from family and friends, financial concerns in completing college, gender, and unit load.

Next, seven latent factors and three single indicator items are included to represent student interactions with the college “environment,” which are hypothesized to directly or indirectly affect intent to persist. These include institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate given a select set of

individual characteristics, perceptions of mattering, sense of belonging, engagement/involvement experiences, socio-academic integrative experiences, goal commitment, length of college attendance, and grade point average. Environmental experiences are under the influence or direct control of the institution and its institutional agents (Astin, 1991b).

Lastly, intent to persist serves as the single “output” or dependent variable in the model.

While no conceptual framework or theory will likely account for the experiences of every student attending college, the conceptual model in Figure 1 sought to explore its relevance to college students by accounting for various input and environment variables on student persistence. The works discussed in the literature review, as well as others noted below, were thought to theoretically support the interrelationships modeled in Figure 1—directly or indirectly. The hypothesized directionality of construct impact was based on the works reviewed; albeit, these did not universally or explicitly posit directionality; sometimes directionality was implied; or works contradicted each other. Straight, single-arrow lines denote hypothesized causal relationships among the constructs.

Figure 1. A Conceptual Model on the Impact of Mattering, Sense of Belonging, Engagement/Involvement, and Socio-academic Integrative Experiences on Intent to Persist

Conceptual Model Propositions

At the heart of the model, is the proposition that perceived institutional commitment to students directly or indirectly impacts student perceptions of mattering, sense of belonging, institutional engagement/involvement, socio-academic integrative experiences, goal (educational) commitment, and ultimately intent to persist. The model further contends that:

- a) Institutional commitment to students is demonstrated in the actions taken by the college to facilitate college transition and adjustment. This is further shown by actions and behaviors exhibited by institutional agents such as instructors and counselors in their ongoing interactions with students that facilitate student development in a positive learning environment. Institutional commitment will in turn influence goal commitment, perceptions of mattering, sense of belonging, and intent to persist.
- b) To the degree that students perceive a high level of institutional commitment, and have positive relationships with racially/ethnically diverse peers characterized as close, friendly, supportive, and available, their sense of belonging to the institution will be enhanced. Having hostile experiences with others at the institution owing to personal characteristics (i.e., gender, race/ethnicity, sexual orientation, age) that result in feelings of alienation will deleteriously affect sense of belonging. A positive sense of belonging has the potential to influence student intentions to persist.
- c) Perceptions of mattering to the college will be influenced by institutional commitment to students, by positive interactions with diverse peers, and by a positive campus climate. In turn, perceptions of mattering to the institution will enhance students' sense of belonging, and facilitate engagement/involvement, and socio-academic integration.

- d) Student involvement in campus activities and engagement in educationally beneficial activities promoting leadership skill development and community service will enhance feelings of belonging to the institution, and facilitate socio-academic integration at the institution. Involvement has the potential to influence intent to persist.
- e) Socio-academic integrative experiences such as meeting with instructors and counselors outside of class, spending time studying/researching, and participating in academically rigorous and supportive programs will directly and positively impact student's intentions to persist. Integrative experiences may be partially influenced by the support students receive from family/friends, by perceived mattering to the institution, and their involvement at the institution.
- f) Institutional commitment to students, perceived mattering and sense of belonging to the institution, engagement/involvement, socio-academic integrative experiences, and goal commitment will influence student intent to persist.

Variables in the Model and Support from the Literature

Immediately below, select literature is discussed to provide context for the hypothesized relationships depicted in Figure 1. Table 1 presents the variables composing the entire model, along with the coding scheme employed.

Input Variables (Exogenous)

Transition Support from Family and Friends. Research suggests that the transition to college after high school graduation is complex and often difficult (Terenzini et al., 1994; Tinto, 1993). This is especially true for first generation college students, traditionally underrepresented ethnic minorities, low income students, and developmental education students. Given student background characteristics, the degree of “match and fit” between the student and the institution,

and the support received within and outside the college may facilitate their adjustment, involvement, integration, and commitments, which in turn may influence decisions to remain or prematurely leave college (Astin, 1993; Pascarella & Terenzini, 1991, 2005; Terenzini et al., 1994; Tinto, 1975, 1993). Having the support of family members and friends to attend college has been found to directly impact institutional and goal commitments, intent to persist, and actual persistence, albeit often mediated through various intervening variables (Allen & Nora, 1995; Hurtado & Carter, 1997; Nora et al., 2005; Nora & Cabrera, 1993; Rendón et al., 2000; Strauss & Volkwein, 2004). Several scholars have noted that maintaining family ties, characterized by strong support for students while at college, exercises an indirect effect through institutional fit or institutional commitment on intent to persist (Cabrera et al., 1992a; Hurtado & Carter, 1997; Torres, 2006).

Transition support from family and friends is operationalized in this study via a composite variable averaging responses to two questions asking students their level of agreement that family and friends have been supportive of them in attending college.

Financial Concerns. Students' concern over paying for college has been cited as not only impacting college attendance, but also their ability to engage in out-of-the classroom curricular, co-curricular activities, and student activities (Bailey & Alfonso, 2005; Barnett, 2011; Bean & Metzner, 1985; Cabrera, Nora, & Castañeda, 1992b; Gildersleeve, 2011; Hurtado et al., 2011; Nora et al., 2011b; Rendón Linares & Muñoz, 2011; Wood, 2012). This is especially true when students' (and families) financial resources are limited and the student must work off-campus to provide financially for him/herself, and in many cases to help support their families. Lacking financial assistance in the form of institutional, state, or federal grants have a negative impact on persistence for impacted minorities, first generation, and low income students;

whereas, concerns over loan attainment and repayment discourages students from attending college (Chen & DesJardins, 2010).

Financial concerns is operationalized in this study via a single item asking students to note their level of agreement that finances have been a significant obstacle while attending college.

Gender and Race/Ethnicity. Gender and race/ethnicity are used in the model primarily as control variables, albeit research on mattering has found gender differences across several studies, with females generally perceiving higher degrees of mattering in relation to specific others and to their colleges (Dixon-Rayle, 2005; Marshall, 2001; Schieman & Taylor, 2001; Schlossberg, 1989; Tovar et al., 2008). With respect to ethnic minority students, there is a significant body of literature examining their experiences with the college environment, peer interactions, student-instructor interactions, etc. Some of this research demonstrates that traditionally underrepresented ethnic minority students have a more difficult time transitioning to the college environment, often experience discriminatory, hostile, and invalidating interactions with peers and institutional agents, and tend to persist and graduate from institutions at significantly lower rates their ethnic “majority” counterparts (e.g., Bensimon, 2007; Huff, 2009; Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005; Johnson et al., 2007b; Kraemer, 1997; Locks et al., 2008; Rendón, 1994; Seidman, 2005; Snyder & Dillow, 2011).

Gender is dichotomously coded in this study. The impact of race/ethnicity will be examined in the model via a series of multiple group invariance analyses for the resulting model. While all ethnic groups will be incorporated into the omnibus model, invariance analyses will be conducted for Asian/Pacific Islander, Latino, and White students. However, separate analyses

for African American and American Indian/Alaskan Native students were not possible given their small samples.

Unit Load (exogenous). Much of the higher education literature speaks about the benefits of attending college on a full-time basis. In most instances, this means carrying a minimum of 12 units per semester. With respect to community college students, full-time attendance has been associated with higher retention and persistence rates for first-year and second-year students (Crisp & Nora, 2010; Feldman, 1993; Snyder & Dillow, 2011).

Unit load is operationalized as the number of units in which students enrolled at the time data was collected.

Environment Variables (Exogenous and Endogenous)

Length of College Attendance (exogenous). This variable serves as a control in the model. As noted elsewhere, the dataset used in this study included students attending community college for the first time and beyond. It is likely that student intent to persist differs by length of attendance, hence the need to control for this background characteristic.

Length of college attendance is operationalized through a single question asking students how many spring and fall semesters they have attended college.

Grade Point Average (exogenous). GPA is used as a control variable. However, research on community college students has shown that second year GPA predicts student persistence and degree attainment into the third year of college (Crisp & Nora, 2010).

GPA is operationalized through a single question asking students to report the GPA they had achieved up until the time the data was collected. The GPA for first time college students was obtained from institutional records.

Institutional Commitment to Students (exogenous). Tinto (1993) noted institutional commitment in student retention research takes two forms: student commitment to the institution and institutional commitment to the student. Tinto specifically noted that “The mirror image of individual commitment to the institution is the commitment of the institution, as exhibited to the behaviors of its faculty and staff, to the individual” (p. 208). This commitment is reflected in the “ethos of caring,” characterizing the institution. Furthermore, Tinto asserted that the institutions’ commitment to students reinforces students’ commitment to the institution. Despite the fact that institutional commitment has garnered much attention in the literature and has been incorporated into various persistence models as a mediator between student background characteristics, academic and social integration, goal commitments, intent to persist, and persistence (Bean, 1982; Bean & Eaton, 2000; Bean & Metzner, 1985; Braxton, 1999; Braxton, Hirschy, & McClendon, 2004; Braxton, Sullivan, & Johnson, 1997; Cabrera et al., 2012; Cabrera et al., 1992a; Cabrera et al., 1993; Spady, 1971; Tinto, 1975, 1987, 1993), little research has been conducted specifically assessing the impact of institutional commitment to students on intent to persist or persistence (Braxton et al., 2004; Braxton, Jones, Hirschy, & Hartley Iii, 2008; Jones, 2010). Furthermore, Braxton et al. (2004), noted that the organizational influence on student departure from institutions is partially manifested in their commitment to student welfare. Institutional commitment to students is reflected in the actions of administrators, faculty, and staff that affect students. These may include expressing a genuine interest in students and their development, positive relationships characterized by respect, and supportive institutional policies. Braxton and colleagues noted that the higher the level of commitment to students, the greater the likelihood for social integration, which in turn reinforces students’ commitment to the college and to persist. This proposition was empirically supported by Braxton et al. (2008), who

found a strong association on social integration. Similarly, Jones (2010) found a strong positive association between institutional commitment to students and subsequent student commitment to college. Given the few studies assessing the impact of institutional commitment to students, this study seeks to bridge this gap in the literature by examining its impact on factors such as mattering, sense of belonging, engagement/involvement, socio-academic integrative experiences, goal commitment, and ultimately intent to persist.

In this study, institutional commitment to students is operationalized via seven items reflective of actions taken by the college to facilitate students' transition and adjustment, and by behaviors exhibited by instructors and counselors in their ongoing interactions with students, which are thought to facilitate student development in the learning environment.

Interactions with Diverse Peers (endogenous). Research examining the influence of student interactions with diverse peers on various student cognitive, affective, learning, and college outcomes is vast (Pascarella & Terenzini, 2005; Smith et al., 1997). Smith and Schonfeld (2000) have noted that interactions with diverse students decreases prejudice, and both increases understanding of others and positively impacts academic success. In the case of White students, they state that interactions with students of a different background has been associated with such outcomes as satisfaction with college, openness to others, and to cognitive and learning outcomes. With respect to the model presented in Figure 1, research also suggests that frequent and positive interactions with diverse students exerts a positive impact on students sense of belonging to the institution; perceived racial tension and a chilly campus climate, on the other hand, negatively impact belonging (Hurtado & Carter, 1997; Hurtado et al., 2007; Hurtado & Ponjuan, 2005; Locks et al., 2008; Maestas et al., 2007).

In the context of this study, interactions with diverse peers is operationalized by four items characterizing student relationships with racially/ethnically diverse peers as friendly, close, supportive, and available.

Hostile Campus Climate (endogenous). Hurtado and Carter (1997), noted that college environments are “influenced by a historical legacy of inclusion or exclusion of groups, by the structural diversity or numerical representation of diverse people, the nature of interactions among diverse groups, and individual perceptions of the environment” (p. 236). They further noted that perceptions of a hostile campus climate deleteriously affects retention and persistence for some students. Research also notes that perceptions of a hostile campus climate deleteriously impacts students’ sense of belonging; whereas, interactions with others deemed as positive favor sense of belonging (Hurtado & Ponjuan, 2005).

Perceptions of a hostile campus climate is operationalized in this study via four variables asking students to rate their level of agreement that they have experienced isolation at their campus owing to personal characteristics (gender, race/ethnicity, sexual orientation, and age).

Mattering to College (endogenous). Mattering to college has been hypothesized to impact student involvement on campus and student persistence (Schlossberg, 1989). Research also contends that a sense of mattering facilitates learning and student development (Huff, 2009; Hult Jr., 1979; Rendón Linares & Muñoz, 2011; Schieferecke, 2009; Wentzel, 1997). Dixon-Rayle and Chung (2007) found that perceived support from family and friends, positively predicted levels of mattering to college friends, which in turn predicted mattering to the institution. Studies have also found moderate to strong correlations with sense of belonging, including perceived peer support, perceived faculty support/comfort, perceived classroom comfort, and decreased feelings of isolation. Of import to this study is the finding that students’

perceptions of mattering are enhanced by the quality of interactions with individuals at the college including instructors, counselors, and diverse students (Tovar et al., 2008). While little empirical evidence is available to support the premise that mattering exercises an influence on student persistence, Kent (2004), reported that students who persisted to degree completion perceived themselves as mattering to the institution, to peers, and faculty, whereas those not persisting did not. Similarly, research on the related construct of validation has also shown that academically validating experiences positively impacted intention to persist for students of color and older students, mediated by integration at the college (Barnett, 2006, 2010, 2011).

With respect to this study, perceptions of mattering to the college are operationalized via the General College Mattering subscale of the *College Mattering Inventory* (Tovar et al., 2009). The subscale assesses general perceptions of mattering to the institution.

Sense of Belonging (endogenous). Research has shown that various engagement/involvement variables such as participation in select student activities, holding leadership roles in student organizations, number of hours studied, and demonstrated faculty interest in students exert a positive impact on sense of belonging to the institution (Hurtado & Carter, 1997; Hurtado et al., 2007; Hurtado & Ponjuan, 2005; Locks et al., 2008; Maestas et al., 2007; Nuñez, 2009). As noted above, interactions with diverse peers and perceptions of a hostile campus climate also affect belonging to the institution. Several works examining students' perceptions of belonging and attachment have found a positive relationship with intent to persist and persistence at two-year and four-year institutions (Allison, 1999; Hausmann et al., 2007; Hausmann et al., 2009; Karp et al., 2010).

With respect to this study, sense of belonging is operationalized using the Mattering versus Marginality subscale of the *College Mattering Inventory* (Tovar & Simon, 2010), which is reflective of students' perceptions of belonging, fit, acceptance or rejection at the institution.

Engagement/Involvement (endogenous). Research on college student involvement and engagement in educational beneficial practices is vast and continues to evolve. Astin, Pace, Kuh and many others have noted over the years that student efforts to partake in academic and social activities supporting their learning and development is linked to college outcomes such as retention, persistence, and degree attainment (Astin, 1984, 1993, 1999; Kuh, 2006; Kuh et al., 2008; Kuh et al., 2005; Pace, 1980, 1984; Pascarella & Terenzini, 1991, 2005). Kuh et al. (2008) found that student participation in co-curricular activities (6-20 hours per week) had a strong positive effect of second year persistence. Berger and Milem (1999) found that early involvement (with students or faculty) is strongly connected to social and academic integration, subsequent commitment to college, and persistence. However, scholars have also noted that students at community colleges are less likely to be involved in activities traditionally associated with those of senior universities, and thus we must account for this limitation in student persistence research (Rendón, 2006; Rendón Linares & Muñoz, 2011). Some studies have found that younger students attending community colleges are more likely to be involved than older students, and they are also more likely to report gains in cognitive, social, and personal domains (Glover & Murrell, 1998; Miller, Pope, & Steinmann, 2005; Schmid & Abell, 2003). Students who serve as leaders of clubs and of student government organizations have the opportunity to work directly with administrators, faculty senates, and other constituencies to represent the needs and concerns of their peers as it applies to institutional policy. In doing so, they develop a stronger sense of community and belonging to their institution, and form informal relationships

with faculty that enable them to integrate into the college community and connect them to beneficial capital resources that facilitate college completion and transfer (Miles, 2010).

Engagement/involvement in this study is operationalized via three items pertaining to their involvement in student activities, student government, and in community service.

Socio-academic Integrative Experiences (Endogenous). Research on the academic and social integration of students to the institution has been the subject of study in hundreds of studies as noted in the literature review. The operationalization for these two cornerstones of student retention (Tinto, 1993) has ranged widely and attempts at “precise measurement” have yielded ever-changing “definitions” of the constructs. Braxton and colleagues argue that social integration and institutional commitment are two “reliable sources” influencing student persistence (Braxton, 1999; Braxton & Hirschy, 2005; Braxton et al., 2004; Braxton & Lien, 2000; Braxton & McClendon, 2001). However, it has also been noted that academic and social integration activities or experiences do not always take place apart from each other, but may co-occur in and out of the classroom. These “socio-academic integrative moments” transpire during events or activities when students interact with institutional agents and other students (Deil-Amen, 2011). Researchers have found that for community college students, student-faculty interactions of an academic and social nature serve as vehicles for imparting important information to students, increase their comfort in college, and are precursors to student retention (Cejda & Hoover, 2010; Deil-Amen, 2011).

This study adopts Deil-Amen’s conceptualization of “socio-academic integrative moments” in operationalizing academic and social integration. This construct is measured by eight variables accounting for students’ interactions with institutional agents—instructors and counselors—hours spent studying/researching, participating in an academically rigorous program

characterized by high student-faculty and student-counselor contact, and academic challenges experienced.

Goal Commitment (Endogenous). Consistent with institutional commitment discussed above, goal commitment has been the subject of much study and is incorporated into student persistence models. Goal commitment specifically refers to students' commitment to their educational or occupational goals (Tinto, 2003). Tinto asserts that initial goal commitment exercises a direct impact on subsequent goal and institutional commitment, and an indirect effect on student persistence. Hausmann et al. (2009) found a strong direct effect on intentions to persist for African American students and a moderate effect for White students. On the other hand, Cabrera et al. (1992a), found a small effect on intent to persist, but not directly on persistence. Nora and colleagues also found small to moderate effects between institutional commitment and goal commitment and academic/social integration and goal commitment.

In this study, goal commitment is operationalized using a single variable asking students the highest degree they intend to complete.

Output Variables (Exogenous)

Intent to Persist (exogenous). Intent to persist serves as the only output variable in this study and is operationalized using a single 5-point Likert scale variable asking students to rate their agreement that no matter what, they intended to complete their educational goal. Such variable has been used in several studies, including (Bean, 1982; Cabrera et al., 2012; Cabrera et al., 1992a; Cabrera et al., 1993).

Note should be taken that this study did not examine actual persistence to degree completion. This data was not available to the researcher. However, the retention literature

suggests that intent to persist predicts persistence (Bers & Smith, 1991; Hausmann et al., 2009; Voorhees, 1987; Webb, 1989).

Table 1

Variables in Conceptual Model and Coding Scheme

Variable/Factor	Variable Number in Dataset	Items Used to Assess Variable
Outcome Variable (Endogenous)		
Intent to Persist	Q177	No matter what, I intend to complete my educational goal (Scale: 1 = Strongly Disagree; 5 = Strongly Agree) Distribution: 4% strongly disagreed, 8% disagreed, 16% neither agreed nor disagreed, 19% agreed, and 53% strongly agreed. Mean score is 4.11 (1.16), skewness of -1.12.
Input Variables (Exogenous—Controls)		
Unit Load	Q125	In how many units did you enroll this semester? (scaled item; range = 1-23 units)
Gender	Q119	0=male; 1=female
Financial Concerns	Q180	Finances have been a significant obstacle while attending college (Scale: 1 = Strongly Disagree; 5 = Strongly Agree)
Transition Support to College	SupFamFrd	Composite of support from family and friends (Scale: 1 = Strongly Disagree; 5 = Strongly Agree) Family supportive of attending college Friends supportive of attending college
Environment Variables (Exogenous)		
Length of attendance (serving as control)	Q126	How many full semesters (fall and spring) have you attended college (including this spring)? (1=Only this semester so far; 2=2 semesters; 3=3-4 semesters; 4=5-6

Variable/Factor	Variable	Items Used to Assess Variable
	Number in Dataset	
		semesters; 5 = 7 or more semesters)
Grade Point Average (serving as control)	GPA	What is your current GPA? (0 = Under 2.0; 1= 2.0-2.49; 2 = 2.5 – 2.99; 3 = 3.0-3.49; 4 = 3.5-4.0)
Institutional Commitment to Students		6 items (Unless noted, scored with scale: 1 = not at all; 5 = very much)
	M59	Counselors at the college generally show their concern for students' well-being
	M17	My counselor is generally receptive to what I have to say
	M39	If I had a personal problem, I believe that counselors would be willing to discuss it with me
	M07	It is comforting to know that my contributions are valued by my instructors
	M38	My instructors sometimes ignore my comments or questions (reverse coded)
	Q176	I received all the assistance I needed to successfully transition and adjust to the college (Scale: 1 = Strongly Disagree; 5 = Strongly Agree)
Interactions with Diverse Peers		4 semantic differential scale items with 5 answer choices (5/1) answering to the following prompt: The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as:
	Q70	friendly (5)/unfriendly (1)
	Q74	close (5)/distant (1)

Variable/Factor	Variable	Items Used to Assess Variable
	Number in Dataset	
	Q78	supportive (5)/unsupportive (1)
	Q82	available (5)/unavailable (1)
Environment Variables (Endogenous)		
Perceptions of a Hostile Campus Climate		4 Items (Scale: 1 = not at all; 5 = very much)
	M18neg	I sometimes feel alone and isolated at the college because of my gender (reverse coded)
	M55neg	I sometimes feel alone and isolated because of my race/ethnicity (reverse coded)
	M36neg	I sometimes feel alone and isolated because of my sexual orientation (reverse coded)
	M63neg	I sometimes feel alone and isolated because of my age (reverse coded)
Perceptions of Mattering to the College		General College Mattering Subscale—8 items (Tovar, Simon, & Lee, 2009) (Scale: 1 = not at all; 5 = very much)
	M48	There are people on campus who are sad for me when I fail in something I set out to do
	M52	Some people on campus are disappointed in me when I do not accomplish all I should
	M53	People on campus are generally supportive of my individual needs
	M40	People on campus seem happy about my accomplishments
	M62	I sometimes feel pressured to do better because people at the college

Variable/Factor	Variable	Items Used to Assess Variable
	Number in Dataset	
		would be disappointed if I did not
	M61	There are people at the college who are concerned about my future
	M54	There are people at the college who are genuinely interested in me as a person
	M26	Other students are happy for me when I do well in exams or projects
Sense of Belonging		Operationalized via the Mattering versus Marginality Subscale
		7 items; (Tovar, Simon, & Lee, 2009)
		(All items reverse coded; Scale: 1 = not at all; 5 = very much)
	M31	Sometimes I feel alone at the college
	M30	Sometimes I feel that no one at the college notices me
	M56	I often feel socially inadequate at school
	M08	Sometimes I feel that I am not interesting to anyone at the college
	M32	Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college
	M34	I often feel isolated when involved in student activities
	M49	I often feel that I do not belong at this college
Engagement/Involvement		3 items answering to the following prompt:
		On average, how many hours per week do you spend on the following activities?
		(Scale: 1=None; 2=1-5; 3=6-10; 4=11-15; 5=16-20; 6=21-30; 7=31-40; 8=41+)
	Q129	Campus activities (e.g., student clubs, organizations, events on

Variable/Factor	Variable	Items Used to Assess Variable
	Number in Dataset	
		campus)
	Q134	Volunteering (community service)
	Q173_1	Are you currently or have you been a member of any of the following: Associated Students or Club Officer (0=No; 1=Yes)
Socio-Academic Integrative Experiences		5 items encompassing socio-academic experiences with institutional agents and activities.
	AcadValidInst	Academic Validation from Instructor Composite variable resulting from averaging five variables: M09. Instructors sometimes tell me how much they appreciate my comments and participation in class; M21. If I stopped attending college, most of my instructors would be disappointed; M35. I receive thoughtful and timely comments on my work from my instructors; M57. Most of my instructors know my name; M43. If I asked my instructors for help, I am confident that I would receive it. (Scale: 1 = not at all; 5 = very much; derived via Principal Components Analysis; alpha = .75) 2 semantic differential scale items with 5 answer choices (5/1) answering to the following prompt: The quality of my interactions and relationships with instructors can best be characterized as: InsSup supportive (5)/unsupportive (1); InsAvail available (5)/unavailable (1) Q116 Since starting college, I have met with my instructors outside of class at least:

Variable/Factor	Variable	Items Used to Assess Variable
	Number in Dataset	
		(Scale: 1=not yet; 2=once only; 3=2-3 times; 4=4-5 times; 5=More than 5 times)
	Q115	Since starting college, I have met with a counselor at least: (Scale: 1=not yet; 2=once only; 3=2-3 times; 4=4-5 times; 5=More than 5 times)
	Q128	On average, how many hours per week do you spend on the following activities? Studying (e.g., reading, homework, research) (Scale: 1=None; 2=1-5; 3=6-10; 4=11-15; 5=16-20; 6=21-30; 7=31-40; 8=41+)
	Q182	I have experienced significant academic difficulties while attending college (Scale: 1 = Strongly Disagree; 5 = Strongly Agree)
	Q173_9	Are you currently or have you been a member of any of the following: Scholars Program (Honors Program) (0=No; 1=Yes)
Goal Commitment	Q123	What is the highest degree you intend to complete? (Scale: 0=personal interest; 1=Career/Vocational Certificate; 2=AA degree; 3=Bachelor's degree; 4=Master's degree; 5=Doctorate or Professional Degree (MD, JD, DD))

Research Questions and Hypotheses

Consistent with the model propositions discussed above and depicted in Figure 1, the following research questions and hypotheses are posed:

Q1. Does the implied measurement model for institutional commitment, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, and socio-academic integrative experiences adequately fit the observed data? If not, what respecified model results in improved model fit?

Q1.1. Is the respecified measurement model race/ethnicity invariant? If not invariant, how do the measurement models differ?

Q2. Does the hypothesized structural model regressing intent to persist on student background characteristics, institutional commitment, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, socio-academic integrative experiences, and goal commitment adequately fit the observed data? If not, what respecified structural model results in improved model fit?

Q2.1. Is the hypothesized structural model for intent to persist race/ethnicity invariant? If not, how do the structural models differ?

Q3. Given a good fit for the global structural model, are the following directional hypotheses (as depicted in Figure 2) supported?

H₁. Institutional commitment to students will exert a positive and direct effect on sense of belonging, mattering, involvement, goal commitment, and intent to persist.

- H₂. Institutional commitment to students and interactions with racially/ethnically diverse peers will positively impact sense of belonging to the institution. By contrast, perceptions of a hostile campus climate will negatively impact sense of belonging. Sense of belonging will exert a direct and positive effect on intent to persist.
- H₃. Institutional commitment to students and interactions with racially/ethnically diverse peers will positively impact students' perceptions of mattering to the institution. By contrast, perceptions of a hostile campus climate will negatively impact mattering. Mattering, in turn will exert a direct positive effect on sense of belonging, engagement/involvement and socio-academic integrative experiences, and an indirect effect on intent to persist through sense of belonging, engagement/involvement and socio-academic integrative experiences.
- H₄. Institutional commitment to students and perceptions of mattering to the college will positively impact students' engagement/involvement. Involvement/ engagement will exert a positive and direct effect on sense of belonging, socio-academic integrative experiences, and on intent to persist. Involvement/ engagement will exert an indirect effect on persistence through socio-academic integrative experiences and goal commitment.
- H₅. Perceptions of mattering to the college and engagement/involvement at the institution will positively impact socio-academic integrative experiences. Socio-academic integrative experiences will have a positive and direct

effect on intent to persist, and an indirect effect mediated by goal commitment.

- Q4. Is there evidence to support the notion that the constructs of involvement/engagement, sense of belonging, mattering, perceptions of the campus climate, and peer relationships might form part of an overarching construct?

Figure 2. Hypothesized relationships in conceptual model

Selection of Quantitative Methodology, Model Specification, and Hypothesis Testing

Given the nature of the research questions and the hypothesized model summarized in Figure 1, a quantitative research design was selected. Specifically, structural equation modeling (SEM) was deemed the most appropriate method to assess the goodness of fit of the model with the observed data. The model integrates both latent and measured variables, and as such, it may be described as a “hybrid” path analysis model (Kline, 2005). While it is conceivable that this model could be empirically tested with OLS multiple regression using all predictor variables found in Table 1 to predict the dependent variable (with some limitations), such method does not permit the researcher to simultaneously assess the interrelationships among latent and measured variables in the model or assess model fit (Byrne, 2010; Kline, 2005). These interrelationships are of prime import to this study.

Kline (2005) notes that SEM (1) may be used to evaluate the implied “causal” relationship for the variables under study; (2) takes a confirmatory approach (albeit not exclusively) in that models must be specified *a priori*; (3) permits the simultaneous use of both latent and observed (measured) variables; (4) is concerned primarily with the analysis of covariance structures and error measurement; (5) direct and indirect effects may be derived; (6) enables the researcher to assess differences between the hypothesized and alternative models subjected to respecification; and (7) provides a means to assess model fit with a variety of indices, while placing less emphasis on significance testing in comparison to other statistical techniques.

Procedures for Carrying Out Structural Equation Modeling

All SEM analyses were conducted in IBM SPSS AMOS 21. Non-SEM analyses were carried out in IBM SPSS 21. The following sequential steps (and associated tasks) derived from the literature were followed when conducting SEM analyses (Byrne, 2010; Kline, 2005; Ullman, 2006).

Model Specification

The hypothesized model in Figure 1 was graphically specified as a path diagram in AMOS. Latent variables are denoted with ellipses; observed or measured variables with rectangles; single-headed arrows denote the directional impact of one variable upon another; residual errors are expressed in a circle.

Model Identification

The goal of this step was to have a model that was *over identified* to enable hypothesis testing; that is, the number of parameters (e.g., regression coefficients, variances, covariances) to be estimated had to be less than the number of observations in the model [observations = $p(p + 1)/2$; where p is the number of observed variables]. The difference between the observations and the number of parameters to be estimated had to be positive, thus resulting in the number of degrees of freedom associated with the specified model ($df > 0$). Moreover, this step necessitated that each latent variable be scaled to a metric. This was accomplished by fixing the loading of the first congeneric variable for each factor to 1.0 loading and a zero loading on all other factors.

Sample Size and Power

A large sample size ($N > 200$) is generally required for SEM, albeit this is dependent on model complexity; the more complex the model, the greater the number of cases needed.

According to Kline (2005), the ratio of cases to the number of parameters to be estimated should be 10:1.

Data Screening

As an initial step, the data file was examined for evidence of coding or data input errors. Next, a missing data analysis was conducted in SPSS to determine the degree to which missing data might present a problem and to determine if the pattern of missingness was systematic or at random. While there are several options for handling missing data, including case deletion, dummy variable adjustment, single stochastic regression imputation, multiple stochastic regression imputation (i.e., “multiple imputation”), and Maximum Likelihood—EM algorithm with multiple imputation (Puma, Olsen, Bell, & Price, 2009), multiple imputation as handled by AMOS was expected to be carried out. Multiple imputation is currently considered “the most respectable method of dealing with missing data” (Tabachnick & Fidell, 2006, p. 72).

Furthermore, stochastic regression imputation procedures derive missing values with the same variance as the observed values (Puma et al., 2009). It has also been noted that AMOS, in particular, “provides [imputed] estimates that are efficient and consistent” (Arbuckle, 2011, p. 270). Following guidelines provided by leading proponents of the multiple imputation procedure, all variables presented in Table 1, including the outcome or dependent variable, were to be used to estimate 10 sets of imputed values (Little & Rubin, 2002; Puma et al., 2009).

The next step of data screening was to identify outliers. The Mahalanobis distance (D^2), distributed as a chi square with degrees of freedom equal to the number of variables (set at $p < .001$) was used to identify multivariate outliers (Tabachnick & Fidell, 2006). Prior to this analysis, it was anticipated that outliers would be examined and if warranted, deleted from the dataset.

Univariate and multivariate normality was also examined. Given the difficulty in interpreting transformed scores when dealing with non-normality on the variable in question, variable transformation was not conducted. Instead, maximum likelihood (ML) estimation with bias corrected test statistics derived from bootstrapping procedures was used to assess model fit. Bootstrapping is a resampling procedure whereby a sample is treated as the population and from which subsamples equal in size are drawn randomly with replacement for a specific number of times (generally > 1000 bootstrap samples are recommended), to determine parameter estimates under non-normal conditions (Efron, 1988). While traditional ML estimation is subjected to meeting multivariate normality, bootstrapping techniques do not require meeting this assumption (Arbuckle, 2011; Byrne, 2010).

Model Estimation

During this step of the process, all parameters characterizing the hypothesized model were estimated in AMOS using maximum likelihood. ML is the most common method used in SEM and it requires that data be multivariate normal (Kline, 2005). While other estimation methods are available, these generally require excessively large samples to implement ($N > 2,500$) or work best with a limited number of variables (< 25). Despite the non-normality in the data, ML was selected, and as noted previously, ML bootstrap estimates were requested. This included the calculation of the Bollen-Stine bootstrap bias corrected p -value to aid in the interpretation of model fit, instead of the usual ML p -value used with normally distributed data.

Model Evaluation/Fit

Given the significant lack of consensus in the literature for preferred means to assess model fit, methodologists recommend researchers use a variety of indices of fit (Byrne, 2010; Kline, 2005; Ullman, 2006). Whereas, statistical significance is desired in other multivariate

techniques, SEM is not strictly concerned with significance testing. One of the most common criteria reported in SEM studies is the chi square test statistic (CMIN). A statistically non-significant p -value is said to demonstrate good model fit. However, chi square values are sample size dependent and sensitive to model complexity, and models otherwise judged of “good fit” may be rejected when sample sizes are “large” ($N > 200$, according to Kline, 2005). Hence, the following goodness of fit indices were also used in this study. Optimal values for each is reported in parentheses: the χ^2 to df ratio (with values ≤ 4.0); the comparative fit index (CFI; $\geq .90$ -.95); the root mean square error of approximation and RMSEA 90% confidence interval (RMSEA; $\leq .06$, although values $\leq .10$ may be acceptable); and, lastly, the standardized root mean square residual (SRMR; $\leq .10$). These indices account for such things as sample size, number of parameters in the model, model complexity, and degrees of freedom (Byrne, 2010; Kline, 2005; Ullman, 2006).

Model Respecification

In the course of evaluating model fit as noted above, careful attention was placed on the examination of standardized residuals, modification indices, and their expected parameter change statistic. These pointed to potential sources of model misspecification. For example, modification indices point to variables cross-loading on more than one factor (a threat to discriminant validity), or to error covariances that might result in improved model fit (Byrne, 2010). While the model presented in Figure 1 was hypothesized *a priori*, all attempts at model trimming or model building took on an exploratory *post hoc* approach. All attempts at model modification were grounded on theory (MacCullum, 1995).

Data Screening Results

Missing Values

As an initial step, the working data file was examined for evidence of coding or data input errors. Frequency analyses were conducted for each variable and no evidence of miscoding, or of values outside the expected range for each variable was found. Next, a missing value analysis (MVA) was conducted in SPSS to determine the degree to which missing data might present a problem and to help establish if the pattern of missingness, if any, was systematic or at random. Based on an examination of the output generated by the SPSS MVA procedure, there were no cases with missing values on any of the variables of interest to the study. Given this finding, the planned multiple imputation analysis was not conducted.

Normality, Identification, and Disposition of Outliers

Assessment of Normality. The next step involved in the data screening process was to examine the distribution of scores across variables. Using the Kolmogorov-Smirnov and the Shapiro-Wilk tests in SPSS, the output readily revealed that the distributions for all variables departed significantly from normality ($p < .001$). However, as noted by many methodologists, these tests are extremely sensitive to large sample sizes, and small departures from normality may still lead to significant findings (Field, 2009; Tabachnick & Fidell, 2006). Thus, a visual inspection of histograms and P-P plots was performed, along with an examination of the values for skewness and kurtosis. In doing so, several variables “appeared” to depart from normality.

Identification of Univariate Outliers. Anticipating the use of maximum likelihood estimation in conducting SEM analyses (as reported in Chapter 4), a decision was made to transform all variables into Z-scores to help identify cases responsible for departures from normality in some variables. Since the sample for this study was rather large, a Z-score $> |3.29|$,

($p < .001$) was set as a cutoff to identify possible outliers (Tabachnick & Fidell, 2006). Based on this analysis, seven variables contained extreme scores beyond the cutoff of 3.29. Of the 2,200 cases in the dataset, 1,944 (88.4%) had no univariate outliers in any variable; 227 (10.3%) had an outlier in a single variable; 26 (1.2%) had an outlier in two variables; 2 (0.1%) had an outlier in three variables; and 1 (0.04%) had an outlier in four variables. The variables in question were: transition support from family/friends ($n = 43$); “My instructors sometimes ignore my comments or questions” ($n = 31$); “I sometimes feel alone and isolated at the college because of my gender” ($n = 26$); “I sometimes feel alone and isolated at the college because of my sexual orientation” ($n = 70$); students’ perception that instructors are supportive of them ($n = 23$); hours spent per week on campus activities ($n = 61$); and hours spent per week volunteering ($n = 35$).

Disposition of Univariate Outliers. In considering whether or not the “outlying” cases above are representative of the population under study, one must consider these in light of the purpose of the study and the sample before a decision is made to remove them from the dataset and further consideration (Tabachnick & Fidell, 2006). Generally speaking, the research questions in this study interrogate if students attending community colleges experience the college environment in a similar manner. To the degree they do or do not, *is* relevant to the study. The variables with outlying cases above are indicative of the college experience. It is very likely that while most students have satisfactory and supportive interactions with the institution and institutional agents, other students may not. Experiencing a hostile campus climate, for example, may be in fact a reality for many students (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005; Locks et al., 2008; Rhee, 2008; Strayhorn, 2012; Tovar et al., 2008; Tovar et al., 2009; Yi, 2007).

Despite the methodological challenges that outliers may have on the multivariate analyses planned, it was concluded that removing “extreme cases” for the variables above would have been deleterious to the study. Thus, the next decision made was how to handle these univariate outliers: pursue data transformations or change the scores (Field, 2009; Osborne & Overbay, 2004; Tabachnick & Fidell, 2006).

As noted previously, a decision was made prior to examining the dataset that data transformations would not be carried out. This was based on the difficulty that such transformations have in the interpretability of findings. Hence, the only viable option was to change scores on the variables with the outlying cases, “so that they are deviant, but not as deviant as they were... Because measurement of variables is sometimes rather arbitrary anyway, this is often an attractive alternative to reduce the impact of a univariate outlier” (Tabachnick & Fidell, 2006, p. 77). As noted by Osborne and Overbay (2004), truncating values for outlying scores to “the highest (or lowest) reasonable score” is an acceptable solution (n.p., section: “How to deal with outliers,” ¶ 5).

Using the above methodological “guidelines” and the researcher’s justification for not deleting cases, outlying cases were truncated to the next highest or lowest value with the recognition this was not a “perfect solution.” Table 2 presents standardized and non-standardized descriptive statistics for the seven variables containing extreme outlying cases—with Z-scores above |3.29| *before* univariate outlier truncation. Table 3, on the other hand presents the same information for all variables *after* univariate outlier truncation.

Table 2

Non-Standardized and Select Standardized Descriptives for Variables in Study Before

Univariate Outlier Truncation (N = 2,200)

Variable ^c	Descriptives (Non-Standardized)						Standardized		N Cases ^c z > 3.29
	Min	Max	Mean	SD	Skew ^a	Kur ^b	Min	Max	
SupFamFrd ^d	1	5	4.49	0.87	-1.98	3.71	-4.02	0.59	43
M38 ^r	1	5	4.27	0.95	-1.25	0.97	-3.44	0.76	31
M18neg	1	5	1.37	0.83	2.42	5.42	-0.45	4.38	26
M36neg ^d	1	5	1.28	0.75	3.08	9.60	-0.37	4.96	70
Q129 ^d	1	8	1.38	0.79	3.36	16.42	-0.49	8.42	61
Q134 ^d	1	8	1.45	0.88	3.03	12.84	-0.51	7.40	35
InsSup	1	5	4.04	0.89	-0.69	0.11	-3.41	1.07	23

^a *S.E.* = .052

^b *S.E.* = .104

^c Extreme scores noted in this column were subsequently truncated to the next highest or lowest value in the corresponding variable.

^r Item was reverse coded before analysis.

^e Refer to Table 1 (page 79) for full variable names.

Table 3

Non-Standardized and Select Standardized Descriptives for Variables in Study After Univariate Outlier Truncation in Seven Variables (N = 2,200)

Variable ^c	Descriptives (Non-Standardized)						Standardized		N Cases ^c z > 3.29
	Min	Max	Mean	SD	Skew ^a	Kur ^b	Min	Max	
Q177	1	5	4.11	1.16	-1.12	0.22	-2.68	0.77	
Q125	1	23	10.37	4.03	-0.33	-0.60	-2.33	3.14	
Q119	1	2	1.59	0.49	-0.37	-1.87	-1.20	0.83	
Q180	1	5	3.47	1.44	-0.44	-1.13	-1.72	1.07	
SupFamFrd	2	5	4.51	0.81	-1.68	1.92	-3.10	0.61	0
Q126	1	5	2.87	1.20	0.20	-0.80	-1.56	1.77	
GPA	0	4	2.84	1.14	-0.76	-0.33	-2.49	1.02	
M59	1	5	3.32	1.23	-0.30	-0.79	-1.88	1.37	
M17	1	5	3.46	1.19	-0.42	-0.60	-2.07	1.30	
M39	1	5	3.32	1.33	-0.29	-1.04	-1.75	1.26	
M07	1	5	3.88	1.04	-0.73	-0.04	-2.77	1.07	
M38 ^r	2	5	4.29	0.91	-1.04	0.01	-2.51	0.78	0
Q176	1	5	3.31	1.23	-0.27	-0.84	-1.88	1.37	
Q70	1	5	4.12	0.96	-0.84	-0.02	-3.25	0.92	
Q74	1	5	3.36	1.11	-0.23	-0.52	-2.14	1.48	
Q78	1	5	3.68	1.11	-0.53	-0.37	-2.41	1.19	
Q82	1	5	3.53	1.16	-0.38	-0.62	-2.18	1.26	
M18neg	1	4	1.36	0.78	2.18	3.73	-0.46	3.38	90

Variable ^c	Descriptives (Non-Standardized)						Standardized		N Cases ^c z > 3.29
	Min	Max	Mean	SD	Skew ^a	Kur ^b	Skew ^a		
							Min	Max	
M36neg	1	4	1.25	0.63	2.61	6.02	-0.39	4.39	29
M55neg	1	5	1.59	1.06	1.78	2.20	-0.56	3.21	
M63neg	1	5	1.78	1.19	1.37	0.68	-0.66	2.71	
M48	1	5	2.76	1.22	0.08	-0.93	-1.45	1.84	
M52	1	5	2.49	1.14	0.30	-0.78	-1.31	2.19	
M53	1	5	3.00	1.11	-0.12	-0.61	-1.80	1.80	
M40	1	5	3.09	1.14	-0.11	-0.64	-1.83	1.67	
M62	1	5	2.46	1.23	0.40	-0.85	-1.19	2.06	
M61	1	5	3.26	1.20	-0.23	-0.81	-1.88	1.45	
M54	1	5	3.32	1.17	-0.30	-0.69	-1.98	1.44	
M26	1	5	3.26	1.15	-0.31	-0.60	-1.96	1.50	
M31 ^r	1	5	3.49	1.38	-0.43	-1.08	-1.81	1.10	
M30 ^r	1	5	3.74	1.27	-0.69	-0.61	-2.15	0.99	
M56 ^r	1	5	3.93	1.23	-0.85	-0.40	-2.38	0.87	
M08 ^r	1	5	3.68	1.23	-0.58	-0.68	-2.18	1.07	
M32 ^r	1	5	3.30	1.33	-0.23	-1.08	-1.74	1.28	
M34 ^r	1	5	3.91	1.17	-0.81	-0.26	-2.49	0.93	
M49 ^r	1	5	4.08	1.18	-1.12	0.22	-2.60	0.78	
Q129	1	4	1.36	0.68	2.15	4.70	-0.53	3.90	61
Q134	1	4	1.42	0.75	1.90	3.15	-0.57	3.45	77
Q173_1	0	1	0.11	0.31	2.58	4.65	-0.34	2.92	

Variable ^e	Descriptives (Non-Standardized)						Standardized		N Cases ^c z > 3.29
	Min	Max	Mean	SD	Skew ^a	Kur ^b	Skew ^a		
							Min	Max	
AcadValidInst	1	5	3.48	0.83	-0.26	-0.40	-3.00	1.85	0
InsAvail	1	5	4.01	0.93	-0.69	-0.05	-3.24	1.06	
InsSup	1.25	5	4.05	0.86	-0.49	-0.70	-3.25	1.10	
Q116	1	5	2.99	1.43	0.00	-1.22	-1.39	1.40	
Q115	1	5	3.36	1.24	-0.16	-0.92	-1.91	1.33	
Q128	1	8	3.61	1.54	0.90	0.15	-1.69	2.86	
Q182	1	5	2.65	1.28	0.29	-0.94	-1.29	1.84	
Q173_9	0	1	0.09	0.29	2.88	6.28	-0.31	3.19	
Q123	0	5	3.62	1.13	-0.83	0.70	-3.21	1.22	

^a S.E. = .052

^b S.E. = .104

^c Extreme scores noted in this column were subsequently truncated to the next highest or lowest value in the corresponding variable.

^d Variables predicting multivariate outliers from non-outliers.

^r Item was reverse coded before analysis.

^e Refer to Table 1 (page 79) for full variable names.

As noted in Table 3, the truncation of extreme scores in the seven variables in question was generally successful in reducing the impact of univariate outliers—the standardized scores saw a significant drop in their values, and certainly closer to the desired 3.29. Specifically, three of the variables (SupFamFrd—transition support from family/friends; M38—*My instructors sometimes ignore my comments or questions*; and InsSup—students’ perception that instructors are supportive of them) had no cases with a standardized score above the 3.29. The largest Z-scores for the remaining four variables ranged from |3.38-4.39|, down from the previous |3.41-8.42|. Note should be taken, however, that in reducing the overall influence of univariate outliers as indicated in their standardized value, the number of univariate outliers increased for two variables (M18—*I sometimes feel alone and isolated at the college because of my gender*; and Q134—hours spent per week volunteering).

Identification and Disposition of Multivariate Outliers. In order to identify the presence of multivariate outliers, all variables in Table 1, forming part of the Input-Environment-Outcome clusters were regressed (OLS multiple regression) on Case ID number. Tabachnick and Fidell (2006) have noted that multivariate outliers are not affected by the dependent variable (p. 99), hence the use of Case ID. The purpose of this analysis was to derive the Mahalanobis distance (D^2) for every case in the dataset to aid in the identification of multivariate outliers. The Mahalanobis distance is distributed as a χ^2 with degrees of freedom equal to the number of variables, $\chi^2(48) = 84.04$, set at $p < .001$ (Tabachnick & Fidell, 2006). Based on this analysis 112 (5.1%) cases exceeded the 84.04 critical value and were thus classified as multivariate outliers. Only 50 (19.5%) of the 256 univariate outlying cases were also found to be multivariate outliers.

While not specifically of interest to this study, 17 of the 48 variables collectively discriminated between multivariate outliers from non-outliers. An examination of multicollinearity statistics (VIF, tolerance, conditioning index, and excessive variance on two or more variables) did not identify any issues of concern. All values were within expectations. Moreover, bivariate correlations did not exceed $|.60|$.

However, an examination of means for each of the 17 variables did uncover statistically significant differences ($p < .01$) between multivariate outliers and non-outliers in 13 variables as noted in Table 4. Given the nature of the variables, the outlying cases were of students who could be classified as marginalized from the college environment and who were more involved on student activities and volunteer work.

Table 4

Variables Predicting Multivariate Outliers (N = 112) from Non-Outliers (N = 2,088)

Variable	Mean*		SD	
	Not Outlier	Outlier	Not Outlier	Outlier
SupFamFrd. Transition support from family and friends	4.53	4.14	0.78	1.11
GPA	2.86	2.44	1.12	1.37
M59. Counselors at the college generally show their concern for students' well-being	3.34	2.93	1.21	1.52
Q74. The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as: close (5)/distant (1)	3.39	2.73	1.07	1.47
Q78. The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as: available (5)/unavailable (1).	3.56	2.91	1.13	1.54
M36. I sometimes feel alone and isolated because of my sexual orientation (reverse coded)	1.23	1.47	0.60	0.96
M52. Some people on campus are disappointed in me when I do not accomplish all I should	2.52	2.09	1.12	1.42
M62. I sometimes feel pressured to do better because people at the college would be disappointed if I did not	2.49	1.88	1.21	1.45
61. There are people at the college who are concerned about my future	3.29	2.68	1.18	1.51
M32. Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college (reverse coded)	3.34	2.66	1.30	1.65
M49. I often feel that I do not belong at this college (reverse coded)	4.11	3.42	1.15	1.64

Variable	Mean*		SD	
	Not		Not	
	Outlier	Outlier	Outlier	Outlier
Q129. Average number of hours per week spent on campus activities	1.35	1.59	0.65	1.03
Q134. Average number of hours per week spent volunteering	1.41	1.64	0.72	1.06

*All differences significant at $p < .01$

Despite the earlier proposition that univariate outlying cases were relevant to the analyses in this study, after careful consideration of the nature of the multivariate outlying cases, it would appear that the decision not to delete all univariate outlying cases was correct. However, in face of the evidence presented above, it is very likely that with respect to multivariate outliers and non-outliers, that the two sets of cases may indeed represent two different populations of students: (1) representing the “typical” community college student (at least for the institution where data was collected); and (2) representing students who despite their desire to be in and partake of the full college experience, they cannot, since they are confronted with multiple and varying marginalizing and alienating encounters with the institution and institutional agents.

The options for how to handle multivariate outliers, especially given the above, was to either delete the 13 variables responsible for the outlying cases, to delete the outlying cases themselves, or keep them all in the analyses. The latter option was deemed untenable since multivariate normality is a requirement for SEM procedures. Additionally, since the variables are of primary concern to the study, a decision was made to delete the multivariate outliers from further consideration. This action was consistent with recommendations from leading methodologists (Field, 2009; Osborne & Overbay, 2004; Tabachnick & Fidell, 2006). Hence the final sample for the study consisted of 2,088 cases.

Despite the elimination of the multivariate outliers, it seems appropriate that future research consider analyzing them further, as they speak to the experiences of significantly marginalized students.

Descriptives for Final Sample

Table 5 displays demographic characteristics for the remaining 2,088 cases in the sample, following the elimination of 112 multivariate outlying cases. No significant changes in demographic characteristics were noted between the initial and final sample. In most instances, the percentage change was less than one percentage point. Of the final 2,088 students, 852 were males (40.8%) and 1,236 were females (59.2%). With respect to ethnicity, 737 (35.3%) were White; 460 (22.0%) Latino/Latina; 435 (20.8%) Asian/Pacific Islander; 113 (5.4%) other; 113 (5.3%) multiracial; 104 (5.0%) Black/African American; 10 (0.5%) American Indian/Native American; and 116 (5.6%) declined to state. As for citizenship status, 1,466 (70.2%) were U.S. citizens, 269 (12.9%) legal residents, 288 (13.8%) held a student visa (“international students”), and 65 (3.1%) were undocumented. Participants ranged in age from 18 to 87, with a mean of 24.45 ($SD = 7.84$). They were enrolled in an average of 10.36 ($SD = 4.02$; ranging from 1 to 23) units in the semester when the data was collected. Based on the number of units enrolled, 995 (47.7%) attended on a part-time basis, while 1,093 (52.3%) attended on a full-time basis. With respect to length of college student attendance, 282 (13.5%) were attending for the first time (first semester); 559 (26.8%) for 2 semesters; 657 (31.5%) for 3-4 semesters; 338 (16.2%) for 5-6 semesters; and 252 (12.1%) for 7 or more semesters. With respect to educational goals, most students expressed intent to pursue advanced degrees, including 486 (23.3%) a doctorate/professional degree, 736 (35.2%) a master’s degree, and 583 (27.9%) a baccalaureate degree. Additionally, 195 (9.3%) noted an interest in an associate degree, 39 (2.3%) intended to only complete a career certificate, while 39 (1.9%) were taking courses for personal interest only. Lastly, with respect to grade point averages, 746 (35.7%) students reported a cumulative

GPA of 3.5-4.0; 676 (32.4%) of 3.0-3.49; 369 (17.7%) of 2.5-2.99), 222 (10.6%) of 2.0-2.49; and 75 (3.6%) below 2.0.

Table 5

Demographic Characteristics for Final Sample (N = 2,088)

Student Characteristic	n	Pct.
Gender		
Male	852	40.80%
Female	1236	59.20%
Race/Ethnicity		
American Indian/Native American	10	0.50%
Asian/Pacific Islander	435	20.80%
Black/African American	104	5.00%
Latino/a	460	22.00%
White	737	35.30%
Multiracial	113	5.40%
Other	113	5.40%
Declined to state	116	5.60%
Length of Attendance		
1 semester	282	13.50%
2 semesters	559	26.80%
3-4 semesters	657	31.50%
5-6 semesters	338	16.20%

Student Characteristic	n	Pct.
7 or more semesters	252	12.10%
Educational Goals		
Taking courses for personal interest	39	1.90%
Career/Vocational Certificate	49	2.30%
AA degree	195	9.30%
Bachelor's degree	583	27.90%
Master's degree	736	35.20%
Doctorate or Professional Degree (MD, JD, DD)	486	23.30%
Grade Point Average		
Under 2.0	75	3.60%
2.0 – 2.49	222	10.60%
2.5 – 2.99	369	17.70%
3.0 – 3.49	676	32.40%
3.5 – 4.0	746	35.70%
Marital Status		
Single, never married	1693	81.10%
Married	199	9.50%
Divorced	86	4.10%
Widow/er	1	0.00%
In a domestic partnership	64	3.10%
Declined to state	45	2.20%
English as First Language		
Yes	1209	57.90%
No	879	42.10%

Student Characteristic	n	Pct.
Number of Units Enrolled (Mean = 10.36; <i>SD</i> = 4.02)		
1 - 6 units	481	23.10%
7-11 units	514	24.6%
12 or more	1093	52.30%
Citizenship Status		
U.S. Citizen	1466	70.20%
Legal Resident (permanent, temporary, refugee)	269	12.90%
Student Visa	288	13.8%
Undocumented	65	3.10%
Income (family)		
Under \$10,000	355	17.10%
\$10,000 - \$19,999	316	15.20%
\$20,000 - \$29,999	265	12.80%
\$30,000 - \$39,999	179	8.60%
\$40,000 - \$49,999	131	6.30%
\$50,000 - \$59,999	109	5.30%
\$60,000 - \$69,999	70	3.40%
\$70,000 - \$79,999	56	2.70%
\$80,000 - \$89,999	39	1.90%
\$90,000 - \$99,999	36	1.70%
Over \$100,000	146	7.00%
Decline to state	373	18.00%
Age (Mean = 24.45; <i>SD</i> = 7.84)		
18 to 24	1411	67.5%

Student Characteristic	n	Pct.
25-34	449	21.4%
35-45	173	8.3%
46+	54	2.5%

Data Analyses for Research Questions

Descriptive Statistics

SPSS 21 was used to help describe student characteristics. Frequencies and proportions with respect to the entire sample, by gender (male; female), ethnicity, length of college attendance (1-2 semesters; 3-4 semesters; more than 4 semesters), and unit load (part-time; full-time) were examined. Means and standard deviations for all continuous variables were also calculated. Statistical significance was assessed via independent sample t-tests and one-way ANOVA. Where violations of equal variances, the Brown-Forsythe statistic was examined and reported, instead of the F statistic. Statistical significance was set to $p < .01$.

Analyses for Research Question 1

Research Question 1 is concerned with the assessment of the measurement model. Each factor is composed of multiple variables. The initial step of the analysis was the identification of the measurement model. The number of data points and parameters encompassing the model were estimated. Since the resulting degrees of freedom were > 0 , the confirmatory factor analysis (CFA) proceeded as planned. An omnibus CFA was conducted to ascertain model fit by examining several goodness of fit measures, including the CFI, RMSEA, and SRMR. Unstandardized and standardized residuals, modification indices, and expected parameter change statistics were also checked to determine, if and how, the measurement model should be

improved. A simple structure with no cross-loading items was pursued; however, theoretical principles also guided plausible cross-loadings. While seeking model respecification, several indicators from several factors were either deleted or merged with a different factor. Error correlations were permitted when supported by theory (Byrne, 2010; MacCullum, 1995). Such error covariances often derive from characteristics of either the items in question (e.g., tapping into similar constructs, redundancy) or the respondents.

Analyses for Research Question 1.1

Research Question 1.1 was concerned with the assessment of race/ethnicity invariance for the measurement model above. Byrne (2010) notes that the assessment of invariance encompasses the comparison of a baseline model with no constraints, against increasingly restrictive models to determine if they are significantly different (not invariant) for the groups in question. The analysis started with the invariance of factor loadings. Given invariant parameters, the analysis continued by imposing additional equality constraints in error covariances and factor covariances. Since the purpose of this invariance analysis was to identify how the measurement model might differ by race/ethnicity, and not to develop an invariant model, all statistically significant differences found led to freely estimating the parameter in question. Before invariance analysis was conducted, residual path coefficients were set to 1.0 to enable the analysis to proceed (Byrne, 2010).

Analyses for Research Question 2

Research Question 2 was concerned with assessing the goodness of fit for the structural model. The model controlled for the effects of gender, financial concerns, support from family/friends, length of college attendance, unit load, and GPA. The same analytic procedure described for Research Question 1 was followed.

Analyses for Research Question 2.1

Research Question 2.1 is concerned with the assessment of race/ethnicity invariance for the structural model. Consistent with Research Question 1.1, the same analytic procedure was pursued.

Analyses for Research Question 3

Research Question 3 outlines five hypotheses that examine the effects of institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate, mattering, sense of belonging, engagement/involvement, socio-academic integrative experiences, and goal commitment on students' intent to persist. The hypotheses collectively proposed expected relationships among the constructs—positive or negative (Figure 2). The analysis entailed an examination and reporting of the direct, indirect, and total effects of constructs in the structural model on intent to persist. Statistically significant path coefficients guided the interpretability of factor and variable interrelationships, as reported in Chapter 4.

Analyses for Research Question 4

Research Question 4 sought to determine if the constructs of engagement/involvement, sense of belonging, mattering, perceptions of the campus climate, and peer relationships might form part of an omnibus construct. To this end, a second-order confirmatory factor analysis composed of five factors was examined. The variables composing each factor are reported in Table 1. Consistent with SEM procedures, a first-order confirmatory factor analysis was initially conducted. Model fit was assessed in the same manner as for Research Question 1. Once an acceptable model was found, the second-order confirmatory factor analysis was pursued.

Conclusion

Chapter 3 presented a discussion of the methodology employed in this study. The conceptual model being tested was explained in detail, including the model's propositions, and the variables encompassing it. The research questions and corresponding directional hypotheses guiding this study were also presented. It discussed the research methodology characterizing the study, including research design, sample, data used, data analyses conducted, and data screening procedures/results. A description of the demographic characteristics of the final sample was also discussed. Chapter 4 will present the results of the study.

CHAPTER 4

RESULTS

This chapter begins by describing the results of several univariate analyses conducted on the variables constituting the conceptual model in the study by race/ethnicity, gender, and length of college attendance. It then proceeds to describe the results associated with each of the research questions investigated in the study.

Descriptives for Conceptual Model Variables: Differences by Race/Ethnicity, Gender, and Length of College Attendance

Before proceeding with the structural equation modeling analyses, mean differences by race/ethnicity (ANOVA—four levels), gender (independent samples *t*-tests), and length of college attendance (ANOVA—three levels) were assessed. The Levene test for homogeneity of variance and the appropriate *p*-value was examined to determine if statistically significant differences between or among groups existed. For ANOVAs showing that the variances for groups could not be assumed, the Brown-Forsythe statistic was examined. Given the large sample, statistical significance was set at $p < .01$. Based on this examination, the following statistically significant differences were found and are noted in Tables 6, 7, and 8, alongside the means and standard deviations. Moreover, the correlation matrix for the final sample is included in Appendix B for reference.

Differences by Race/Ethnicity

White Students. In comparison to students of other race/ethnicity (Asian, Latino/a, and Black), White students were *most likely* to report:

- having a higher GPA.

They were also *least likely* to report:

- finances were a concern for them while attending college;
- having close or supportive relationships with diverse peers;
- feeling alone or isolated because of their race/ethnicity;
- spending a significant number of hours per week on campus activities;
- meeting with a counselor;
- experiencing academic difficulties while attending college.

Latino/a Students. In comparison to students of other race/ethnicity (White, Black, Asian), Latino/a students were *most likely* to report:

- finances were a concern for them while attending college;
- that if they had a personal problem, counselors would be willing to discuss it with them;
- experiencing academic difficulties while attending college.

They were also *least likely* to report:

- feeling alone at the college;
- feeling isolated from student activities;
- not belonging at the college;

Asian/PI Students. In comparison to students of other race/ethnicity (White, Latino/a, Black), Asian/PI students were *most likely* to report:

- enrolling in more units during the semester;
- feeling alone at the college, and particularly feeling alone and isolated because of their gender, sexual orientation, and race/ethnicity;
- instructors sometimes ignoring their comments or questions;

- spending a significant number of hours per week on campus activities and studying.

They were also *least likely* to report:

- their contributions were valued by their instructors;
- having friendly and supportive relationships with diverse peers;
- there were people at the college who were concerned about their future or who were genuinely interested in them as a person;
- feeling isolated when involved in student activities;
- instructors were available to them and be academically validated by them;
- meeting with instructors outside of class.

Black Students. In comparison to students of other race/ethnicity (White, Latino/a, Asian), Black students were *most likely* to report:

- counselors at the college generally showed their concern for students' well-being;
- their contributions were valued by their instructors;
- receiving all the assistance needed from the institution to successfully transition and adjust to the college;
- having friendly, close, and supportive relationships with diverse peers;
- there were people at the college who were concerned about their future and who were genuinely interested in them as a person;
- instructors as available to them and be academically validated by them;
- meeting with a counselor.

They were also *least likely* to report:

- instructors ignored their comments or questions;

- feeling alone at the college, and particularly isolated because of their gender;
- feeling socially inadequate at the college;
- not feeling interesting to anyone at the college.

Differences by Gender

Female vs. Male Students. In comparison to male students, females were *most likely* to report:

- finances were a concern for them while attending college;
- enrolling in fewer units during the semester;
- having a higher GPA;
- counselors at the college generally showed their concern for students' well-being, believed counselors would be willing to discuss personal problems with them;
- their contributions were valued by their instructors;
- receiving all the assistance needed from the institution to successfully transition and adjust to the college;
- having friendly, close, and supportive relationships with diverse peers;
- feeling alone at the college, and particularly feeling alone and isolated because of their gender, sexual orientation, and race/ethnicity;
- there were people at the college who were concerned about their future and who were genuinely interested in them as a person;
- feeling socially inadequate and not belonging at the college;
- instructors as available to them and be academically validated by them;
- meeting with a counselor;
- spending a significant number of hours per studying.

They were also *least likely* to report:

- instructors ignored their comments or questions;
- not feeling interesting to anyone at the college;
- meeting with an instructor outside of class;
- spending a significant number of hours per week on campus activities;
- experience academic difficulties while attending college.

Differences by Length of College Attendance

First Semester Students. In comparison to students attending for two or more semesters, first-time college students were *most likely* to report:

- counselors would be willing to discuss personal problems with them;

They were also *least likely* to report:

- instructors ignored their comments or questions;
- isolating themselves from others at the college;
- not belonging at the college;
- spending a significant number of hours per week on campus activities, volunteering, or be part of a club;
- meeting with a counselor or instructor outside of class;
- being a member of the Scholars Program;
- lower degree aspirations.

Second Semester Students. In comparison to students attending college for other lengths of time, second semester students were *most likely* to report:

- enrolling in more units;
- not belonging at the college;

They were also *least likely* to report:

- holding a leadership role in the Associated students or a student club.

Second-Year Students. In comparison to students attending college for other lengths of time, second-year students were *most likely* to report:

- spending a significant number of hours per week on campus activities;
- being a member of the Scholars Program.

They were also *least likely* to report:

- isolating themselves from others at the college.

Third-Year Students. In comparison to students attending college for other lengths of time, third-year students were *most likely* to report:

- holding a leadership role in the Associated Students or a student club;
- the highest degree aspirations.

They were also *least likely* to report:

- counselors would be willing to discuss personal problems with them;
- instructors ignored their comments or questions;
- feeling alone and isolated because of their age.

Fourth-Year and Beyond Students. In comparison to students attending college for a shorter length of time, fourth-year (and above) students were *most likely* to report:

- enrolling in fewer units;
- feeling alone and isolated because of their age.
- spending a significant number of hours per week volunteering;
- meeting with a counselor or instructor outside of class;

They were also *least likely* to report:

- holding a leadership role in the Associated Students or a student club.

Conclusion of Differences

As noted in the preceding sections, statistically significant differences ($p < .01$) were observed across many variables by race/ethnicity, gender, and length of college attendance. While it is beyond the scope of this study to examine differences at the univariate level, select findings are noted below.

As a group, Asian students, in comparison to other students appear to have more marginalizing and alienating experiences than students of any other race/ethnicity. While they immersed themselves into their academic studies and made an effort to engage in student activities, they also reported having few relationships characterized as friendly and supportive with diverse peers. Black students, on the other hand, seem to have found a college environment conducive to their learning and development, where they believed institutional agents are available to them from the time they transitioned to college, to the time they established themselves in it, particularly in the classroom. They also noted having more interactions with diverse peers characterized as close, supportive, and friendly. Latino/a students, while being concerned about their finances and experiencing more academic difficulties while in college, also expressed higher levels of belonging—the polar opposite of alienation and loneliness. Lastly, White students, while being academically successful, were least likely to have relationships with diverse peers, or feel isolation owing to their race, and were also somewhat disconnected from campus activities.

With respect to gender, female students tended to be academically successful and generally perceived the classroom environment favorably, where instructors made them feel welcome and elicited their participation. They also believed counselors were available to them

to discuss personal and other problems, and visited them more often than males. Females were also most likely to have interactions with diverse peers characterized as close, supportive, and friendly; albeit they tended to also experience alienating experiences given their identity—race/ethnicity, gender, and sexual orientation.

As for length of college attendance, first-semester students generally reported good classroom-based interactions. While not highly involved academically or socially, they reported a high sense of belonging. However, second semester students, reported the lowest sense of belonging in comparison to students attending college for any other period of time. Second year students, seem to have thrived academically and socially and devoted more time to campus activities and participated in the college's honors program to a greater degree. Third year students, seem to have maintained their involvement in student activities, while also holding the most leadership roles in campus clubs and organizations. However, they also showed more alienating classroom experiences. Lastly, fourth year students reported the lowest degree aspirations, but they met more often with a counselor, and spent more hours volunteering. They also tended to experience more age-related marginalizing experiences.

Table 6

Descriptive Statistics for Final Sample by Race/Ethnicity (N = 2,088)

Variable ^a	Mean						SD					
	White (n=737)	Latino (n=460)	Asian (n=435)	Black (n=104)	Other (n=352)	Total	White (n=737)	Latino (n=460)	Asian (n=435)	Black (n=104)	Other (n=352)	Total
Q177	4.04	4.17	4.13	4.16	4.18	4.12	1.18	1.09	1.12	1.19	1.15	1.14
Q125***	10.16	9.59	11.86	9.25	10.28	10.36	4.13	3.58	3.94	4.04	3.96	4.02
Q119*	1.62	1.56	1.55	1.67	1.60	1.59	0.49	0.50	0.50	0.47	0.49	0.49
Q180***	3.27	3.70	3.43	3.63	3.59	3.47	1.48	1.32	1.39	1.43	1.37	1.42
SupFamFr ^d *	4.59	4.48	4.45	4.55	4.53	4.53	0.74	0.83	0.79	0.83	0.78	0.78
Q126*	2.89	2.90	2.70	2.95	2.96	2.87	1.21	1.21	1.12	1.30	1.22	1.20
GPA***	3.15	2.35	2.94	2.44	2.94	2.86	1.02	1.14	1.12	1.06	1.09	1.12
M59***	3.33	3.55	3.22	3.61	3.16	3.34	1.21	1.18	1.16	1.18	1.29	1.21
M17	3.44	3.56	3.45	3.54	3.35	3.46	1.20	1.18	1.05	1.17	1.25	1.17
M39***	3.30	3.57	3.21	3.54	3.17	3.33	1.29	1.28	1.29	1.30	1.36	1.31
M07***	3.94	3.89	3.70	4.01	3.93	3.88	1.05	0.98	1.02	0.98	1.00	1.02
M38 ^r ***	4.29	4.40	4.17	4.45	4.28	4.30	0.89	0.86	0.93	0.81	0.90	0.90
Q176**	3.38	3.43	3.33	3.47	3.11	3.34	1.20	1.25	1.07	1.32	1.24	1.20
Q70***	4.13	4.21	3.90	4.38	4.21	4.13	0.95	0.91	0.99	0.77	0.89	0.94
Q74***	3.30	3.51	3.32	3.72	3.44	3.39	1.13	1.05	1.05	0.91	1.04	1.07
Q78***	3.66	3.80	3.62	4.06	3.71	3.71	1.11	1.09	1.05	0.87	1.06	1.08
Q82*	3.50	3.67	3.53	3.74	3.55	3.56	1.14	1.15	1.11	1.01	1.12	1.13
M18neg***	1.26	1.29	1.52	1.24	1.38	1.34	0.67	0.72	0.89	0.57	0.80	0.75

Variable ^a	Mean						SD					
	White	Latino	Asian	Black	Other	Total	White	Latino	Asian	Black	Other	Total
	(n=737)	(n=460)	(n=435)	(n=104)	(n=352)		(n=737)	(n=460)	(n=435)	(n=104)	(n=352)	Total
M36neg***	1.19	1.17	1.34	1.26	1.27	1.23	0.58	0.55	0.64	0.64	0.63	0.60
M55neg***	1.32	1.52	2.00	1.66	1.58	1.57	0.81	0.94	1.24	1.15	1.00	1.02
M63neg	1.80	1.63	1.80	1.81	1.75	1.76	1.17	1.11	1.14	1.21	1.16	1.15
M48	2.76	2.72	2.87	2.80	2.82	2.79	1.19	1.24	1.10	1.25	1.21	1.19
M52	2.44	2.52	2.56	2.58	2.59	2.52	1.10	1.17	1.05	1.24	1.16	1.12
M53	3.08	2.97	2.96	3.14	3.00	3.02	1.10	1.16	0.97	1.18	1.07	1.09
M40	3.15	3.09	3.04	3.17	3.11	3.11	1.15	1.18	0.98	1.09	1.13	1.12
M62	2.41	2.57	2.51	2.63	2.49	2.49	1.23	1.22	1.12	1.31	1.24	1.21
M61***	3.27	3.44	3.07	3.54	3.35	3.29	1.19	1.22	1.06	1.11	1.21	1.18
M54***	3.40	3.27	3.18	3.60	3.42	3.34	1.16	1.16	1.09	1.11	1.10	1.14
M26	3.27	3.25	3.26	3.47	3.30	3.28	1.14	1.18	1.05	1.13	1.07	1.12
M31 ^r **	3.51	3.63	3.33	3.63	3.60	3.52	1.34	1.35	1.36	1.43	1.31	1.35
M30 ^r	3.80	3.81	3.62	3.80	3.88	3.78	1.24	1.22	1.26	1.41	1.18	1.24
M56 ^r ***	4.04	4.04	3.63	4.13	4.07	3.96	1.23	1.17	1.15	1.20	1.15	1.20
M08 ^r ***	3.75	3.78	3.46	3.91	3.74	3.70	1.18	1.22	1.20	1.16	1.19	1.20
M32 ^r	3.35	3.29	3.32	3.48	3.34	3.34	1.29	1.34	1.28	1.29	1.28	1.30
M34 ^r ***	3.97	4.06	3.60	4.03	4.00	3.92	1.11	1.12	1.20	1.09	1.12	1.14
M49 ^r ***	4.14	4.31	3.90	4.20	4.01	4.11	1.15	1.05	1.12	1.18	1.22	1.15
Q129***	1.28	1.35	1.50	1.38	1.31	1.35	0.58	0.63	0.78	0.67	0.60	0.65
Q134	1.38	1.38	1.43	1.54	1.47	1.41	0.67	0.70	0.78	0.86	0.75	0.72
Q173_1	0.11	0.08	0.11	0.07	0.12	0.10	0.31	0.27	0.32	0.25	0.33	0.30

Variable ^a	Mean						SD					
	White (n=737)	Latino (n=460)	Asian (n=435)	Black (n=104)	Other (n=352)	Total	White (n=737)	Latino (n=460)	Asian (n=435)	Black (n=104)	Other (n=352)	Total
AcadValidInst***	3.57	3.39	3.29	3.69	3.58	3.48	0.83	0.83	0.73	0.85	0.82	0.82
InsAvail**	4.06	4.09	3.90	4.15	4.00	4.03	0.94	0.90	0.85	0.88	0.94	0.91
InsSup*	4.11	4.10	3.94	4.12	4.03	4.06	0.85	0.85	0.79	0.85	0.91	0.85
Q116***	2.95	2.94	2.89	3.12	3.28	3.00	1.44	1.38	1.44	1.44	1.42	1.43
Q115***	3.13	3.45	3.52	3.54	3.39	3.35	1.21	1.23	1.16	1.37	1.23	1.23
Q128***	3.59	3.34	3.89	3.55	3.57	3.59	1.51	1.37	1.65	1.43	1.56	1.53
Q182***	2.25	2.97	2.89	2.71	2.59	2.62	1.19	1.26	1.20	1.24	1.24	1.25
Q173_9*	0.10	0.06	0.08	0.08	0.12	0.09	0.30	0.23	0.27	0.27	0.32	0.28
Q123	3.59	3.63	3.56	3.63	3.76	3.62	1.14	1.06	1.12	1.11	1.14	1.12

*** $p < .001$; ** $p < .01$; * $p < .05$

^a Refer to Table 1 (page 79) for full variable names.

^r Item was reverse coded before analysis.

Table 7

Descriptive Statistics for Final Sample by Gender (N = 2,088)

Variable ^a	Mean		SD	
	Male (n = 852)	Female (n = 1,236)	Male (n = 852)	Female (n = 1,236)
Q177	4.11	4.12	1.11	1.16
Q125**	10.72	10.12	3.90	4.09
Q180	3.46	3.47	1.44	1.40
SupFamFrd***	4.45	4.58	0.82	0.76
Q126	2.84	2.88	1.17	1.22
GPA*	2.80	2.90	1.11	1.13
M59	3.33	3.35	1.16	1.25
M17	3.46	3.45	1.13	1.20
M39	3.28	3.37	1.26	1.34
M07*	3.82	3.93	1.03	1.01
M38 ^r *	4.24	4.33	0.91	0.88
Q176	3.33	3.35	1.21	1.20
Q70***	4.01	4.21	0.99	0.90
Q74**	3.31	3.45	1.06	1.08
Q78***	3.58	3.80	1.07	1.07
Q82***	3.46	3.63	1.13	1.13
M18neg***	1.41	1.29	0.82	0.70
M36neg***	1.31	1.18	0.69	0.53
M55neg***	1.65	1.51	1.07	0.98
M63neg	1.79	1.73	1.14	1.16
M48**	2.69	2.85	1.18	1.20
M52	2.54	2.50	1.08	1.15
M53*	2.95	3.07	1.07	1.10
M40***	2.99	3.19	1.10	1.12
M62	2.51	2.47	1.18	1.23

Variable ^a	Mean		SD	
	Male (<i>n</i> = 852)	Female (<i>n</i> = 1,236)	Male (<i>n</i> = 852)	Female (<i>n</i> = 1,236)
M61**	3.21	3.35	1.14	1.20
M54***	3.19	3.44	1.13	1.13
M26***	3.19	3.35	1.10	1.13
M31 ^r	3.53	3.52	1.30	1.38
M30 ^r	3.75	3.79	1.23	1.25
M56 ^r *	3.89	4.01	1.20	1.20
M08 ^r	3.67	3.73	1.18	1.21
M32 ^r	3.40	3.29	1.27	1.31
M34 ^r	3.89	3.94	1.14	1.15
M49 ^r *	4.03	4.16	1.15	1.14
Q129	1.36	1.34	0.66	0.65
Q134	1.39	1.43	0.71	0.73
Q173_1	0.10	0.10	0.30	0.31
AcadValidInst*	3.44	3.51	0.82	0.81
InsAvail***	3.93	4.10	0.93	0.90
InsSup***	3.96	4.13	0.86	0.84
Q116	3.01	2.98	1.46	1.41
Q115	3.34	3.35	1.21	1.24
Q128	3.54	3.63	1.50	1.54
Q182	2.68	2.58	1.22	1.28
Q173_9	0.08	0.09	0.28	0.28
Q123*	3.68	3.58	1.04	1.17

*** $p < .001$; ** $p < .01$; *** $p < .05$

^a Refer to Table 1 (page 79) for full variable names.

^r Item was reverse coded before analysis.

Table 8

Descriptive Statistics for Final Sample by Length of College Attendance (N = 2,088)

Variable ^a	Mean						SD					
	Semesters in College						Semesters in College					
	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total
Q177	4.13	4.16	4.14	4.09	3.96	4.12	1.09	1.13	1.12	1.19	1.21	1.14
Q125***	10.04	11.06	11.06	9.84	8.09	10.36	3.98	3.84	3.87	3.93	4.02	4.02
Q119	1.60	1.58	1.58	1.61	1.63	1.59	0.49	0.49	0.50	0.49	0.49	0.49
Q180	3.53	3.34	3.49	3.54	3.54	3.47	1.45	1.44	1.41	1.35	1.42	1.42
SupFamFrd	4.46	4.56	4.51	4.54	4.54	4.53	0.83	0.76	0.78	0.80	0.79	0.78
GPA	2.83	2.85	2.90	2.89	2.78	2.86	1.16	1.21	1.08	1.05	1.07	1.12
M59*	3.48	3.34	3.31	3.21	3.43	3.34	1.16	1.21	1.20	1.26	1.21	1.21
M17	3.47	3.40	3.44	3.49	3.55	3.46	1.12	1.19	1.15	1.19	1.22	1.17
M39**	3.54	3.40	3.27	3.17	3.33	3.33	1.25	1.30	1.30	1.36	1.29	1.31
M07	3.89	3.83	3.88	3.91	3.96	3.88	0.97	1.07	1.01	0.99	1.03	1.02
M38 ^r ***	4.47	4.31	4.25	4.21	4.32	4.30	0.85	0.88	0.91	0.90	0.91	0.90
Q176	3.40	3.29	3.37	3.33	3.34	3.34	1.19	1.23	1.19	1.21	1.21	1.20

Variable ^a	Mean						SD					
	Semesters in College						Semesters in College					
	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total
Q70	4.11	4.13	4.14	4.11	4.13	4.13	0.96	0.92	0.96	0.97	0.88	0.94
Q74	3.39	3.42	3.38	3.38	3.40	3.39	1.07	1.10	1.09	1.06	0.98	1.07
Q78	3.78	3.70	3.70	3.69	3.71	3.71	1.04	1.11	1.10	1.08	0.99	1.08
Q82	3.61	3.62	3.52	3.54	3.54	3.56	1.11	1.14	1.17	1.14	1.01	1.13
M18neg*	1.40	1.38	1.35	1.26	1.27	1.34	0.81	0.81	0.75	0.67	0.66	0.75
M36neg	1.28	1.25	1.23	1.21	1.20	1.23	0.66	0.62	0.59	0.57	0.56	0.60
M55neg	1.60	1.61	1.55	1.59	1.46	1.57	1.06	1.06	0.99	1.04	0.94	1.02
M63neg**	1.71	1.75	1.73	1.67	2.01	1.76	1.09	1.13	1.15	1.12	1.31	1.15
M48	2.73	2.73	2.77	2.87	2.88	2.79	1.17	1.20	1.18	1.21	1.19	1.19
M52	2.49	2.51	2.53	2.63	2.38	2.52	1.09	1.16	1.08	1.17	1.11	1.12
M53	3.02	3.02	2.98	3.05	3.07	3.02	1.03	1.11	1.08	1.14	1.05	1.09
M40*	3.16	3.00	3.09	3.20	3.21	3.11	1.03	1.15	1.10	1.13	1.16	1.12
M62	2.55	2.50	2.46	2.48	2.48	2.49	1.27	1.25	1.17	1.18	1.20	1.21
M61	3.37	3.21	3.30	3.33	3.36	3.29	1.13	1.18	1.19	1.19	1.16	1.18

Variable ^a	Mean						SD					
	Semesters in College						Semesters in College					
	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total
M54	3.30	3.31	3.30	3.42	3.45	3.34	1.04	1.15	1.14	1.18	1.14	1.14
M26	3.29	3.23	3.31	3.28	3.33	3.28	1.14	1.15	1.11	1.11	1.09	1.12
M31 ^{r*}	3.58	3.44	3.44	3.63	3.71	3.52	1.31	1.41	1.35	1.32	1.26	1.35
M30 ^r	3.82	3.71	3.71	3.88	3.90	3.78	1.16	1.32	1.25	1.19	1.19	1.24
M56 ^r	4.02	3.92	3.91	4.01	4.09	3.96	1.22	1.18	1.22	1.17	1.16	1.20
M08 ^r	3.77	3.66	3.68	3.70	3.81	3.70	1.15	1.24	1.20	1.16	1.22	1.20
M32 ^{r**}	3.55	3.38	3.24	3.25	3.36	3.34	1.27	1.34	1.26	1.27	1.31	1.30
M34 ^r	3.91	3.91	3.90	4.00	3.90	3.92	1.10	1.19	1.12	1.15	1.13	1.14
M49 ^{r***}	4.26	3.99	4.04	4.25	4.23	4.11	0.97	1.21	1.21	1.01	1.13	1.15
Q129***	1.27	1.31	1.42	1.39	1.27	1.35	0.51	0.58	0.73	0.71	0.62	0.65
Q134***	1.32	1.36	1.44	1.46	1.48	1.41	0.67	0.66	0.73	0.76	0.83	0.72
Q173_1***	0.06	0.06	0.12	0.14	0.13	0.10	0.24	0.25	0.33	0.35	0.33	0.30
AcadValidInst*	3.58	3.41	3.47	3.50	3.55	3.48	0.76	0.81	0.83	0.82	0.82	0.82
InsAvail	4.10	4.04	4.01	3.97	4.03	4.03	0.86	0.94	0.90	0.95	0.90	0.91

Variable ^a	Mean						SD					
	Semesters in College						Semesters in College					
	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total	1 (n=282)	2 (n=559)	3-4 (n=657)	5-6 (n=338)	7+ (n=252)	Total
InsSup	4.11	4.07	4.05	4.00	4.09	4.06	0.80	0.88	0.86	0.83	0.85	0.85
Q116***	2.19	2.66	3.16	3.45	3.60	3.00	1.24	1.38	1.37	1.39	1.35	1.43
Q115***	2.54	3.08	3.53	3.72	3.87	3.35	1.05	1.14	1.19	1.25	1.10	1.23
Q128	3.64	3.48	3.61	3.75	3.55	3.59	1.59	1.45	1.54	1.58	1.49	1.53
Q182	2.45	2.65	2.62	2.62	2.73	2.62	1.18	1.22	1.26	1.27	1.35	1.25
Q173_9***	0.02	0.09	0.11	0.09	0.10	0.09	0.15	0.28	0.31	0.29	0.31	0.28
Q123**	3.40	3.67	3.65	3.72	3.55	3.62	1.23	1.14	1.08	1.03	1.13	1.12

*** $p < .001$; ** $p < .01$; *** $p < .05$

^a Refer to Table 1 (page 79) for full variable names.

^r Item was reverse coded before analysis.

Structural Equation Modeling Analyses

This section reports findings for Research Questions 1, 1.1, 2, 2.1, 3, and 4. The analyses entailed several confirmatory factor analyses (CFA), multiple group invariance analyses, and hybrid path analyses, which were guided by the conceptual model depicted in Figure 1 (p. 65). All were conducted in the context of structural equation modeling (SEM) in AMOS 21. Since the dataset was multivariate non-normal, Maximum Likelihood estimation with 2,000 bootstrap samples was used in each analysis. Bollen-Stine bootstrap bias corrected p -values were used in the interpretation of model fit, instead of the usual ML p -value used with normally distributed data. A non-significant χ^2 is indicative of good fit and is regarded as *the* “gold standard” by SEM methodologists, albeit it is also recognized it is highly susceptible to large sample sizes and may lead to the rejection of models, all too frequently, even if the model is correct (Byrne, 2010; Hayduk & Littvay, 2012; Kline, 2005; MacCullum, 1995; West, Taylor, & Wu, 2012). Several indices of fit were used in addition to the χ^2 p -value. These included : the χ^2 to df ratio (with values < 4.0 desired); the comparative fit index (CFI; $\geq .90$ -.95); the root mean square error of approximation and RMSEA 90% confidence interval (RMSEA; $\leq .06$, although values $\leq .10$ may be acceptable); and, lastly, the standardized root mean square residual (SRMR; $\leq .10$). These indices account for such things as sample size, number of parameters in the model, model complexity, and degrees of freedom (Byrne, 2010; Kline, 2005; Ullman, 2006; West et al., 2012).

Research Question 1: The Measurement Model

Research Question 1 is concerned with the assessment of the measurement model depicted in Figure 1, with the exception of all control variables. Accordingly, the key task was to demonstrate that the implied measurement model for institutional commitment, interactions

with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, and socio-academic integrative experiences adequately fit the observed data. While each factor was originally proposed to encompass the specific variables denoted in Table 1 (p. 79), it was also a goal to develop as parsimonious a model as possible, and where appropriate, model trimming or model building was to be pursued.

With respect to the number of items forming a factor, questions have been raised in the literature as to just how many indicators should “compose” or represent a given construct in SEM. Based on a recent review of the literature, discussions on the SEM Network (SEMNET listserv), and statistical evidence, Hayduk and Littvay (2012, p. 1), noted that using the “few best indicators... are often sufficient. More than three indicators are rarely warranted because additional redundant indicators provide less research benefit.”

As an initial step in assessing the identification of the measurement model for Research Question 1, and given the exploratory nature of this study, a series of confirmatory factor analyses were conducted to ascertain that the proposed indicators were in fact representative of the construct. Once the individual CFAs were conducted, the analysis of the omnibus measurement model depicted in Figure 1 followed.

Preliminary Confirmatory Factor Analyses by Construct

CFA of Institutional Commitment to Students. The hypothesized model for institutional commitment was composed of six items: M59—*Counselors at the college generally show their concern for students' well-being*; M17—*My counselor is generally receptive to what I have to say*; M39—*If I had a personal problem, I believe that counselors would be willing to discuss it with me*; M07—*It is comforting to know that my contributions are valued by my instructors*; M38—*My instructors sometimes ignore my comments or questions*; and Q176—I

received all the assistance I needed to successfully transition and adjust to the college. A review of the CFA results, suggested the model was of poor fit for the data and should be rejected, bootstrap Bollen-Stine $\chi^2(9, N = 2,088) = 78.61, p < .001, \chi^2/df = 8.74, CFI = .98, SRMR = .04, RMSEA = .06$ (90% CI = .049, .074). A review of factor loadings, univariate and multivariate normality estimates, standardized residuals, MIs, and EPC statistics pointed that indicators M38 (instructors sometimes ignore comments or questions) and M07 (student contributions being valued by instructors) might be problematic as they were associated with error covariances with other items. Hence, these items were eliminated from further consideration. The respecified model resulted in improved fit, bootstrap Bollen-Stine $\chi^2(2, N = 2,088) = 2.15, p = .40, \chi^2/df = 1.07, CFI = 1.0, SRMR = .01, RMSEA = .01$ (90% CI = .001, .044).

Thus, institutional commitment to students was represented with four indicators (M59, M17, M39, Q176) as noted on Table 9, which also presents a summary of the goodness of fit statistics for the alternate models discussed above.

Table 9

Summary of Goodness-of-Fit Indices for Alternate Models of Institutional Commitment to Students

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 6 Items ^a	78.61	9	8.74	.98	.04	.06 (90% CI = .049, .074)
Respecified Model 1: 4 Items	2.15	2	1.07	1.0	.01	.01 (90% CI = .001, .044)
Deletion of items M38, M07						

^aOriginal items in CFA hypothesized model: M59—*Counselors at the college generally show their concern for students' well-being*; M17—*My counselor is generally receptive to what I have to say*; M39—*If I had a personal problem, I believe that counselors would be willing to discuss it with me*; M07—*It is comforting to know that my contributions are valued by my instructors*; M38—*My instructors sometimes ignore my comments or questions*; and Q176—*I received all the assistance I needed to successfully transition and adjust to the college*.

CFA of Interactions with Diverse Peers. The hypothesized model for interactions with diverse peers was composed of four semantic differential items, answering to the following prompt: *The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as: friendly/unfriendly (Q70), close/distant (Q74), supportive/unsupportive (Q78), and available/unavailable (Q82)*. A review of the CFA results, suggested the model was of poor fit for the data and should be rejected, bootstrap Bollen-Stine $\chi^2(2, N = 2,088) = 26.20, p < .001, \chi^2/df = 13.10, CFI = .99, SRMR = .02, RMSEA = .08$ (90% CI = .052, .103). A review of factor loadings, univariate and multivariate normality estimates, standardized residuals, MIs, and EPC statistics pointed that indicator Q70 (diverse peer interactions as close/distant) was of concern, as it was associated with a large error covariance with item Q82 (diverse peer interactions as available/unavailable). Given the nature of the items (i.e., tapping

into the same aspect of student interactions), an error covariance between these items (Q70 and Q82) was imposed and freely estimated in the subsequent run. The respecified model resulted in significant improved fit, bootstrap Bollen-Stine $\chi^2(1, N = 2,088) = 1.33, p = .31, \chi^2/df = 1.33$, CFI = 1.0, SRMR = .01, RMSEA = .01 (90% CI = .001, .061). Table 10 presents a summary of the goodness of fit statistics for the alternate models discussed above.

Thus, interactions with diverse peers was represented with the four indicators originally hypothesized (Q70, Q74, Q78, and Q82) and with an error covariance for indicators Q70 and Q82 in the assessment of the measurement model in Figure 1, as summarized in Table 10.

Table 10

Summary of Goodness-of-Fit Indices for Alternate Models of Interactions with Diverse Peers

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 4 Items ^a	26.20	2	13.10	.99	.02	.08 (90% CI = .052, .103)
Respecified Model 1: 4 Items	1.33	1	1.33	1.0	.01	.01 (90% CI = .001, .061)
Addition: error covariance						
between eQ70-eQ82						

^aOriginal items in CFA hypothesized model: *The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as: friendly/unfriendly (Q70), close/distant (Q74), supportive/unsupportive (Q78), and available/unavailable (Q82).*

CFA of Perceptions of a Hostile Campus Climate. The hypothesized model for perceptions of a hostile campus climate was composed of four items: M18—*I sometimes feel alone and isolated at the college because of my gender* (reverse coded); M55—*I sometimes feel alone and isolated because of my race/ethnicity* (reverse coded); M36neg—*I sometimes feel alone and isolated because of my sexual orientation* (reverse coded); M63—*I sometimes feel alone and isolated because of my age* (reverse coded).

A review of the CFA results (Table 11) suggested the model was of good fit for the data, bootstrap Bollen-Stine $\chi^2(2, N = 2,088) = 7.11, p = .10, \chi^2/df = 3.55, CFI = 1.00, SRMR = .01, RMSEA = .04$ (90% CI = .010, .064). A review of factor loadings, univariate and multivariate normality estimates, standardized residuals, MIs, and EPC statistics were also within expected parameters.

Thus, perceptions of a hostile campus climate was represented with the four indicators (M18, M55, M36, and M63), as originally planned, in the assessment of the measurement model in Figure 1.

Table 11

Summary of Goodness-of-Fit Indices for Perceptions of a Hostile Campus Climate

Model	Goodness-of-Fit Measures					
	χ^2	<i>df</i>	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	≥ .95	≤ .10	≤ .06
Hypothesized Model: 4 Items ^a	7.11	2	3.55	1.00	.01	.04 (90% CI = .010, .064)

^a Original items in CFA hypothesized model: M18—*I sometimes feel alone and isolated at the college because of my gender* (reverse coded); M55—*I sometimes feel alone and isolated because of my race/ethnicity* (reverse coded); M36neg—*I sometimes feel alone and isolated because of my sexual orientation* (reverse coded); M63—*I sometimes feel alone and isolated because of my age* (reverse coded).

CFA of Sense of Belonging. The hypothesized model for sense for belonging was composed of seven items: M31—*Sometimes I feel alone at the college*; M30—*Sometimes I feel that no one at the college notices me*; M56—*I often feel socially inadequate at school*; M08—*Sometimes I feel that I am not interesting to anyone at the college*; M32—*Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college*; M34—*I often feel isolated when involved in student activities*; M49—*I often feel that I do not belong at this college*.

A review of the CFA results, suggested the model was of poor fit for the data and should be rejected, bootstrap Bollen-Stine $\chi^2(14, N = 2,088) = 120.78, p < .001, \chi^2/df = 8.63, CFI = .98, SRMR = .04, RMSEA = .06$ (90% CI = .051, .071). Factor loadings, univariate and multivariate normality estimates, standardized residuals, MIs, and EPC statistics indicated that items M56 (social inadequacy) and M08 (not of interest to anyone at the college) were associated with large error covariances with multiple other items. Moreover, it appeared that M30 (no one notices student) and M32 (self-isolation from others) shared a degree of redundancy, and allowing their error covariances to be freely estimated might result in improved model fit. Hence, items M56 and M08 were deleted from further consideration. A freely estimated error covariance for M30 and M32 was permitted in the next run. The respecified model resulted in improved fit, with a bootstrap Bollen-Stine $\chi^2(4, N = 2,088) = 9.99, p = .09, \chi^2/df = 2.20, CFI = 1.00, SRMR = .02, RMSEA = .03$ (90% CI = .005, .048). Table 12 presents a summary of the goodness of fit statistics for the alternate models discussed above.

Thus, sense of belonging was represented with five (M31, M30, M32, M34, and M49) indicators and with an error covariance between item M30 and M32 in the assessment of the measurement model in Figure 1.

Table 12

Summary of Goodness-of-Fit Indices for Alternate Models of Sense of Belonging

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 7 Items ^a	120.78	14	8.63	.98	.04	.06 (90% CI = .051, .071)
Respecified Model 1: 5 Items	9.99	4	220	1.00	.02	.03 (90% CI = .005, .048)
Deletion of items M56, M08						
Addition: error covariance						
between M30-M32						

^aOriginal items in CFA hypothesized model: M31—*Sometimes I feel alone at the college*; M30—*Sometimes I feel that no one at the college notices me*; M56—*I often feel socially inadequate at school*; M08—*Sometimes I feel that I am not interesting to anyone at the college*; M32—*Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college*; M34—*I often feel isolated when involved in student activities*; M49—*I often feel that I do not belong at this college*.

CFA of Mattering. The hypothesized model for mattering was composed of eight items: M48—*There are people on campus who are sad for me when I fail in something I set out to do*; M52—*Some people on campus are disappointed in me when I do not accomplish all I should*; M53—*People on campus are generally supportive of my individual needs*; M40—*People on campus seem happy about my accomplishments*; M62—*I sometimes feel pressured to do better because people at the college would be disappointed if I did not*; M61—*There are people at the college who are concerned about my future*; M54—*There are people at the college who are genuinely interested in me as a person*; M26—*Other students are happy for me when I do well in exams or projects*.

CFA results suggested the model was of very poor fit for the data and should be rejected, bootstrap Bollen-Stine $\chi^2(20, N = 2,088) = 432.21, p < .001, \chi^2/df = 21.61, CFI = .95, SRMR = .05, RMSEA = .10$ (90% CI = .091, .108). A review of factor loadings, univariate and multivariate normality estimates, standardized residuals, MIs, and EPC statistics indicated that items M52 (*Some people on campus are disappointed in me when I do not accomplish all I should*) and M40 (*People on campus seem happy about my accomplishments*) were connected to large error covariances with several other items. Item M52 appeared to be especially tapping into the same aspect of mattering as item M48 (*There are people on campus who are sad for me when I fail in something I set out to do*), and had a higher kurtosis value. The same was true for M40 with M26 (*Other students are happy for me when I do well in exams or projects*). Other items of concern were M62 (*I sometimes feel pressured to do better because people at the college would be disappointed if I did not*) and M26, albeit to a lesser degree. Hence, items M52 and M40 were deleted from further consideration in the subsequent run. The respecified model resulted in improved fit; though not to an acceptable degree, bootstrap Bollen-Stine $\chi^2(9, N = 2,088) = 132.19, p < .001, \chi^2/df = 14.67, CFI = .98, SRMR = .04, RMSEA = .08$ (90% CI = .069, .093). Again, an examination of the results reinforced the suspicion that indicators M62 and M26 were exercising undue influence on model fit, with excessive MI values owing to error covariances with several items. A decision was made to pursue an additional modification to the model by removing these indicators. Indices of fit readily pointed to the soundness of this decision, suggesting a good model: bootstrap Bollen-Stine $\chi^2(2, N = 2,088) = 2.88, p = .32, \chi^2/df = 1.44, CFI = 1.00, SRMR = .01, RMSEA = .02$ (90% CI = .001, .048). Table 13 presents a summary of the goodness of fit statistics for the alternate models discussed above.

Thus, mattering was represented with four indicators (M48, M53, M61, and M54) in the assessment of the measurement model in Figure 1.

Table 13

Summary of Goodness-of-Fit Indices for Alternate Models of Mattering

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 8 Items ^a	432.21	20	21.61	.95	.05	.10 (90% CI = .091, .108)
Respecified Model 1: 6 Items Deletion of items M52, M40	132.19	9	14.67	.98	.04	.08 (90% CI = .069, .093)
Respecified Model 2: 4 Items Deletion of items M62, M26						

^a Original items in CFA hypothesized model: M48—*There are people on campus who are sad for me when I fail in something I set out to do*; M52—*Some people on campus are disappointed in me when I do not accomplish all I should*; M53—*People on campus are generally supportive of my individual needs*; M40—*People on campus seem happy about my accomplishments*; M62—*I sometimes feel pressured to do better because people at the college would be disappointed if I did not*; M61—*There are people at the college who are concerned about my future*; M54—*There are people at the college who are genuinely interested in me as a person*; M26—*Other students are happy for me when I do well in exams or projects*.

CFA of Socio-academic Integrative Experiences. The hypothesized model for socio-academic integrative experiences was composed of eight items: AcadValidInst—academic validation from instructors; InsAvail—quality of student interactions and relationships with instructors as available/unavailable; InsSup—quality of student interactions and relationships with instructors as supportive/unsupportive; Q116—times meeting with instructors outside of class, Q115—times meeting with a counselor; Q128—hours spent per week studying; Q182—I

have experienced significant academic difficulties while attending college; and Q173_9—Scholars Program (honors program) participant.

The CFA results suggested the model was of very poor fit for the data and should be rejected, bootstrap Bollen-Stine $\chi^2(20, N = 2,088) = 784.69, p < .001, \chi^2/df = 39.23, CFI = .78, SRMR = .15, RMSEA = .14$ (90% CI = .127, .144). Item Q173_9 (participation in Scholars Program) was severely skewed and kurtotic, and showed a very high standardized residual with Q115 (times meeting with a counselor). The MI for the error covariance between items Q115 and Q116 (number of times meeting with instructors) was the highest at 302.69 units. Before proceeding with additional analyses, and given the apparent redundancy or overlap between the two items (number of times meeting with institutional agents), the two items were combined and averaged into a new variable named InstAgents.

Thus, the hypothesized model was respecified by deleting Q115 and Q116, and substituting them with the new variable, number of times meeting with institutional agents—InstAgents. However, the fit statistics for the model continued to show a significant lack of fit, bootstrap Bollen-Stine $\chi^2(14, N = 2,088) = 411.85, p < .001, \chi^2/df = 29.42, CFI = .87, SRMR = .09, RMSEA = .12$ (90% CI = .107, .117). Factor loadings for meetings with institutional agents, hours spent per week studying, experiencing academic difficulties, and participation in Scholars Program, were relatively small (loadings $< .20$), in comparison to the other three items (academic validation from instructor, perceived instructor availability, perceived instructor support), which had much higher loadings (.60-.90). Given this, three items were deleted from the next respecified model (hours spent studying, experiencing academic difficulties while in college, and Scholars Program participation), while keeping the variable InstAgents (number of times

meeting with institutional agents), partially justified on theoretical grounds; but also out of concern that the resulting CFA model would be under-identified with just three indicators.

Analyses with three items on a single factor in the context of a CFA, results in an unidentified model, with zero degrees of freedom; thus AMOS will not allow the analysis to continue. This is often not an issue of concern when such factor (with 3 indicators) is combined with others into a multifactor model (such as the measurement model shown in Figure 1). Thus, by permitting InstAgents to remain in the socio-academic integrative experiences factor, the analysis proceeded.

Fit indices for the second respecified model consisting of four items (meetings with institutional agents, academic validation from instructors, perceived instructor availability, perceived instructor support) resulted in significant improvement, bootstrap Bollen-Stine $\chi^2(2, N = 2,088) = 47.19, p < .001, \chi^2/df = 23.59, CFI = .98, SRMR = .03, RMSEA = .10$ (90% CI = .080, .131). However, the significant χ^2 suggested the model was of poor fit to the data. While examining the MIs, it was noted that allowing an error covariance between meetings with institutional agents and academic validation from instructors would result in a better model. The covariance was guided by theory suggesting that faculty-student relationships might be affected in part by the type and frequency of informal interactions students have with instructors outside of class to discuss academic, personal, career, or social issues (Deil-Amen, 2011; Tinto, 1993, 2012a). After imposing the error covariance, the model's fit was significantly improved, bootstrap Bollen-Stine $\chi^2(1, N = 2,088) = 2.63, p = .12, \chi^2/df = 2.63, CFI = 1.00, SRMR = .01, RMSEA = .03$ (90% CI = .001, .072). Table 14 presents a summary of the goodness of fit statistics for the alternate models discussed above.

Socio-academic integrative experiences was represented with four indicators (meetings with institutional agents, academic validation from instructors, perceived instructor availability, perceived instructor support) and an error covariance between academic validation from instructors and meetings with institutional agents) in the assessment of the measurement model in Figure 1.

Table 14

Summary of Goodness-of-Fit Indices for Alternate Models of Socio-academic Integrative Experiences

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 8 Items ^a	784.69	20	39.23	.78	.15	.14 (90% CI = .127, .144)
Respecified Model 1: 7 Items Averaged items Q115, Q116 into InstAgents	411.85	14	29.42	.87	.09	.12 (90% CI = .107, .117).
Respecified Model 2:4 Items Deletion of items Q128, Q182, 173_9	47.19	2	23.59	.98	.03	.10 (90% CI = .080, .131)
Respecified Model 3:4 Items Error covariance for AcadValidInst and InstAgents	2.63	1	2.63	1.00	.01	.03 (90% CI = .001, .072).

^a Original items in CFA hypothesized model: AcadValidInst—academic validation from instructors; InsAvail—quality of student interactions and relationships with instructors as available/unavailable; InsSup—quality of student interactions and relationships with instructors as supportive/unsupportive; Q116—times meeting with instructors outside of class, Q115—times meeting with a counselor; Q128—hours spent per week studying; Q182—I have experienced significant academic difficulties while attending college; and Q173_9—Scholars Program (honors program) participant.

CFA of Engagement/Involvement. The hypothesized model for engagement/involvement was originally conceptualized with three items (Q129—hours spent on campus activities; Q173_1—currently holding leadership role in the Associated Students organization or a club officer; Q134—hours per week spent volunteering). Since two items originally thought to reflect socio-academic integrative experiences were in fact of poor fit for that construct, a decision was made to incorporate these (Q128—hours per week spent studying; and Q173_9—Scholars Program[honors] participation) into the engagement/involvement factor. These items measure “efforts” students devote to academic endeavors: hours studying and participation in an honors program. These indicators seem to reflect “good practices” associated with the general engagement framework (Kuh, 2001, 2006; Kuh, Whitt, & Strange, 1989; McClenney, 2007; McClenney & Marti, 2006; McClenney et al., 2006). Thus, the engagement/involvement model was specified with five variables. The CFA results (Table 15) suggested the model was of good fit for the data, bootstrap Bollen-Stine $\chi^2(5, N = 2,088) = 10.24, p = .17, \chi^2/df = 2.05, CFI = .99, SRMR = .01, RMSEA = .02$ (90% CI = .001, .042). No additional constraints were imposed on the model.

Engagement/involvement was represented with the five indicators above (Q128, Q129, Q134, Q173_1, and Q173_9) in the assessment of the measurement model in Figure 1.

Table 15

Summary of Goodness-of-Fit Indices for Engagement/Involvement Model

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 5 Items	10.24	5	2.05	.99	.01	.02 (90% CI = .001, .042)

^a Original items in CFA hypothesized model: Q129—hours spent on campus activities; Q173_1—currently holding leadership role in the Associated Students organization or a club officer; Q134—hours per week spent volunteering; Q128—hours per week spent studying; and Q173_9—Scholars Program[honors] participation.

Confirmatory Factor Analysis for the Conceptual Model

Model Specification. Following the preliminary analyses above, the full measurement model associated with the conceptual model illustrated in Figure 1 was specified in AMOS with seven factors. Each factor was represented by the indicators and error covariances noted for the individual CFAs above. A graphical representation of the measurement model as produced by AMOS is shown in Figure 3. As illustrated, the model is hypothesized to consist of seven factors: institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, and socio-academic integrative experiences. The key research question guiding the analysis was: Does the hypothesized model adequately fit the observed data? If not, what respecified model results in improved model fit?

Since the dataset exhibited evidence of skewness and kurtosis in the preliminary descriptive analyses, maximum likelihood estimation with 2,000 bootstrap samples was used in AMOS 21. The bootstrap procedure produced the Bollen-Stine corrected χ^2 p -value to help

Figure 3. Graphical representation of the measurement model for the hypothesized Conceptual Model as produced by AMOS.

assess model fit. Several indices of fit were also used to assess the overall goodness of fit for the model, including the χ^2/df ratio, CFI, SRMR, and RMSEA.

Model Identification. The goal of this step was to have a model that was *over identified* to enable hypothesis testing. Thus, the number of parameters (e.g., regression coefficients, variances, covariances) to be estimated had to be less than the number of observations in the model [observations = $p(p + 1)/2$; where p is the number of observed variables]. The difference between the observations and the number of parameters to be estimated had to be positive, thus resulting in the number of degrees of freedom associated with the specified model ($df > 0$). The resulting number of observations was 465 [observations = $30(30 + 1)/2$]. Accordingly, the CFA model noted in Figure 3 consisted of 84 parameters to be estimated. Thus the resulting number of degrees of freedom was 381 [$465 - 84 = 381$]. With respect to sample size and power, the ratio of cases to the number of parameters to be estimated should be 10:1, although this is often not met in SEM studies (Kline, 2005). The resulting ratio for the CFA was 25:1, exceeding the threshold significantly. Moreover, this step necessitated that each latent variable be scaled to a metric. The first congeneric variable for each factor was set to a 1.0 loading and a zero loading on other factors.

Evaluation of Model Fit—Seven Factors/30 Indicators. Results of the confirmatory factor analysis revealed the hypothesized model was a poor fit to the data and should be rejected, bootstrap Bollen-Stine $\chi^2(381, N = 2,088) = 2516.26, p < .001, \chi^2/df = 6.60, CFI = .91, SRMR = .06, RMSEA = .05$ (90% CI = .050, .059). While the SRMR and RMSEA values fell within acceptable thresholds, the significant bias corrected χ^2 , the χ^2/df ratio, and the CFI value did not.

The standardized residual covariance matrix included multiple residual values in excess of 2.58, which are considered large and indicative of model misfit (Byrne, 2010). Indicators

M61— *There are people at the college who are concerned about my future*—and academic validation from instructors had the largest standardized residual of 11.14. Academic validation from instructors also shared excessive standardized covariances with other indicators (M30— *Sometimes I feel that no one at the college notices me*; M48— *There are people on campus who are sad for me when I fail in something I set out to do*; M53— *People on campus are generally supportive of my individual needs*; M61— *There are people at the college who are concerned about my future*; M54— *There are people at the college who are genuinely interested in me as a person*; and Q128—hours per week spent studying).

Meetings with institutional agents (InstAgents) also had eight covariances with other items (M48, M61, M54, Q173_9—Scholar Program member, Q129—hours per week spent on campus activities, Q134—hours per week spent volunteering, Q128, and Q173_1—currently hold leadership role in Associated Students organization of college club).

Item Q176 (transition assistance to college) also exhibited large standardized residuals with 19 other indicators, although those associated with M49 (*I often feel that I do not belong at this college*), AcadValidInst, and M61 were of greater concern since the residual values were above 6.0. Indeed, a review of the MIs for the regression weights showed that meetings with institutional agents—originally hypothesized to represent the Socio-academic Integrative Experiences (SAIE) factor—cross-loaded with the Engagement/Involvement factor. The MI was the largest at 233.91 (EPC = 1.11). Additionally, academic validation from instructors, with a MI value of 201.73 (EPC = 0.26) showed evidence of cross-loading with the Mattering factor, and possibly with Institutional Commitment to Students factor (IC2S; MI = 2.57; EPC = 0.14); although such cross-loadings did not support the temporal and causal nature implied in the Conceptual Model in Figure 1. Item Q176 also showed moderate MIs indicative of possible

cross-loadings on the Perceived Hostile Campus Climate (HCC) factor, Sense of Belonging (SOB) factor, and Interactions with Diverse Peers (IWDP) factor, not to mention multiple error covariances.

Reviewing the content of the items, it appears that academic validation from instructors—an indicator intended for the SAIE factor), shares a strong covariance with items primarily tapping into the constructs of mattering and sense of belonging. The same may be said for meetings with institutional agents (also an indicator for the SAIE factor) being closely associated with aspects of Mattering and Engagement/Involvement. As for Q176 (transition assistance to college), it is conceivable that in receiving transition support from the institution to aid in the adjustment to college, students consider all those institutional agents, programs, and services that came to their aid. Moreover, these actions, in turn affected students' perceptions of the campus climate and their relationships with agents and diverse peers.

Given the above sources of concern and evidence of misfit, the hypothesized measurement model above was rejected. Consistent with the exploratory nature of this study, model respecification was pursued. Details follow.

Evaluation of Fit for Respecified Model 1—Seven Factors/27 Indicators. The respecified model consisted of seven factors with 27 indicators, after the deletion of three items: academic validation from instructors, meetings with institutional agents, and transition assistance to college. The previous error covariance between academic validation from instructors and meetings with institutional agents was also removed. A total of 77 parameters were estimated, with a resulting 301 degrees of freedom. The ratio of parameters to be estimated to cases in the analysis was 27:1. Results of the confirmatory factor analysis revealed the respecified model was a poor fit to the data and should be rejected, bootstrap Bollen-Stine $\chi^2(378, N = 2,088) =$

1257.70, $p < .001$, $\chi^2/df = 4.18$, CFI = .95, SRMR = .04, RMSEA = .04 (90% CI = .037, .041).

While the CFI, SRMR and RMSEA values fell within acceptable thresholds, the significant bias-corrected χ^2 and the χ^2/df ratio values did not. The standardized residual covariance matrix showed several excessive values above 2.58 units among variables. Indicator M49 (*I often feel that I do not belong at this college*) shared 12 covariances with other items ranging from |2.64 – 6.55|. Additionally, there was evidence of cross-loadings with the institutional commitment to students factor (MI = 43.99; EPC = .15) and the social-academic integrative experiences factor (MI = 29.32; EPC = .16). Item M61 (part of the Mattering factor; *There are people at the college who are concerned about my future*) also showed evidence of a possible cross-load with the institutional commitment to students factor (MI = 49.82; EPC = .13). With respect to error covariances, the output showed a large covariance between the error terms for M59 (*Counselors at the college generally show their concern for students' well-being*) and M61 (*There are people at the college who are concerned about my future*) with a MI = 67.48 and EPC = .12. Item Q70 (interactions with diverse students as friendly/unfriendly) also appeared to cross-load with the perceptions of a hostile campus climate factor (MI = 52.42; EPC = -.27). Several of the MIs associated with the error term showed covariances with other items, thus suggesting the item should be removed. In light of these findings, the cross-loadings, and the apparent redundancy in the items, a second model respecification was carried out as noted below.

Evaluation of Fit for Respecified Model 2—Seven Factors/24 Indicators. The second respecification of the model consisted of seven factors with 24 indicators, after the deletion of three additional items: M49 (*I often feel that I do not belong at this college*); M61 (*There are people at the college who are concerned about my future*); and Q70 (interactions with diverse students as friendly/unfriendly), from the previous model. The error covariance between

interactions with diverse peers as friendly/unfriendly and Q82 (interactions with diverse students as available/unavailable) was also removed since Q70 was removed from the model. A total of 70 parameters were estimated, resulting in 230 degrees of freedom. The ratio of parameters to be estimated to cases in the analysis was 30:1.

Results of the respecified confirmatory factor analysis revealed the second respecification of the model resulted in improved fit. The goodness of fit measures for this model were: bootstrap Bollen-Stine $\chi^2(230, N = 2,088) = 804.56, p < .001, \chi^2/df = 3.50, CFI = .97, SRMR = .04, RMSEA = .04$ (90% CI = .032, .037). Based on the indices of fit criteria selected for this study, Respecified Model 2 met all but the non-significant χ^2 threshold. However, as has been discussed, a significant χ^2 may be due to the large sample size employed in this analysis. In reviewing the modification indices associated with regression weights and covariances, none “stood out” to signal a significant misspecification in the model. There were three sets of error covariances that could possibly have been freely estimated in the model (eH63-eS31; eM54-eS30; and eH55-eE128). The MI for these sets were MI = 23.34 (EPC = -.10), MI = 19.86 (= .07), and MI = 13.28 (EPC = .10), respectively. These values were not considered sufficiently large to justify the error covariances, despite the fact that an argument based on theoretical grounds could have been made.

In the interest of parsimony, Respecified Model 2 is presented as the model of best fit for the data in this study.

Research Question 1 Conclusion

In response to the research question proposed, the hypothesized measurement model depicted in Figure 3 did not fit the data adequately. Consistent with the research question, an alternate model of best fit (Respecified Model 2) is presented in its place. Figures 4 and 5

present standardized and non-standardized coefficients for the model. All regression weights (factor loadings) are statistically significant at $p < .001$. All correlations among the factors are statistically significant at $p < .001$, with the exception of perceptions of a hostile campus climate and engagement/involvement, which was not significant ($p = .06$). The error covariance between eS30 and eS32 was significant at $p < .05$. Table A-1 presents these coefficients in tabular form.

Table 16 below presents a summary of goodness-of-fit indices for the Hypothesized model, Respecified Model 1, and Respecified Model 2—model of best fit.

CFA Measurement Model for Respecified Model 2
 2 error covariances; del:AcadValidInst, InstAgents, Q126, M49, M61, Q70
 Standardized estimates
 Chi Sq =804.557 p=.000 Chi to df = 3.498; RMSEA=.035 RMR=.037 CFI=.966

Figure 4. Standardized coefficients for Respecified Model 2

CFA Measurement Model for Respecified Model 2
 2 error covariances; del:AcadValidInst, InstAgents, Q126, M49, M61, Q70
 Unstandardized estimates
 Chi Sq =804.557 p=.000 Chi to df = 3.498; RMSEA=.035 RMR=.037 CFI=.966

Figure 5. Unstandardized coefficients for Respecified Model 2

Table 16

*Summary of Goodness-of-Fit Indices for Alternate Models of the Conceptual Measurement**Model*

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 30 Items ^a	2516.26	381	6.60	.91	.06	.05 (90% CI = .050, .059)
(with covariances between: Q70-Q82; M30-M31; AcadValidInst-InstAgents)						
Respecified Model 1: 27 Items	1257.70	301	4.18	.95	.04	.04 (90% CI = .037, .041)
(Deleted: AcadValidInst, InstAgents, Q126)						
Respecified Model 2: 24 Items	804.56	230	3.50	.97	.04	.04 (90% CI = .032, .037)
(Deleted: M49, M61, Q70)						
Best-Fit Model						

^aOriginal items in CFA hypothesized model: **Institutional Commitment to Students Factor** (M59—*Counselors at the college generally show their concern for students' well-being*; M17—*My counselor is generally receptive to what I have to say*; M39—*If I had a personal problem, I believe that counselors would be willing to discuss it with me*; M07—*It is comforting to know that my contributions are valued by my instructors*; M38—*My instructors sometimes ignore my comments or questions*; and Q176—*I received all the assistance I needed to successfully transition and adjust to the college*); **Interactions with Diverse Peers Factor** (*The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as: friendly/unfriendly (Q70), close/distant (Q74), supportive/unsupportive (Q78), and available/unavailable (Q82)*). **Perceptions of a Hostile Campus Climate Factor** (M18—*I sometimes feel alone and isolated at the college because of my gender (reverse coded)*; M55—*I sometimes feel alone and isolated because of my race/ethnicity (reverse coded)*; M36neg—*I sometimes feel alone and isolated because of my sexual orientation (reverse coded)*; M63—*I sometimes feel alone and isolated because of my age (reverse coded)*). **Sense of Belonging Factor** (M31—*Sometimes I feel alone at the college*; M30—*Sometimes I feel that no one at the college notices me*; M56—*I often feel socially inadequate at school*; M08—*Sometimes I feel that I am not interesting to anyone at the college*; M32—*Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college*; M34—*I often feel isolated when involved in student activities*; M49—*I often feel that I do not belong at this college*). **Mattering Factor** (M48—*There are people on campus who are sad for me when I fail in something I set out to do*; M52—*Some people on campus are disappointed in me when I do not accomplish all I should*; M53—*People on campus are generally supportive of my individual needs*; M40—*People on campus seem happy about my accomplishments*; M62—I

sometimes feel pressured to do better because people at the college would be disappointed if I did not; M61—*There are people at the college who are concerned about my future*; M54—*There are people at the college who are genuinely interested in me as a person*; M26—*Other students are happy for me when I do well in exams or projects*). **Socio-Academic Integrative Experiences Factor** (AcadValidInst—academic validation from instructors; InsAvail—quality of student interactions and relationships with instructors as available/unavailable; InsSup—quality of student interactions and relationships with instructors as supportive/unsupportive; Q116—times meeting with instructors outside of class, Q115—times meeting with a counselor; Q128—hours spent per week studying; Q182—*I have experienced significant academic difficulties while attending college*; and Q173_9—Scholars Program (honors program) participant). **Engagement/Involvement Factor** (Q129—hours spent on campus activities; Q173_1—currently holding leadership role in the Associated Students organization or a club officer; Q134—hours per week spent volunteering; Q128—hours per week spent studying; and Q173_9—Scholars Program[honors] participation).

Research Question 1.1: Invariance Analysis of Measurement Model for Race/Ethnicity

Research Question 1.1 was concerned with the assessment of multiple group invariance of the respecified measurement model (Respecified Model 2) for race/ethnicity. Of particular import to this study was the invariance analysis for White, Latino, Asian, Black and American Indian/Alaskan Native students. However, the sample size for Black ($N = 104$) and American Indian/Alaskan Native ($N = 12$) students were relatively small to carry out confirmatory factor analyses of the groups to assess the adequacy of fit of the measurement model. Typically SEM requires a minimum 200 cases—more in cases of complex models and when multivariate non-normality may be of concern (Byrne, 2010; Kline, 2005).

The goal of this analysis was to determine (1) if the measurement model was invariant across groups, or (2) in the absence of invariance, to determine how the groups' configural and structural models might differ. As discussed by Byrne (2010), invariance analyses encompass the comparison of a baseline model with no constraints, against increasingly restrictive models to determine if they are significantly different (not invariant). The initial step establishes a baseline model against which other models will be compared—the configural model. Next, factorial measurement and structure of the model across groups is examined. Byrne further notes that the baseline and the more restrictive models may be compared by examining the difference in χ^2 ($\Delta\chi^2$), degrees of freedom, and the resulting p value. A statistically significant difference would indicate non-invariance in the model. However, the χ^2 approach to invariance testing has been judged as “too restrictive,” particularly since SEM studies only emulate “real life.” Methodologists have proposed that a change in the CFI value (ΔCFI) be examined instead of the $\Delta\chi^2$. A difference $> .01$ in the CFI value has been proposed as the cutoff by which to judge the presence of non-invariance (Byrne, 2010; Cheung & Rensvold, 2002).

Table 17

Goodness of Fit Measures for the Measurement Model (Respecified Measurement Model 2) by Race/Ethnicity

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Respecified Model 2: 24 Items (Deleted: M49, M61, Q70) Best-Fit Model	804.56	230	3.50	.97	.04	.04 (90% CI = .032, .037)
Race/Ethnicity Models:						
White ($N = 737$)	392.39	230	1.71	.97	.04	.03 (90% CI = .026, .036)
Latino/a ($N = 460$)	326.43	230	1.42	.97	.04	.03 (90% CI = .024, .036)
Asian ($N = 435$)	402.28	230	1.67	.95	.05	.04 (90% CI = .035, .048)
Black ($N = 104$)	316.77	230	1.38	.90	.07	.06 (90% CI = .043, .076)
Other ($N = 352$)	388.14	230	1.93	.95	.06	.04 (90% CI = .037, .052)

Consistent with SEM practices, and before the multiple group invariance analysis for race/ethnicity was carried out, the goodness of fit for Respecified Model 2 with 24 indicators distributed across seven factors was examined for each group. As noted in Table 17, Respecified Model 2 fit the data exceptionally well for White [$\chi^2(230, N = 737) = 392.39$, CFI = .97, SRMR = .04, RMSEA = .03 (90% CI = .026, .036)]; Latino/a [$\chi^2(230, N = 460) = 326.43$, CFI = .97, SRMR = .04, RMSEA = .03 (90% CI = .024, .036)]; and Asian students [$\chi^2(230, N = 435) = 402.28$, CFI = .95, SRMR = .05, RMSEA = .05 (90% CI = .035, .048)]. While not specifically, of interest to this study, the model was also of good fit for students of Other races/ethnicities

$[\chi^2(230, N = 352) = 388.14, CFI = .95, SRMR = .06, RMSEA = .04 (90\% CI = .037, .052)]$. As expected, the model was of poor fit for Black students $[\chi^2(230, N = 104) = 316.77, CFI = .90, SRMR = .07, RMSEA = .06 (90\% CI = .043, .076)]$. Given these findings, the multiple group invariance analyses followed.

Configural, Measurement, and Structural Invariance

For this particular study, the baseline model was specified for all groups at once with no constraints imposed. The resulting measures of fit were $\chi^2(690, N = 1632) = 1121.20, CFI = .967, SRMR = .04, RMSEA = .02 (90\% CI = .017, .022)$. Based on this information, the hypothesized multigroup model (Respecified Model 2 with 7 factors and 24 indicators) was characterized as exceptionally well fitting across groups.

The next step in the analysis entailed an evaluation of measurement invariance (factor loadings) of the model across groups. The resulting fit statistics once again reinforced the findings from the baseline model suggesting that factor loadings behaved similarly across groups, $\chi^2(724, N = 1632) = 1203.42, \Delta\chi^2 = 88.22, \Delta df = 34, CFI = .963, SRMR = .05, RMSEA = .02 (90\% CI = .018, .028)$. While the more stringent χ^2 difference test argued for a model that was non-invariant, the negligible change of .004 in the CFI value pointed to a model that was indeed invariant across groups (Table 18). Based on the ΔCFI criterion ($\Delta CFI = .004$) it was concluded the loadings were similar across groups.

In the next step of the analysis, the structural invariance of the model across groups was tested. Goodness-of-fit statistics showed evidence of a generally well-fitting model with respect to factor covariances across groups, $\chi^2(780, N = 1632) = 1333.13, \Delta\chi^2 = 211.94, \Delta df = 90, CFI = .958, SRMR = .07, RMSEA = .02 (90\% CI = .019, .023)$. The ΔCFI was .009, suggesting invariant covariance structures.

Table 18

Goodness-of-Fit Statistics for Tests of Multigroup (All Races) Invariance: Respecified Model 2

Model Description	Comparative Model	χ^2	df	$\Delta\chi^2$	Δdf	Sig.	CFI	ΔCFI
1. Configural model; no constraints imposed	-	1121.20	690	-	-	-	.967	-
2. Measurement Model (Model A). All factor loadings constrained equal.	2A v. 1	1203.42	724	34	82.22	< .001	.963	.004
3. Structural Model (Model 2A with covariances among all factors constrained equal).	3 v. 1	1333.13	780	90	211.94	< .001	.958	.009

Latent Means Analysis for Measurement Model

A latent means structure analysis was conducted to determine if the scores on the latent constructs of the measurement model (Respecified Model 2) significantly differed by race/ethnicity. White students were coded as the reference group for two of the analyses. Latino/as were also coded as the reference group for one analysis. Table 19 presents a summary of the findings. Notably, there were statistically significant differences in some of the factor means by race/ethnicity.

In comparison to White students, Latino/a students had higher latent means on the Institutional Commitment to Students and Interactions with Diverse Peers factors ($p < .01$). Asian students, also in comparison to White students had statistically significant higher means on

three factors—Hostile Campus Climate, Socio-academic Integrative Experiences, Engagement/Involvement—and lower means on Mattering and Sense of Belonging. Assessing differences between Latino/a (the reference group) and Asian students, Asians had higher means on Institutional Commitment to Students, Perceptions of a Hostile Campus Climate, and Engagement/Involvement; and lower means on Interactions with Diverse Peers, Socio-academic Integrative Experiences, and Sense of Belonging ($p < .01$).

Generally speaking, it was not unexpected that the latent means by race/ethnic groups would be different. While it is certainly possible that the meaning of the items in the questionnaire that students completed at the time of data collection might be interpreted differently, and that cultural factors might be at play (to a degree in their interpretation), it is plausible that the means reflect the actual experiences of students at the college.

Table 19

Latent Means Differences by Race/Ethnicity for Measurement Model (Respecified Model 2)

Factor	White Students as Reference Group		Latino/a Students as Reference Group
	Latino/a	Asian	Asian
Institutional Commitment to Students	0.227***	-0.085	-0.319***
Interactions with Diverse Peers	0.15**	-0.009	-0.162**
Perceptions of a Hostile Campus Climate	0.034	0.312***	0.26***
Socio-academic Integrative Experiences	-0.001	0.17***	-0.174**
Engagement/Involvement	-0.024	0.182***	0.167***
Perceptions of Mattering	-0.099	-0.103*	-0.008
Sense of Belonging	0.058	-0.209**	-0.28***

*** $p < .001$; ** $p < .01$; * $p < .05$ **Research Question 1.1 Conclusion**

In considering the invariance analysis findings above (summarized on Table 19), it appears that Respecified Measurement Model 2 is invariant across race/ethnic groups with respect to the configural, measurement, and structural models. In moving forward with the assessment of the full structural model implied in Figure 1 (the conceptual model), it appears that the hypothesized model was correctly conceptualized. Results also suggest the latent means for the seven factors in the measurement model do differ to some extent by race.

Research Question 2: The Structural Model

The focus of Research Question 2 was to assess the goodness-of-fit for a hypothesized structural model regressing intent to persist on student background characteristics, institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, socio-academic integrative experiences, and goal commitment (Figure 1). In the absence of a well-fitting model, the research question called for the respecification of the hypothesized model to produce a better-fitting model.

This research question follows a call by researchers to continue to test extant college student development and success theories and conceptual frameworks that dominate the higher education literature, and in particular, “to tease out the nuances of these concepts [i.e., involvement, engagement, integration, sense of belonging] in research related to student development and success” (Wolf-Wendel et al., 2009, p. 426).

Given that most theoretical models have been developed and empirically tested with four-year, White students, the present study offers advantages over existing frameworks in that it incorporates some of the “classic” student persistence and success theoretical tenets, while also expanding upon these with a community college population. The hypothesized structural model also integrates some of the newer concepts in the literature, such as sense of belonging (which has been researched primarily with minority, four-year student populations), and mattering/validation (which has also investigated racially\ethnically diverse college student populations at four-year and two-year institutions). This study employs a large dataset corresponding to a multiply diverse community college student sample. Details of the analysis of the structural model follow.

Assessment of the Structural Model for Intent to Persist

Model Specification. The hypothesized structural model for this study was specified in AMOS 21. It was based on the Conceptual Model illustrated in Figure 1. The model encompassed seven factors (institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, and socio-academic integrative experiences) with a total of 24 indicators distributed among the factors, five single variables serving as controls, and the outcome variable—intent to persist. The measurement aspect of the model was based on Respecified Model 2 (Figure 4). A graphical depiction of the hypothesized structural model as implemented in AMOS is shown in Figure 6, which hypothesized 36 regression paths (illustrated, along with residual error and covariances in the model). The key research questions guiding the analysis were: Does the hypothesized structural model adequately fit the observed data? If not, what respecified model results in improved model fit?

As with all previous analyses, maximum likelihood estimation with 2,000 bootstrap samples was used owing to the presence of multivariate non-normality. The bootstrap procedure produced the Bollen-Stine corrected χ^2 *p*-value to help assess model fit. The Bollen-Stine *p*-value was used, in lieu of the traditional ML χ^2 *p*-value, which is sensitive in the presence of multivariate non-normality and large sample sizes. Several indices of fit were also used to assess the overall goodness of fit for the model, including the χ^2/df ratio, CFI, SRMR, and RMSEA.

Model Identification. The goal of this step was to derive a model that was *over identified* to enable hypothesis testing. The number of parameters in the model to be estimated were 105, with 33 observed variables. Thus, the resulting degrees of freedom consisted of 456.

With respect to sample size and power, the ratio of cases to the number of parameters to be estimated was 20:1—twice the number recommended for SEM (Kline, 2005). As with the CFAs above, the first congeneric variable for each factor was set to a 1.0 loading and a zero loading on all other factors. Unlike the CFA, residual error terms were included in all endogenous variables.

Evaluation of Model Fit. Results of the SEM analysis for the hypothesized structural model showed it was of poor fit to the data and should be rejected, bootstrap Bollen-Stine $\chi^2(456, N = 2,088) = 2794.59, p < .001, \chi^2/df = 6.13, CFI = .88, SRMR = .10, RMSEA = .05$

Figure 6. Hypothesized structural model for intent to persist.

(90% CI = .048, .051). The only index of fit falling within the required thresholds was the RMSEA.

A review of the regression weights associated with paths among factors and control variables in the model revealed a few non-significant ($p < .05$) paths in the model, including: perceptions of a hostile campus climate to mattering; institutional commitment to students to engagement/involvement; engagement/involvement to sense of belonging; and engagement/involvement to socio-academic integrative experiences. Moreover, the following regression paths were also not significant: financial concerns to engagement/involvement; financial concerns to goal commitment; financial concerns to intent to persist; length of college attendance to sense of belonging; unit load to socio-academic integrative experiences; unit load to interactions with diverse peers; institutional commitment to students to goal commitment; and socio-academic integrative experiences to goal commitment.

The modification indices (MI) and the expected parameter (EPC) statistics also pointed to several sources of misfit. Based on the MI and EPC values, it appeared that adding several regression paths to model might result in improved fit. For example, the variable college transition support from family/friends shared large MIs/EPCs with several other variables: intent to persist (MI of 227.11; EPC = .456), perceptions of a hostile campus climate (MI = 74.71; EPC = -.16); institutional commitment to students (MI = 39.82, EPC = .20); and interactions with diverse peers (MI = 48.15, EPC = .13). Together, these MIs point out that families and friends play a significant role in the college student experience, particularly as students are faced with a college environment and experiences that challenge them academically, socially, and emotionally.

Consistent with theory and literature, several large MI/EPC statistics also supported the addition of paths for interactions with diverse peers and other variables: institutional commitment to students (MI = 195.30; EPC = .77) and socio-academic integrative experiences (MI = 130.57; EPC = .28). Another large MI encompassed institutional commitment to students to interactions with diverse peers (MI = 194.61; EPC = .22)—a reversed path from interactions with diverse peers to institutional commitment to students shown above. These MIs also suggest that diverse peer interactions may exercise a role in student's view of the institution and ultimately on their intent to persist.

Other MIs of interest were engagement/involvement to goal commitment (MI = 161.43; EPC = .62); GPA to goal commitment (MI = 58.74, EPC = .17); and gender to sense of belonging (MI = 23.40, EPC = -.22). The addition of these paths were also theoretically consistent.

With respect to cross-loading items, two large MIs/EPCs suggested that item Q70 (the characterization of student interactions with diverse peers as friendly/unfriendly—part of the interactions with diverse peers factor), and item M34 (*I often feel isolated when involved in student activities*—part of the sense of belonging factor), might also be tapping into aspects of the hostile campus climate factor (MI = 59.17, EPC = -.25; MI = 23.02, EPC = -.21, respectively). However, given the interest in preserving a simple structure to the degree possible, the deletion of these two items from further consideration in lieu of retaining them as cross-loading items was supported.

Lastly, the evaluation of error covariances among all variables revealed two covariances of interest given their large MI/EPC values: unit load with goal commitment (MI = 97.50, EPC = .95) and unit load with item Q128 (hours spent studying per week; MI = 19.67, EPC = .55). It is

certainly reasonable to conclude that as students set and commit to the pursuit of an educational goal, that they are likely to decide just how many units per semester they need to take in order to achieve said goal in the timeframe they specified. Similarly, the more units a student takes, the greater the time they are expected to, and more likely devote preparing for class, doing homework, researching, etc. Thus, the addition of these error covariances to a respecified model were favored.

Note should be taken that while two of the MIs above correspond to the same set of factors (interactions with diverse peers to institutional commitment to students and institutional commitment to students to interactions with diverse peers), the directionality implied by the MIs is different. Adding a path from interactions with diverse peers to institutional commitment to students would result in approximately a .77 path loading, whereas adding a path from institutional commitment to students to interactions with diverse peers would result in a smaller regression loading of approximately to .22. Given that the model is not strictly developmental in nature, it is certainly theoretically consistent to expect that positive interactions with students may exercise a positive effect on students' views of the institution and the commitment of these toward students; particularly, when colleges and universities make a concerted effort to establish programs and services that cater to the needs of, and promote interactions among diverse students (e.g., multicultural centers, affinity-based programs—Latino Center, African American Center—international student clubs, diversity workshops). Moreover, adding a regression path from interactions with diverse peers to institutional commitment to students is consistent with the Conceptual Model's second Proposition (p. 66):

To the degree that students perceive a high level of institutional commitment, and have positive relationships with racially/ethnically diverse peers characterized as close,

friendly, supportive, and available, their sense of belonging to the institution will be enhanced. Having hostile experiences with others at the institution owing to personal characteristics (i.e., gender, race/ethnicity, sexual orientation, age) that result in feelings of alienation will deleteriously affect sense of belonging. A positive sense of belonging has the potential to influence student intentions to persist.

Based on the evidence presented above, the structural model was judged of poor fit and rejected. Consistent with the research question, respecification of the model was pursued with the intent of deriving a model of best fit. This step was undertaken with the understanding that the evaluation of model fit was *post hoc* and exploratory. While statistical significance was desired, it was not the sole guiding factor in the respecification process. The addition of paths in the model needed to be consistent with theory (as elaborated above). Additionally, a parsimonious model was championed. Table 20 presents goodness-of-fit statistics for alternate models of the structural model for intent to persist.

Table 20

Summary of Goodness-of-Fit Indices for Alternate Models of the Structural Model for Intent to Persist

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	≤ 4.0	$\geq .95$	$\leq .10$	$\leq .06$
Hypothesized Model: 7 factors	2794.59	456	6.13	.88	.10	.05 (90% CI = .048, .051)
Respecified Structural Model 1: (Deleted: 12 regression paths and 2 cross-loading items. Added: 10 regression paths; 2 error covariances).	1393.89	395	3.53	.94	.06	.04 (90% CI = .033, .037)
Respecified Structural Model 2: (Deleted: 2 regression paths. Added: 3 regression paths).	1344.38	394	3.41	.95	.06	.03 (90% CI = .032, .036)
$\Delta\chi^2$ in Respecified Models = 49.51						
$\Delta df = 1$						
$p < .001$						

Respecification of Structural Model—Respecified Structural Model 1. Using findings from the evaluation of the hypothesized model, Respecified Structural Model 1 incorporated the deletion of 12 regression paths found not to be statistically significant in the evaluation of the hypothesized model. Two cross-loading items, M34 (*I often feel isolated when involved in student activities*) and Q70 (diverse peer interactions as friendly/unfriendly) were also omitted. Ten regression paths and two error covariances were added to the model. These revisions were based on the examination of MI and EPC parameters derived from covariance and regression paths in the hypothesized model. All changes are consistent with theory and the Conceptual Model Propositions.

The deleted paths included: perceptions of a hostile campus climate to mattering; institutional commitment to students to engagement/involvement; engagement/involvement to sense of belonging; engagement/involvement to socio-academic integrative experiences; financial concerns to engagement/involvement; financial concerns to goal commitment; financial concerns to intent to persist; length of college attendance to sense of belonging; unit load to socio-academic integrative experiences; unit load to interactions with diverse peers; institutional commitment to students to goal commitment; and socio-academic integrative experiences to goal commitment. The deletion of the three regression paths pertaining to financial concerns resulted in no paths remaining for this variable in the model. Rather than eliminating the variable from the model at this juncture, a new path from financial concerns to GPA was added based on a MI of 15.33 (EPC = -.07) found in the hypothesized structural model.

The other added paths were: from college transition support from family/friends to intent to persist, to perceptions of a hostile campus climate, to institutional commitment to students, and to interactions with diverse peers; interactions with diverse peers to institutional commitment

to students; interactions with diverse peers to socio-academic integrative experiences; engagement/involvement to goal commitment; GPA to goal commitment; and gender to sense of belonging; and financial concerns to GPA. Lastly, two error covariances were also specified between unit load and goal commitment and between unit load and Q128 (hours per week spent studying).

Respecified Structural Model 1—Model Identification. As with the hypothesized model, the respecified exploratory structural model on intent to persist was *over identified*. The number of parameters in the model to be estimated were 101, with 31 observed variables. Thus, the resulting degrees of freedom were 395. With respect to sample size and power, the ratio of cases to the number of parameters to be estimated was 20:1—twice the number recommended for SEM (Kline, 2005). As with the hypothesized structural model above, the first congeneric variable for each factor was set to a 1.0 loading and a zero loading on all other factors. No cross-loading items were permitted. Residual error terms were included in all endogenous variables, and two error covariances were added between unit load and goal commitment and between unit load and Q128 (hours per week spent studying).

Evaluation of Model Fit—Respecified Structural Model 1. The resulting respecified model showed evidence of improved fit, in comparison to the hypothesized model, bootstrap Bollen-Stine $\chi^2(395, N = 2,088) = 1393.89, p < .001, \chi^2/df = 3.53, CFI = .944, SRMR = .06, RMSEA = .04$ (90% CI = .033, .037). As can be observed in Table 20, the χ^2 value, while still significant, dropped by nearly 50% and the CFI nearly reached the cutoff of .95. The χ^2/df ratio, the SRMR, and the RMSEA also showed evidence of a good model with all values reaching the desired levels.

The regression weights associated with paths among factors and control variables in the model were nearly all statistically significant (most at $p < .001$). However, a few paths ceased being significant: college transition support from family/friends to mattering ($p = .16$); sense of belonging to GPA ($p = .06$); sense of belonging to intent to persist ($p = .09$); and institutional commitment to students to intent to persist ($p = .13$). The regression modification indices suggested three additional paths should be incorporated into the model: gender to interactions with diverse peers (MI = 15.44, EPC = .16); length of college attendance to engagement/involvement (MI = 28.16, EPC = .06); and perceptions of a hostile campus climate to goal commitment (MI = 8.44, EPC = -.14). While the output suggested that adding some error covariances to the model, these would not likely result in a vastly improved model, but would no doubt result in a much more complex model. Hence, error variances were not considered.

In considering the next steps to improve model fit, there was an interest in maintaining a model with a simple structure—if feasible—while also anticipating how the model might generalize to different student populations (i.e., racial/ethnic minorities). The addition of the three paths suggested above by the MIs/EPCs would also help explain the experiences of college students with respect to their intent to persist in a more nuanced manner. The decision to delete two paths from college transition support from family/friends to mattering and institutional commitment to students to intent to persist was favored primarily because of the large p -value (.16 in both cases), and a belief that the path was not likely to differ significantly from one racial/ethnic group to another once an invariance analysis was conducted. However, the deletion of the two other paths from sense of belonging to GPA and sense of belonging to intent to persist was rejected on theoretical grounds. Specifically, a growing body of literature on sense of belonging suggests that college students of different racial/ethnic backgrounds do experience

college climates differently and are impacted by these differently (Freeman et al., 2007; Hausmann et al., 2007; Hoffman et al., 2002; Hurtado & Carter, 1997; Locks et al., 2008; Nuñez, 2009; Saenz, Ngai, & Hurtado, 2007; Strayhorn, 2008; Tovar & Simon, 2010). Given the p -values of $< .10$ for both of these paths, it was anticipated these regression paths would achieve statistical significance for some student groups.

Given the findings above, respecification of the model was sought a second time.

Respecified Structural Model 2—Model Identification. The second respecification of the structural model implemented the addition of three regression paths: gender to interactions with diverse peers; length of college attendance to engagement/involvement; and perceptions of a hostile campus climate to goal commitment. Two regression paths were also deleted: college transition support from family/friends to mattering and institutional commitment to students to intent to persist. After executing these changes, the respecified model on intent to persist was *over identified*. The number of parameters in the model to be estimated were 102, with 31 observed variables. Thus, the resulting degrees of freedom were 394. The ratio of cases to the number of parameters to be estimated was 20:1. As with the previous models, the first congeneric variable for each factor was set to a 1.0 loading and a zero loading on all other factors. No cross-loading items were permitted. Residual error terms were included in all endogenous variables, and three error covariances remained between M30 (*Sometimes I feel that no one at the college notices me*) and M32 (*Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college*); unit load and goal commitment; and unit load and Q128 (hours spent per week studying).

Evaluation of Model Fit—Respecified Structural Model 2. The resulting nested respecified model showed evidence of increased fit, in comparison to the previous model, $\Delta\chi^2_{(1)}$

= 49.51, $p < .001$. The resulting fit indices for the model were: bootstrap Bollen-Stine $\chi^2(394, N = 2,088) = 1344.38$, $p < .001$, $\chi^2/df = 3.41$, CFI = .95, SRMR = .06, RMSEA = .03 (90% CI = .032, .036). As can be observed in Table 20, the χ^2 value while still significant, dropped by an additional 50 units, the χ^2/df ratio, SRMR, CFI, and RMSEA all showed evidence of a good fitting model. Figures 7 and 8 present standardized and unstandardized estimates for the path loadings in the model, respectively. All parameters were significant at $p < .001$, except for the path loadings from gender to mattering ($p < .05$); institutional commitment to students to perceptions of a hostile campus climate ($p < .01$); sense of belonging to GPA ($p < .05$); GPA to goal commitment ($p < .01$); perceptions of a hostile campus climate to goal commitment ($p < .01$); sense of belonging to intent to persist ($p = .06$); GPA to intent to persist ($p < .01$); socio-academic integrative experiences to intent to persist ($p < .01$). Tables A-2 through A-6 (in Appendix A) provide the full complement of parameter estimates in standardized and unstandardized form, including the squared multiple correlations.

Research Question 2 Conclusion—The Structural Model of Best Fit

Respecified Structural Model 2 is presented as the model of best fit to the data. Comparing the hypothesized model to the accepted best-fitting model, the following conclusions are drawn:

- 1) 14 of the original 36 hypothesized causal paths in the model were removed owing to non-significant regression weights. The most significant path deletions from a theoretical standpoint were: engagement/involvement to socio-academic integrative experiences, institutional commitment to students to goal commitment, and socio-academic integrative experiences to goal commitment. The significance of these deletions will be explored in Chapter 5.

- 2) Two items, M34 (*I often feel isolated when involved in student activities*) and Q70 (interactions with diverse peers as friendly/unfriendly) were deleted from the model given they cross-loaded on two factors each.
- 3) 13 regression paths not specified *a priori* were added to the model, all theoretically justified and proven to better account for the inter-relationships among latent variables with the outcome variable—intent to persist.
- 4) Two error covariances were added between two single-indicator items (unit load and goal commitment; and unit load and Q128—hours spent per week studying). The original error covariance for M30 (*Sometimes I feel that no one at the college notices me*) and M32 (*Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college*) remained in the model.

Figure 7. Standardized coefficients for Respecified Structural Model 2 on intent to persist:

Model of best fit.

Figure 8. Unstandardized coefficients for Respecified Structural Model 2 on intent to persist:

Model of best fit.

Research Question 2.1: Invariance Analysis of the Structural Model for Race/Ethnicity

Research Question 2.1 was concerned with the assessment of multiple group invariance of the respecified structural model (Respecified Structural Model 2) for race/ethnicity, particularly as it applied to structural regression (causal) paths. The causal structure implies that student background characteristics, institutional commitment, interactions with diverse peers, perceptions of a hostile campus climate, sense of belonging, mattering, engagement/involvement, socio-academic integrative experiences, and goal commitment exert an effect on community college students' intent to persist.

The cornerstone of the analysis focused on the equivalence of the model across racial/ethnic groups. To the degree that the causal model was not invariant, it was deemed a central question in the study. Hence, the goal was not to explicitly derive a model that was completely race/ethnicity invariant. It was believed that any differences in regression causal paths would be indicative of the unique set of experiences associated with any given racial/ethnic group. Of particular import to this study was the invariance analysis for White (the reference group), Latino, Asian, Black and American Indian/Alaskan Native students. However, the sample sizes for Black ($N = 104$) and American Indian/Alaskan Native ($N = 12$) students were exceptionally small for a causal model as complex as the one in question, as specified in Figure 7. While the students of "other" race/ethnicities participated in the study, they do not form part of the invariance analysis since their racial/ethnic background is unknown.

As discussed by Byrne (2010), invariance analyses encompass the comparison of a baseline model with no constraints, against increasingly restrictive models to determine if they are significantly different (not invariant). The initial step establishes a baseline model against which other models are compared—the configural model. Next, factorial measurement and the

structure of the model across groups is examined. Byrne further notes that the baseline and the more restrictive models may be compared by examining the differences in χ^2 ($\Delta\chi^2$), degrees of freedom, and the resulting p value. A statistically significant difference indicates non-invariance in the model. However, the χ^2 approach to invariance testing has been judged “too restrictive.” Instead, it is recommended that changes in the CFI value (ΔCFI) be examined. A difference $> .01$ in the CFI value has been proposed as the cutoff by which to judge the presence of non-invariance (Byrne, 2010; Cheung & Rensvold, 2002).

Configural, Measurement, and Structural Invariance

Model Fitness by Race/Ethnicity. As recommended by Byrne (2010), fitness of the proposed causal model should be tested for each group separately before establishing a baseline model with no constraints. As seen in Table 21, Respecified Structural Model 2—the model of best fit—adequately fit the data for all student groups, except for Black students as expected. Indices of fit indicated the model had exceptional fit for White [$\chi^2(394, N = 737) = 699.88$, CFI = .95, SRMR = .07, RMSEA = .03 (90% CI = .029, .036)] and Latino/a students [$\chi^2(394, N = 460) = 557.31$, CFI = .96, SRMR = .07, RMSEA = .03 (90% CI = .024, .036)]. The model showed evidence of misfit for Asian [$\chi^2(394, N = 737) = 660.44$, CFI = .93, SRMR = .09, RMSEA = .04 (90% CI = .034, .045)] and Other [$\chi^2(394, N = 352) = 602.36$, CFI = .93, SRMR = .08, RMSEA = .04 (90% CI = .033, .045)]. The CFI value for Asian and Other students fell just below the desired level of .95. With respect to Black students, the model clearly showed a lack of fit [$\chi^2(394, N = 104) = 575.22$, CFI = .82, SRMR = .17, RMSEA = .07 (90% CI = .055, .078)]. However, as stated previously, the sample size was considerably small ($N = 104$) and a much larger sample size was required to assess the adequacy of fit. Given the small sample size, no

further analyses pertaining to the equivalency of the structural model were conducted for Black students.

In reviewing some of the potential sources of misfit in the model corresponding to each racial/ethnic group, the following observations were noted:

White students. Twelve non-significant regression causal paths were found: college transition support from family/friends to institutional commitment to students, gender to mattering, gender to sense of belonging, institutional commitment to students to perceptions of a hostile campus climate, institutional commitment to students to sense of belonging, sense of belonging to GPA, sense of belonging to intent to persist, perceptions of a hostile campus climate to goal commitment, financial concerns to GPA, GPA to goal commitment, socio-academic integrative experiences to intent to persist, and goal commitment to intent to persist. Additionally, modification indices and the expected parameter change statistic suggested that adding a path from gender to GPA might improve the model slightly.

Latino/a students. Twelve non-significant regression causal paths were found: engagement/involvement to intent to persist, gender to interactions with diverse peers, gender to mattering, gender to sense of belonging, GPA to goal commitment, GPA to intent to persist, institutional commitment to students to sense of belonging, socio-academic integrative experiences to intent to persist, interactions with diverse peers to perceptions of a hostile campus climate, length of attendance to intent to persist, sense of belonging to GPA, and sense of belonging to intent to persist. Additionally, MI and EPC statistics suggested that adding a path from financial concerns to sense of belonging might improve the model slightly.

Asian students. Seven non-significant regression causal paths were found: engagement/involvement to intent to persist; financial concerns to GPA, length of attendance to

intent to persist, mattering to socio-academic integrative experiences; sense of belonging to GPA, sense of belonging to intent to persist, and college transition support from family/friends to socio-academic integrative experiences. MI and EPC statistics suggested that adding a path from unit load to GPA might improve model fit.

Summary of observed differences for all groups. Based on the above, Latino students shared seven non-significant paths with White students (gender to mattering, gender to sense of belonging, GPA to goal commitment, institutional commitment to students to sense of belonging, socio-academic integrative experiences to intent to persist, sense of belonging to GPA, and sense of belonging to intent to persist); four non-significant paths with Asian students (financial concerns to GPA, sense of belonging to GPA, sense of belonging to intent to persist, and college transition support from family/friends to socio-academic integrative experiences). Asian and Latino students shared four non-significant paths (engagement/involvement to intent to persist, length of attendance to intent to persist, sense of belonging to GPA, and sense of belonging to intent to persist); and White students did not share three non-significant paths with either Latino/a and Asian students (goal commitment to intent to persist, perceptions of a hostile campus climate to goal commitment, and institutional commitment to students to perceptions of a hostile campus climate).

In considering the above findings, it is important to point out that the removal of non-significant paths from Respecified Model 2 for some of the racial/ethnic groups above would result in the removal of complete factors from the model. However, given that the goodness of fit for the model is exceptional to adequate, there seems to be little incentive to do so. Additionally, their removal would result in a different model not consistent with the Conceptual Model. After all, the purpose of the present study was to assess how the constructs collectively

interact to impact community college students' intent to persist. Lastly, while parsimony in the model was sought, over-fitting it was also a concern.

Following these preliminary analyses for the assessment of fit for each racial/ethnic group, multiple group invariance analyses continued as elaborated below.

Table 21

Summary of Goodness-of-Fit Indices for the Structural Mode/ (Respecified Structural Model 2) by Race/Ethnicity

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	< 4.0	> .95	< .10	< .06
Model of Best Fit:	1344.38	394	3.41	.95	.06	.03 (90% CI = .032, .036)
Respecified Structural Model 2						
Race/Ethnicity Models:						
White ($N = 737$)	699.88	394	1.78	.95	.07	.03 (90% CI = .029, .036)
White ($N = 737$) ^a	706.18	394	1.79	.95	.07	.03 (90% CI = .029, .037)
Latino/a ($N = 460$)	557.31	394	1.41	.96	.07	.03 (90% CI = .024, .036)
Asian ($N = 435$)	660.44	394	1.67	.93	.09	.04 (90% CI = .034, .045)
Black ($N = 104$)	575.22	394	1.46	.82	.17	.07 (90% CI = .055, .078)
Other ($N = 352$)	602.36	394	1.53	.93	.08	.04 (90% CI = .033, .045)

^aAfter the removal of a non-significant error covariance found for items M30-M32 in the invariance analysis for the measurement model in Research question 2.1.

The Baseline Model. The baseline model with no constraints imposed in Respecified Model 2 resulted in $\chi^2(1182, N = 1632) = 1917.78$, CFI = .948, SRMR = .08, RMSEA = .02 (90% CI = .018, .021). Based on this information, the baseline multigroup model (Respecified Structural Model 2) was characterized as well-fitting across groups. Consistent with invariance procedures, this baseline model was used to compare differences in the next set of models.

Measurement Invariance for Causal Structure. The next step in the analysis entailed an evaluation of measurement invariance of the model across the three groups (White, Latino/a, and Asian students). Factor loadings for the indicator variables were set equal across groups. The resulting fit statistics were $\chi^2(1228, N = 1632) = 2028.22$, CFI = .943, SRMR = .08, RMSEA = .02 (90% CI = .018, .022). While the more stringent χ^2 difference test argued that factor loadings differed across groups, the negligible change of .005 in the CFI value pointed to a model that was indeed invariant across groups. As may be observed in Figures 9, 10, and 11, the standardized regression loadings for White, Latino/a, and Asian students did not differ significantly overall, according to the Δ CFI criterion. However, comparing individual paths, the magnitude of the loadings appear to differ somewhat in some instances. For example, the magnitude of the path loadings from college transition support from family/friends for Latino/a students to institutional commitment to students and interactions with diverse peers, were three times as large as those for White students (albeit, they were still considered small). Notably, the path between financial concerns to GPA was negative and significant for Latino students, but not for White students; suggesting that financial concerns have a deleterious effect for Latino students, but are of no consequence for White students as a group. The magnitude of the loading between engagement/involvement and intent to persist was nearly three times as large for White students than for Latino/as, suggesting this construct may be of greater importance for White

students than for Latino/as. With respect to differences between White and Asian students, the magnitude of path loadings generally favored Asian students; although, the path from perceptions of a hostile campus climate to goal commitment was significantly higher, but negative for Asian students.

Structural Invariance for Causal Structure Model. A summary of the invariance analysis conducted is presented on Table 22. In an effort to expedite the invariance analysis, the parameters for the three groups were initially constraint equal. The configural and measurement models, however, suggested some parameters might not be equivalent across the three groups (Model 2A and 3A as noted on Table 22). The corresponding CFI values were .943 and .940. In contrast, the CFI value for the unconstrained base model was .948. While the CFI values approximated each other, the analysis was taken a step further by examining differences between White and Latino/a students and between White and Asian students.

Goodness-of-fit statistics showed that the measurement model, the structural regression paths model, and the structural covariances model was invariant for White and Latino students. The resulting CFI values for each model were .953, .952, and .949, respectively. The corresponding CFI value for the unconstrained baseline model was .954.

Moving forward to the equivalence of models between White and Asian students, the baseline model's CFI value was .944. By comparison, the measurement model setting all factor loadings equal, resulted in a CFI value of .938. While the Δ CFI was .006, below the .01 cutoff recommended (Byrne, 2010)—suggesting a good model—but out of abundance for caution, a series of models constraining equal one factor loading at a time were run. The end result for these models was the need to freely estimate eight loadings. The CFI value for the measurement model with eight loadings freely estimated was .942, or a Δ CFI was .002. Examining the content

of these items, three “favored” White students, and five, Asian students. Those for White students were M30 (reversed: *Sometimes I feel no one at the college notices me*), Q173_9 (Scholars Program participation), and InsSup (quality of interaction with instructor as available to student). Items “favoring” Asian students included M36 (isolation and loneliness owing to sexual orientation), M18 (isolation and loneliness owing to gender), M39 (counselors willingness to assist with personal problem), Q173_1 (has held a leadership role in Associated Students or campus club), and Q134 (hours spent per week volunteering). Taken together, it would appear that some indicators in the measurement model are indeed sensitive to the campus climate experiences for Asian students, in particular. These findings are consistent with the univariate analyses reported at the beginning of Chapter 4.

Following the above analysis for the measurement model (with some constraints imposed), a review of the structural regression paths was undertaken. Goodness-of-fit statistics showed the regression paths model and the structural covariances model were invariant for White and Asian students (summarized on Table 22). The CFI values for both models were .939 (Δ CFI was .005).

Research Question 2.1 Conclusion

The collective findings of the invariance studies conducted suggest that the configural, measurement, and structural models for Respecified Structural Model 2 are fully invariant for White and Latino/a students. Partial invariance (Dimitrov, 2010) was found for the measurement model between White and Asian students, albeit their configural and structural models were equivalent. All in all, it appears that Respecified Structural Model 2 is operating equally across groups and thus, the direct, indirect, and total effects for the model may be examined and compared across groups (examined in Research Question 3 below).

Table 22

*Summary of Goodness-of-Fit Indices for Race/Ethnicity Structural Invariance Analysis**(Respecified Structural Model 2)*

Model Description	Comparative Model	Goodness-of-Fit Measures						
		χ^2	df	$\Delta\chi^2$	Δdf	Sig.	CFI	ΔCFI
1. Configural baseline model; no constraints imposed (Model 1)	–	1917.78	1182	–	–	–	.948	–
2. Measurement Model (Model 2A) All factor loadings constrained equal.	2A v. 1	2028.22	1228	110.44	46	< .001	.943	.005
3. Structural Model (Model 3A) factor loadings constrained equal; structural regression paths set equal (All Groups)	3 v. 1	2126.88	1284	209.10	102	< .001	.940	.008
White – Latino/a Comparisons								
WL0. White-Latinos unconstrained	–	1257.24	788	–	–	< .001	.954	–
WL1. Measurement Model	WL0	1293.25	811	36.01	23	.04	.953	.001
WL2. Structural regression path Model	WL0	1329.85	839	72.61	51	.025	.952	.002
WL3. Structural covariances	WL0	1371.17	855	113.93	67	<.001	.949	.004
White – Asian Comparisons								
WA0. White-Asian unconstrained	–	1360.46	788	–	–	< .001	.944	–
WA1. Measurement Model	WA0	1441.76	811	81.33	23	<.001	.938	.006

Model Description	Comparative Model	Goodness-of-Fit Measures						
		χ^2	df	$\Delta\chi^2$	Δdf	Sig.	CFI	ΔCFI
All factor loadings equal								
WA2. Measurement Model with M36, M18,M39, M48, Q173_9, Q173_1, Q134, InsSup, M30 freely estimated.	WA0	1392.23	796	31.77	8	<.001	.942	.002
WA3. Structural Regression Paths	WA0	1450.39	824	89.23	36	<.001	.939	.005
WA4. Structural Covariances	WA0	1462.8	836	102.41	48	<.001	.939	.005

Figure 9. Standardized coefficients for Respecified Structural Model 2 (Model of best fit) on intent to persist: White students ($n = 737$).

Figure 10. Standardized coefficients for Respecified Structural Model 2 (Model of best fit) on intent to persist: Latino/a students ($n = 460$).

Research Question 3: The Effects of Directional Hypotheses on Intent to Persist

Direct, Indirect & Total Effects for Structural Model

Research Question 3 outlined five directional hypotheses that examined the effects of institutional commitment to students, interactions with diverse peers, perceptions of a hostile campus climate, mattering, sense of belonging, engagement/involvement, socio-academic integrative experiences, and goal commitment on community college students' intent to persist. The hypotheses collectively proposed expected relationships among the constructs—positive or negative (Figure 2). While the five directional hypotheses were exclusively based on the factors above, other student background characteristics (i.e., units enrolled, transition support from family/friends, financial concerns, gender, length of attendance, GPA) formed part of the model tested, and their effect will be reported as well—and in context with the former.

The analysis for Research Question 3 entailed an examination of the direct, indirect, and total effects of constructs in the structural model (Respecified Structural Model 2) on intent to persist. Since Respecified Structural Model 2 was found to be invariant (or partially invariant) across three racial/ethnic groups, findings could be reported based on the analysis of a single model that includes all students in the sample. However, much would be lost in doing this since the structural model accounts for a different proportion of the variance by race/ethnicity; and despite the overall finding that the model was invariant, such analyses did not point to a perfectly and completely equivalent structural model. Therefore, findings will be reported for the entire group of students (White, Latino/a, Asian, Black, Other; referred to as ALL hereafter), as well as for White, Latino/a, and Asian students separately. Tables 23, 24, and 25 present summaries of the direct, indirect, and total effects of Conceptual Model components by race/ethnic group.

While many are the findings associated with the direct, indirect and total effects in the model, I will initially discuss findings pertaining to the five directional hypotheses described in Chapter 3. Following this, additional effects for each of the seven factors and three endogenous variables (GPA, goal commitment, and intent to persist) will also be discussed—albeit this is an ancillary presentation of findings.

Findings for Hypothesis 1

Hypothesis 1 contended that institutional commitment to students would exert a positive and direct effect on sense of belonging, mattering, engagement/involvement, goal commitment, and intent to persist. As noted in Figure 12, two of the five hypothesized paths from the Conceptual Model involving Hypothesis 1 were confirmed or partially confirmed (institutional commitment to students to mattering and institutional commitment to students to sense of belonging). The other three paths (from institutional commitment to students to engagement/involvement, to goal commitment, and to intent to persist) did not obtain a statistically significant loading ($p < .05$) and were deleted from the model. The path from institutional commitment to students to mattering was significant and positive (as hypothesized) for all students as a group (.43, $p < .001$), White (.40, $p < .001$), Latino/a (.57, $p < .001$), and Asian students (.40, $p < .001$). The path from institutional commitment to students to sense of belonging was only significant for ALL (-.10, $p < .001$), albeit in the opposite direction than hypothesized.

As noted in the Research Question 2 section, Respecified Structural Model 2—the Conceptual Model—called for the addition of several structural paths, two of which directly impacted Hypothesis 1. The two added paths were institutional commitment to students to perceptions of a hostile campus climate, which was significant for ALL students only (-.10, $p < .001$). The second added path, institutional commitment to students to socio-academic

integrative experiences attained statistical significance across groups (ALL = .20, $p < .001$; White = .15, $p < .001$; Latino/a = .24, $p < .001$; and Asian = .18, $p < .01$). Thus, Hypothesis 1 was partially supported.

Based on these findings, it appears that institutional commitment to students has a greater and direct impact on issues pertaining to the campus climate and to relationships with institutional agents. Given that three paths were removed from the model, it appears that institutional commitment to students has very little or no impact on student's intentions or commitments (goals and persistence), or ability to readily partake in curricular or co-curricular activities designed to engage them at the college. Notice should be taken that a perceived lack of commitment to students from the institution, appears to influence students' views of a hostile campus climate and to decreased levels of sense of belonging. Counteracting these negative findings is the fact that institutional commitment to students exerts a high level of influence on students' perceptions of mattering to the college. This is true for all races/ethnicities, but it is especially influential with Latino/a's sense of mattering. Feelings of mattering to the institution are developed by students when they are genuinely noticed by instructors/counselor/administrators; when they feel supported/understood by them; or when others praise them for their accomplishments or take notice of their failures—while still expressing support (Dixon-Rayle & Chung, 2007; France, 2011; Rosenberg & McCullough, 1981; Schlossberg, 1989; Schlossberg et al., 1989; Tovar & Simon, 2010; Tovar et al., 2008; Tovar et al., 2009).

Figure 12. Hypothesis 1: Hypothesized, deleted, and confirmed paths in model.

Findings for Hypothesis 2

Based on Figure 2, Hypothesis 2 pronounced that institutional commitment to students and interactions with racially/ethnically diverse peers would positively impact their sense of belonging to the institution. By contrast, perceptions of a hostile campus climate would negatively influence sense of belonging. Moreover, it noted that sense of belonging would exert a direct and positive effect on intent to persist. As illustrated on Figure 13, the paths corresponding to the three factors in question (institutional commitment to students, interactions with diverse peers, and perceptions of a hostile campus climate), did exercise a direct effect on sense of belonging, albeit to a different degree. As has been previously noted, institutional commitment to students had a small and negative effect on sense of belonging for ALL students as a group ($-.10, p < .001$), but a non-significant effect on the individual racial/ethnic groups. Interactions with diverse peers also had a small and positive effect on sense of belonging for all groups (ALL = $.14, p < .001$; White = $.15, p < .01$, Asian = $.14, p < .001$), except Latino/s ($.12, n.s$). Finally, the hypothesized path from perceptions of a hostile campus climate to sense of belonging was highly significant and negative (as expected) for all student groups, and the magnitude of the coefficients can be characterized as large (ALL = $-.50, p < .001$; White = $-.43, p < .01$; Latino /a = $-.44$; Asian = $-.53, p < .001$). Despite these three significant paths leading to sense of belonging, the direct path from belonging to intent to persist was not statistically significant for any racial/ethnic group. Thus, Hypothesis 2 was partially supported.

As may also be observed on Figure 13, two additional paths also led directly to sense of belonging: mattering to sense of belonging and gender to sense of belonging. The mattering to belonging path, while not incorporated into Hypothesis 2, had been diagrammed into the Conceptual Model and its effects were analyzed in the full structural model. The path coefficients were significant, positive, and large in magnitude for all student groups (ALL = $.40$,

$p < .001$; White = .41, $p < .01$; Latino/a = .52; Asian = .36, $p < .001$). This clearly is a good addition to Hypothesis 2. This effect had been observed in two previous studies published by the author of this study while assessing the factorial validity of the *College Mattering Inventory* and the *Sense of Belonging Scales* (Tovar & Simon, 2010; Tovar et al., 2009). The final addition to the path structure corresponding to Hypothesis 2 was gender to sense of belonging. Albeit, this negative path was significant only for ALL students as a group ($-.10$, $p < .001$), but not for any of the individual racial/ethnic groups. Given the negative loading, it appears that men have a lower sense of mattering to the institution, in comparison to female students.

Figure 13. Hypothesis 2: Hypothesized, deleted, and confirmed paths in model.

Findings for Hypothesis 3

This hypothesis established that institutional commitment to students and interactions with racially/ethnically diverse peers would positively impact students' perceptions of mattering to the institution. By contrast, perceptions of a hostile campus climate would negatively impact mattering. Mattering, in turn would exert a direct positive effect on sense of belonging, engagement/involvement and socio-academic integrative experiences, and an indirect effect on intent to persist through sense of belonging, engagement/involvement and socio-academic integrative experiences.

As noted in Figure 14, seven of the nine hypothesized paths were confirmed (or partially supported) in the model (institutional commitment to students to mattering; interactions with diverse peers to mattering; mattering to socio-academic integrative experiences; mattering to engagement/involvement; mattering to sense of belonging; socio-academic integrative experiences to intent to persist; and engagement/involvement to intent to persist). An additional path was not supported (sense of belonging to intent to persist), albeit it was retained in the model since it was an integral part of the Conceptual Model and at the time this decision was made, it was expected that a statistically significant path would be found for some student groups. However, this expectation was not met. Lastly, one path was not supported in the SEM analysis and was removed from the model entirely (perceptions of a hostile campus climate to mattering).

Figure 14. Hypothesis 3: Hypothesized, deleted, and confirmed paths in model.

Examining the magnitude and direction of the path coefficients for institutional commitment to students and interactions with diverse peers, both leading to mattering, it is clear these factors greatly influence community college students' perceptions of mattering to the institution, regardless of their race/ethnicity. With respect to some ethnic differences in the model, institutional commitment to students seems to have a much higher impact on Latino/a students than on any other group (loading = .57, $p < .001$). While still statistically significant at $p < .001$, the path loading from interactions with diverse peers to mattering was the lowest among the groups. It appears that institutional actions exert a higher degree of influence on perceptions of mattering for Latino/a students than do interactions with diverse peers. These two constructs seem to impact all other students approximately equally.

As was discussed previously, mattering influences student perceptions of belonging at the college to a statistically significant degree for all students, but as seen in Figure 14, this is especially true for Latino/as (loading = .52, $p < .001$), and less so for Asian students (loading =

.36, $p < .01$). Similarly, and given the magnitude of the path loading, mattering also influences quite significantly Latino/as' decisions/ability to engage in educationally purposeful activities, but less so for Asians (.46, $p < .001$; .22, $p < .01$, respectively). The impact of mattering on engagement/involvement was also high for White and ALL students.

Just as mattering had a significant influence on engagement/involvement, it also exhibited a statistically significant relationship to students' socio-academic integrative experiences for all racial/ethnic groups. However, this was particularly true for White students (.27, $p < .001$). Mattering appears to influence socio-academic integrative experiences to a lesser degree on Latino/as (.16, $p < .05$).

Of the three factors in the model directly predicting intent to persist, engagement/involvement had a particular influence for ALL students collectively, and White students, in particular. No statistically significant path from engagement/involvement to intent to persist was found from Asian or Latino/as. Lastly, the role of socio-academic integrative experiences on intent to persist was particularly important for Asian students (.10, $p < .05$) and ALL students as a group (.07, $p < .01$). socio-academic integrative experiences did not exert a statistically significant impact of intent to persist for White and Latino/a students.

Taking all of these findings as a group, the conclusion is that Hypothesis 3 was “mostly” correct in asserting the inter-relationship among the constructs with mattering as the moderator and mediator for group differences in student experiences with sense of belonging, engagement/involvement, socio-academic integrative experiences, and ultimately intent to persist. Recontextualizing the hypothesis, one may conclude that institutional commitment to students and interactions with racially/ethnically diverse peers positively impacts students' perceptions of mattering to the institution. Mattering, in turn exerts a direct and positive effect

on sense of belonging, engagement/involvement and socio-academic integrative experiences, and an indirect effect on intent to persist through sense of belonging, engagement/involvement and socio-academic integrative experiences. Albeit, how influential each of these factors is in ultimately predicting intent to persist is subject to the unique experiences of racial and ethnic groups.

Findings for Hypothesis 4

Hypothesis 4 predicted that institutional commitment to students and perceptions of mattering to the college would positively impact students' engagement/involvement. Moreover, it asserted engagement/involvement would exert a positive and direct effect on sense of belonging, socio-academic integrative experiences, and on intent to persist. In turn, engagement/involvement would exert an indirect effect on persistence through socio-academic integrative experiences and goal commitment. These hypothesized relationships are depicted in Figure 15. As may be noted, four of the nine hypothesized paths were confirmed in the model (mattering to engagement/involvement; engagement/involvement to intent to persist; socio-academic integrative experiences to intent to persist; and goal commitment to intent to persist). Four paths were removed owing to a lack of a relationship with a target variable (institutional commitment to students to engagement/involvement; engagement/involvement to sense of belonging; socio-academic integrative experiences to goal commitment; and engagement/involvement to socio-academic integrative experiences). Another such path was kept in the model, although its path loadings were not statistically significant (sense of belonging to intent to persist). As reported above, it was believed that sense of belonging would directly impact intent to persist beliefs of students. Additionally, after a full analysis and respecification of the structural model—the Conceptual Model—an additional path from

engagement/involvement to goal commitment was added. This new path resulted in an additional indirect path leading to intent to persist.

As noted above, perceptions of mattering had a strong influence on engagement/involvement for all student groups, but particularly for Latino/as, and significantly less for Asians (.46, $p < .001$; .22, $p < .01$, respectively). Engagement/involvement had a small direct effect on intent to persist for ALL and White students only (.13, $p < .001$; .18, $p < .001$, respectively) and an indirect effect on persistence through goal commitment. The path from socio-academic integrative experiences to intent to persist had small, positive, and significant loading for ALL and Asian students only (.07, $p < .01$; .10, $p < .05$, respectively). The influence of engagement/involvement on goal commitment can be appreciated in Figure 15. Based on these loadings, all students regardless of race/ethnicity seem to be affected equally (loadings from .26-.27).

Similar to the construct of mattering, engagement/involvement appears to play a pivotal role in reinforcing students' commitment to their educational goals and in turn their intentions to complete their degree. Socio-academic integrative experiences, on the other hand, appears to exert its effect independently. Thus, reinforcing the assertion that social/academic integration plays a role in student decision to remain at the institution, albeit not necessarily with traditionally underrepresented students like Latino/as (Rendón et al., 2000; Rendón Linares & Muñoz, 2011; Tinto, 1993).

Figure 15. Hypothesis 4: Hypothesized, deleted, and confirmed paths in model.

Findings for Hypothesis 5

The last directional hypothesis concerning Research Question 3 was Hypothesis 5, which proposed that perceptions of mattering to the college and engagement/involvement at the institution would positively impact socio-academic integrative experiences. Socio-academic integrative experiences would also have a positive and direct effect on intent to persist, and an indirect effect mediated by goal commitment.

As observed in Figure 16, mattering was found to exercise a moderate direct effect on socio-academic integrative experiences for all community college students in the study (ALL = .19, $p < .001$; White = .27, $p < .001$; Latino/a = .16, $p < .05$; and Asian = .19, $p < .01$). Both socio-academic integrative experiences and goal commitment also had small direct effect on intent to persist for ALL students as a group (ALL = .07, $p < .01$; ALL = .09, $p < .01$, respectively). The path from goal commitment to intent to persist was also significant for Latino/a and Asian students (Latino/a = .11, $p < .05$; Asian = .10, $p < .01$), but not for White students (White = .06, $p > .05$). Contrary to the hypothesis, two paths were not statistically significant and were deleted from the structural model. Engagement/involvement did not directly influence socio-academic integrative experiences. Similarly, socio-academic integrative experiences did not directly impact goal commitment. Given the elimination of the two non-significant paths from the model, engagement/involvement did not indirectly impact intent to persist through socio-academic integrative experiences as was hypothesized.

Figure 16. Hypothesis 5: Hypothesized, deleted, and confirmed paths in model.

Conclusion for Research Question 3

In accounting for all the findings above, the directional hypotheses proposed in Chapter 3 were only partially supported in the respecified Conceptual Model (Respecified Structural Model 2—fully illustrated in Figure 7). The following are some brief conclusions derived from testing the hypotheses (in no particular order):

- This study did not find support for the hypothesized direct relationship from sense of belonging to intent to persist, unlike findings from a four-year college for African American and White students (Hausmann et al., 2007).
- Nancy Schlossberg famously asserted that institutions that were concerned with students' perceptions of mattering would find students who were highly involved/engaged on campus, and where their retention was high (Schlossberg, 1989). Until the time of this study, this assertion had remained an empirical question to be investigated. As noted in several of the hypotheses above, mattering did in fact exert moderate to strong influences on several key factors, which among them were engagement/involvement, socio-academic integrative experiences, and sense of belonging. However, mattering did not directly impact intent to persist to degree completion as Schlossberg and the Conceptual Model had anticipated. As will be noted later in another section, the standardized total effect (direct plus indirect as noted on Table 25) of mattering on intent to persist was .094 ($p = .002$) for ALL students, .11 for White students, .10 for Latino/a students and .06 for Asian students. That is, when mattering goes up by 1 standard deviation, intent to persist goes up by 0.094 standard deviations. The total effects of mattering can also be observed in its relationship with socio-

academic integrative experiences, with standardized total effects ranging from .16 for Latino/a students to .27 for White students. Similarly, mattering exerted strong positive total effects on engagement/involvement from .22 for Asian students to .47 for Latino/a students. While the effect of sense of belonging on intent to persist was not statistically significant for any students in the study, Hypothesis 1 did confirm the importance of mattering on community college students' sense of belonging to their institution. Some of the strongest total effects in the model entailed the mattering-sense of belonging relationship. Standardized total effects were .40 for all students, .41 for White students, .52 for Latino/as, and .36 for Asian students. Thus, mattering appears to play an important role for all students across several intermediate college outcomes.

- Another key finding from the hypotheses was the role of engagement/involvement in impacting several intermediate variables such as socio-academic integrative experiences, sense of belonging, and ultimately intent to persist, especially for White students and students as a whole (though not for Latino/as or Asians). Referring once again to the total effects of engagement/involvement on intent to persist, this study found a small to moderate and positive relationship. The standardized total effect (direct plus indirect) of engagement/involvement on intent to persist was .18 ($p < .001$) for ALL students, .23 ($p < .001$) for White students, .13 for Latino/a students (n.s.), and .12 ($p < .05$) for Asian students.
- With respect to socio-academic integrative experiences, much of the statistically significant findings based on Hypotheses 1-5, were that it exerted a small direct effect on intent to persist for all students as a group, as well as for Asian student.

This finding carried through when reviewing the total effects of socio-academic integrative experiences on intent to persist, with a standardized total effect of .07 for all students and .10 for Asian students.

- As noted in another section, the literature on college climates for students is well developed and continues to grow. However, much of this literature has concentrated on the experiences of four-year students, like so many other research areas, including those above and in the Conceptual Model. In this study, perceptions of a hostile campus climate had a strong, negative, and total effect on sense of belonging for all students regardless of race/ethnicity, but particularly for Asian students (-.53), and ALL students closely following (-.50). The effect on sense of belonging for White and Latino/a students was influenced quite significantly by perceptions of a hostile campus climate experiences (-.43, -.44, respectively).
- Also characterized by a rich and growing literature, this study as noted in Hypothesis 1 findings, interactions with diverse peers had a very strong direct effect on mattering and a small to moderate effect on SOB. The total effects of interactions with diverse peers on mattering was .55 for ALL students, .57 for White students, .50 for Latino/as, and .57 for Asian students. While these total effects are quite strong for everyone in the study, it is also significant to note that both interactions with diverse peers had the strongest effect on White and Asian students, albeit the differences for Latino/as are minor. With respect to the influence of interactions with diverse peers on sense of belonging, a similar, if smaller pattern was found by race/ethnicity, ranging from .40 for Latino/as to .45

for White students. Just as important, the total effects of interactions with diverse peers on engagement/involvement and socio-academic integrative experiences should be highlighted. Asian students while having the lowest standardized total effects for interactions with diverse peers to engagement/involvement at .13, still benefitted significantly from those diverse peer interactions. Also significant is the finding that Latino/as benefitted more from these relationships, which impacted their engagement/involvement at the college (.23). Again, some of the highest total effects observed in this study were on the relationship between interactions with diverse peers and socio-academic integrative experiences. In fact, no other variable in the model accounted for such high path loadings leading to socio-academic integrative experiences in the Conceptual Model. The standardized total effect was .58 for ALL, White, and Latino/as; and a close .55 for Asian students.

Direct and Indirect Effects of the Respecified Conceptual Model on Intent to Persist, Matter, Sense of Belonging, Engagement/Involvement, and Socio-Academic Integrative Experiences

In this section, the decomposition of effects for the Conceptual Model are discussed in greater detail for several of the key constructs in the model. Research Question 3 addressed these on a limited basis and only as they applied to the five directional hypotheses constituting it. As has been noted several times, the Conceptual Model is complex, with a total of 37 unique paths, most of which are statistically significant for the four groups in the study: all students (ALL), White, Latino/a, and Asian. The sections that follow will discuss the standardized direct and indirect effects associated with intent to persist to degree completion based on the inter-relationships noted in the corresponding versions of the Conceptual Model. Recall that the model was found invariant for White and Latino/a students, and that a few factor loadings were freely estimated for Asian students (as discussed in the results section for Research Question 2.1). As may be observed on Table 23, the total variance on intent to persist was similar for three of the racial/ethnic groups, and significantly higher for one: ALL = .21, White = .21, Latino/a = .19, and Asian = .28. Some of the paths contributing differently in the model by race/ethnicity, will be noted as the direct, indirect, and total effects for the Conceptual Model are discussed below. As a point of information, Table 23 summarizes the direct effects for the Conceptual Model, while Table 24 presents the indirect effects. Lastly, the total effects are summarized on Table 25.

Direct and Indirect Effects of Intent to Persist

Table 23 presents the direct effects of several variables on intent to persist. These include, engagement/involvement, sense of belonging, socio-academic integrative experiences, goal commitment, GPA, length of attendance, and college transition support from family/friends.

Judging by the magnitude and statistical significance of the path loadings, transition support from family and friends was the only variable in the model to exert a direct, and highest degree of influence on intent to persist across all racial/ethnic groups (ranging from .31 for Latino/as to .43 for Asians). Higher levels of support were associated with higher intentions to persist. As suggested in the retention literature, the direct effect of goal commitment on intent to persist was significant for three groups of students, ALL, Latino/as, and Asian students. A higher GPA was also correlated with persistence intentions for all students as a group, for White and Asian students, but not for Latino/as. Engagement/involvement in educationally purposeful and co-curricular activities positively impacted intent to persist, albeit only for White (.18) and ALL (.13). Socio-academic integrative experiences, namely, perceiving instructors as available and supportive, was a positive factor on persistence for ALL and Asian students only. Lastly, length of college attendance was the only variable in the model to negatively impact persistence intentions for ALL and White students; although non-significant, negative effects were also found for Latino/a and Asian students. While it was believed based on limited extant literature that sense of belonging would directly and positively impact persistence intentions, this was not the case in this study. It is plausible, that sense of belonging may affect actual persistence. However, this study was unable to assess this.

Although several of the hypothesized paths in the Conceptual Model were not found to have a direct effect on intent to persist, these exercised an indirect influence. Interactions with diverse peers was influential for all students in the study, regardless of race/ethnicity (.09-.11), exerting its influence through sense of belonging, hostile campus climate, institutional commitment, engagement/involvement, and socio-academic integrative experiences. A similar relationship was found for institutional commitment to students, whose impact was exerted

through the mediating effects of a hostile campus climate, sense of belonging, mattering, and socio-academic integrative experiences. Engagement/involvement also carried a small, but significant indirect effect on persistence for all students. Of the other variables in the model, GPA had a small, positive influence on intent to persist for ALL and Asian students. Lastly, and notably, transition support from family and friends also had a small indirect effect through several of the same variables above for all, but White students.

Direct and Indirect Effects of Perceptions of Mattering to the College

Three factors/variables accounted for approximately 50% of the variance on mattering to the college for all ethnic groups in the study (.48-.49 for ALL, Whites, and Asians), and slightly higher for Latino/as (.54). Higher levels of perceived institutional commitment to students was related to higher perceptions of mattering, particularly for Latino/as (.57). Interactions with diverse peers exerted a higher positive direct effect for White and Asian students (.44); interestingly, the effect was significantly lower—albeit still positive—for Latino/as (.28). Females as a group, and Asian females in particular, reported higher levels of mattering, in contrast to male students.

With respect to indirect effects for mattering to the college, interactions with diverse peers, mediated through institutional commitment had a higher positive effect for Latino/as (.22) than for other students (.12-.14). Similarly, transition support from family/friends, mediated through interactions with diverse peers and institutional commitment, had a higher indirect effect on Latino/as (.18) than other students (.06-.12). These differences are largely based in the stronger direct effects of supportive family/friends on interactions with diverse peers and institutional commitment to students on mattering, for Latino/as.

No other studies in the higher education literature had directly examined the relationship between institutional commitment to students and perceptions of mattering and interactions with

diverse peers and mattering. Thus, this study is the first of its kind to empirically demonstrate there exists a causal positive effect between the two sets of factors. Based on these findings, it would appear that institutional commitment to students plays a particularly significant role in communicating to students an “ethic of care” as suggested by Tinto (1993), which in turn influences perceptions of mattering to the institution. Likewise, the importance of interactions with diverse peers also played a significant role in facilitating perceptions of mattering. While other studies had examined this relationship on a limited basis, by examining differences by race/ethnicity, such analyses had been correlational in nature (Tovar et al., 2008; Tovar et al., 2009). Thus, this study provides stronger support for diverse peer interactions on intermediate college outcomes such as mattering.

Direct and Indirect Effects of Sense of Belonging

Similar to mattering, five factors/variables accounted for just over half the variance in sense of belonging to the institution for ALL, Latino/as, and Asian students, and exactly 50% for White students. Perceptions of mattering had the highest direct effect on belonging, especially for Latino/as (.52) and significantly less for Asians (.36). Interactions with diverse peers also exerted a positive significant effect for all, but Latino/as, albeit not to the degree that mattering did. In contrast to these positive predictors of sense of belonging, three factors in the model were associated with lower levels of belonging: institutional commitment to students (for ALL), gender (male-ALL and Asians), and noticeably, perceptions of a hostile campus climate. Based on the magnitude of the direct effects loadings, Asian students’ sense of belonging to the institution (-.53) was most affected when confronting a campus environment that was not welcoming owing to their personal characteristics. While the effect for White and Latino/a students was also negative, perceptions of a hostile campus climate had a lower impact on their sense of belonging (-.43, -.44, respectively).

The indirect effects associated with sense of belonging are generally consistent with those found for perceptions of mattering to the college. This comes as no surprise considering the similarities the constructs share. Of import to this analysis is the finding that institutional commitment to students appears to counteract the effects of perceptions of a hostile campus climate, which otherwise exerts a strong negative effect on belonging. Results of the analysis indicates this is particularly true for Latino/as (indirect effect = .35), although it is also significant for other students (.17-.20). This same mediating effect was found for interactions with diverse peers, albeit the effect was similar across groups (.27-.30). The indirect effects of supportive family/friends on belonging was more complex, but nonetheless it accounted for a statistically significant portion of the variance (with indirect standardized loadings ranging from .14 to .19). Lastly, gender also exercised a small indirect effect mediated through both interactions with diverse peers and perceptions of a hostile campus climate.

Consistent with previous studies, these findings confirm the deleterious effect that hostile campus environments exercise on community college students' perceptions of belonging to the campus (Hausmann et al., 2007; Hausmann et al., 2009; Hurtado & Carter, 1997; Locks et al., 2008; Nuñez, 2009; Tovar & Simon, 2010). However, counteracting the "chilly" campus climate are positive interactions students have with diverse peers and institutional commitment to students. Of these only the former relationship has been reported in the literature. Additionally, perceptions of mattering to the institution clearly have a strong positive effect on sense of belonging. While the relationship between mattering and sense of belonging has been theorized (Strayhorn, 2012), and correlations reported (Tovar & Simon, 2010; Tovar et al., 2009), this study is the first to report the causal effect of mattering on belonging, and it is particularly noteworthy to highlight the fact that this relationship carries through regardless of students'

race/ethnicity. Given the above, this study makes two unique contributions: (1) the finding that institutional commitment to students has the potential to counteract perceptions of a hostile campus climate, thus increasing students' sense of belonging at the institution; and (2) the positive causal nature of the effects of mattering on sense of belonging.

Direct and Indirect Effects of Engagement/Involvement

Three variables in the conceptual model empirically demonstrated a direct effect on engagement/involvement: perceptions of mattering, units enrolled, and length of college attendance. Together they accounted for 29% of the variance for White and Latino/as, 24% for all students, and 11% for Asian students. Both the number of units enrolled and perceptions of mattering had a similar positive impact as a whole. However, mattering had a stronger positive effect for Latino/as (.46) than for any other racial/ethnic group, and especially Asian students (.22). With respect to units enrolled, the greater the number of units in which they enrolled, the more students were engaged/involved on campus, although this appears to be moderated by race/ethnicity (White = .37, Latino/a/Asian = .25).

The review of indirect effects on engagement/involvement highlighted the importance of mattering as a mediator variable between institutional commitment to students and their engagement in educationally beneficial activities. In addition, this relationship was found to be particularly significant for Latino/as (.26), compared to other students (.09-.15). Similarly, interactions with diverse peers exercised a moderate indirect relationship with engagement, mediated by mattering, and was especially influential for White and Latino/as (.23-.23). Also significant were the indirect effects of transition support from family/friends and gender, albeit to a lesser degree—but for all student groups.

While it may be expected that the more courses/units a student takes per semester may in fact result in higher levels of engagement/involvement in educationally purposeful and co-

curricular activities, the causal relationship between mattering and engagement/involvement had also only been alluded to in the literature (France & Finney, 2009; Schlossberg, 1989; Strayhorn, 2012). Indeed these authors have also articulated that a sense of belonging to the institution engenders involvement. However, as described in an earlier section (findings for Research Question 2), the structural model confirmed the directionality hypothesized in this study (mattering to engagement/involvement), and there was no evidence as suggested by modification indices and expected parameter change statistics to suggest that sense of belonging impacted engagement/involvement. Again, this study provides empirical support on the causal nature of mattering to engagement/involvement. Moreover, the study also established the mediating role of mattering and helps highlight the importance of institutional commitment to students (especially for Latino/as) and of diverse peer interactions (for White and Latino/as). The study also shows that the lack of a significant implied path from sense of belonging to engagement/involvement in the respecified Conceptual Model, evidences a lack of support for previously held beliefs of the impact of sense of belonging on involvement. It seems the directionality of the relationship is just the opposite.

Direct and Indirect Effects of Socio-academic Integrative Experiences

Four variables in the conceptual model empirically supported a direct effect on socio-academic integrative experiences: institutional commitment to students, interactions with diverse peers, perceptions of mattering, and transition support from family/friends. All four of the path coefficients were statistically significant for ALL, White, Latino/a, and Asian students. However, the percentage of variance accounted for was different. The lowest percentage of variance was among Asian students (.41), followed by ALL and White (.45), and the highest was for Latino/as (.49). The factor to exert the highest direct impact on integration was interactions with diverse peers to a similar degree among all students (.38-.41). Perceived institutional

commitment to students had a slightly different influence by race/ethnicity: White: .15, Asian = .18, ALL = .20 and Latino/a = .24. The effect of perceptions of mattering to the college was similar for ALL and Asian students. However, mattering was most influential on socio-academic integrative experiences for White students (.27) and least influential for Latino/as (.16). Lastly, support from family/friends had a small, significant, and positive effect on integration for all students in the study (.07-.10).

As with engagement/involvement, interactions with diverse peers held an important indirect effect on integrative experiences, which had a stronger effect for White than for any other students. The indirect role of institutional commitment and transition support from family/friends was also significant for all groups, with all showing a similar (small) effect. Gender also exerted a small positive indirect effect through mattering for White and ALL students.

These findings reinforce to a degree, Tinto's conceptualization of the interactional nature of institutional commitments and participation in the social/academic communities of the college (Tinto, 1975, 1987, 1993). Whereas Tinto's interactionalist model has been the subject of much review and criticism, and much has been said about this framework not accounting for the experiences of impacted groups or of community colleges, researchers have also failed to examine a key element in that model; namely, institutional commitment to students. Researchers have focused primarily on students' commitment to the institution. However, Tinto explicitly acknowledged that "The mirror image of individual commitment to the institution is the commitment of the institution, as exhibited by the behaviors of its faculty and staff, to the individual" (1993; p. 208). This commitment is reflected in the "ethos of caring" characterizing the institution. This study has demonstrated the important value that institutional commitment

and perceptions of mattering (as a proxy for an “ethos of caring”) in influencing student participation in the social and academic communities of the college—regardless of race/ethnicity. While other studies have examined on a limited basis the influence of institutional commitment on students’ subsequent commitment to the institution, this study was the first to investigate the influence of institutional commitment to students on a community college population. Importantly, the study found that indeed, institutional commitment plays a crucial role in integrative experiences for ethnic minorities, including Asian and Latino/as. As well, this is the first study to examine the role of mattering on socio-academic integrative experiences and it was noted that higher perceptions of mattering are associated with higher levels of socio-academic integration.

Table 23

Direct effects of Conceptual Model components by Race/Ethnicity

Direct effects on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β
Intent to Persist to Degree Completion												
<i>R</i> ²			.205			.214			.190			.281
Engagement/Involvement	.301	***	.134	.411	***	.177	.157		.070	.084		.040
Sense of Belonging	.045	†	.045	.077	†	.072	.045		.047	.041		.043
Socio-academic integrative experiences	.105	**	.071	-.045		-.030	.133		.095	.145	*	.100
Goal commitment	.090	**	.089	.065		.063	.115	*	.112	.093	**	.095
GPA	.066	**	.065	.123	**	.107	.083	†	.087	.147	**	.151
Length of attendance	-.062	***	-.065	-.065	*	-.067	-.064		-.072	-.037		-.038
Transition support from family and friends	.491	***	.338	.538	***	.340	.398	***	.307	.598	**	.434
Interactions with Diverse Peers												
<i>R</i> ²			.031			.015			.036			.044
Transition support from family and friends	.154	***	.143	.090	*	.077	.172	***	.171	.155	***	.152
Gender	.158	***	.092	.164	*	.091	.122		.073	.204	**	.126
Institutional Commitment to Students												
<i>R</i> ²			.129			.108			.197			.113
Transition support from family and friends	.132	**	.099	.069		.049	.207	***	.169	.104	*	.086
Interactions with Diverse Peers	.411	***	.331	.383	***	.320	.463	***	.381	.366	**	.310
Perceptions of Matter to the College												
<i>R</i> ²			.478			.477			.540			.491
Institutional Commitment to Students	.333	***	.425	.332	***	.399	.457	***	.566	.314	**	.396
Interactions with Diverse Peers	.400	***	.411	.440	***	.443	.276	***	.281	.415	**	.444

Direct effects on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β
Gender	.078	*	.046	.078		.044	.104		.063	.129	**	.086
Perceptions of a Hostile Campus Climate												
<i>R</i> ²			.111			.092			.078			.090
Institutional Commitment to Students	-.053	***	-.096	-.014		-.024	-.080	†	-.135	-.031		-.045
Interactions with Diverse Peers	-.106	***	-.155	-.119	***	-.175	-.077		-.107	-.117	***	-.145
Transition support from family and friends	-.166	***	-.224	-.180	***	-.225	-.106	*	-.147	-.182	**	-.222
Engagement/Involvement												
<i>R</i> ²			.239			.285			.292			.113
Perceptions of mattering to the college	.207	***	.336	.219	***	.377	.269	***	.461	.153	***	.221
Units enrolled	.043	***	.342	.045	***	.368	.033	**	.250	.032	***	.246
Length of attendance	.065	***	.154	.063	**	.151	.064	*	.162	.049	***	.105
Sense of Belonging												
<i>R</i> ²			.523			.495			.527			.528
Institutional Commitment to Students	-.109	***	-.100	-.019		-.018	-.141	†	-.125	-.084	†	-.070
Interactions with Diverse Peers	.183	***	.136	.182	**	.145	.156	†	.115	.199	**	.140
Perceptions of a hostile campus climate	-.977	***	-.498	-.795	***	-.432	-.842	***	-.444	-.940	***	-.533
Perceptions of mattering to the college	.557	***	.404	.509	***	.405	.722	***	.519	.551	**	.362
Gender	-.229	***	-.099	-.130	†	-.058	-.181	†	-.079	-.242	**	-.106
Socio-Academic Integrative Experiences												
<i>R</i> ²			.457			.452			.490			.409
Institutional Commitment to Students	.144	***	.195	.110	**	.146	.181	**	.239	.141	**	.179
Interactions with Diverse Peers	.374	***	.409	.339	***	.378	.373	**	.406	.361	**	.388
Perceptions of mattering to the college	.182	***	.194	.243	***	.269	.151	*	.161	.190	**	.190

Direct effects on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β
Transition support from family and friends	.080	***	.081	.094	**	.089	.093	*	.101	.067	*	.070
Grade Point Average												
<i>R</i> ²			.116			.111			.137			.101
Engagement/Involvement	.699	***	.316	.641	***	.318	.753	**	.318	.688	**	.320
Sense of Belonging	.047	*	.048	.049		.053	.077		.078	-.033		-.034
Financial concerns	-.069	***	-.087	.025		.037	-.109	**	-.128	-.001		-.001
Goal Commitment												
<i>R</i> ²			.120			.113			.116			.133
Perceptions of a hostile campus climate	-.138	**	-.071	-.020		-.010	-.193	‡	-.110	-.248	*	-.144
Engagement/Involvement	.604	***	.274	.616	***	.272	.574	**	.261	.581	**	.270
GPA	.062	*	0.062	.063		.056	.056		.060	.093	*	.093

****p* < .001; ***p* < .01; ****p* < .05; ‡*p* < .10

^a Encompasses all students in the study based on the finding that Respecified Structural Model 2 (the adjusted Conceptual Model) was race/ethnicity invariant for White, Latino, and Asian students.

^b The following factor loadings were freely estimated based on a minor indication the model might not be fully invariant for Asian students: M36, M18, M39, M48, Q173_9, Q173_1, Q134, InsSup, M30.

Table 24

Indirect effects of Conceptual Model components by Race/Ethnicity

Indirect effects on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β
Intent to Persist to Degree Completion												
Institutional Commitment to Students	.056	***	.052	.044	**	.039	.084	***	.079	.046	**	.040
Interactions with Diverse Peers	.129	***	.096	.090	***	.067	.139	**	.108	.118	**	.087
Perceptions of a hostile campus climate	-.059	*	-.030	-.068	*	-.034	-.066		-.037	-.057		-.034
Perceptions of mattering to the college	.130	***	.094	.148	***	.110	.135	**	.103	.085	**	.058
Engagement/Involvement	.105	***	.047	.121	**	.052	.133	*	.059	.161	**	.077
Sense of Belonging	.003	***	.003	.006		.006	.007		.007	-.005		-.005
Units	.017	***	.062	.024	***	.084	.010	†	.032	.008	*	.029
Financial concerns	-.005	**	-.006	.003		.004	-.010	*	-.012	.000		.000
Transition support from family and friends	.046	***	.031	.019	†	.012	.061	***	.047	.043	**	.031
Length of attendance	.027	***	.028	.034	**	.035	.019	†	.021	.012	**	.012
Gender	.019	*	.008	.015		.006	.022		.010	.026	*	.012
GPA	.006	***	.096	.004		.067	.006		.108	.009	*	.087
Interactions with Diverse Peers												
Transition support from family and friends												
Gender												
Institutional Commitment to Students												
Transition support from family and friends	.063	***	.047	.035	*	.025	.080	***	.065	.057	***	.047
Gender	.065	***	.030	.063	*	.029	.057		.028	.074	**	.039
Perceptions of Mattering to the College												
Interactions with Diverse Peers	.137	***	.141	.127	***	.128	.211	***	.216	.115	**	.123

Indirect effects on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β
Transition support from family and friends	.127	***	.121	.074	*	.064	.178	***	.181	.115	**	.121
Gender	.085	***	.050	.093	*	.052	.060		.036	.108	**	.072
Perceptions of a Hostile Campus Climate												
Interactions with Diverse Peers	-.022	***	-.032	-.005		-.008	-.037	†	-.052	-.011		-.014
Transition support from family and friends	-.027	***	-.036	-.012	*	-.015	-.036	**	-.050	-.023	***	-.028
Gender	-.020	***	-.017	-.020	*	-.017	-.014	†	-.011	-.026	***	-.020
Engagement/Involvement												
Institutional Commitment to Students	.069	***	.143	.073	***	.150	.123	***	.261	.048	***	.087
Interactions with Diverse Peers	.111	***	.185	.124	***	.215	.131	***	.229	.081	***	.125
Transition support from family and friends	.026	***	.041	.016	**	.024	.048	***	.083	.017	***	.027
Gender	.034	***	.033	.037	**	.036	.044	**	.046	.036	***	.035
Sense of Belonging												
Institutional Commitment to Students	.237	***	.220	.180	***	.172	.397	***	.354	.202	**	.168
Interactions with Diverse Peers	.379	***	.283	.381	***	.304	.382	***	.280	.382	***	.268
Transition support from family and friends	.265	***	.183	.205	***	.139	.235	***	.172	.273	***	.189
Gender	.132	***	.057	.132	**	.059	.141	*	.061	.189	**	.083
Socio-Academic Integrative Experiences												
Institutional Commitment to Students	.061	***	.083	.081	***	.108	.069	*	.091	.059	**	.075
Interactions with Diverse Peers	.157	***	.172	.180	***	.201	.157	***	.171	.152	***	.163
Transition support from family and friends	.109	***	.110	.060	**	.057	.143	***	.155	.100	***	.106
Gender	.098	***	.062	.104	**	.064	.080	†	.052	.129	†	.086
Grade Point Average												
Institutional Commitment to Students	.054	***	.051	.054	***	.056	.112	***	.101	.029	**	.025

Indirect effects on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β	<i>b</i>	<i>p</i>	β
Interactions with Diverse Peers	.104	***	.078	.107	***	.092	.140	***	.104	.036		.026
Perceptions of a hostile campus climate	-.046	*	-.024	-.039		-.023	-.065		-.035	.031		.018
Perceptions of mattering to the college	.171	***	.125	.165	***	.141	.258	***	.187	.087	*	.058
Units enrolled	.030	***	.108	.029	***	.117	.025	**	.079	.022	***	.079
Transition support from family and friends	.031	***	.022	.021	**	.015	.054	***	.040	.003		.002
Length of attendance	.046	***	.049	.041	**	.048	.048	*	.052	.033	***	.034
Gender	.019	*	.008	.024	*	.012	.030		.013	.027	**	.012
Goal Commitment												
Institutional Commitment to Students	.052	***	.049	.048	***	.044	.092	***	.089	.038	**	.032
Interactions with Diverse Peers	.091	***	.069	.086	***	.066	.105	***	.083	.082	***	.059
Perceptions of a hostile campus climate	-.003	*	-.001	-.002		-.001	-.004		-.002	.003		.002
Perceptions of mattering to the college	.136	***	.100	.145	***	.110	.169	***	.131	.097	***	.065
Sense of Belonging	.003	*	.003	.003		.003	.004		.005	-.003		-.003
Engagement/Involvement	.043	*	.020	.041		.018	.042		.019	.064	*	.030
Units enrolled	.028	***	.100	.030	***	.107	.021	**	.070	.021	***	.073
Financial concerns	-.004	**	-.005	.002		.002	-.006		-.008	.000		.000
Transition support from family and friends	.044	***	.031	.015		.010	.058	***	.046	.061	**	.043
Length of attendance	.042	***	.045	.041	*	.044	.040	*	.045	.031	***	.031
Gender	.024	***	.011	.025	*	.011	.030	**	.014	.030	**	.013

*** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$

^a Encompasses all students in the study based on the finding that Respecified Structural Model 2 (the adjusted Conceptual Model) was race/ethnicity invariant for White, Latino, and Asian students.

^b The following factor loadings were freely estimated based on a minor indication the model might not be fully invariant for Asian students: M36, M18, M39, M48, Q173_9, Q173_1, Q134, InsSup, M30.

Table 25

Total effects of Conceptual Model components by Race/Ethnicity

Total effect on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	b	Sig.	β	b	Sig.	β	b	Sig.	β	b	Sig.	β
Intent to Persist to Degree Completion												
Institutional Commitment to Students	.056	***	.052	.044	**	.039	.084	***	.079	.046	**	.040
Interactions with Diverse Peers	.129	***	.096	.090	**	.067	.139	**	.108	.118	**	.087
Perceptions of a hostile campus climate	-.059	*	-.030	-.068	*	-.034	-.066		-.037	-.057		-.034
Perceptions of mattering to the college	.130	***	.094	.148	***	.110	.135	**	.103	.085	**	.058
Engagement/Involvement	.405	***	.181	.532	***	.229	.290		.129	.245	*	.117
Sense of Belonging	.048	†	.048	.083	*	.078	.052		.055	.036		.038
Socio-academic integrative experiences	.105	**	.071	-.045		-.030	.133		.095	.145	*	.100
Goal commitment	.090	**	.089	.065		.063	.115	*	.112	.093	**	.095
GPA	.072	**	.071	.127	**	.110	.089	†	.094	.156	**	.160
Length of attendance	-.035	†	-.037	-.031		-.032	-.046		-.051	-.025		-.026
Units enrolled	.017	***	.062	.024	***	.084	.010	†	.032	.008		.029
Financial concerns	-.005	**	-.006	.003		.004	-.010	*	-.012	.000		.000
Gender	.019	*	.008	.015		.006	.022		.010	.026	*	.012
Transition support from family and friends	.536	***	.369	.557	***	.353	.459	***	.354	.641	**	.465
Interactions with Diverse Peers												
Transition support from family and friends	.154	***	.143	.090	*	.077	.172	***	.171	.155	***	.152
Gender	.158	***	.092	.164	*	.091	.122		.073	.204	**	.126
Institutional Commitment to Students												
Transition support from family and friends	.195	***	.146	.104	*	.074	.286	***	.235	.160	**	.134
Interactions with Diverse Peers	.411	***	.331	.383	***	.320	.463	***	.381	.366	**	.310
Gender	.065	***	.030	.063	*	.029	.057		.028	.074	**	.039

Total effect on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	b	Sig.	β	b	Sig.	β	b	Sig.	β	b	Sig.	β
Perceptions of Mattering to the College												
Institutional Commitment to Students	.333	***	.425	.332	***	.399	.457	***	.566	.314	**	.396
Interactions with Diverse Peers	.537	***	.551	.567	***	.570	.487	***	.497	.529	**	.567
Gender	.162	***	.097	.171	*	.096	.163	*	.099	.236	**	.157
Transition support from family and friends	.127	***	.121	.074	*	.064	.178	***	.181	.115	**	.121
Perceptions of a Hostile Campus Climate												
Institutional Commitment to Students	-.053	***	-.096	-.014	***	-.024	-.080	†	-.135	-.031		-.045
Interactions with Diverse Peers	-.128	***	-.187	-.124	***	-.183	-.114	*	-.158	-.128	***	-.159
Transition support from family and friends	-.192	***	-.260	-.193	**	-.241	-.142	***	-.197	-.205	**	-.250
Gender	-.020	***	-.017	-.020	*	-.017	-.014	†	-.011	-.026	***	-.020
Engagement/Involvement												
Institutional Commitment to Students	.069	***	.143	.073	***	.150	.123	***	.261	.048	***	.087
Interactions with Diverse Peers	.111	***	.185	.124	***	.215	.131	***	.229	.081	***	.125
Perceptions of mattering to the college	.207	***	.336	.219	***	.377	.269	***	.461	.153	***	.221
Units enrolled	.043	***	.342	.045	***	.368	.033	**	.250	.032	***	.246
Transition support from family and friends	.026	***	.041	.016	**	.024	.048	***	.083	.017	***	.027
Length of attendance	.065	***	.154	.063	**	.151	.064	*	.162	.049	***	.105
Gender	.034	***	.033	.037	**	.036	.044	**	.046	.036	***	.035
Sense of Belonging												
Institutional Commitment to Students	.129	***	.119	.161	***	.154	.257	**	.229	.118	**	.098
Interactions with Diverse Peers	.562	***	.419	.562	***	.449	.539	***	.395	.581	**	.408
Perceptions of a hostile campus climate	-.977	***	-.498	-.795	***	-.432	-.842	***	-.444	-.940	***	-.533
Perceptions of mattering to the college	.557	***	.404	.509	***	.405	.722	***	.519	.551	**	.362
Gender	-.097	*	-.042	.002		.001	-.040		-.018	-.053		-.023

Total effect on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	b	Sig.	β	b	Sig.	β	b	Sig.	β	b	Sig.	β
Transition support from family and friends	.265	***	.183	.205	***	.139	.235	***	.172	.273	***	.189
Socio-Academic Integrative Experiences												
Institutional Commitment to Students	.205	***	.278	.190	***	.254	.250	***	.330	.201	**	.254
Interactions with Diverse Peers	.530	***	.581	.519	***	.579	.530	***	.577	.513	**	.552
Perceptions of mattering to the college	.182	***	.194	.243	***	.269	.151	*	.161	.190	**	.190
Transition support from family and friends	.189	***	.192	.155	***	.146	.236	***	.255	.167	***	.176
Gender	.098	***	.062	.104	**	.064	.080	†	.052	.129	**	.086
Grade Point Average												
Institutional Commitment to Students	.054	***	.051	.054	***	.056	.112	***	.101	.029	**	.025
Interactions with Diverse Peers	.104	***	.078	.107	***	.092	.140	***	.104	.036		.026
Perceptions of a hostile campus climate	-.046	*	-.024	-.039		-.023	-.065		-.035	.031		.018
Perceptions of mattering to the college	.171	***	.125	.165	***	.141	.258	***	.187	.087	*	.058
Sense of Belonging	.047	*	.048	.049		.053	.077		.078	-.033		-.034
Engagement/Involvement	.699	***	.316	.641	***	.318	.753	**	.318	.688	**	.320
Units enrolled	.030	***	.108	.029	***	.117	.025	**	.079	.022	***	.079
Financial concerns	-.069	***	-.087	.025		.037	-.109	**	-.128	-.001		-.001
Transition support from family and friends	.031	***	.022	.021	*	.015	.054	***	.040	.003		.002
Length of attendance	.046	***	.049	.041	**	.048	.048	*	.052	.033	***	.034
Gender	.019	*	.008	.024	*	.012	.030		.013	.027	**	.012
Goal Commitment												
Institutional Commitment to Students	.052	***	.049	.048	***	.044	.092	***	.089	.038	**	.032
Interactions with Diverse Peers	.091	***	.069	.086	***	.066	.105	***	.083	.082	***	.059
Perceptions of a hostile campus climate	-.141	**	-.073	-.022		-.011	-.197	†	-.113	-.245	*	-.142
Perceptions of mattering to the college	.136	***	.100	.145	***	.110	.169	***	.131	.097	***	.065
Sense of Belonging	.003	*	.003	.003		.003	.004		.005	-.003		-.003

Total effect on:	All Students ^a (N = 2,088)			White (n = 737)			Latino (n = 460)			Asian ^b (n = 435)		
	b	Sig.	β	b	Sig.	β	b	Sig.	β	b	Sig.	β
Engagement/Involvement	.648	***	.294	.656	***	.290	.616	***	.280	.645	**	.299
GPA	.062	*	.062	.063		.056	.056		.060	.093	*	.093
Units enrolled	.028	***	.100	.030	***	.107	.021	**	.070	.021	***	.073
Financial concerns	-.004	**	-.005	.002		.002	-.006		-.008	.000		.000
Transition support from family and friends	.044	***	.031	.015		.010	.058	***	.046	.061	**	.043
Length of attendance	.042	***	.045	.041	**	.044	.040	*	.045	.031	***	.031
Gender	.024	***	.011	.025	*	.011	.030	**	.014	.030	**	.013

*** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$

^a Encompasses all students in the study based on the finding that Respecified Structural Model 2 (the adjusted Conceptual Model) was race/ethnicity invariant for White, Latino, and Asian students.

^b The following factor loadings were freely estimated based on a minor indication the model might not be fully invariant for Asian students: M36, M18, M39, M48, Q173_9, Q173_1, Q134, InsSup, M30.

Research Question 4: The Omnibus “Student Success” Construct?

Research Question 4 sought to determine if the constructs of engagement/involvement, sense of belonging, mattering, perceptions of the campus climate, and peer relationships might form part of an unnamed omnibus construct. Common among these constructs is the fact that these are written about in the higher education literature with great frequency; are integrated into various college student success and persistence models; and they are oftentimes conceptualized or defined similarly, yet are given a different “label” (Akin, 2009; Astin, 1984, 1993; Barnett, 2010; Berger & Milem, 1999; Bers & Smith, 1991; Braxton & Hirschy, 2005; Braxton & Lien, 2000; Cabrera et al., 1992a; Crisp & Mina, 2012; Crisp & Nora, 2010; Deil-Amen, 2011; Dixon-Rayle & Chung, 2007; Dowd et al., 2011; Feldman, 1993; France, 2011; France & Finney, 2010; France et al., 2010; Freeman et al., 2007; Hausmann et al., 2007; Hausmann et al., 2009; Hoffman et al., 2002; Hurtado & Carter, 1997; Kodama, 2002; Kuh, 2006; Kuh et al., 2008; Lundberg & Schreiner, 2004; Lynch Ervin, 2010; Maestas et al., 2007; Metzner & Bean, 1987; Nora & Crisp, 2012; Nora et al., 2011a; Nuñez, 2009; Pike, 2012; Rendón, 2006; Rendón et al., 2000; Rhee, 2008; Schlossberg, 1989; Strayhorn, 2008, 2012; Tinto, 1993, 2006, 2012a, 2012b; Torres, 2006; Tovar et al., 2009; Wolf-Wendel et al., 2009).

While this study was not meant to “definitively” declare that the above constructs are the only factors would form part of this omnibus construct, the nature of the data collected lent itself to investigate this possibility. To this end, a second-order confirmatory factor analysis composed of five factors was examined.

Second-Order Confirmatory Factor Analysis

Model Specification. The second-order confirmatory factor analysis model was based on Respecified Model 2 (Figure 4). The individual five factors were composed of the same

indicators and error covariance in that model, as illustrated in Figure 17. The model contends that the covariation among the first-order factors is completely accounted for by their regression on the second-order (omnibus) factor.

Figure 17. Hypothesized second-order confirmatory factor analysis model for Omnibus construct.

The key research question guiding the analysis was: Does the hypothesized model adequately fit the observed data? If not, what respecified model results in improved model fit?

As with Research Question 1, maximum likelihood estimation with 2,000 bootstrap samples was used in AMOS 21. The bootstrap procedure produced the Bollen-Stine corrected χ^2 *p*-value to help assess model fit. The Bollen-Stine *p*-value was used, in lieu of the usual ML χ^2 *p*-value, which is inflated in the presence of multivariate non-normality. Several indices of fit were also used to assess the overall goodness of fit for the model, including the χ^2/df ratio, CFI, SRMR, and RMSEA.

Model Identification. As specified in Figure 17, the model was *over identified* with 146 degrees of freedom (19 observations; 44 parameters to be estimated). With respect to sample size and power, the ratio of cases to the number of parameters to be estimated should be 10:1, (Kline, 2005). The resulting ratio for the CFA was 47:1, exceeding the threshold significantly. The first congeneric variable for each first-order factor was set to 1.0 loading, and a zero loading on all other factors.

Evaluation of Model Fit—Five Factors/19 Indicators. Results of the confirmatory factor analysis revealed the hypothesized model was a poor fit to the data and should be rejected, bootstrap Bollen-Stine $\chi^2(146, N = 2,088) = 834.35, p < .001, \chi^2/df = 5.72, CFI = .94, SRMR = .07, RMSEA = .05$ (90% CI = .044, .051). All loadings were significant at $p < .001$; although, the engagement/involvement factor had the lowest standardized loading (.29), in comparison to the four other factors: interactions with diverse peers (.64), perceptions of a hostile campus climate (-.49), mattering (.74), and sense of belonging (.75). Thus, it appears that the engagement/involvement factor (as measured in this study), accounted for only a small portion of the variance on the second-order factor. The standardized residual covariance matrix included

many excessive values above 2.58, which are considered large and indicative of model misfit (Byrne, 2010). Indicators M18 (*I sometimes feel alone and isolated at the college because of my gender*), M36 (*I sometimes feel alone and isolated because of my sexual orientation*), M55 (*I sometimes feel alone and isolated because of my race/ethnicity*), and M63 (*I sometimes feel alone and isolated because of my age*), all part of the perceptions of a hostile campus climate factor were responsible for most of the large variances, which ranged from |2.69| to |9.31|. Modification indices also indicated that adding a few error covariances from items constituting the perceptions of a hostile campus climate to those in the other factors might result in improved fit. Given these findings the model was rejected. In response to Research Question 4, this study did not find support for an omnibus second-order factor based on five first-order factors: engagement/involvement, interactions with diverse peers, perceptions of a hostile campus climate, mattering, and sense of belonging. Consistent with the research question, respecification of the model was pursued.

Evaluation of Model Fit for Respecified Omnibus Model—Four Factors/15

Indicators. Respecified Omnibus Model 1 dropped the perceptions of a hostile campus climate factor from further consideration. The respecified model exhibited evidence of good fit, bootstrap Bollen-Stine $\chi^2(85, N = 2,088) = 253.20, p < .001, \chi^2/df = 2.98, CFI = .98, SRMR = .04, RMSEA = .03$ (90% CI = .026, .035). All indices of fit were better than the threshold set *a priori*, as shown in Table 26. While the MIs noted the addition of error covariances among some indicators might result in better fit, a need for parsimony prevailed. Respecified Omnibus Second-Order Model 1 is proposed as the best fitting model. Standardized coefficients are presented in Figure 18. All loadings and variances are significant at $p < .001$.

Research Question 4 Conclusion

Based on the evaluation of model fit, it is concluded that diverse peer interactions, mattering, sense of belonging, and engagement/involvement encompass part of a second-order omnibus factor—perhaps the unnamed “student development and success” factor that Wolf-Wendel et al. (2009) allude to in their seminal work. Consistent with their argument, each of these constructs uniquely contributes toward the “understanding of the [student success] puzzle” (p. 426).

Table 26

*Summary of Goodness-of-Fit Indices for Alternate Models of the Omnibus Second-Order CFA**Model*

Model	Goodness-of-Fit Measures					
	χ^2	df	χ^2 / df	CFI	SRMR	RMSEA (90% CI)
Optimal Values	-	-	< 4.0	> .95	< .10	< .06
Hypothesized Model: 5 factors; 19 items ^a (with covariances between: eS30-eS32)	834.356	146	5.72	.94	.07	.05 (90% CI = .044, .051)
Respecified Omnibus Second-Order Model 1: 4 factors; 15 items (Deleted: HCC factor) Best fit	1257.70	85	2.98	.98	.04	.03 (90% CI = .026, .035)

^aOriginal items in CFA hypothesized model: **Interactions with Diverse Peers Factor** (*The quality of my interactions and relationships with students of another race/ethnicity can best be characterized as: close/distant (Q74), supportive/unsupportive (Q78), and available/unavailable (Q82)*). **Perceptions of a Hostile Campus Climate Factor** (M18—*I sometimes feel alone and isolated at the college because of my gender* (reverse coded); M55—*I sometimes feel alone and isolated because of my race/ethnicity* (reverse coded); M36neg—*I sometimes feel alone and isolated because of my sexual orientation* (reverse coded); M63—*I sometimes feel alone and isolated because of my age* (reverse coded)). **Sense of Belonging Factor** (M31—*Sometimes I feel alone at the college*; M30—*Sometimes I feel that no one at the college notices me*; M32—*Sometimes I get so wrapped up in my personal problems that I isolate myself from others at the college*; M34—*I often feel isolated when involved in student activities*). **Mattering Factor** (M48—*There are people on campus who are sad for me when I fail in something I set out to do*; M53—*People on campus are generally supportive of my individual needs*; M54—*There are people at the college who are genuinely interested in me as a person*). **Engagement/Involvement Factor** (Q129—hours spent on campus activities; Q173_1—currently holding leadership role in the Associated Students organization or a club officer; Q134—hours per week spent volunteering; Q128—hours per week spent studying; and Q173_9—Scholars Program[honors] participation).

Figure 18. Standardized coefficients for Respecified Omnibus Second-Order CFA Model.

Chapter 4 Conclusion

As a way of summarizing the findings for this study, Figures 19 to 28 graphically depict the total effects of the Conceptual Model on intent to persist, mattering, sense of belonging, engagement/involvement and socio-academic integrative experiences—arguably the most significant findings in the study. These figures readily highlight the dramatic effect that select factors or variables exerted on the outcome in question.

Figure 19. Total direct (D) and indirect (I) effects on intent to persist for community college students by race/ethnicity. [Legend: SUPFAMFRD = college transition support from family/friends; ENGAGE = engagement/involvement; SOB = sense of belonging; INTEGR = socio-academic integrative experiences; GOAL = goal (educational) commitment; LOA = length of college attendance; IC2S = institutional commitment to students; IWDP = interactions with diverse peers; HCC = perceptions of a hostile campus climate; MATTER = mattering to the college; UNITS = units enrolled; FINANCES = financial concerns while attending college].

Figure 20. Total direct (D) and indirect (I) effects on intent to persist for community college students: (a) all students, (b) White, (c) Latino/a, (d) Asian. [Refer to Figure 19 for legend]

Figure 19 presents a summary of the effects of 14 variables on intent to persist for four groups of students (all students in the study, White, Latino/a, and Asian). It may be observed that the effect of support from family and friends was not only the largest across groups, but also two-to-three times as large as the effect of any other variable. Figure 20 presents the same information in isolation by individual racial/ethnic group.

Figures 21 and 22 graphically display the effects of four factors/variables on students' perceptions of mattering to the college. As may be readily noted, interactions with diverse peers had the greatest impact on mattering for three student groups (all students, White, and Asian), followed by institutional commitment to students. The opposite was true for Latino/a students; that is, institutional commitment exerted a higher effect on mattering, albeit closely followed by interactions with diverse peers. Figure 22 presents the same information in isolation by individual racial/ethnic group.

Figure 21. Total direct and indirect (I) effects on mattering to college for community college students by race/ethnicity. [Legend: IC2S = institutional commitment to students; IWDP = interactions with diverse peers; SUPFAMFRD = college transition support from family/friends]

(a)

(b)

(c)

(d)

Figure 22. Total direct indirect (I) effects on mattering to college for community college students: (a) all students, (b) White, (c) Latino/a, (d) Asian. [Legend: IC2S = institutional commitment to students; IWDP = interactions with diverse peers; SUPFAMFRD = college transition support from family/friends]

With respect to sense of belonging, Figures 23 and 24 summarize the direct and indirect effects of six factors/variables for students in the study. The largest effect on belonging was perception of a hostile campus climate held by students; whereas, the largest positive effect was perceived mattering to the college, closely followed by interactions with diverse peers. As may be observed, Asian students were most affected by a hostile campus climate, and Latino students by higher perceptions of mattering to the institution.

Figure 23. Total direct and indirect (I) effects on sense of belonging for community college students by race/ethnicity. [Legend: IC2S = institutional commitment to students; IWDP = interactions with diverse peers; HCC= hostile campus climate; MATTER = perceived mattering to the college; SUPFAMFRD = college transition support from family/friends]

Figure 24. Total direct indirect (I) effects on sense of belonging for community college students: (a) all students, (b) White, (c) Latino/a, (d) Asian. [Refer to Figure 23 for legend]

Continuing on to the effects of engagement/involvement, its direct and indirect effects are depicted in Figures 25 and 26. Mattering exerted a higher effect on engagement/involvement for Latino/a students. The effect on the outcome variable by mattering and number of units in which students were enrolled at the time of the study was nearly identical for all students as a group and for White students. For Asian students, the number of units enrolled exerted a higher direct effect, albeit very closely followed by mattering.

Figure 25. Total direct and indirect (I) effects on engagement/involvement for community college students by race/ethnicity. [Legend: MATTER = perceived mattering to the college; UNITS= units enrolled; LOA = length of college attendance; IC2S = institutional commitment to students; IWDP = interactions with diverse peers; SUPFAMFRD = college transition support from family/friends].

Figure 26. Total direct indirect (I) effects on engagement/involvement for community college students: (a) all students, (b) White, (c) Latino/a, (d) Asian. [Refer to Figure 25 for legend]

Lastly, Figures 27 and 28 display a summary of the effects of five factors/variables on socio-academic integrative experiences for community college students by race/ethnicity.

Interactions with diverse peers had the strongest direct effect—nearly twice as much as the next factor—institutional commitment to students. The magnitude of the effect was nearly identical for students as a whole; that is, regardless of race/ethnicity.

Figure 27. Total direct and indirect (I) effects on socio-academic integrative experiences for community college students by race/ethnicity. [Legend: IC2S = institutional commitment to students; IWDP = interactions with diverse peers; MATTER = perceived mattering to the college; SUPFAMFRD = college transition support from family/friends]

Figure 28. Total direct indirect (I) effects on socio-academic integrative experiences for community college students: (a) all students, (b) White, (c) Latino/a, (d) Asian. [Refer to Figure 27 for legend]

CHAPTER 5

CONCLUSIONS

Following a call to continue tease out the nuances associated with diverse college student persistence and success, this study examined how factors such as institutional commitment to students, mattering, sense of belonging, interactions with diverse peers, perceptions of the campus climate, engagement/involvement, socio-academic integrative experiences, and goal commitment collectively impact community college students' intention to persist to degree completion. Whereas much has been written independently about each of these areas in the higher education literature, this study was the first to incorporate all these constructs into a single conceptual framework, thus enabling the researcher to assess the multidimensional and complex nature of persistence decisions for either two-year or four-year college students. As will be noted below, this study broke ground on several fronts. It is the first in the literature to empirically demonstrate a causal effect between institutional commitment to students and perceptions of mattering and with sense of belonging. It is also the first to demonstrate that mattering to the institution exerts a moderate to strong influence on community college students' engagement/involvement, socio-academic integrative experiences, sense of belonging, and indirectly on intent to persist. The study is also the first to present empirical evidence in support of an omnibus "student development and success" construct alluded to by Wolf-Wendel, et al. (2009) in their seminal work. Of import to these findings is that this construct explained a significant proportion of the variance for engagement/involvement, belonging, mattering, and interactions with diverse peers. The individual factors composing this omnibus construct were also found to exert an independent effect on intent to persist.

The impetus for the study was the ongoing educational crisis facing the U.S.; namely, the significant shortage of individuals holding college degrees (or career technical education certificates) to adequately support the economic needs of the nation. It has been noted repeatedly that the U.S. will experience a shortage of approximately 16 million degrees of the number required to meet the country's workforce needs of 2025 (Lumina Foundation for Education, 2010; National Center for Higher Education Management Systems and Jobs for the Future, 2007; Organization for Economic Co-operation and Development, 2011; Santiago & Reindl, 2000). Moreover, without these "credentialed" individuals, it is less likely that the U.S. will be able to compete in a rapidly changing global economy as jobs go unfilled.

As was noted in Chapter 1, community colleges stand to play a significant role in preparing students to join the workforce of tomorrow, by designing career/technical education programs and services responsive to the national economy. That is, community colleges may design short-term certificate programs or associate degree programs in areas of need and subsequently train students for jobs requiring a college-level education. Community colleges may also continue to promote their transfer mission (Cohen & Brawer, 2008) by preparing students to join baccalaureate-granting institutions.

Concomitant to this degree shortage is the ongoing problem of college student attrition/stopout. Statistics compiled by ACT (American College Testing, 2011) noted that the national first-to-second year retention rate for public community colleges was 55.4%. Federal statistics put this figure at 60% for full-time students and 40.1% for part-time students across the nation (Snyder & Dillow, 2011). By contrast, the first-to-second year retention rate for students at public four-year institutions was 73.3%. Furthermore, cross-institutional longitudinal studies have shown that just over 20% of first-time, full-time degree-seeking students attending public

community colleges obtained an associate degree or certificate within 150% of the expected "normal time," or three years (Snyder & Dillow, 2011). This percentage differed markedly by race/ethnicity. This study, for example showed that non-resident alien, Asian, and White students "graduated" at higher rates than Latino/a and Black students, suggesting that the factors and dynamics leading to dropout/stopout impact students differently. But it is also likely that practices and actions within institutional control—under the direct purview of community colleges—may counteract the extent to which students stop attending college.

This study attempted to explore one potential means to address this degree/credential shortcoming by examining how and to what degree, interactions between students and the institution, and students and institutional agents are taking place and how they differ by race/ethnicity. It was expected that such examination might uncover specific factors or practices that may enhance the probability of community college students completing a degree/certificate. It was noted in Chapter 2 that previous studies have attempted to do this by proposing and testing a variety of college impact and persistence-based models, which have examined how factors such as student background characteristics, finances, involvement, engagement, and integration impact student retention. However, these models have not yet proven to be a panacea to the completion agenda. Moreover, these models, have not yet examined purposefully the collective impact of constructs such as those in this study to explain community college students' intentions to persist or actual persistence to degree completion. Thus, this study was the first of its kind to have explored this shortcoming.

In reviewing the components characterizing the conceptual model presented in Figure 1, one may ask if in fact the model is relevant to a community college population given that such students have traditionally differed by background characteristics, degree aspirations, patterns of

attendance, etc. However, community colleges have varying educational missions, some of which may be emphasized more than others in response to local community needs (Bragg, 2001; Cohen & Brawer, 2008). Additionally, there are community colleges that have built their reputations around attracting students interested in transferring to four-year institutions after associate degree attainment or completion of lower-division coursework (Bahr, 2012; Gándara, Alvarado, Driscoll, & Orfield, 2012). Recent statistics from the National Center for Education Statistics have also shown that background characteristics between some community college students and students attending open enrollment or least selective four-year institutions may in fact not be very different—even with respect to remedial education enrollment (Sparks & Malkus, 2013). Moreover, the line between who constitutes a community college student is constantly being blurred by the “swirling” enrollment of students occurring especially in urban/suburban areas (Borden, 2004; McCormick, 2003). Likewise, more and more “four-year students” attend community colleges either while attending a university or because of finances (etc.) they “reverse transfer” to community colleges (Hossler et al., 2012). Hence, it is argued that the conceptual model for this study was relevant for this specific study. As noted in Chapters 3 and 4, nearly 95% of the sample of students participating in this study expressed an interest in transferring to a four-year institution. Thus, the elements of the model are all applicable. The addition of two constructs, mattering and sense of belonging, were particularly useful in explaining the dynamics leading to intent to persist, engagement/involvement, and socio-academic integration. These two concepts have been acknowledged in the literature in recent years as possibly accounting for the unique experiences of community college, traditionally underrepresented, low income, and first-generation college students, especially with

respect to persistence and attrition decisions (Barnett, 2010, 2011; Rendón, 2002; Rendón Linares & Muñoz, 2011; Tinto, 2012a; Wolf-Wendel et al., 2009).

Summary and Discussion of Findings

At the heart of the conceptual model for this study, was the proposition that perceived institutional commitment to students directly or indirectly impacts student perceptions of mattering, sense of belonging, institutional engagement/involvement, socio-academic integrative experiences, goal (educational) commitment, and ultimately intent to persist. It was posited that interactions with diverse peers and perceptions of a hostile campus climate and grade point average might also influence persistence intentions. The conceptual model integrated several control variables reported in the literature as influencing select college student outcomes. These included length of attendance, enrollment intensity, financial concerns, gender, and supportive family/friends. The study was specifically interested in examining structural differences in the conceptual model by race/ethnicity—not with the goal of developing a “one-fits-all” underlying structure, but to identify if students from various groups “understood” and experienced the above constructs similarly or differently.

The study began by assessing the goodness-of-fit of a measurement model (Research Question 1) consisting of seven factors (institutional commitment, perceptions of mattering, sense of belonging, interactions with diverse peers, perceptions of a hostile campus climate, institutional involvement/ engagement, and socio-academic integrative experiences). This analysis resulted in the respecification of the measurement model, which in essence entailed the elimination of several indicators that did not in fact adequately “represent” the factors.

The respecified measurement model was then subjected to a multiple group invariance analysis for race/ethnicity (Research Question 1.1). Of import to the study was the invariance

analysis for White, Latino, Asian, Black and American Indian/Alaskan Native students. However, given the small sample size for Black ($N = 104$) and American Indian/Alaskan Native ($N = 12$) students the invariance analysis for these groups was not carried out, albeit these students remained part of the whole group analyses (ALL students). In considering the invariance analysis findings (and after *post hoc* adjustments), the measurement model was found to be invariant across race/ethnic groups with respect to the configural, measurement, and structural models. Results did suggest the latent means for the seven factors in the measurement model differed slightly by race, but did not warrant either the exclusion of any group from the study or prevent the comparison of groups in further analyses.

Following this, the underlying structure of the hypothesized conceptual model (as depicted in Figure 1) was examined (Research Question 2). Factor indicators included in the model were based on the respecified measurement model above. Moreover, five exogenous (control variables), two endogenous, and one endogenous-outcome variables were all incorporated into the structural model. After two *post hoc* respecifications, 14 of the original 36 hypothesized causal paths in the model were removed owing to non-significant regression weights. The most significant path deletions from a theoretical standpoint were the paths from engagement/involvement to integration, institutional commitment to goal commitment, and integration to goal commitment (to be discussed below). Concomitantly, 13 regression paths not specified *a priori* were added to the model—all theoretically justified and proven to better account for the inter-relationships among latent variables with the outcome variable—intent to persist. Other small adjustments (error covariances) were also made. Goodness-of-fit indices indicated the above adjustments resulted in a good-fitting model.

Consistent with the multiple group invariance analysis for the measurement model, the structural model underlying the conceptual model was examined (Research Question 2.1). The equality of models was assessed for White, Latino/a, Asian and all students in the study as a group (ALL=White, Latino/a, Asian, Black, American Indian/Alaskan Native, Other). Results revealed that the structural model was clearly invariant between White and Latino/a students, but one index of fit (i.e., CFI) suggested the structural model might differ somewhat for Asian students. Carrying through with this examination, partial invariance for the measurement aspect of the model between White and Asian students was found, albeit their configural and structural models were equivalent. Upon further evaluation, it was decided that in moving to the examination of direct, indirect, and total effects that several parameters in the measurement model for Asian students would be freely estimated, albeit the structural model itself was deemed race/ethnicity invariant.

Since the conceptual model incorporated several constructs reported in the literature as impacting or mediating college students' success and outcomes, a second-order confirmatory factor analysis was conducted to determine if the constructs of engagement/involvement, sense of belonging, mattering, perceptions of the campus climate, and diverse peer relationships might form part of an omnibus construct (Research Question 4). Common among these constructs is the fact that they are integrated into various college student success and persistence models, college impact models, and are oftentimes conceptualized or defined similarly, yet are given different names. Several goodness-of-fit indices supported the conclusion that the variance associated with each of four constructs (diverse peer interactions, mattering, sense of belonging, and engagement/involvement—but not hostile campus climate) could be explained by a second-order omnibus factor. Despite their unique and divergent nature, it is possible the four constitute

what Wolf-Wendel et al. (2009) term a “student development and success” factor, and together contribute toward our “understanding of the [student success] puzzle” (p. 426).

Lastly, the direct, indirect and total effects of the respecified conceptual model were investigated. Five directional hypotheses were proposed (Research Question 3) on the expected interrelationships among the constructs—positive or negative. The directional hypotheses were partially supported by the respecified model. Given the invariant (or partially invariant) nature of the conceptual model, comparisons across groups were deemed appropriate.

Conclusions drawn from the analysis of the five hypotheses include the following:

(1) Contrary to limited findings for four-year colleges (Hausmann et al., 2007), this study did not find support for the hypothesized direct relationship from sense of belonging to intent to persist for any racial/ethnic group.

(2) The posited, albeit hypothesized relationship between mattering and involvement and mattering and persistence articulated by Schlossberg (1989) was partially supported. Until the time of this study, this assertion had remained an empirical question to be addressed. Indeed, mattering exerted a moderate to strong direct influence on community college student engagement/involvement, socio-academic integrative experiences, sense of belonging, and indirect effect on intent to persist. The relationship between mattering and sense of belonging is consistent with previous research noting that academic validation, a related construct to mattering, positively impacts community college students sense of “competent membership,” a construct akin to sense of belonging thought to represent Tinto’s socio-academic integration concepts (Barnett, 2006, 2010).

(3) Another key finding from the hypotheses was the role of engagement/involvement in directly impacting socio-academic integrative experiences, sense of belonging, and intent to

persist (especially for White students and students as a whole, but not for Latino/as or Asians).

Of significance for this particular finding is that engagement/involvement, socio-academic integrative experiences, and sense of belonging appear to be distinct constructs; supporting previous positions expressed by leading proponents and researchers for these constructs (as noted in Wolf-Wendel et al., 2009).

(4) Socio-academic integrative experiences accounted for a small portion of the variance in intent to persist for all students as a whole, as well as for Asian students—but not significantly for Latino/as or White students. This finding was significant particularly for Asian students given that they held poor impressions of relationships with instructors and classroom-based interactions with them (as demonstrated in the univariate analyses). Thus, it appears that actively participating in socio-academic integrative experiences around positive instructor interactions has real benefits for marginalized students—a finding consistent with the literature (Deil-Amen, 2011; Tinto, 2012a, 2012b). In light of previous criticisms in the literature that academic and social integration “privilege students who best fit into the mainstream academic culture” (Rendón, 2006, p. 4) and that these constructs poorly explain the experiences of impacted groups with respect to persistence (Rendón et al., 2000; Tierney, 1992), the meaning of these findings is not entirely clear. On the one hand, the low explanatory power of integration on intent to persist could substantiate the criticism above. It could also be argued that Asian students might now be part of the mainstream higher educational culture and thus the statistical significance between integration and intent to persist could be expected. However, Asian students are by no means a homogenous group. Moreover, the fact that socio-academic integrative experiences did not have a statistically significant path loading with intent to persist for White students, questions the generalization of the criticism above. It is very likely that individual campus cultures and the

degree to which specific student populations are represented, and are “seen” at those campuses that may in fact influence how students partake in various aspects of socio-academic integration. Recent findings from researchers have noted that classroom-based forms of socialization and academic validation from instructors (in and outside the classroom) may in fact contribute to community college student persistence (Barnett, 2006, 2010; Tinto, 2012a). This latter finding approximates how socio-academic integrative experiences were measured in this study.

(5) Perceptions of a hostile campus climate had a strong negative effect on sense of belonging for all students regardless of race/ethnicity, but particularly for Asian students. These findings are fully consistent with the growing number of studies on sense of belonging, which consistently report similar findings (Hausmann et al., 2007; Hausmann et al., 2009; Hurtado & Carter, 1997; Locks et al., 2008; Nuñez, 2009; Saenz et al., 2007; Strayhorn, 2012). It should be noted that this effect was also found for White students in this study.

(6) Interactions with diverse peers had a very strong direct effect on mattering and a small to moderate effect on sense of belonging. Diverse peer interactions had the strongest effect on White and Asian students’ sense of belonging. It exerted a greater influence on engagement/involvement for Latino/as; and on socio-academic integration for all students, regardless of race—again questioning the generalized criticism of integration in the literature. Although, it is also acknowledged that positive interactions with diverse peers exercises a compensatory effect on measures of the college environment, which might otherwise be judged as privileging one group over another (Rendón, 2006).

Additional and important findings from the examination of the direct, indirect, and total effects explained by the conceptual model are now highlighted. Several of these empirical findings are reported for the first time in the literature.

(7) The total variance associated with intent to persist for the respecified conceptual model was similar across three racial/ethnic groups, and significantly higher for one: ALL = .21, White = .21, Latino/a = .19, and Asian = .28. This suggests that the conceptual model explains Asian students' experiences better than for other students. In fact, two factors appear to have played a greater role in explaining the total effects for Asian students: higher levels of support from family/friends and higher grade point averages. The findings for GPA are consistent with previous studies reporting that Asian students achieve higher GPAs even after controlling for background characteristics and high school GPA (Dennis, Phinney, & Chuateco, 2005). The direct and indirect effects on intent to persist are graphically depicted in Figures 19 and 20 (at the conclusion of Chapter 4).

(8) With respect to intent to persist, transition support from family and friends exerted the highest (and direct) degree of influence on intent to persist across all racial/ethnic groups; reinforcing the crucial role that strong support from family and friends plays in facilitating college transition and adjustment (Allen & Nora, 1995; Cabrera et al., 1992a; Hurtado & Carter, 1997; Nora et al., 2005; Nora & Cabrera, 1993; Rendón et al., 2000; Strauss & Volkwein, 2004; Torres, 2006). As suggested in the retention literature, the direct effect of goal commitment on intent to persist was significant for all students as a whole, Latino/as, and Asian students. GPA was also correlated with persistence intentions for all student groups, but not for Latino/as, suggesting that no matter their performance in college Latino/as intend to carry through in their commitment to earn a degree (Tovar & Simon, 2006). Engagement/involvement in educationally purposeful and co-curricular activities directly and positively impacted intent to persist for White students and all students as a group. This finding is generally consistent with findings from four-year studies (Kuh et al., 2008) and at least one other community college-

based study (McClenney & Marti, 2006) noting the complete or near absence of compensatory effects with respect to engagement/persistence with ethnic minority students, especially Latino/as. Socio-academic integrative experiences—generally consisting of perceived instructor availability and support—was a positive factor on persistence for all students as a group and Asian students. Length of college attendance exerted a negative impact on persistence intentions for students as a whole and White students, but as noted previously, it did not have a significant influence for Latino/a and Asian students. Lastly, with respect to the outcome variable in the conceptual model—intent to persist—it was hypothesized that sense of belonging would positively impact persistence intentions. However, no direct effects were present for any student group. The magnitude of the total effects for belonging on persistence did reach statistical significance for White students, indicating that sense of belonging had a small total effect on the outcome variable. This last finding, while disappointing, does suggest that other factors play a more significant role on intentions to persist. However, this study cannot in any way ascertain that a direct/indirect effect of belonging on actual persistence does not exist. As noted elsewhere in this manuscript, the literature on sense of belonging is relatively new and the available studies have primarily used this variable as an *outcome* variable (e.g., Hurtado & Carter, 1997; Nuñez, 2009; Strayhorn, 2008). Only one four-year study has examined thus far the effect of sense of belonging for African American and White students on second year persistence (Hausmann et al., 2009).

(9) With respect to perceptions of mattering to the college, this study was the first to examine the impact of institutional commitment to students, interactions with diverse peers and transition support from family and friends on mattering—all of which exerted positive, moderate to strong direct effects. Diverse interactions with peers and transition support from

family/friends were also found to indirectly influence perceptions of mattering to a greater degree for Latino/as. This study is the first that empirically demonstrates the causal nature between institutional commitment and student perceptions of mattering. This finding lends support to Tinto's (1993) contention that institutional commitment communicates to students an "ethic of care" on part of the institution, which in turn may exert an influence on student success and persistence. The direct and indirect effects of mattering to the college are graphically depicted in Figures 21 and 22 (at the conclusion of Chapter 4).

(10) This study is also the first to report the causal effect of mattering on belonging, whereas others have only theorized it (Strayhorn, 2012). This effect was found across all racial/ethnic groups, but it was strongest for Latino/as. Also of great significance and not previously reported in the literature is the finding that institutional commitment to students and interactions with diverse peers counteract the effects that a perceived hostile campus climate has on students' sense of belonging at the institution. This is the first community college study to empirically demonstrate such relationship. The direct and indirect effects of sense of belonging are graphically depicted in Figures 23 and 24 (at the conclusion of Chapter 4).

(11) Also significant to the study was the finding of mattering exerting a direct effect on engagement/involvement, and a moderating effect between institutional commitment and engagement especially Latino/a students. While this relationship had been implied in previous studies (France & Finney, 2009; Schlossberg, 1989; Strayhorn, 2012), this study provides the empirical evidence to substantiate the causal relationship. The direct and indirect effects on intent to persist are graphically depicted in Figures 25 and 26 (at the conclusion of Chapter 4).

(12) While the role of socio-academic integrative experiences on intent to persist was small, the role of institutional commitment to students, interactions with diverse peers,

perceptions of mattering, and transition support from family/friends on socio-academic integration cannot be overstated, as they were all significant factors across all racial/ethnic groups. Although, institutional commitment to students appears to exert a higher effect for Latino/as, while mattering enhanced White students' integrative experiences. The direct and indirect effects of socio-academic integrative experiences are graphically depicted in Figures 27 and 28 (at the conclusion of Chapter 4).

(13) While it was expected that institutional commitment to students would exert a direct positive effect on goal commitment and intent to persist, no direct link was evidenced in this study. However, institutional commitment to students appears to play a significant, albeit indirect role in influencing student participation in the social and academic communities of the college—regardless of race/ethnicity, but it is especially compensatory for Asian and Latino/as. This study was the first to investigate the influence of institutional commitment to students on a community college population.

(14) Gender was found to influence several key factors leading to intent to persist. A small significant negative path from gender to sense of belonging was found for all students as a group and for Asian students, but not for Latino/as or White students. This finding suggested that males experienced lower perceptions of belonging to the institution. Gender also influenced interactions with diverse peers, albeit to a small degree, for all students, White students, and Asian, but not Latino/a students. With respect to the total effects in the model, gender appeared to impact perceptions of mattering significantly more for Asian students (favoring females), but slightly less for other race/ethnic groups. In reference to pattern of attendance; that is, the number of units in which students were enrolled at the time the study was conducted, exercised a positive impact on engagement/involvement across the board—significantly higher for all

students as a group and for White students, but less so for Latinos/as and Asians. Number of units enrolled also had a small, positive, and significant total effect on intent to persist for all students and White students only, on GPA for all students, and on goal commitment for all groups.

Rearticulation of Conceptual Model Propositions on Intent to Persist

Given the above findings and consistent with the respecification of the Conceptual Model, a revision of its propositions is in order. Accordingly, the following revised propositions are offered:

At the heart of the model, is the proposition that perceived institutional commitment to students directly or indirectly impacts student perceptions of mattering, sense of belonging, institutional engagement/involvement, socio-academic integrative experiences, goal (educational) commitment, and ultimately intent to persist. The model further contends that:

- a) Institutional commitment to students is demonstrated in the actions taken by the college to facilitate college transition and adjustment. This is further shown by actions and behaviors exhibited by institutional agents such as instructors and counselors in their ongoing interactions with students that facilitate student development in a positive learning environment. Institutional commitment will in turn directly influence student perceptions of mattering to the college, sense of belonging, and socio-academic integrative experiences.
- b) To the degree that students perceive a high level of institutional commitment, and have positive relationships with racially/ethnically diverse peers characterized as close, supportive, and available, their sense of belonging to the institution will be enhanced. Perceiving the campus climate as hostile owing to personal characteristics (i.e., gender,

race/ethnicity, sexual orientation, age) that result in feelings of alienation will deleteriously affect sense of belonging. A positive sense of belonging has the potential to exert influence on grades.

- c) Perceptions of mattering to the college will be directly influenced by institutional commitment to students and by positive interactions with diverse peers. In turn, perceptions of mattering to the institution will enhance students' sense of belonging, and facilitate engagement/involvement, and socio-academic integration, and ultimately intent to persist.
- d) Student involvement in campus activities and engagement in educationally beneficial activities promoting leadership skill development, community service, and academically rigorous activities will wield a direct influence on grades, goal commitment, and intent to persist.
- e) Socio-academic integrative experiences characterized by informal and supportive interactions with institutional agents—especially instructors—will directly and positively impact student's intentions to persist. Integrative experiences will be partially influenced by the support students receive from family/friends, by perceived mattering to the institution, and institutional commitment to students.
- f) Perceived mattering to the college, sense of belonging to the institution, engagement/involvement in educationally beneficial activities, socio-academic integrative experiences, goal commitment, and grades will all directly influence student intent to persist.

Implications for Theory

Findings from this study both support and question theoretical tenets about the impact of institutional commitment to students, socio-academic integration, and sense of belonging as directly impacting persistence. Of course, in this study, actual persistence to degree completion was not examined. Instead, community college students' intentions to persist served as the outcome variable. Thus, the extent to which these findings support or contradict theory, are likely relevant to student intentions only.

The best known and tested model on student persistence is Tinto's longitudinal model of institutional departure (Tinto, 1975, 1987, 1993). In this model, he asserted that institutional commitment to students plays a significant role in reinforcing students' intentions and commitments (e.g., commitment to the institution), and persistence decisions. Findings from this study did not support a direct link between institutional commitment to students and persistence intentions for community college students of any race/ethnicity; nor did it directly influence goal commitments. However, this study highlighted the significant role that institutional commitment exerts on factors such as perceptions of mattering, student engagement/involvement in educationally beneficial activities, sense of belonging, and socio-academic integrative experiences. Institutional commitment to students was particularly important for Latino/as across several intermediate outcome variables including engagement, mattering, sense of belonging to the institution, and integrative experiences.

The perceived value of academic and social integration in explaining student persistence continues to ensue; although there is a growing recognition that academic integration—as traditionally measured—cannot sufficiently explain whether a student remains or drops out of college (Berger & Braxton, 1998; Braxton, 1999; Braxton & Hirschy, 2005; Braxton et al., 1997;

Kraemer, 1997; Tinto, 2006, 2012a). Critics have rightly argued that integration as a construct holds little to no value, and is unfair, for traditionally underrepresented college students, low income, and first generation college students (Hurtado & Carter, 1997; Rendón et al., 2000; Tierney, 1992). Researchers have now begun to move away from traditional notions of academic/social integration. They now emphasize that “socio-academic integrative moments” (Deil-Amen, 2011) occur throughout the campus, but especially through informal interactions between students and institutional agents—namely instructors. There is also a growing recognition that socio-academic integrative experiences occur in the classroom itself, largely facilitated by active learning pedagogies, and group-based activities conceptualized by instructors where students of diverse backgrounds interact with one another (Tinto, 2012a). This study both supports and contradicts the notion that integrative experiences directly influence intentions to persist. Results from the study supported the value of this construct for all students as a group and for Asian students, but not for White or Latino/a students. However, direct path coefficients in the model were relatively small. The finding for all students could be a statistical artifact owing to the large sample size, however. As noted previously, it could also be that integrative experiences do privilege some students over others (Rendón, 2006)—perhaps those privileged from having had parents who attended college or whom otherwise possess higher levels of cultural and social capital (Lareau, 2003; Nora, 2004; Stanton-Salazar, 1997), and thus know how college works. Despite the lack of “sufficient” evidence in this study to truly validate the integration-persistence intentions link, the findings do point out that impacted groups such as Latino/as could still draw benefits from socio-academic integrative experiences; albeit, this appears to be the case only if they perceive high levels of institutional commitment toward them and can draw on the support from family/friends.

This study also investigated if sense of belonging to the institution could explain the variance associated with intention to persist for community college students. Theoretical work suggests that belonging should influence intentions to persist and actual persistence (Hurtado & Carter, 1997; Tinto, 2012a), and at least two studies with four-year college students have found support for this relationship (Hausmann et al., 2007; Hausmann et al., 2009). However, the present study did not find such support. It is unclear from these findings if sense of belonging truly lacks value for community college students' persistence intentions, or if in fact, it exercises a direct link to actual persistence. Unfortunately, this could not be examined in this study. It could also be that assessing students' general sense of belonging to the institution is not sufficient. My previous work and those of others suggest that sense of belonging may be multidimensional and context/object-specific (Hoffman et al., 2002; Tovar & Simon, 2010). Hence, future research should explore this possibility.

Implications for Research & Limitations

With respect to implications for research, it is crucial that the validity of the conceptual model be studied with a variety of community colleges, especially since their educational missions and values differ. Whereas, the college where data was gathered had a dominant transfer-focus, results for institutions with a strong CTE mission and programs, may find this model not as useful. Future research should also investigate the applicability of the model to four-year students, across institutional types.

As noted throughout, this study focused on assessing community college students' intentions to persist. Moving forward, it will be important to test the conceptual model by integrating longitudinal data, including actual persistence to degree completion indicators. Focusing on urban community colleges, this might be accomplished by examining centralized

databases often held by statewide community college agencies, such as the California Community Colleges Chancellor's Office, where enrollment data for students attending community colleges in the state are maintained. Moving this to a national level, it may be possible to track participating students' progression to degree completion through the National Student Clearinghouse. This is especially important given the "swirling" nature of community college student attendance.

On the methodological front, and before validating the conceptual model with other institutions, it is highly recommended that "better" measures for engagement/involvement and socio-academic integrative experiences that are reflective of community colleges and of community college students are developed. Moreover, it will be important to collect sufficient data for various student groups, including Black and American Indian/Alaskan Native students, who were significantly underrepresented in this study, thus preventing the validation of the conceptual model on them. The model's applicability could also be assessed with an international student (student visa) population. However, it will be important to integrate measures of acculturation and adjustment in the validation process. Lastly, it is also recommended that multiple group invariance analyses for the underlying structural framework of the model for gender, socio-economic status, residency status, age, etc., be conducted. This study only focused on race/ethnicity. Unfortunately, it is too common in higher education that invariance analyses for college impact models and college persistence models are simply not conducted. A review of the leading higher education journals will readily point this out.

Implications for Practice

Examining the total effects of various constructs and variables in the conceptual model tested in this study—and as noted in the findings above—one will note that college transition

support from family and friends was the single factor that had the highest impact on intent to persist for community college students, followed by engagement/involvement in educationally beneficial activities—curricular and co-curricular. Interactions with diverse peers, institutional commitment to students, and perceptions of mattering to the institution directly and indirectly contributed to several intermediate outcomes (sense of belonging and socio-academic integrative experiences), as well as intent to persist for most student groups. Given these findings and the complex nature of the relationships associated with the factors examined in this study, it appears that key to the success of community college students is first and foremost, the support of family and friends. As such, community college administrators and counselors should actively integrate specific ideas into their college orientation programs on how family and friends could be involved in students' education. These ideas could be disseminated as part of comprehensive parent/significant other orientations or workshops; or in semi-formal family/friends mentoring or academic coaching programs where college personnel teach “coaches” strategies to support their student during key transition periods. Such a program is currently being piloted at a small scale at Cerritos College in California, and is in the planning stages with several thousand students at Santa Monica College.

Additionally, since institutional commitment to students, mattering, and interactions with diverse peers play such an important role across intermediate college outcomes, there exists an opportunity for community colleges to “exploit” the impact of these constructs in students' academic lives. Given the nature of mattering and institutional commitment to students, it seems that instituting cost-neutral or relatively inexpensive trainings/workshops for faculty, counselors, and other college personnel could exercise high benefits for both the student and the institution. Such trainings could emphasize the importance of agent-student relationships in college

progression and adjustment. The notion of creating and sustaining a supportive, welcoming college and classroom environment where students feel genuinely valued and important, where their needs are recognized, where faculty and staff outreach directly to them to discuss their accomplishments or offer support as they experience difficulties, should be emphasized.

Moreover, as institutional agents, instructors and counselors alike can influence how students socialize at the college, how and to what degree they are exposed to other diverse students, and to resources supporting their success. As protective agents, instructors and counselors serve as conduits to college-related information of various forms, particularly during key “pivotal moments” in the college-planning process (Espinoza, 2007; Lundberg & Schreiner, 2004; Museus, 2010; Santos Laanan, 2003). Consistent with previous studies and given the very nature of the community college system, it is often difficult for students to form relationships with instructors—relationships that could prove essential to their success. Thus, community college administrators and faculty must make a concerted effort to design strategies to reach-out to students within the very places they are found, namely the classroom. More and more, there is a growing recognition that faculty must facilitate engagement/involvement in the classroom, and this need not always be formal in nature (Tinto, 2012a).

Conclusion

Drawing from this study and the literature, the success of community college students in general, and of marginalized students in particular, is influenced by the availability of resources to support their transition and adjustment to college. This includes systematic, purposeful, and informal agent-student interactions. According to Deil-Amen (2011), marginalized populations will successfully navigate the cultural, psychosocial, and the intellectual realms of the college experience when they are adequately supported by institutional agents. This in turn, will

facilitate students' perceptions that the college is committed to their success, that they matter to the institution, and that they belong. Ultimately, these perceptions will likely exert an influence on students' decisions to remain or depart the institution.

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Appendix A

Supplemental Tables & Figures for Chapter 4

Table A-1

Unstandardized and Standardized Coefficients for Respecified Measurement Model 2—the Model of Best Fit Research Question 1)

Item	Unstandardized Estimates				Standardized
	Estimate	S.E.	C.R.	Sig.	Estimate
Institutional Commitment to Students (IC2S)					
M39	0.917	0.029	31.983	***	0.737
M17	0.75	0.025	29.514	***	0.671
M59 ^a	1				0.868
Interactions with Diverse Peers (IWDP)					
Q82	1.086	0.028	38.811	***	0.814
Q78	1.117	0.027	41.23	***	0.878
Q74 ^a	1				0.79
Perceptions of a Hostile Campus Climate (HCC)					
M63neg	1.172	0.068	17.26	***	0.495
M55neg	1.422	0.068	20.934	***	0.679
M36neg	0.627	0.036	17.585	***	0.507
M18neg ^a	1				0.647
Socio-Academic Integrative Experiences (SAIE)					
InsSup	0.993	0.027	37.06	***	0.899
InsAvail	1				0.845
Engagement/Involvement (ENGAGEMENT)					
Q173_1	0.248	0.025	10.004	***	0.353

Item	Unstandardized Estimates				Standardized
	Estimate	S.E.	C.R.	Sig.	Estimate
Q128	1.097	0.119	9.187	***	0.309
Q134	0.707	0.065	10.921	***	0.419
Q129 ^a	1				0.661
Q173_9	0.174	0.021	8.237	***	0.266
Perceptions of Mattering (MATTERING)					
M54	1.093	0.036	30.682	***	0.792
M53	1.078	0.035	31.194	***	0.814
M48 ^a	1				0.692
Sense of Belonging (SOB)					
M34	0.541	0.022	24.157	***	0.537
M32	0.67	0.027	24.661	***	0.586
M30	0.889	0.025	35.587	***	0.812
M31 ^a	1				0.843

^a First congeneric item; not freely estimated.

*** $p < .001$

Table A-2

*Unstandardized Structural Paths (Regression Weights & Covariances) for Model of Best Fit
(Respecified Structural Model 2)*

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Estimate	S.E.	C.R.	p
Regression Weights						
F = Factor						
F_IWDP	←	Gender	0.158	0.04	3.954	***
F_IWDP	←	SupFamFrd	0.154	0.025	6.142	***
F_IC2DS	←	F_IWDP	0.411	0.032	12.953	***
F_IC2DS	←	SupFamFrd	0.132	0.031	4.271	***
F_MATTERING	←	Gender	0.078	0.033	2.362	0.018
F_HCC	←	F_IWDP	-0.106	0.021	-5.074	***
F_HCC	←	F_IC2DS	-0.053	0.017	-3.132	0.002
F_HCC	←	SupFamFrd	-0.166	0.02	-8.273	***
F_MATTERING	←	F_IWDP	0.4	0.025	15.958	***
F_MATTERING	←	F_IC2DS	0.333	0.021	16.094	***
F_SOB	←	F_IWDP	0.183	0.037	4.875	***
F_SOB	←	F_IC2DS	-0.109	0.031	-3.492	***
F_SOB	←	Gender	-0.229	0.045	-5.053	***
F_ENGAGEMENT	←	Length of Attendance	0.065	0.013	4.928	***
F_ENGAGEMENT	←	F_MATTERING	0.207	0.026	7.905	***
F_SOB	←	F_MATTERING	0.557	0.049	11.447	***
F_ENGAGEMENT	←	Unit Load	0.043	0.006	7.799	***
F_SOB	←	F_HCC	-0.977	0.067	-14.634	***
GPA	←	F_SOB	0.047	0.024	2.002	0.045

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Estimate	S.E.	C.R.	<i>p</i>
GPA	←	Financial Concerns	-0.069	0.017	-4.131	***
GPA	←	F_ENGAGEMENT	0.699	0.09	7.727	***
F_INTEGRATION	←	SupFamFrd	0.08	0.019	4.251	***
F_INTEGRATION	←	F_MATTERING	0.182	0.03	6.016	***
Goal Commitment	←	GPA	0.062	0.023	2.636	0.008
F_INTEGRATION	←	F_IC2DS	0.144	0.02	7.137	***
F_INTEGRATION	←	F_IWDP	0.374	0.025	14.744	***
Goal Commitment	←	F_HCC	-0.138	0.048	-2.874	0.004
Goal Commitment	←	F_ENGAGEMENT	0.604	0.093	6.479	***
M63neg	←	F_HCC	1			
M55neg	←	F_HCC	1.181	0.067	17.539	***
M36neg	←	F_HCC	0.598	0.04	15.051	***
M18neg	←	F_HCC	0.88	0.051	17.364	***
Q74	←	F_IWDP	1			
Q78	←	F_IWDP	1.119	0.027	41.236	***
Q82	←	F_IWDP	1.086	0.028	38.761	***
M32	←	F_SOB	0.665	0.029	23.093	***
M17	←	F_IC2DS	0.751	0.025	29.575	***
M59	←	F_IC2DS	1			
M39	←	F_IC2DS	0.919	0.029	32.073	***
M54	←	F_MATTERING	1.092	0.036	30.738	***
M48	←	F_MATTERING	1			
Q129	←	F_ENGAGEMENT	0.705	0.074	9.515	***
Q128	←	F_ENGAGEMENT	1			
InsAvail	←	F_INTEGRATION	1			

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Estimate	S.E.	C.R.	<i>p</i>
M53	←	F_MATTERING	1.076	0.034	31.248	***
Intent to PERSIST	←	F_SOB	0.045	0.024	1.894	0.058
Intent to PERSIST	←	GPA	0.066	0.022	2.992	0.003
Q173_9	←	F_ENGAGEMENT	0.192	0.023	8.306	***
Q173_1	←	F_ENGAGEMENT	0.199	0.024	8.173	***
Q134	←	F_ENGAGEMENT	0.529	0.062	8.539	***
InsSup	←	F_INTEGRATION	0.99	0.027	37.301	***
Intent to PERSIST	←	Length of Attendance	-0.062	0.019	-3.266	0.001
Intent to PERSIST	←	F_INTEGRATION	0.105	0.035	3.04	0.002
Intent to PERSIST	←	SupFamFrd	0.491	0.029	16.702	***
Intent to PERSIST	←	Goal Commitment	0.09	0.022	4.041	***
M30	←	F_SOB	0.892	0.028	32.24	***
M31	←	F_SOB	1			
Intent to PERSIST	←	F_ENGAGEMENT	0.301	0.077	3.88	***

Covariances

Gender	↔	Length of Attendance	0.011	0.013	0.867	0.386
Length of Attendance	↔	SupFamFrd	0.014	0.021	0.656	0.512
Gender	↔	Financial Concerns	0.002	0.015	0.134	0.894
SupFamFrd	↔	Financial Concerns	-0.098	0.024	-4.01	***
Financial Concerns	↔	Unit Load	-0.312	0.123	-2.541	0.011
Gender	↔	SupFamFrd	0.032	0.008	3.778	***
Gender	↔	Unit Load	-0.137	0.043	-3.211	0.001
SupFamFrd	↔	Unit Load	0.274	0.068	4.022	***

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Estimate	S.E.	C.R.	<i>p</i>
Length of Attendance	↔	Unit Load	-0.718	0.105	-6.833	***
Length of Attendance	↔	Financial Concerns	0.046	0.037	1.229	0.219
eGoal	↔	Unit Load	0.479	0.103	4.641	***
eS30	↔	eS32	-0.059	0.026	-2.252	0.024
eEI128	↔	Unit Load	0.827	0.143	5.79	***

*** $p < .001$

^a Denotes this variable represents a latent factor in the model.

Table A-3

Standardized Structural Paths (Regression Weights & Correlations) for Model of Best Fit

(Respecified Structural Model 2)

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Regression Weight
Regression Weights			
F = Factor			
F_IWDP	←	Gender	0.09***
F_IWDP	←	SupFamFrd	0.14***
F_IC2DS	←	F_IWDP	0.33***
F_IC2DS	←	SupFamFrd	0.10***
F_MATTERING	←	Gender	0.05*
F_HCC	←	F_IWDP	-0.16***
F_HCC	←	F_IC2DS	-0.10***
F_HCC	←	SupFamFrd	-0.22***
F_MATTERING	←	F_IWDP	0.41***
F_MATTERING	←	F_IC2DS	0.43***
F_SOB	←	F_IWDP	0.14***
F_SOB	←	F_IC2DS	-0.10***
F_SOB	←	Gender	-0.10***
F_ENGAGEMENT	←	Length of Attendance	0.15***
F_ENGAGEMENT	←	F_MATTERING	0.34***
F_SOB	←	F_MATTERING	0.40***
F_ENGAGEMENT	←	Unit Load	0.34***
F_SOB	←	F_HCC	-0.50***
GPA	←	F_SOB	0.05*
GPA	←	Financial Concerns	-0.09***
GPA	←	F_ENGAGEMENT	0.32***
F_INTEGRATION	←	SupFamFrd	0.08***
F_INTEGRATION	←	F_MATTERING	0.19***

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Regression Weight
Goal Commitment	←	GPA	0.06*
F_INTEGRATION	←	F_IC2DS	0.20***
F_INTEGRATION	←	F_IWDP	0.41***
Goal Commitment	←	F_HCC	-0.07**
Goal Commitment	←	F_ENGAGEMENT	0.27***
M63neg	←	F_HCC	0.50***
M55neg	←	F_HCC	0.67***
M36neg	←	F_HCC	0.49***
M18neg	←	F_HCC	0.65***
Q74	←	F_IWDP	0.79***
Q78	←	F_IWDP	0.88***
Q82	←	F_IWDP	0.81***
M32	←	F_SOB	0.58***
M17	←	F_IC2DS	0.67***
M59	←	F_IC2DS	0.87***
M39	←	F_IC2DS	0.74***
M54	←	F_MATTERING	0.79***
M48	←	F_MATTERING	0.69***
Q129Trunc	←	F_ENGAGEMENT	0.55***
Q128	←	F_ENGAGEMENT	0.33***
InsAvail	←	F_INTEGRATION	0.85***
M53	←	F_MATTERING	0.81***
Intent to PERSIST	←	F_SOB	0.05†
Intent to PERSIST	←	GPA	0.07**
Q173_9	←	F_ENGAGEMENT	0.35***
Q173_1	←	F_ENGAGEMENT	0.34***
Q134Truc	←	F_ENGAGEMENT	0.37***
InsSupTrunc	←	F_INTEGRATION	0.90***
Intent to PERSIST	←	Length of Attendance	-0.07***

Factor ^a or Indicator	Direction	Factor ^a or Indicator	Regression Weight
Intent to PERSIST	←	F_INTEGRATION	0.07***
Intent to PERSIST	←	SupFamFrd	0.34***
Intent to PERSIST	←	Goal Commitment	0.09***
M30	←	F_SOB	0.82***
M31	←	F_SOB	0.84***
Intent to PERSIST	←	F_ENGAGEMENT	0.13***
Correlations			
Length of Attendance	↔	SupFamFrd	0.014
Gender	↔	Financial Concerns	0.003
SupFamFrd	↔	Financial Concerns	-0.088
Financial Concerns	↔	Unit Load	-0.055
Gender	↔	SupFamFrd	0.083
Gender	↔	Unit Load	-0.069
SupFamFrd	↔	Unit Load	0.087
Length of Attendance	↔	Unit Load	-0.149
Length of Attendance	↔	Financial Concerns	0.027
eGoal	↔	Unit Load	0.114
eS30	↔	eS32	-0.078
eEI128	↔	Unit Load	0.146

*** $p < .001$; ** $p < .01$; * $p < .05$; † $p = .06$.

^a Denotes this variable represents a latent factor in the model.

Table A-4

Squared Multiple Correlations for Model of Best Fit (Respecified Structural Model 2)

Factor ^a or Indicator	Estimate
F_IWDP	0.031
F_IC2DS	0.129
F_MATTERING	0.478
F_HCC	0.111
F_ENGAGEMENT	0.239
F_SOB	0.523
GPA	0.116
Goal Commitment	0.12
F_INTEGRATION	0.457
InsSup	0.806
Q173_1	0.113
Q173_9	0.121
InsAvail	0.717
Q128	0.142
Q129	0.305
Q134	0.138
M48	0.48
M53	0.662
M54	0.627

Factor ^a or Indicator	Estimate
Intent to PERSIST	0.205
M39	0.544
M59	0.752
M17	0.451
M32	0.339
M31	0.713
M30	0.668
Q82	0.662
Q78	0.772
Q74	0.622
M18neg	0.422
M36neg	0.238
M55neg	0.45
M63neg	0.251

Table A-5

Variances for Model of Best Fit (Respecified Structural Model 2)

Source	Estimate	S.E.	C.R.	<i>p</i>
Gender	0.242	0.007	32.303	***
Length of Attendance	1.434	0.044	32.303	***
SupFamFrd	0.616	0.019	32.303	***
Financial Concerns	2.007	0.062	32.303	***
Unit Load	16.14	0.499	32.346	***
resDP	0.693	0.034	20.516	***
resICS	0.959	0.046	21.035	***
resHC	0.298	0.029	10.255	***
resM	0.354	0.023	15.108	***
resSOB	0.614	0.038	16.07	***
resEngInv	0.196	0.036	5.496	***
eGPA	1.116	0.038	29.596	***
resIntExp	0.324	0.016	19.782	***
eGoal	1.101	0.037	29.407	***
eHC63	0.998	0.035	28.162	***
eHC55	0.572	0.026	22.019	***
eHC36	0.382	0.013	28.45	***
eHC18	0.356	0.015	23.114	***
eDP74	0.434	0.018	24.81	***
eDP78	0.264	0.015	17.086	***
eDP82	0.432	0.019	23.235	***
eS30	0.51	0.031	16.63	***

Source	Estimate	S.E.	C.R.	<i>p</i>
eS31	0.518	0.035	14.823	***
eS32	1.109	0.041	27.12	***
eIC17	0.755	0.028	26.84	***
eIC59	0.364	0.027	13.346	***
eIC39	0.778	0.033	23.819	***
ePer	1.033	0.033	31.679	***
eM54	0.482	0.022	22.113	***
eM53	0.401	0.02	20.478	***
eM48	0.735	0.027	26.859	***
eEI134	0.451	0.016	28.814	***
eEI128	1.986	0.07	28.308	***
eEI1739	0.069	0.002	29.306	***
eEI1731	0.08	0.003	29.543	***
eIEInsSup	0.141	0.013	10.605	***
eIEInsAv	0.236	0.015	16.01	***
eEI129	0.293	0.013	22.58	***

*** $p < .001$

Appendix B

Appendix B-1: Correlation Matrix for Variables in Conceptual Model (N = 2,088)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Q177	1												
2. Q125	.149**	1											
3. Q119	0.002	-.072**	1										
4. Q180	-0.03	-.054*	0.003	1									
5. SupFamFrd	.379**	.090**	.083**	-.088**	1								
6. Q126	-0.043	-.152**	0.019	0.027	0.014	1							
7. GPA	.167**	.193**	.046*	-.091**	.089**	-0.003	1						
8. M59	.126**	0.004	0.008	-0.002	.124**	-0.025	0.03	1					
9. M17	.137**	.092**	-0.002	0.022	.106**	0.027	.051*	.584**	1				
10. M39	.117**	0.009	0.031	0.016	.104**	-.063**	0.02	.639**	.497**	1			
11. M07	.173**	0.025	.051*	0.031	.106**	0.029	.102**	.291**	.263**	.259**	1		
12. M38	.122**	-.058**	.049*	-.062**	.176**	-.056*	0.018	.234**	.153**	.238**	.186**	1	
13. Q176	.281**	.085**	0.01	-.072**	.256**	-0.003	.120**	.379**	.268**	.313**	.248**	.206**	1
14. Q70	.159**	-0.029	.105**	0.031	.161**	0.002	.045*	.228**	.174**	.195**	.209**	.221**	.214**
15. Q74	.140**	.045*	.062**	.051*	.124**	-0.005	0.024	.215**	.139**	.180**	.189**	.104**	.208**
16. Q78	.122**	-0.011	.103**	0.042	.128**	-0.015	.064**	.274**	.203**	.239**	.255**	.178**	.242**
17. Q82	.095**	.044*	.072**	0.02	.120**	-0.028	.057**	.249**	.205**	.220**	.217**	.135**	.237**
18. M18neg	-.099**	.062**	-.076**	.045*	-.178**	-.065**	-.063**	-.080**	-.068**	-.118**	-.085**	-.228**	-.122**
19. M36neg	-.107**	0.009	-.111**	0.034	-.138**	-0.039	0.016	-.068**	-.068**	-.104**	-.091**	-.237**	-.084**
20. M55neg	-.049*	.093**	-.072**	.051*	-.162**	-0.035	-0.03	-.094**	-0.02	-.114**	-.052*	-.242**	-.135**
21. M63neg	-.115**	-.082**	-0.023	.064**	-.173**	.046*	0.005	-.096**	-.076**	-.110**	-0.037	-.162**	-.150**
22. M48	.123**	.087**	.063**	0.015	.091**	.048*	.127**	.327**	.266**	.288**	.287**	.120**	.237**
23. M52	.082**	.105**	-0.017	.044*	0.023	-0.004	0.025	.271**	.207**	.235**	.230**	0.025	.180**
24. M53	.125**	.044*	.053*	-0.021	.131**	0.012	.120**	.437**	.345**	.379**	.356**	.188**	.336**
25. M40	.141**	0.041	.089**	0.003	.094**	0.039	.140**	.438**	.337**	.412**	.393**	.179**	.309**
26. M62	.059**	.050*	-0.017	.063**	0.025	-0.017	0.009	.325**	.221**	.244**	.242**	.072**	.199**
27. M61	.171**	0.022	.058**	0.012	.141**	0.016	.071**	.518**	.372**	.414**	.408**	.215**	.359**
28. M54	.152**	.064**	.107**	0.036	.135**	0.042	.126**	.350**	.272**	.295**	.353**	.198**	.267**

Appendix B-1: Correlation Matrix for Variables in Conceptual Model (continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
29. M26	.082**	0.034	.071**	0.021	.109**	0.019	.066**	.274**	.246**	.232**	.254**	.121**	.176**
30. M31	.110**	-0.031	-0.005	-.051*	.127**	.043*	.067**	.195**	.137**	.168**	.152**	.223**	.250**
31. M30	.135**	-0.01	0.016	-0.032	.135**	0.036	.099**	.188**	.134**	.178**	.191**	.233**	.236**
32. M56	.149**	-.105**	.050*	-0.016	.156**	0.023	.069**	.106**	.054*	.101**	.121**	.206**	.199**
33. M08	.100**	-0.023	0.022	-.053*	.110**	0.013	.097**	.197**	.139**	.204**	.207**	.229**	.226**
34. M32	.140**	-0.012	-0.038	-.091**	.135**	-.051*	.090**	.122**	.083**	.110**	.055*	.206**	.169**
35. M34	.118**	-.052*	0.024	-0.035	.142**	0.008	0.023	.151**	.103**	.154**	.140**	.289**	.140**
36. M49	.162**	-.070**	.057**	-0.016	.172**	0.032	.079**	.252**	.183**	.207**	.209**	.287**	.315**
37. Q129	.096**	.197**	-0.015	-0.001	-0.012	0.027	.096**	.113**	.109**	.079**	.101**	-.048*	.072**
38. Q134	.059**	0.029	0.03	-0.015	0.001	.076**	.063**	0.033	0.002	0.011	.074**	-.094**	0.003
39. Q173_1	0.038	.071**	0.013	0.026	-0.002	.092**	.088**	0.008	.046*	0.002	.085**	-0.017	0.017
40. AcadValidInst	.185**	0.013	.047*	-0.024	.162**	0.011	.183**	.420**	.272**	.372**	.476**	.378**	.343**
41. InsAvail	.173**	0.021	.090**	-0.024	.179**	-0.029	.085**	.372**	.263**	.310**	.314**	.317**	.301**
42. InsSup	.168**	-0.007	.101**	-0.035	.174**	-0.017	.114**	.350**	.238**	.281**	.362**	.312**	.304**
43. Q116	.107**	.142**	-0.01	.045*	.069**	.307**	.132**	.079**	.099**	.068**	.186**	-0.002	.104**
44. Q115	.080**	.184**	0.007	.072**	0.014	.323**	0.032	.194**	.310**	.140**	.087**	-.053*	.075**
45. Q128	.124**	.251**	0.027	0.002	0.027	0.017	.227**	.070**	.114**	.067**	.127**	-0.026	.065**
46. Q182	-.180**	-.073**	-0.039	.257**	-.162**	0.042	-.420**	-.043*	-0.016	-0.035	-.102**	-.132**	-.184**
47. Q173_9	.079**	.143**	0.009	-0.012	.043*	.066**	.189**	.069**	.112**	0.024	.045*	0.007	.079**
48. Q123	.171**	.216**	-.043*	-0.007	.064**	0.035	.174**	0.033	.096**	0.029	.062**	-.046*	0.033

** p < 0.01; *p < .05

Note: means and standard deviations are reported in Tables 7, 8, and 9

Appendix B-1: Correlation Matrix for Variables in Conceptual Model (continued)

Variable	14	15	16	17	18	19	20	21	22	23	24	25	26
14. Q70	1												
15. Q74	.576**	1											
16. Q78	.616**	.699**	1										
17. Q82	.512**	.643**	.710**	1									
18. M18neg	-.165**	-.061**	-.085**	-.094**	1								
19. M36neg	-.140**	-.031	-.076**	-.059**	.380**	1							
20. M55neg	-.245**	-.120**	-.156**	-.135**	.443**	.342**	1						
21. M63neg	-.156**	-.158**	-.125**	-.167**	.282**	.247**	.319**	1					
22. M48	.219**	.318**	.361**	.316**	-.070**	-0.006	-.073**	-.063**	1				
23. M52	.146**	.256**	.261**	.234**	0.014	.074**	0.019	-0.015	.558**	1			
24. M53	.270**	.327**	.393**	.352**	-.092**	-0.025	-.117**	-.098**	.566**	.511**	1		
25. M40	.303**	.326**	.410**	.364**	-.084**	-0.023	-.095**	-.085**	.600**	.472**	.647**	1	
26. M62	.149**	.228**	.243**	.195**	0.041	.088**	0.021	0.038	.469**	.524**	.432**	.442**	1
27. M61	.290**	.309**	.366**	.323**	-.111**	-.050*	-.135**	-.103**	.528**	.441**	.607**	.621**	.498**
28. M54	.339**	.368**	.398**	.382**	-.152**	-.064**	-.178**	-.153**	.548**	.447**	.643**	.612**	.392**
29. M26	.245**	.262**	.364**	.306**	-.109**	-0.029	-.085**	-.050*	.486**	.359**	.441**	.564**	.309**
30. M31	.277**	.314**	.303**	.290**	-.312**	-.172**	-.347**	-.353**	.261**	.147**	.325**	.324**	.104**
31. M30	.284**	.299**	.294**	.271**	-.300**	-.166**	-.333**	-.281**	.297**	.196**	.343**	.366**	.131**
32. M56	.289**	.258**	.257**	.250**	-.297**	-.216**	-.433**	-.341**	.123**	0.03	.191**	.181**	0.02
33. M08	.242**	.246**	.271**	.253**	-.255**	-.148**	-.262**	-.201**	.232**	.156**	.306**	.313**	.125**
34. M32	.205**	.209**	.213**	.216**	-.192**	-.113**	-.202**	-.235**	.111**	0.035	.178**	.171**	-0.018
35. M34	.235**	.194**	.204**	.202**	-.255**	-.217**	-.318**	-.261**	.116**	0.02	.174**	.164**	0.007
36. M49	.311**	.263**	.273**	.264**	-.231**	-.169**	-.313**	-.318**	.222**	.116**	.263**	.301**	.158**
37. Q129	.071**	.126**	.096**	.123**	0.016	0.037	.054*	-.055*	.194**	.201**	.161**	.178**	.178**
38. Q134	0.033	.067**	.064**	.083**	-0.011	.070**	0.04	0.021	.083**	.086**	.079**	.103**	.109**
39. Q173_1	0.006	0.026	0.019	.054*	0.011	0.031	0.025	0.005	.083**	.091**	.043*	.073**	.045*
40. AcadValidInst	.301**	.283**	.349**	.316**	-.122**	-.090**	-.163**	-.095**	.447**	.357**	.557**	.566**	.337**

Appendix B-1: Correlation Matrix for Variables in Conceptual Model *(continued)*

Variable	14	15	16	17	18	19	20	21	22	23	24	25	26
41. InsAvail	.352**	.361**	.420**	.451**	-.127**	-.120**	-.144**	-.129**	.304**	.179**	.367**	.367**	.176**
42. InsSup	.403**	.381**	.494**	.456**	-.133**	-.127**	-.148**	-.116**	.332**	.226**	.418**	.411**	.228**
43. Q116	.080**	.155**	.111**	.125**	-0.041	-0.025	-0.033	-0.035	.213**	.208**	.174**	.217**	.157**
44. Q115	0.023	.076**	0.017	.059**	0.021	0.009	.071**	-0.023	.184**	.153**	.120**	.176**	.135**
45. Q128	0.029	.056*	.066**	.051*	0.027	-0.027	.082**	0.017	.157**	.118**	.110**	.153**	.120**
46. Q182	-.112**	-0.031	-.086**	-.061**	.104**	.068**	.152**	.105**	-.055*	0.027	-.132**	-.106**	0.043
47. Q173_9	0.019	0.03	0.041	.045*	-0.012	-0.009	-0.022	0	.114**	.114**	.095**	.077**	.072**
48. Q123	0.032	.044*	.044*	.056*	-.094**	-0.033	-0.025	-0.033	.081**	.076**	.067**	.080**	0.024

Appendix B-1: Correlation Matrix for Variables in Conceptual Model (continued)

Variable	27	28	29	30	31	32	33	34	35	36	37	38	39
27. M61	1												
28. M54	.568**	1											
29. M26	.410**	.438**	1										
30. M31	.277**	.374**	.216**	1									
31. M30	.306**	.424**	.225**	.685**	1								
32. M56	.177**	.275**	.127**	.545**	.496**	1							
33. M08	.304**	.375**	.218**	.516**	.581**	.439**	1						
34. M32	.152**	.203**	.149**	.507**	.440**	.393**	.352**	1					
35. M34	.175**	.232**	.127**	.439**	.415**	.420**	.372**	.347**	1				
36. M49	.306**	.290**	.193**	.441**	.430**	.408**	.362**	.294**	.301**	1			
37. Q129	.164**	.164**	.063**	.108**	.111**	0.014	.088**	.051*	0.026	.054*	1		
38. Q134	.119**	.111**	-0.006	.061**	.068**	0.03	0.043	0.036	0.009	-0.018	.281**	1	
39. Q173_1	.063**	.094**	0.015	0.021	0.023	0.001	.052*	-0.006	-0.003	0.015	.255**	.134**	1
40. AcadValidInst	.562**	.529**	.391**	.303**	.353**	.218**	.350**	.192**	.213**	.328**	.091**	.053*	.056*
41. InsAvail	.393**	.354**	.249**	.229**	.259**	.168**	.248**	.156**	.232**	.251**	.087**	.060**	.051*
42. InsSup	.424**	.396**	.278**	.265**	.294**	.208**	.282**	.139**	.245**	.283**	.079**	.062**	.043*
43. Q116	.224**	.223**	.130**	.147**	.155**	.067**	.108**	0.025	.048*	.102**	.232**	.146**	.149**
44. Q115	.160**	.119**	.081**	.043*	.074**	-0.007	.043*	-0.002	-0.001	.047*	.225**	.111**	.117**
45. Q128	.117**	.104**	.115**	0.024	.054*	-0.032	0.017	.074**	-0.034	.060**	.178**	.165**	.086**
46. Q182	-.094**	-.133**	-.072**	-.163**	-.180**	-.175**	-.203**	-.236**	-.130**	-.180**	-0.026	-0.005	-0.038
47. Q173_9	.094**	.107**	0.021	0.011	.053*	0.03	.057**	0.035	0.038	-0.01	.173**	.091**	.101**
48. Q123	.108**	.102**	0.011	0.036	.046*	.045*	.059**	-0.01	0.019	0.009	.154**	.127**	.096**

Appendix B-1: Correlation Matrix for Variables in Conceptual Model *(continued)*

Variable	40	41	42	43	44	45	46	47
40. AcadValidInst	1							
41. InsAvail	.488**	1						
42. InsSup	.537**	.760**	1					
43. Q116	.249**	.141**	.143**	1				
44. Q115	.068**	.062**	0.037	.385**	1			
45. Q128	.147**	.076**	.089**	.207**	.193**	1		
46. Q182	-.238**	-.118**	-.148**	0.012	.127**	-.046*	1	
47. Q173_9	.062**	.061**	0.042	.190**	.211**	.092**	-.054*	1
48. Q123	.051*	.054*	.044*	.178**	.154**	.146**	-.066**	.180**