

PREDICTING FIRST-YEAR COLLEGE ACHIEVEMENT:
EVALUATION OF A SELF-REGULATORY COPING MODEL

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ABSTRACT

The current trends observed in 4-year college graduation and retention rates (ACT 2011; 2012; 2013; 2014; Tinto, 2006) demonstrate a need for improvement in student academic achievement outcomes. Overwhelmingly, research finds that the first year in college is the time of greatest risk for student academic failure and drop out. Challenges associated with academic-oriented forms of stress and anxiety (Baillie & Fitzgerald, 2000; Bembenuddy, 2008; Cassady, 2010; Collier & Morgan, 2008; Jean, 2010; Pike & Kuh, 2005; Soria & Stebleton, 2012; Turner et al., 2012) coupled with limitations in effective coping strategies (Hofer et al., 1998; Kitsantas et al., 2008; McInerney, 2011; Pintrich & Zusho, 2002; Robbins et al., 2004; Zimmerman & Schunk, 2008) lie at the center of the difficulties these first-year students experience, which ultimately play a significant role in persistence and achievement outcomes. This is particularly true for students from at-risk populations (e.g., first-generation students, ethnic minorities; Balemian & Feng, 2013; Borman & Overman, 2004; Choy, 2001; Engle, 2007; Jones et al., 2010; Pascarella et al., 2004; Toldson, 2012). Postsecondary institutions continue to seek answers through formal assessment and research investigations that may pave the way toward improving the achievement outcomes of their student population.

The wide body of research confirms that no single factor reliably predicts college academic success or failure, although institutions have traditionally relied upon indicators of prior achievement (i.e., H.S. GPA and college entrance exams) for such inferences (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Zypher et al., 2007). Rather, it is the collective of factors from environmental, behavioral and personal domains that interact and have the potential to positively or negatively influence college student achievement (Bandura, 1986; 1997; 1999; Lazarus & Folkman, 1984;

Snow et al., 1996). As such, the Transactional Stress and Coping model (Lazarus & Folkman, 1984) provides a comprehensive model through which the influence and interaction of multiple factors associated with student stress-appraisals, coping responses, and eventual outcomes can be examined within investigations of college academic achievement.

The main purpose of this study was to examine the degree of influence student background characteristics, indicators of prior achievement, anxiety-laden cognitive belief states, and self-regulated learning had on first-year college student achievement. Informed by the Lazarus and Folkman (1984) framework, a proposed academic-oriented stress-appraisal and coping model was tested for viability in predicting student achievement outcomes at the conclusion of their first-year in college. This study investigated research questions specifically associated with: 1) the influence of gender, ethnicity and first-generation status on first-year achievement; 2) the influence of student prior achievement (i.e., H. S. GPA and SAT scores) on first-year achievement; 3) the potential mediating influence of cognitive appraisals on first-year achievement; and 4) the potential moderating role of self-regulated learning in first-year achievement. For this archival study, all student demographic data, measures of prior achievement, first-year college achievement (cumulative GPA) and self-report responses to the LASSI-HS (Weinstein & Palmer, 1990) instrument were accessed from a large sample ($N = 29,431$) of first-time, first-year students enrolled at a mid-sized, Midwestern 4-year university during years 2004-2012. Using an established model of stress-appraisal and coping (Lazarus & Folkman, 1984) within an academic context, five models were tested using Structural Equation Modeling (SEM) to answer the specific research questions and investigate the utility of the models in predicting first-year college achievement.

The results revealed that although all background factors (i.e., gender, ethnicity, first-generation status) were statistically significant predictors of first-year achievement (GPA), their influence on first-year GPA was minimal. Additionally, prior achievement had a statistically significant, but weak, influence on first-year GPA. Although the direct path relationships for all pre-existing personal factors were statistically significant, the results also indicated anxious cognitive appraisals served a mediating role between these factors and first-year GPA. Thus, a partially mediated model best represented the relationships among these variables. The potential moderating effects of motivational regulation and active coping strategies did not have any meaningful impact in the two self-regulatory coping models tested. Although some statistically significant relationships were observed and provided evidence that background factors, prior achievement, anxious cognitive appraisals and self-regulated learning are associated, their influence was minimal and offered little practical utility in explaining first-year college student achievement.

Overall, the results of the study were unexpected given the strong theoretical and empirical support for the measures utilized in the study and literature supporting meaningful and rather robust relationships among the variables of interest. This atypical finding seemed to be due primarily to the first-year student GPAs, and suggests attending to concerns related to the evaluation of student performance and achievement in the first year of college. Exploration of this pattern with additional performance and student typology data may guide institutional decision making related to student selection, program rigor, or evaluation practices. The implications of these results within the discussion of student success in higher education as well as directions for future research are also provided.

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CHAPTER I

INTRODUCTION

Present trends in graduation and retention rates at traditional 4-year postsecondary institutions remain relatively stagnant (American College Testing Program [ACT], 2011; 2012; 2013; 2014; Tinto, 2006). For full-time attendees at 4-year institutions, the five-year graduation rate is 46% (ACT, 2014; National Center for Education Statistics [NCES], 2014). Retention of first-year students poses a particular challenge for these institutions, with approximately 30% to 36% of students leaving after the first year (ACT, 2014). Despite widespread efforts to address the issue, institutions still find that many students struggle in the first year to achieve their academic goals. Investigations into potential predictors of student outcomes point to a myriad of factors.

Effective Factors for Predicting Academic Achievement in Higher Education

Although measures of prior achievement continue to provide predictive value to institutions regarding students' potential for success in college (Alarcon & Edwards, 2013; DeBerard, Spielmans, & Julka, 2004; Harackiewicz, Barron, Tauer, & Elliot, 2002; Kowitlawakul, Brenkus, & Dugan, 2013; Randsell, 2001; Robbins et al., 2004; Zypher, Bradley, Landis, & Thoreson, 2007), other factors also contribute to achievement outcomes. Research finds that students who experience significant life stressors and stressful conditions during their first year of college are at higher risk for academic failure (Budney & Paul, 2003; Dressler, 1991). Significant stressors for these students take a variety of forms but are primarily attributed to difficulty adjusting to college life and the rigor of college work (Baillie & Fitzgerald, 2000; Collier & Morgan, 2008; Jean, 2010; Lapsley, Rice, & Shadid, 1989; Pike & Kuh, 2005; Soria & Stebleton, 2012; Turner, Thompson, Huber & Arif, 2012; Wei, Russell, & Zakalik, 2005) and

anxiety associated with academic demands and the educational environment (Barrows, Dunn, & Lloyd, 2013; Crede & Kuncel, 2008; Hsieh, Sullivan, Sass, & Guerra, 2012). Unfortunately, first-generation students comprise a student population who experiences even greater difficulties with stress and attaining their college educational goals (Balemian & Feng, 2013; Choy, 2001; Engle, 2007; Pascarella, Pierson, Wolniak, & Terenzini, 2004), highlighting yet another at-risk subgroup of students.

Students who employ more adaptive and effective coping strategies in response to stressful conditions are able to navigate these challenges more effectively and achieve at higher levels (Dysen & Renk, 2006; McNamara, 2000; Sasaki & Yamasaki, 2007). In light of the connection between student functioning and coping strategies, the body of literature suggests that understanding the relationships between academically stressful conditions experienced by college freshmen and the strategies they use to cope is critical in identifying those with greatest needs as well as developing interventions to facilitate better transitions into college and continued success over the duration of their academic careers (Dysen & Renk, 2006; Sasaki & Yamasaki, 2007).

Lazarus and Folkman (1984) provided the Transactional Stress and Coping model as a useful theoretical framework to explain the relationship between how particular stress appraisals and various selected coping strategies contribute to differing outcomes in individuals. According to this model, personal characteristics interact with social environments and directly influence individuals' cognitive appraisals of events or situations. Cognitive appraisals, or evaluative judgments, result in some form of positive or negative emotional response state and determine whether the potential stressor poses a threat or benefit to the individual (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). Based upon the cognitive appraisal,

individuals employ particular coping strategies in an effort to manage these stressors either by adjusting their emotional disposition (i.e., emotion-focused coping) or employing active strategies to alter the level of threat in the given situation (i.e., problem-focused coping). The coping strategies enable individuals to adapt to the stressful conditions, with positively adaptive strategies contributing to more favorable outcomes (Folkman & Lazarus, 1985; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Lazarus, 1993a; Lazarus & Folkman, 1984).

Lazarus and Folkman's (1984) specific model has primarily been utilized as the guiding theoretical framework investigating a myriad of research topics (i.e., physical trauma, mental health), but not as widely referenced within the academic context. The majority of this research has focused primarily on elementary and secondary student populations (Boekaerts, 1993; Hunter & Boyle, 2004; Lay, Edwards, Parker, & Endler, 1989; Sowa & May, 1997). Of the existing body of research informed by this framework examining the college population, studies have primarily investigated non-U.S. postsecondary institutions (Akgun, 2004; Sinha & Watson, 2007), students experiencing psychological and adjustment issues (Britton, 2004; Chang, 1998; Chang & Strunk, 1999; Park, Armeli, & Tennen, 2004; Sinha & Watson, 2007), and specific populations of students who encounter particular stressors (e.g., student athletes; Giacobbi et al., 2004). Only a select few have examined the role of academic-oriented coping strategies in response to stressful conditions and demands found within academic contexts (Akgun, 2004; Giacobbi et al., 2004; Ying, 2008); however, no studies have been identified that examined student stress-appraisals associated with academic task demands and educational environments with specific emphasis on self-regulatory coping strategies as contributors to achievement outcomes. Although other proposed models derived largely from this theoretical framework

show promise in explaining these specific relationships within the academic context (Cassady & Boseck, 2008; Slavin, Rainer, McCreary & Gowda, 1991; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005), the Lazarus and Folkman framework (1984) offers a viable and parsimonious explanation of the relationships among the variables of interest to this study.

A large body of research provides an expansive and complex view of why students remain and succeed in college (Crede & Kuncel, 2008; Tinto, 2006); yet, traditionally institutions and researchers placed emphasis on measures of prior academic achievement and background factors to best predict performance and achievement in their student population. However, evidence presented by Albert Bandura (1986; 1997; 1999) and Snow, Corno, and Jackson (1996) supports the need for research investigations to consider the role of multiple factors associated with behavioral responses, environmental variables, and person-oriented variables comprised of conative, affective, and cognitive domains in such investigations. The Lazarus and Folkman framework (1984; 1987; Lazarus, 1993a; 1993b) acknowledges these contributions, recognizing that it is the collective of several personal, environmental and psychosocial factors that interacts and ultimately influences performance outcomes.

Pre-Existing Personal Factors

Pre-existing personal factors play a significant role in college student academic performance (Bean, 1990; Johnson et. al, 2004-2005; Scherer & Anson, 2014; Tinto, 2006). Therefore, any comprehensive investigation of college student success necessitates attention to these variables. Research widely substantiates the significant role high school grade point average (H.S. GPA) and college admissions tests (i.e., SAT and ACT) provide in predicting college student success (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Robbins et al., 2004; Zypher et al., 2007).

Gender, ethnicity and first-generation student status are other person factors that bear considerable importance in investigations of university success. Gender effects are critical given the commonly observed achievement differences between male and female college students; males on average typically earn lower college GPA and experience higher drop-out rates compared to females (Alon & Gelbgiser, 2011; Buchmann & Diprete, 2006; DeBerard & Julka, 2000; DeBerard et al., 2004; Goldin, Katz & Kuziemko, 2006; Harackiewicz, et al., 2002; Kitsantas, Winsler, & Huie, 2008). Ethnicity has also been associated with postsecondary achievement. Research investigating achievement outcomes between ethnic majority and minority students consistently finds minority students demonstrate poorer persistence and degree completion rates (American Council on Education [ACE], 2008; 2011; Borman & Overman, 2004; Gordon & Yowell, 1994; Harper, 2009; 2012; Harris & Herrington, 2006; Jones, Barlow, & Villarejo, 2010; Kamee & Justiz, 1988; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007; Toldson, 2012).

Additionally, the impact of first-generation status cannot be ignored within investigations of college student persistence and degree completion. First-generation college students experience academic and non-academic challenges that significantly differ from that of non-first-generation students (Bui, 2002; Gibbons, Woodside, Hannon, Sweeney, & Davison, 2011; Inman & Mayes, 1999; Orbe, 2008). The body of literature demonstrates first-generation students are typically less academically prepared for college admission (Balemian & Feng, 2013; Choy, 2001; Engle, 2007; Pascarella et al., 2004; Riehl, 1994), lack awareness of knowledge facilitative to college adjustment (Choy, 2001; Collier & Morgan, 2008; Jean, 2010; Pascarella et al., 2004; Soria & Stebleton, 2012), report lower educational aspirations (Choy, 2001; Ishitani, 2006), and have less parental emotional and financial support (Choy, 2001; Sparkman, Maulding, &

Roberts, 2012). The residual consequences of these challenges are many, as first-generation students struggle academically, resulting in lower GPA and higher drop-out rates compared to non-first-generation students (Balemian & Feng, 2013; Choy, 2001; DeAngelo et al., 2011; Engle, 2007; Ishitani, 2006; Pascarella et al., 2004; Riehl, 1994; Soria & Stebleton, 2012).

Affective Factors

Beyond the influence of prior ability and personal background factors, research also indicates affective factors (i.e., academic anxiety, attitude toward learning) impact student motivation, information processing, self-regulated learning abilities and ultimately learning and achievement outcomes (Kitsantas, 2002; Kitsantas et al., 2008; Lucio, Hunt, & Bornovalova, 2012; Weinstein & Palmer, 1990; Zimmerman & Schunk, 2008). Research demonstrates that academic-related anxieties can be debilitating to student performance, serving as a barrier to individuals achieving their optimal levels of performance in most academic settings (Barrows et al., 2013; Beilock, 2008; Bembenutty, 2008; Cassady, 2010; Cassady & Johnson, 2002; Chapell et al., 2005; Lynch, 2006; 2010; Seipp, 1991; Zeidner, 1990; Zeidner & Matthews, 2005). The negative impact of academic anxiety is also found to be more pronounced for students who have limited cognitive processing and learning or study skills (Bembenutty, 2008; Crede & Kuncel, 2008; Matthews, Zeidner, & Roberts, 2006; Tobias 1985; Zeidner & Matthews, 2005), which are common characteristics observed within first-year and first-generation college students.

Attitudes toward learning and the college environment comprise another affective factor attributed to college student performance (Albaili, 1997; Chang, Bodem, Sanna, & Fabian, 2011; Chemers, Hu, & Garcia, 2001; Gerardi, 2006; Schiefele, 1991). Of the limited research available, findings reveal that students who maintain a more pessimistic and negative attitude in the learning environment generally experience greater difficulties and poorer achievement outcomes

(Albaili, 1997; Chang et al., 2011; Chemers et al., 2001; Crede & Kuncel, 2008; Gerardi, 2006).

Furthermore, those students who report greater apathy toward their educational tasks and goals experience similar adverse outcomes (Crede & Kuncel, 2008; Schiefele, 1991).

Academic anxieties and negative attitudes toward learning trigger emotional reactions that negatively influence student appraisals of academic tasks, settings or contexts (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). These negative cognitive appraisals may become overwhelming and threatening in the educational environment, prompting students to rely upon more maladaptive patterns of coping (Cassady & Boseck, 2008; Linnenbrink, 2006; Schutz & Lanehart, 2002; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005), further jeopardizing successful achievement outcomes over time.

Coping and Self-Regulated Learning

Although negative cognitive appraisals pose a risk to student achievement via the activation and use of maladaptive coping behaviors, other more adaptive forms of coping may moderate these effects, serving as a protective buffer when achievement is threatened (Pascarella et al., 2004; Phinney & Haas, 2003). Self-regulated learning (SRL) is considered to be an adaptive form of coping for students in response to the academic-oriented demands and situations they routinely encounter (McInerney, 2011; Pintrich & Zusho, 2002; Zimmerman, 2011). Those students characterized as self-regulated learners consistently demonstrate motivation toward academic tasks and learning, maintain effective management of their cognitive abilities and employ academic-oriented volitional strategies in meeting academic demands and goals (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011). Research widely supports the vital role of SRL ability in academic performance and achievement, indicating that the ability to self-regulate is a defining characteristic that separates high-achieving

from low-achieving students (Hofer, Yu, & Pintrich, 1998; Kitsantas et al., 2008; Robbins et al., 2004; Zimmerman & Schunk, 2008). SRL is generally differentiated into two major components: motivational regulation and self-regulated learning strategies.

Motivation is one key component in self-regulated learning (Bussey, 2011; Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008) and serves an important regulatory function for learners (Pintrich & Zusho, 2002; Wolters, Benzoni, & Arroyo-Giner, 2011; Zimmerman, 2011) as it is the mechanism that drives and sustains effort toward students' academic activities (Schunk, Pintrich, & Meece, 2008; Zimmerman, 2011). Therefore this construct is also often referred to as *motivational regulation* (Wolters, 2003; Zimmerman & Schunk, 2008). Research also consistently demonstrates that motivation enhances learning and performance, attributing motivation to more effective study strategy use (Prat-Sala & Redford, 2010; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004; Wolters, 1998), persistence in academic activity (Bandura 1997; 2006; Bandura & Schunk, 1981), and higher academic achievement (Allen, Robbins, Casillas, & Oh, 2008; Crede & Kuncel, 2008; D'Lima, Winsler, & Kitsantas, 2014; Lei, 2010; Robbins et al., 2004; Yip, 2007; 2009). Consequently, motivation has both indirect and direct influences on students' learning outcomes.

Beyond the integral role of motivational regulation, self-regulated learning strategies consist of cognitive and behavioral strategies (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011) that profoundly influence academic achievement over the long-term (Nota, Soresi, & Zimmerman, 2004; Robbins et al., 2004). Research provides substantial evidence highlighting the role particular self-regulated learning skills play in academic performance. Active note-taking, organizing, elaborative rehearsal, visualization, time management, strategic assessment preparation, resourcefulness, and academic discipline are all associated with better academic

performance outcomes (Bembenutty, 2008; George, Dixon, Stansal, Gelb, & Pheri, 2008; Kitsantas et al., 2008; Nota et al., 2004; Robbins et al., 2004; 2006), while distractibility and procrastination hinder performance and achievement (Balkis, 2013; Dietz & Henrich, 2014; Fernandez-Castillo & Gutierrez-Rojas, 2009; George et al., 2008; Grunschel, Patrzek, & Fries, 2013; Keogh, Bond, French, Richards, & Davis, 2004; McDonald, 2013; Zeidner & Matthews, 2005). Those learners more adept in self-regulated learning select strategies that adequately address academic demands, monitor the efficacy of those strategies and adapt their approaches as necessary for goal attainment (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011). By doing so, learners are able to enjoy significant gains in their performance and overall achievement (Pintrich & Zusho, 2002); thus, self-regulated learning strategies function as adaptive coping strategies for students (McInerney, 2011).

Overall, the Transactional Stress and Coping model (Lazarus & Folkman, 1984) provides a comprehensive conceptual framework that can be used to explain how individual students' educational backgrounds, personal characteristics and affective predispositions lead to the establishment of negative cognitive appraisals in the face of academic stressors. Negative cognitive appraisals pose a significant and enduring threat to student success by prompting selection of inefficient self-regulated learning and motivational beliefs and behaviors, leading to poorer learning outcomes (e.g., lower grades, academic withdrawal). However, even when negative cognitive appraisals persist, implementation of positive self-regulatory coping responses may buffer the negative impact of these factors, ultimately yielding more favorable outcomes.

Formalized Institutional Assessment

Most postsecondary institutions employ formal assessment to examine their student populations at the student-level, collecting student demographic information, measures of prior

achievement and indices of learning strategies and attitudes (Peterson & Einarson, 2001).

Through these practices, institutions are better able to examine student learning and achievement outcomes (Higher Learning Commission, 2014; Keup, 2004; Peterson & Einarson, 2001) and identify student achievement potential or areas of intervention (Hoffman Beyer & Gillmore, 2007; Kameen & Justiz, 1988; Keup, 2004). Institutions are also able to demonstrate institutional accountability to improving achievement outcomes (Astin & Lee, 2003; Flick, 2014; Keup, 2004; National Conference on State Legislatures [NCSL], 2012; Peterson & Einarson, 2001; Tinto, 2006).

There is general consensus in favor of institutional assessment as a viable tool in addressing challenges associated with student achievement and institutional effectiveness (Ekman & Pelletier, 2008; Kameen & Justiz, 1988; Keup, 2004; Peterson & Einarson, 2001). To more effectively support optimal student achievement at the institutional level, it is essential to expand the dimensions of inquiry beyond measures of prior achievement or background factors—assessing more dispositional characteristics such as affective tendencies and self-regulation practices, with a high priority on the earliest phases of student activity (Ekman & Pelletier, 2008; Kameen & Justiz, 1988; Keup, 2004; Peterson & Einarson, 2001). Furthermore, the results from such investigations often fail to translate to guided interventions to support those students at risk for academic failure (Tinto, 2006). Institutions gain the most from these investigations if they implement practical, effective strategies that directly address the graduation and retention issue through developing initiatives for student intervention and directing policy, curriculum and program reform (Keup, 2004; Tinto, 2006).

A clear connection exists between student pre-existing factors, affective responses, motivation, and self-regulated learning strategies in college student success (Alarcon & Edwards,

2013; Astin & Lee, 2003; Cassady, 2010; Harackiewicz et al., 2002; Hoffman Beyer & Gillmore, 2007; Keup, 2004; Kitsantas, 2002; Kitsantas et al., 2008; Robbins et al., 2004; Tinto, 2006; Trigwell, Ashwin, & Millan, 2013; Zimmerman & Schunk, 2008; Zypher et al., 2008). However, continued challenges in student retention, particularly during the first-year of college and with first-generation students (Choy, 2001; Keup, 2004; Tinto, 2006), warrant further investigation. Explanations for why students remain and succeed in college are quite complex, justifying the need for a multi-factor approach within such research investigations (Bandura, 1986; 1997; 1999; Snow et al., 1996; Tinto, 2006). Lazarus and Folkman's (1984) Transactional Stress and Coping framework provides one avenue to explain the potential impact of student academic-related stress-appraisals and coping responses on later achievement outcomes through a multi-factor approach. As postsecondary institutions attempt to make strides in meaningfully assessing their student populations in order to promote educational success, this explanatory model may support institutions in those efforts by simultaneously identifying relevant factors that threaten success and specific strategies believed vital to overcoming those threats.

Purpose of the Study

The purpose of the current study is to examine the predictive value of student background characteristics, prior achievement indicators and study and learning strategy patterns in explaining first-year college student achievement. The findings from this study are then anticipated to be instructive to guide future large-scale institutional assessment practices as well as small-scale studies designed to support student success. Specifically, this study will investigate the following research questions (see Figure 1.1 for conceptual model):

1. Do gender, ethnicity and first-generation status (i.e., personal background factors) predict first-year college student achievement?

2. After controlling for student background factors, does prior achievement predict first-year college student achievement?
3. After controlling for student background factors and prior achievement, does negative cognitive appraisal (NCA) predict first-year college student achievement?
4. Do self-regulated learning (SRL) strategies moderate the relationship between negative cognitive appraisal (NCA) and first-year college student achievement?
5. Does motivational regulation moderate the relationship between negative cognitive appraisal (NCA) and first-year college student achievement?

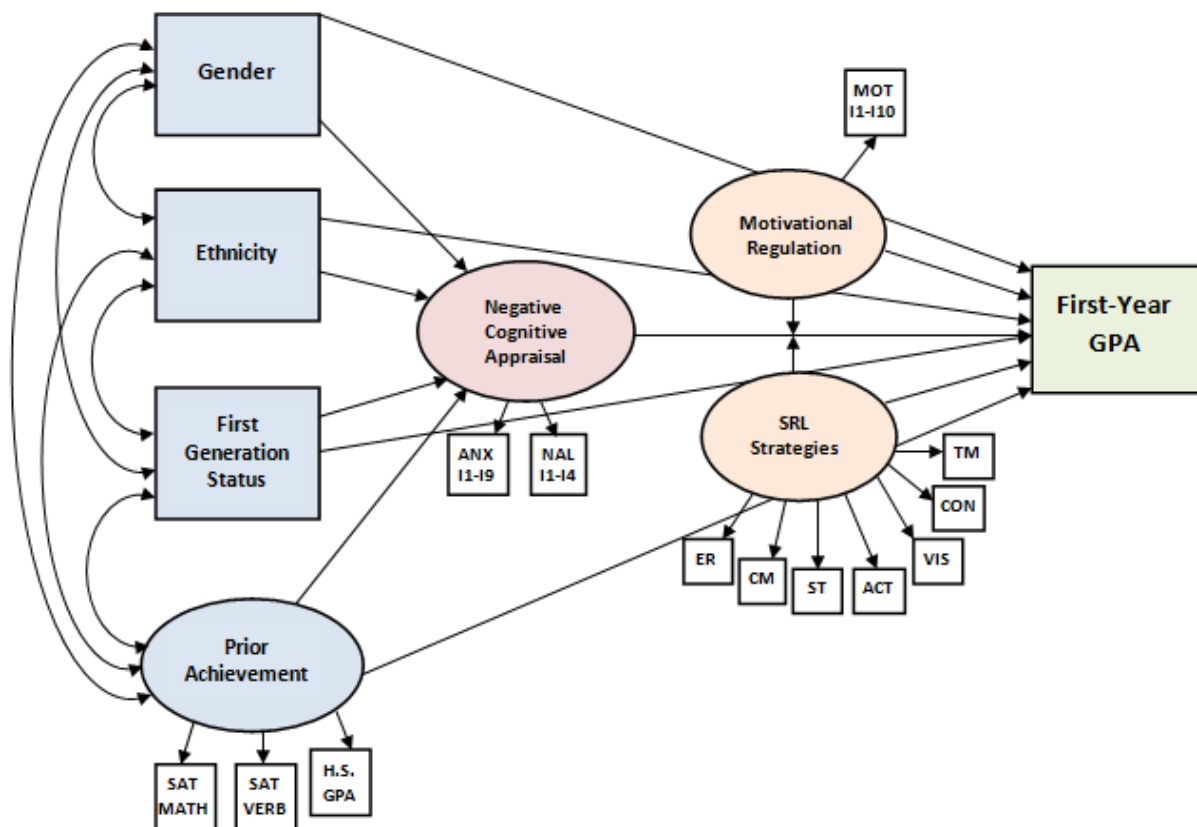


Figure 1.1. The conceptual model depicting the relations among variables of interest to study.

Definitions of Key Terms

First-year college achievement. This is a measure of first-year college student performance using the first-year cumulative grade point average (GPA) ranging from 0.0 to 4.0, which includes all courses taken within the first 12 months of enrollment at the university.

First-generation student. This subgroup of college students is defined as students who are from a family in which neither parent or guardian has earned a college degree (Choy, 2001; Pike & Kuh, 2005; Soria & Stebleton, 2012).

Non-first-generation student. This subgroup of students is defined as students who are from a family in which one parent or guardian has earned at least one baccalaureate degree; this subgroup is also referred to as second-generation and continuing-education students (Choy, 2001; Pike & Kuh, 2005; Soria & Stebleton, 2012).

Ethnicity. For this study, the complicated representation of ethnicity is based on the participating institution's identification of student membership in either: 1) the ethnic majority group for that university (i.e., White) or 2) the ethnic minority group for that university (i.e., American Indian or Alaskan Native, Asian, Black or African American, Bi-Racial, Foreign, Hawaiian or other Pacific Islander, Hispanic).

Prior achievement. This is a measure of student ability prior to entrance into a postsecondary institution using a combination of high school grade point average (H.S. GPA) and college admissions test scores (i.e., SAT Math and SAT Verbal scores).

Negative cognitive appraisal. This is defined as the students' negative evaluative judgments in response to academic demands, requirements and educational settings that are influenced by their affective states (Lazarus & Folkman, 1984; 1987; Spielberger & Vagg, 1995).

Academic-related anxiety. Academic anxiety is defined as tension and cognitive worry experienced in response to academic demands and the academic environment (Cassady, 2010; Weinstein & Palmer, 1990).

Attitude toward learning. This is defined as students' general attitudes and interest in education, school and performing the tasks related to school success (Weinstein & Palmer, 1990).

Self-regulated learning (SRL). This comprises the ability for students to self-direct their learning through use of academic-oriented cognitive abilities, volitional strategies and motivation toward meeting academic demands and goals (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011).

Motivational regulation. This is the ability for students to regulate their motivation toward learning by actively initiating, directing, sustaining and maintaining behaviors in order to attain a goal (Schunk, Pintrich, & Meece, 2008; Zimmerman, 2011; Zimmerman & Schunk, 2008).

Self-regulated learning strategies. This comprises the cognitive ability and active behavioral strategy components of self-regulated learning (SRL) utilized to respond to academic-task demands for goal attainment (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011).

CHAPTER II

REVIEW OF THE LITERATURE

Retention and graduation rates for students seeking a 4-year college degree pose concerns for institutions of higher education. Present trends demonstrate that on average 46% of full-time students who work toward a 4-year college degree graduate within five years (ACT, 2014; NCES, 2014). Graduation rates have remained steady over the past several years (ACT, 2011; 2012; 2013; 2014; Tinto, 2006) and obviously provide a great opportunity for improvement. Promoting college student achievement is not only a matter of supporting students' interests; institutions that fail to demonstrate successful achievement outcomes often face serious economic consequences due to performance-based funding structures in higher education (NCSL, 2012). According to Tinto (2006), student retention and graduation concerns have become "big business" and pose an important issue to entrepreneurs, researchers, educators and administrators. As a result, postsecondary institutions are devoting significant resources toward investigating potential contributing factors to student outcome trends and resolving the challenges associated with achievement in their student populations (Bean, 2005; Braxton, 2000; Braxton, Hirschy, & McClendon, 2004; Seidman, 2005).

Considerable attention has been focused on explaining differences in student performance across grade levels. Recently, the bulk of attention devoted to investigating retention and graduation rates has been focused on the first year of college, which is the period of time with the highest withdrawal rates (Tinto, 2006). Estimates of achievement outcomes at traditional 4-year postsecondary institutions reveal that between 30% and 36% of students will not persist into the second year (ACT, 2014). Beyond the first year, the percentage of withdrawals is less pronounced with the majority of students remaining thereafter through degree attainment.

Predicting Academic Achievement in Higher Education

It is a well-established maxim that prior achievement (i.e., high school grade point average, college entrance exam scores) is one of the most durable and useful predictors for success (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Robbins et al., 2004; Zypher et al., 2007). However, a more complete understanding of undergraduate student achievement necessitates reviewing additional critical factors instrumental in determining success outcomes. In particular, personal responses to stressful events, contextual and situational barriers, and individual implementation of effective or effortful behaviors to promote success vary broadly among students and help explain the variations in performance observed among students with similar incoming credentials (Keup, 2004; Tinto, 2006).

Empirical studies examining first-year college retention illustrate the importance of including a more holistic view of the individual learner when predicting student performance. For instance, the research demonstrates that the experience of stressful conditions in students' college environment influences their decisions on whether to remain or withdraw from an institution (Bean, 2005). Unfortunately, the experience of stress is commonplace for new college students (Budney & Paul, 2003; Dressler, 1991), and attention to students' responses to stress is increasing due to findings that today's college students reported higher levels of stress than in prior years (American College Health Association [ACHA], 2011; Higher Education Research Institute [HERI], 2011).

Common stressors for first-year college students include a broad array of barriers for optimal learning; for example, difficulty adjusting to university life (Lapsley, et al., 1989; Wei et al., 2005), poor preparedness for college-level academic work (Baillie & Fitzgerald, 2000;

Collier & Morgan 2008; Jean, 2010; Pike & Kuh, 2005; Soria & Stebleton, 2012; Turner et al., 2012), academic-related anxieties (Barrows et al., 2013; Crede & Kuncel, 2008; Hsieh et al., 2012), and academic adjustment issues (e.g., self-managing approach to homework; Budny & Paul, 2003). Naturally, all first-year students are faced with stressors that have the potential to threaten academic success. However, individual students' interpretations, or appraisals, of these multiple stressors vary significantly, resulting in a wide range of potential student responses. As the degree of perceived threat imposed by the stressor increases (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987), the higher the probability that the stressor will trigger anxiety responses (Spielberger & Vagg, 1995) and ultimately hinder performance over the short and long-term (Cassady, 2010).

However, once again learner differences exist regarding the responses to the threat-appraisals in academic settings. The negative impact of stress in the first year of college is most pronounced when students employ maladaptive, avoidant, or poorly developed coping strategies in response to perceived stressors (Dyson & Renk, 2006; Turner et al., 2012). Alternatively, individuals who engage in adaptive coping strategies are more likely to experience successful outcomes when a challenge or stressor has been identified (McNamara, 2000; Struthers, Perry, & Menec, 2000). Specifically, in academic settings, the adoption of coping strategies that promote adapting to and effective stress management (e.g., self-regulated learning strategies) enables more favorable achievement outcomes (Bembenutty & Zimmerman, 2003; Devonport & Lane, 2006; Schunk et al., 2008).

Research examining the predictability of student success in the first year of college has clearly established that developing a reliable model for explaining student outcomes requires a multifaceted perspective that acknowledges the influence of several key variables (including

prior ability, threat appraisals, chosen coping strategies). The literature also suggests that understanding the relationships among stressors experienced by first-year college students, their interpretation of those stressors, and the strategies they typically utilize in the face of stressors are critical to identifying student needs and developing interventions that support learner success (Dyson & Renk, 2006; Sasaki & Yamasaki, 2007). One promising framework for examining the relationships among these factors is Lazarus and Folkman's (1984) Transactional Stress and Coping model, which has been utilized to explain how stress appraisals and selected coping strategies contribute to differing outcomes for individuals in a wide variety of domains.

The Transactional Stress and Coping Model: Theoretical Overview

The Transactional Stress and Coping model (Lazarus & Folkman, 1984) originated as an integrative model to explain the relationship between stress and illness, identifying that both stress appraisals and coping strategies were central to this understanding (see Figure 2.1). This model has been effective in guiding diagnostic as well as prescriptive understanding of student achievement as it recognizes that factors within individuals' social environments interact with their personal characteristics and lead to unique interpretations of events or situations. Similar to Bandura (1986; 1997), Lazarus and Folkman postulated that environmental conditions and social factors influence cognition and behaviors uniquely for each person and should not be overlooked when exploring stress and coping. Ultimately it is the person-environment relationship that determines the "condition" of the person (i.e., the appraisal) that dictates the relationship between the potential stressor and eventual coping responses (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). Those situations or events appraised by individuals as threatening induce an anxiety-laden stress response, promoting the chance for less effective coping and poorer outcomes (Spielberger & Vagg, 1995).

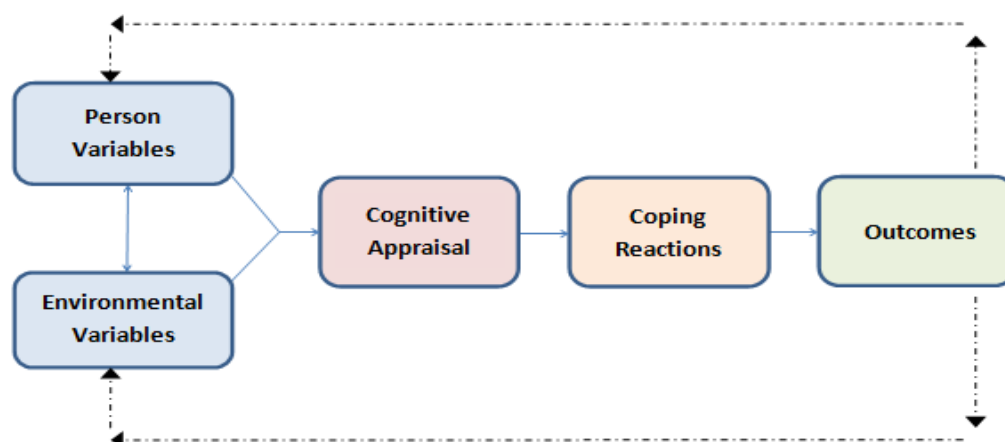


Figure 2.1. An illustration of the Transactional Stress and Coping Model (Lazarus & Folkman, 1987).

Cognitive appraisals. A *cognitive appraisal*, or evaluative judgment regarding situations or events, occurs as individuals interpret events or situations with consideration to their personal well-being. Motivational, emotional and cognitive factors specific to the individual in their particular environmental setting determine the appraisal process resulting in a “relational meaning” of the event, situation or demand (Lazarus, 1993b). Appraisals are informed by individuals’ general beliefs about themselves (i.e., ability, competence, perceived control, self-esteem, self-efficacy) and are highly situation or context-specific. The cognitive appraisal results in some form of emotional response state, which consists of either a positive (i.e., happiness, relief) or negative appraisal (i.e. fear, shame), and eventual judgment of whether the stressor poses a potential benefit or threat (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). It is this cognitive appraisal, not the circumstances themselves, that primarily determines the degree of stress reaction and activates the selection of coping strategies from individuals’ repertoire of potential responses (Folkman et al., 1986; Folkman & Lazarus, 1985; Lazarus, 1993a; 1993b).

Coping reactions. In an attempt to adapt to the situation, overcome adversity, manage stressful encounters, or seek to create more favorable circumstances, individuals engage in a

variety of coping strategies. Lazarus (1993a) defines coping as an effortful cognitive and behavioral process that involves managing psychological stress (Lazarus, 1993a). Coping reactions may consist of behavioral responses toward the environment that attempt to manage stressors (problem-focused coping) or away from the stressful environment or task as a means of escape (avoidance-coping), or emotion-focused coping involving cognitive coping and emotional regulation. Regardless of the method utilized, it is critical to examine employed coping strategies to more accurately review the relationships among cognitive appraisals and outcomes – as both the type and number of chosen coping strategies have been found critical (Duhachek & Kelting, 2009; Folkman et al., 1986; Folkman & Lazarus, 1985; Lazarus, 1993a; Lazarus & Folkman, 1984). Generally, problem-focused coping is believed to be the most adaptive form of coping, resulting in more favorable outcomes as individuals engage in active strategies to directly address the potentially threatening situation (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987).

Taken as a whole, the Transactional Stress and Coping model asserts that each individual is shaped by diverse environmental and situational circumstances, which results in unique cognitive appraisals of similar events or demands. Motivational and cognitive variables contribute to how individuals appraise such events or demands in either a more negative or positive light. The cognitive appraisal then influences the selection of specific coping reactions to manage the stressor, which ultimately leads to more or less favorable outcomes. The model is recursive in that the outcomes that follow selected coping strategies in response to threat appraisals shape the interpretations of future situations and the determination of the predicted efficacy of selected strategies. Overall, this model provides a functional, integrative explanation that may serve as an effective basis for examining the complex relationships among antecedent,

mediating and outcome variables when attempting to predict and intervene on university performance (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1987).

Empirical Research Examining Transactional Stress and Coping

Lazarus and Folkman's (1984) model has been widely used to explain the diversity of coping reactions and outcomes for individuals affected by a variety of stressors such as particular physical or mental health challenges (Baldacchino, Borg, Muscat, & Sturgeon, 2012; Dysvik, Natvig, Eikeland, & Lindstrom, 2005; Groomes & Leahy, 2002; Kennedy, Duff, Evans, & Beedie, 2003; Marnocha & Marnocha, 2013; Sinha & Watson, 2007; Street et al., 2010; Tung, Hunter, & Wei, 2008; Wanzer, Sparks, & Frymier, 2009); chemical substance use (Britton, 2004; Park et al., 2004); trauma or loss (Carlson, 1997; Overlien & Hyden, 2009; Remillard & Lamb, 2005), experiences within certain vocational and recreational areas such as in nursing, social work, military service, teaching (Baloglu, 2008; Ying, 2008) and in high-performance athletes (Hammermeister & Burton, 2004; Nicholls & Polman, 2007).

Interventions to promote better outcomes through support focused on adapting cognitive appraisals of potential stressors or developing more effective coping strategies have also been promising (Kennedy et al., 2003; Carlson, 1997). For example, Kennedy et al. (2003) found that individuals with spinal-cord injuries who participated in an intervention designed to help them develop more positive cognitive appraisals of their condition and utilize adaptive coping strategies reported reductions in feelings of depression and anxiety as well as increases in their self-perceptions.

Overall, the central features and utility of the Lazarus and Folkman (1984) Transactional Stress and Coping model have withstood the test of time in capturing the important relationships among personal, cognitive, environmental and behavioral factors and explaining adaptive and

maladaptive coping reactions in response to challenges and stressors. Just as environmental and psychological factors are important in explaining stress and coping relationships associated with physical, occupational, personal, and spiritual health and well-being, they are also significant features in dictating academic well-being of students. Therefore, the Lazarus and Folkman Transactional Stress and Coping model (1984) has proven useful in conceptualizing the relationships among perceived stressors, appraisals of threat and opportunity, and coping strategies that lead to adaptive or maladaptive outcomes within the academic context.

Transactional stress and coping in academics. Circumstances perceived as stressful and threatening can have a negative impact on academic functioning (Carver & Scheier, 2005; Cassady & Boseck, 2008; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005). When students are faced with potentially stressful situations, their appraisal of the situation is profoundly influenced by their pervasive beliefs about themselves (i.e., perceptions of academic ability, confidence) associated with academic-oriented tasks or the educational context. Highly negative self-appraisals, such as those found in students with low self-efficacy (Bandura, 1993; Bouffard-Bouchard, 1989; Bouffard-Bouchard, Parent, & Larivee, 1991; Prat-Sala & Redford, 2010), induce stress-appraisals of the situation and often result in decreased effort (Carver & Scheier, 2005), or ineffective coping strategies (Barrows et al., 2013; Bembenutty, 2008; Lynch, 2006; 2010). Consequently, this increases the students' vulnerability for academic failure (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). For example, in students who experience higher levels of anxiety in response to academic demands or specific academic requirements (i.e., new academic transitions, test-taking) academic performance is adversely affected (Beilock, 2008; Bembenutty, 2008; Cassady, 2010; Cassady & Johnson, 2002; Chapell et al., 2005; Lynch, 2006; 2010; Zeidner, 1990).

Lower levels of achievement are the most likely consequence of these negative cognitive appraisals, particularly when coping reactions are maladaptive and consist of task avoidance, ineffective study strategies, poor self-regulation or negative emotional states (Carver & Scheier, 2005; Cassady, 2010). However, favorable outcomes are possible in the face of these negative appraisal tendencies when students employ adaptive coping strategies that specifically target the academic demands they routinely face or activate supportive resources in their educational environment that help with either emotional or problem-based coping (Blair & Razza, 2007; Cassady, 2010). Simultaneously, a large body of research on academic performance suggests that students who demonstrate greater ability to effectively manage academic stress and task demands through consistent use of appropriate self-regulation strategies (i.e., manage educational environments, regulate study behaviors, motivational regulation) enjoy more positive achievement outcomes over the long term (e.g., Park, Edmondson, & Lee, 2012; Williams et al., 2008; Zimmerman & Schunk, 2008).

Consistent with the Lazarus and Folkman model (1984), the principle factors in understanding eventual academic success and failure lie in: a) how students perceive (appraise) potentially stressful circumstances- either as potential threatening barriers or manageable challenges and b) the approach (e.g., coping reactions or self-regulation strategies) selected to address the academic-related demands. All college students encounter a variety of stressors and obstacles as they navigate their educational paths, yet as the model suggests, there are wide variations in the students' perceptions of the level of threat inspired by these stressors, resulting in varying levels of vulnerability to stress-related circumstances. This tends to be heightened for students in their first year of college, where they tend to face significant distress, anxiety and a number of adjustment challenges (Andrews & Wilding, 2004; Barrows et al., 2013; Budny &

Paul, 2003; Crede & Kuncel, 2008; Dyson & Renk, 2006; Hsieh et al., 2012; Lapsley et al., 1989; Sasaki & Yamasaki, 2007; Srivastava, Tamir, McGonigal, John, & Gross, 2009; Turner et al., 2012; Wei et al., 2005). Although students may possess similar static characteristics (e.g., gender, ethnicity) as they enter postsecondary educational environments, differing degrees of anxiety, motivation, self-efficacy and attitudes toward college may contribute to quite dissimilar cognitive appraisals of academic-related tasks, events, experiences and expectations during the first-year experience. Whether one views demands or expectations as overwhelming and unmanageable or challenging and manageable will directly contribute to variations in the coping responses, yielding more or less favorable academic achievement outcomes.

Lazarus and Folkman's (1984) model has not been widely utilized for large-scale studies examining student achievement in higher education. Most institutional assessment research tends to be limited due to the inaccessibility of data examining student appraisals and tendencies toward self-regulation and coping. Conversely, studies that are specifically focused on student appraisals or coping strategies often are unable to effectively capture student outcome measures that are durable and reliable indicators of success. As such, the majority of research incorporating the general tenets of the Lazarus and Folkman model within the academic context has focused primarily on smaller and more manageable analyses of elementary and secondary student populations (Boekaerts, 1993; Hunter & Boyle, 2004; Lay et al., 1989; Sowa & May, 1997). Research using this framework in college populations has also generally targeted students attending non-U.S. institutions (Akgun, 2004; Sinha & Watson, 2007) or specific populations of students who encounter particular stressors (e.g., student-athletes; Giacobbi et al., 2004). However, these post-secondary investigations generally have been limited to examining only subsets of the overall model due to the limitations they face in accessing information satisfying

all dimensions of the model, in particular appraisals of stressful conditions and self-regulation tendencies related to academic challenges (rather than affective adjustment to transitions to university life; Britton, 2004; Chang 1998; Chang & Strunk, 1999; Park et al., 2004; Ying, 2008).

Using the Lazarus and Folkman (1984) model, Chang (1998) conducted a study examining the influence of optimism and cognitive appraisal on student outcomes associated with coping and adjustment in a sample of 726 U.S. college students. Results revealed there were significant differences on stress-related appraisals and overall adjustment between students who self-reported as optimists or pessimists. In response to a class event (i.e., exam for course), students who self-reported as pessimists were more likely to appraise the event as stressful and utilize more maladaptive coping responses (e.g., academic disengagement). Those individuals who reported higher optimism reported greater use of engaging coping strategies (e.g., problem-solving) and less disengaged coping strategies (e.g., problem avoidance). The cognitive appraisals accounted for a significant amount of the variance in student-selected coping strategies. Additionally, cognitive appraisals and coping methods significantly predicted student psychological and physical adjustment, with higher rates of stress-appraisals and maladaptive coping responses contributing to heightened difficulties in adjustment over time. While this study clearly established that differential appraisals (pessimist versus optimist) of the same situational event (exam) led to differences in chosen strategies, the study was not able to follow through with a direct examination of outcomes in academic achievement.

A more recent cross-cultural investigation informed by the Transactional Stress and Coping model substantiated the role of stress-appraisals and coping in affective adjustment to university life. In their study of 542 college-aged students sampled from two separate university

populations, one located in India and the other in Canada, Sinha and Watson (2007) examined the role of stress and coping strategies (i.e., escape-avoidance, problem solving) on psychological symptoms (i.e., anxiety, depression). Results revealed that the Canadian students (characteristic of Westernized culture) reported significantly higher levels of perceived stress than the students from India. The Canadian students were also more likely to report escapism or avoidance-coping tendencies that were subsequently strong predictors of later negative psychological symptoms. Students who reported “confrontive” coping (e.g., problem-focused) tendencies were less likely to identify with psychological symptoms. Collectively, the negative cognitive appraisals and maladaptive coping strategies were predictive of low self-esteem, depression, anxiety, hostility, and somatization. Results of this study underscore the connections between appraisal, coping, and non-academic outcomes. The personal factors unique to student background and contextual factors proved important to the establishment of the appraisals. Additionally, the results provide evidence that concurrent self-report measures of student appraisals and coping tendencies can serve as useful predictors of student outcomes.

Consistent with the Lazarus and Folkman model, findings from a study examining 379 U.S. undergraduate students by Chang and Strunk (1999) support the influential role of cognitive appraisals and coping in adjustment outcomes in students who experienced dysphoria. Dysphoria was significantly positively correlated with student reports of lower life satisfaction, physical symptomatology, and disengaged coping activities and associated with greater threat appraisals. While reported dysphoria alone was directly related to maladaptive adjustment, their study demonstrated that these negative outcomes were magnified for students reporting threat-laden cognitive appraisals who also utilized more disengaging coping activities. Research by Park et al. (2004) found similar evidence highlighting the importance of examining both aspects of

cognitive appraisals and coping strategies when identifying outcomes. In their study, students who reported greater levels of negative affect and stress also reported higher alcohol consumption levels - a common outcome when examining responses to stress for learners (Cooper, Frone, Russell, & Mudar, 1995; Mohr et al., 2001). However, examination of chosen stress coping strategies demonstrated that when students engaged in problem-focused coping, reported alcohol consumption decreased, whereas emotion-focused coping was associated with increases in alcohol consumption (Park et al., 2004).

Adaptive coping strategies such as those reported in the Park et al. (2004) study lead the learner toward more proactive solutions to meeting the challenges imposed by stressors in the academic environment. Akgun (2004) demonstrated that the use of these proactive coping strategies was strongly related to student self-efficacy in a sample of 255 Australian undergraduate college students. Results revealed students who reported higher self-efficacy had more positive appraisals of the potentially stressful situation (i.e., lower perceived threat). These students were also more likely to use adaptive forms of coping such as seeking social support, engaging in planful problem solving, and confronting the perceived stressor through problem-focused coping. The results were consistent with the basic transactional model, but an additional variable of interest was identified in this study. Akgun reported that use of positive coping strategies was even more pronounced for students who reported higher levels of learned resourcefulness, or their ability to exert control over their behaviors when faced with everyday problems. Research highlights the positive link between this skill and outcomes. Individuals more adept in learned resourcefulness experience higher self-efficacy, utilize self-regulatory strategies to control their emotional responses and apply problem-solving strategies in response to stressful conditions, minimizing potential negative effects of stress on their performance

(Rosenbaum, 1990; Rosenbaum & Jaffe, 1983). Lower levels of learned resourcefulness contributed to more escape-avoidance behaviors in response to the perceived stressful examination event. Results from this study also highlighted a significant gender difference in perceptions of potentially stressful events, finding that female students perceived examination situations as more stressful than males. This is not surprising, given the wide body of research demonstrating females report higher levels of academic anxiety in nearly all forms and contexts (Bembenutty, 2008; Chapell et al., 2005; Kitsantas et al., 2008; Lynch, 2006; 2010), but highlights the importance of examining the unique contributing features of personal characteristics and contextual differences when examining the overall transactional stress and coping models.

A qualitative study by Giacobbi et al. (2004) examined the sources of stress and coping resources in first-year U.S. female college student-athletes over the course of their first academic year. They utilized the Transactional Stress and Coping model (Lazarus & Folkman, 1984) as their theoretical framework to guide the research questions, line of inquiry and data interpretation, finding it to provide an adequate explanation for conclusions drawn from this study. The female athletes reported significant stressors during their first year, including academics (i.e., transitioning to college-level demands, balancing sport and academics), training intensity, high performance expectations, being away from home and interpersonal relationships associated with coaching staff, teammates and others. Participants indicated engaging in a number of coping strategies to address these stressors, however, the type of coping method evolved over the year. During the earlier parts of the year, they engaged in more emotion-focused coping (i.e., venting to others, humor). Active cognitive coping strategies, although not mentioned at the beginning of the academic year, were employed as the year progressed. It is this

transition to more adaptive forms of coping that the researchers attribute to the greater levels of satisfaction and adjustment observed by the end of the first year. Although this study is qualitative in nature and lacks statistical investigation of the variables of interest, it does draw attention to the potential to adjust the coping strategies employed by learners over the course of an academic year – illustrating the potential to promote adaptive coping through intervention efforts.

Ying (2008) examined the effectiveness of coping strategies for students in a graduate-level social work program. Students were placed in the field and were involved in social work activities. They were assessed regarding the challenges or stressors associated with their work as well as emotional exhaustion, self-detachment and social support system. Using Lazarus and Folkman's framework (1984) in his research, Ying found that in the presence of challenges and stressors, self-detachment and the use of an external social support system (i.e., engaged/adaptive coping) served as positive coping strategies in students. Less use of self-detachment and social support system coping strategies (i.e., maladaptive/disengaged coping) was predictive of higher levels of emotional exhaustion. Here, self-detachment requires individuals to develop a level of self-awareness that enables them to actively separate their own experiences, emotions and cognitions from the influence of stressful situations encountered in the social work environment (Neff, 2003; Ying, 2008). Consistent with Lazarus and Folkman's model (1984), this coping strategy assists students in changing the influence of environmental conditions on outcomes; by reframing the initial negative cognitive appraisal of the stressor, self-detachment allows students to perceive the conditions as less threatening and more manageable. According to Ying, more adaptive coping strategies yield more favorable outcomes for persons facing stressful circumstances in their academic work associated with their vocation of interest.

Related models of stress and coping in academics. A wide body of research has provided adaptations of the general framework proposed by Lazarus and Folkman (1984), attempting to identify the importance of stress and coping in academic success (Cassady & Boseck, 2008; Slavin et al., 1991; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005). The preponderance of those models attempts to explain the experience of academic anxiety and coping responses that translate to more adaptive or maladaptive outcomes.

One of the most influential models was presented by Spielberger and Vagg (1995) and incorporates the stress-outcome transactional process to explain the role of test anxiety in performance. According to their conceptualization, examinations and other academically-demanding situations represent stressful situations that are often appraised by students as threatening and thus evoke an anxious emotional state in response. As a result, attention, information processing and retrieval during the assessment event are adversely affected. Often the coping reactions that follow include decreased motivation (e.g., performance avoidance goal sets), task avoidance (e.g., procrastination), unsuccessful study strategies, or distraction in one's ability to focus and perform (Blair & Razza, 2007; Carver & Scheier, 2005; Zeidner, 1995; Zeidner & Matthews, 2005). Ultimately, these maladaptive forms of coping contribute to performance decrements for test-anxious students. Conversely, some individuals may interpret and appraise potential threats quite differently (i.e., as a "challenge") and respond more adaptively by using the anxiety as a positive motivator toward performance or in developing better strategies to compensate (Spielberger & Vagg, 1995).

Zeidner and Matthews (2005) articulated a similar model of coping in response to academic-related anxieties that reframes coping in the broader self-regulation literature. This approach adopts a more comprehensive examination of the motivational and cognitive

dimensions of self-regulation by accounting for aspects such as fear of failure, established goal sets, and self-monitoring during test preparation and performance. According to their model, the degree and impact of evaluation anxiety (i.e., test anxiety) depend upon a variety of social and situational factors (e.g., high stakes test) that interact with individual student characteristics (e.g., perceived low ability). Therefore, multiple cognitive, affective and behavioral factors associated with the student and academic environment converge, resulting in a variety of consequences for the anxious learner. For such students, Zeidner and Matthews suggest self-regulated learning strategies are key in their ability to effectively cope, indicating that for those students who attend to information and engage in the learning experience, functioning and performance outcomes improve. For students who engage in distraction, procrastination and avoid engaging in tasks necessary to accomplish their academic goals, performance suffers resulting in poorer learner outcomes (Zeidner & Matthews, 2005).

Cassady and Boseck (2008) have more recently proposed an Emotional Information Processing (EIP) Model which integrates the Lazarus and Folkman (1984) framework. In short, this theoretical model attempts to explain how students encode information from their academic environment when demands are placed upon them and interpret those situational cues through their own personal lens. Responses are then selected based upon their cognitive appraisals, personal goals associated with either avoiding or approaching the task and the students' knowledge of potential responses. According to this model, those students who develop more negative, threatening appraisals of the situation and have a limited number or ineffective strategies available to them are at greater risk for poor performance and academic achievement (Cassady & Boseck, 2008).

The Multicultural Model of the Stress Process proposed by Slavin et al., (1991) incorporates all the components of the Lazarus and Folkman model but more specifically emphasizes the role cultural factors play in the stress-coping process. These authors point to the influence cultural background brings as a relevant factor influential to each stage of the stress-coping process. This is particularly true, argue the authors, in situations or institutions where other- and self-oriented beliefs associated with culture can significantly impact one's environmental conditions, cognitive appraisals and coping reactions, for example in academic-oriented expectations (i.e., stereotype threat; Steele & Aronson, 1995; Steele, Spencer, & Aronson, 2002). Although the original Lazarus and Folkman (1984) model recognizes that person-specific factors contribute to the varying cognitive appraisals and coping responses individuals will select, Slavin et al. (1991) advocate for specific inclusion of culture within the model, highlighting the significance of cultural factors as an integral part to this process.

As suggested by the review of the literature, the Lazarus and Folkman (1984) Transactional Stress and Coping model has primarily been utilized as the guiding theoretical framework investigating a myriad of research topics, including college student populations. However, the body of empirical research to date has largely failed to directly investigate students' stress-appraisals in response to academic task demands, educational environments and the selection of particular academic-related coping strategies that contribute to achievement outcomes. This limitation in the research is generally a matter of methodological limitations driven by the inability to access all relevant factors in the model with a sample sufficiently large to test the full model. Considering other extensions to the Transactional Stress and Coping model, the Lazarus and Folkman framework will be utilized to inform the analyses proposed in

this research study as it provides a viable and parsimonious explanation of the relationships among the variables of interest to this study.

Importance of Multifactor Investigations of Student Performance

In-depth review of the literature on predictors of college student achievement demonstrates no single factor places any student more at risk over another. Measures of prior academic achievement and background factors only provide so much information (e.g., Astin & Lee, 2003; Hoffman Beyer & Gillmore, 2007; Keup, 2004; Tinto, 2006). Lazarus and Folkman's framework (1984; 1987; Lazarus, 1993a; 1993b) emphasizes the critical nature of including multiple levels of factors for accurate prediction of student outcomes, recognizing personal characteristics, environmental conditions, and psychosocial determinants of behavioral outcomes. Obviously, this is not a novel perspective, as it is consistent with well-established discussions of human functioning (e.g., Bandura, 1986; 1997; 1999; Snow et al., 1996). Brief overview of the importance of these multiple-perspective orientations to understanding human performance is warranted in a broad investigation of diverse student outcomes. Furthermore, an overview of these metatheoretical perspectives allows a direct alignment with the Transactional Stress and Coping model (Lazarus & Folkman, 1984), identifying a bridge between the relatively disconnected domains of research.

Albert Bandura's Social Cognitive Theory (SCT) provides a widely-used triadic psychosocial model that categorizes factors associated with student performance and achievement outcomes into three interrelated components: personal factors (e.g., cognitive abilities, affective states), behavioral responses (e.g., study strategies, self-regulation), and environmental conditions (Bandura, 1986; 1997; 1999). Within this conceptual framework, Bandura emphasizes the role of human agency as a key contributor to achievement outcomes

(1999; 2006). Individuals, as agentic beings, possess cognitive and behavioral abilities that enable them to construct, select and regulate their actions in response to the environment (1999).

From the Social Cognitive perspective, person-centered variables such as cognitive abilities, self-perceptions and motivation guide individuals' behavioral response patterns. Environmental conditions (i.e., events, social situations) also influence the person and behavioral components. All three components interact in reciprocal fashion, with behavioral responses potentially impacting environmental conditions for example. Ultimately, the bidirectional interactions among these three components contribute to a variety of achievement outcomes.

Social Cognitive Theory highlights the importance of investigating the three interactive components, with particular emphasis on self-efficacy and human agency, in cultivating an understanding of factors predictive of college student achievement. Cognitive beliefs and behavioral response patterns, along with motivational and affective states, are heavily influenced by a person's perceived self-efficacy, or the belief the person holds about what he is capable of doing, learning and accomplishing (Bandura, 1977; 1999). These self-efficacy beliefs are also shaped by environmental factors as much of what a person comes to believe about himself and his abilities is often informed by prior social interactions, experiences within certain environmental contexts, and observing others. Therefore, within the academic context, environmental factors play a significant role in student achievement, influencing behavioral and personal factors that contribute to achievement. A student's degree of self-efficacy often dictates his goal-setting activities, what tasks he should attempt to achieve, and how much effort he should put forth, directing his learning strategy use and task performance (Prat-Sala & Redford, 2010). For that reason, self-efficacy is instrumental to a student's sense of agency (Bandura,

1977; 1999) and has a profound influence on cognitive development and academic performance (Bandura, 1993; Bouffard-Bouchard, 1989; Bouffard-Bouchard, Parent, & Larivee, 1991).

Academically-oriented behavioral responses then constitute the final piece among factors that ultimately contribute to academic persistence and achievement outcomes (Robbins et al., 2004; Trigwell et al., 2013). From the perspective of interpretation in the Transactional Model (Lazarus & Folkman, 1984), self-efficacy is instrumental in the cognitive appraisals individuals form in the face of environmental stressors. In the face of academic stressors, students with high self-efficacy are more likely to adopt a cognitive appraisal that has a lower degree of perceived threat because they are confident in their abilities to meet the challenge imposed (Prat-Sala & Redford, 2010; Zeidner & Matthews, 2005). Subsequently, the motivation and cognitive self-regulation (or coping) strategies consistently selected and employed by the learner in response to these cognitive appraisals rely on the agentic role of the learner (Bandura, 1999; 2006). Those who routinely adopt adaptive self-regulation strategies (e.g., mastery-oriented motivational sets, active cognitive monitoring, effective resource management) enact behavioral response patterns that help meet those challenges effectively. Alternatively, those who adopt less agentic perspectives (e.g., avoidance-goal sets, procrastination, poor self-regulation activities) will have a less effective outcome in performance.

Snow et al. (1996) further expound upon the person component described within Bandura's triadic framework, explaining how person-centered factors contribute to academic performance and achievement. In their discussion, Snow and colleagues identify three distinct domains of human functioning: cognitive, affective and conative. *Cognitive* variables include abilities such as information processing skills and intelligence. Within the academic context, cognitive ability is often measured by college entrance examinations and grade point average,

two reliable predictors of academic success in college (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Robbins et al., 2004; Zypher, et al., 2007). *Affective* factors consist of emotions, personality traits, values and attitudes. Attitudes toward education and academic-oriented anxiety are two academic-related factors categorized within this domain. The *conative* variables are characterized by two distinct states: mental processes and volition. Mental conative factors frequently referenced within the educational milieu include motivation and self-efficacy, while volitional factors include time-management and self-regulatory skills (Snow et al., 1996).

Traditionally, institutions and researchers have primarily examined the contributions of cognitive factors to student performance and achievement outcomes. Snow et al. (1996) assert conative and affective factors are also worthy of investigation as all three processes illuminate individual differences among the student population. In their review, they emphasize that assessments examining educational outcomes should include multiple student variables from all three domains for a more comprehensive and accurate understanding of student characteristics and their relationships within academic contexts. Individual differences exist among students, and it is those differences that often influence the diverse achievement outcomes observed in learners (see Snow et al., 1996 for review). Research by Lazarus (1993b) supports this framework, illustrating that person traits and characteristics contribute to unique cognitive appraisals and behavioral response patterns as a result for each learner, and these individual differences ultimately serve an influential role in student outcomes. Thus, conative and affective factors are viewed as additional critical pieces to understanding academic achievement outcomes.

As a result of institutional assessment and other investigative efforts, a large body of research provides an extensive and complex picture of why students remain in college and succeed (Tinto, 2006). The following section reviews the broad body of literature attempting to predict success in higher education which generally can be classified into (a) pre-existing personal factors, (b) affective influences to performance, and (c) self-regulated learning factors.

Pre-Existing Personal Factors

As Keup (2004) notes, students enter postsecondary institutions with a host of experiences and background variables that directly impact their academic performance over the short and long-term. Students' high school experiences and family contexts play a role in college persistence, yet background information of this nature is often ignored (Tinto, 2006). Therefore, to fully capture the key factors associated with academic achievement outcomes in higher education, the demographic (e.g., gender, ethnicity) and background characteristics (e.g., SES, parent education level, family context) students bring to college must be considered (Bean, 1990; Johnson et al., 2004-2005; Scherer & Anson, 2014). Other influential pre-existing personal factors include students' prior high school experiences and abilities and are worthy of attention (Tinto, 2006).

Prior academic achievement. In their attempt to gauge student retention and achievement outcomes in college, postsecondary institutions rely upon high school grade point average (GPA) and college admissions test scores (i.e., SAT and ACT) as measures of prior academic achievement. This is with good reason as the preponderance of research indicates these measures are consistently strong predictors of success in college over other variables (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Robbins et al., 2004; Zypher et al., 2007). Therefore in predicting student

academic achievement, investigations must include tests of prior achievement as they provide robust information to institutions about their entering student population (Ekman & Pelletier, 2008; Peterson & Einarson, 2001).

Harackiewicz et al. (2002) followed 471 college students enrolled in an introductory psychology course from the first semester through graduation or withdrawal in their study examining prior achievement factors (i.e., SAT/ACT scores, high school GPA) and college performance. Results indicated that students higher in measures of prior achievement demonstrated better psychology course performance and higher first-semester GPAs compared to students exhibiting lower prior achievement. Significance of prior achievement was also evident in cumulative GPAs at time of graduation, indicating prior achievement was a robust predictor of college academic performance both in the short and long-term.

Zypher et al. (2007) found similar support for prior achievement measures as predictors of academic performance, yet their results indicate prior achievement becomes less salient as students progress into the later years of their college career. In a sample of 207 college seniors, they investigated the role of prior achievement (i.e., SAT/ACT scores) and personality factors on student performance across the students' first seven semesters enrolled at the institution. Results indicated that students with higher scores of prior achievement upon entry enjoyed higher college GPA, especially over the first two semesters of college. Although prior achievement still remained a predictive factor beyond the first year, the initial effects became less significant in students' performance across the remaining three years with personality factors better explaining differences in student performance.

In their longitudinal study of 204 freshmen college students, DeBerard and colleagues (2004) examined student demographics, prior ability and other psychosocial variables as

potential predictors of academic achievement and retention. Correlational analyses revealed that high school GPA and SAT total scores were positively associated with college cumulative GPA ($r = .67$; $r = .30$ respectively). High school GPA was also significantly correlated to student persistence from year one into year two ($r = -.20$); those students with higher GPAs were more likely to remain at the institution. Regression analyses demonstrated that high school GPA and SAT scores were strong predictors of first-year cumulative GPA, accounting for a greater proportion of the variance explained compared to other variables (i.e., social support, coping) investigated in the study.

Alarcon and Edwards (2013) also targeted the first year of college in their investigation of prior ability, as indicated by ACT scores, and student retention. In a sample of 584 freshman students, they measured student performance at four different intervals during the first year. Regression analyses found that ACT scores were a significant predictor of retention at all four time points. Students who scored one standard deviation below the mean on ACT scores were .98 times more likely to withdraw from the institution.

Gender. Although gender status does not directly contribute to variations in college student performance, gender has been found to play a significant role in accounting for differences observed in postsecondary retention and achievement outcomes. Research finds that females are at a significant advantage, typically outperforming males in college GPA and completion (Alon & Gelbgiser, 2011; DeBerard & Julka, 2000; DeBerard et al., 2004; Harackiewicz et al., 2002; Kitsantas et al., 2008) even when other variables (i.e., background, prior ability) are controlled for (Buchmann & Diprete, 2006; Goldin et al., 2006).

In their study of 204 freshmen undergraduate students, Deberard et al. (2004) found that female students earned higher cumulative GPAs than the male students, and gender was a

significant predictor of year-one academic performance. In a prior, similar study, Deberard and Julka (2000) found there was a statistical difference between females' and males' performance in college with females demonstrating significantly higher GPAs. Gender was correlated with first-year GPA ($r = .25$) wherein males earned lower GPAs compared to females and were more likely to be placed on academic probation. Similarly, an investigation of 471 college participants by Harackiewicz et al. (2002) revealed freshmen females earned significantly higher introductory psychology course grades and demonstrated better performance in first-semester and cumulative first-year GPAs than their male counterparts. Kitsantas and colleagues (2008) followed 198 undergraduate students across the first two years of college in their investigation of factors hypothesized to predict college student achievement outcomes. The results echo other research, finding females earned significantly higher cumulative GPAs than the male students by the end of their sophomore year. Regression analyses predicting end of sophomore GPA revealed gender as a significant predictor of performance, with gender continuing to significantly predict achievement when other variables (i.e., prior ability, motivation) were also investigated.

Buchmann and DiPrete (2006) conducted an extensive study investigating potential contributors to the perceived gender gap in college performance and achievement outcomes. They utilized data from the National Education Longitudinal Study (NELS; years 1988-2000) and General Social Survey (GSS; years 1972-2002). Not surprisingly, results from this large-scaled study revealed that historically males entered and completed college at higher rates than females. However, more recently a dramatic shift was observed; although females and males enrolled in 4-year institutions at almost identical rates, they experienced significantly different completion and performance outcomes. The work by Buchmann and DiPrete (2006) demonstrated that the advantage females enjoyed emerged after high school once males and

females began taking courses at a 4-year college. Controlling for prior achievement measures and other variables, females still exhibited significantly higher grade point averages (a gap that widened with each passing year in college) and completion rates than their male counterparts.

Ethnicity. An achievement gap continues to exist between ethnic majority and minority students in postsecondary education. Researchers have associated students' status as a member of an ethnic or cultural minority group with increased risk for drop out and academic failure (ACE, 2008; 2011; Borman & Overman, 2004; Gordon & Yowell, 1994; Harper, 2009; 2012; Harris & Herrington, 2006; Jones et al., 2010; Kamee & Justiz, 1988; Kuh et al., 2007; Toldson, 2012). Research finds that minority students are at a significant disadvantage compared to their ethnic majority peers as they are often placed in lower ability educational tracks during elementary and secondary education (Cavazos, Cavazos, Hinojosa, & Silva, 2009; Herrera, 2003; Ou & Reynolds, 2014; Valencia, 2002), and on average, less than one-third of minority high school graduates have college-level reading skills (ACT, 2006). Furthermore, these individuals often lack information helpful to transitioning into higher education (Immerwahr, 2003; Zalsauett, 2005) and experience greater difficulty integrating into the college culture (Odell, Korgen, & Wang, 2005). These challenges then often translate into difficulty achieving their postsecondary goals.

Although minority students are entering colleges at higher rates now more than ever, a national report by the American Council on Education (ACE; 2011) presents a concerning picture of achievement outcomes in this college student sub-population. The report indicates that persistence rates of minority students continue to fall below that of non-Hispanic White and Asian students. The drop-out rates for African American and Hispanic students in the first year of enrollment (both 30%) are almost double that of their ethnic majority peers. Furthermore, of

those students who enrolled, approximately 36% of the African American and 42% of the Hispanic students graduate with a baccalaureate degree within five years compared to slightly over 58% of non-Hispanic White students.

In a large-scale study ($n = 6,834$) comparing college students across various background factors, Jones et al. (2010) found evidence of the achievement gap among students from diverse ethnic groups. They found ethnicity to be strongly associated with baccalaureate degree completion. After controlling for prior high school achievement and gender, African American students were 30% less likely, Hispanic students were 40% less likely and Native American students were two-thirds less likely to earn their college degree compared to White students. However, in STEM-related degrees (i.e., Biology), Jones and colleagues (2010) found that prior high school achievement was a strong, significant predictor of degree completion across all ethnic groups. For this particular degree area, ethnicity was no longer a significant factor predicting degree attainment.

Oh and Reynolds (2014) investigated childhood predictors of later college success or failure in a cohort of inner-city, minority students. Results from their sample of 1,379 students drawn from the Chicago Longitudinal Study indicated that ethnic minority status, low parent educational attainment and low SES significantly predicted lower rates of college attendance and degree completion. Beyond these background variables, classroom adjustment, parental expectations toward education and reading ability were also significant predictors of college achievement outcomes (i.e., attendance, degree completion). Although ethnic minority students were less likely to succeed in college, those students who demonstrated more skilled reading ability, reported high parental expectations for the child's education and better adjustment to the

classroom during their elementary education had a higher likelihood of attending college and completing their degree once enrolled.

Additional research specifically focused on the facilitative factors on postsecondary success for minority students has extended these trends. For example, Morales (2010) conducted a study investigating high-risk students and factors that contributed to academic resilience in minority, low SES, first-generation college students. The results identified two clusters of factors that represented protective factors students reported were instrumental to their academic success in college. Cluster 1 represented strong familial support and adequate preparedness in skills for college success associated with positive high school experiences and relationships. Cluster 2 related to internal factors associated with high levels of student self-efficacy and self-esteem, strong work ethic and high motivation toward education. Thus, in students whose background factors identified them as high-risk for academic failure (ACE, 2006), they instead attained more positive outcomes and attributed their success to a number of factors that extended beyond demographic variables. Beyond Morales' (2010) findings, a wide body of research indicates that the minority students who enjoy greater levels of academic success are those who demonstrate better adjustment to stressful conditions, report more familial support and a high value of education (Cavazos et al., 2010; Ceballo, 2004; Morales, 2008; 2010; Zalaquett, 2005). Additionally, minority students who exhibit higher levels of intrinsic motivation, academic self-efficacy and engage more frequently in problem-focused coping toward academic demands experience more successful achievement outcomes (Bridges, 2010; Cavazos et al., 2010; Harper, 2009; 2012; Moore, Madison-Colomore, & Smith, 2003; Morales, 2010; Phinney & Haas, 2003).

First-generation status. First-generation college students are typically defined as students who are from a family in which neither parent or guardian has earned a college degree

(Choy, 2001; Pike & Kuh, 2005; Soria & Stebleton, 2012). There is a wide body of literature demonstrating that first-generation students experience depressed achievement outcomes; they earn lower grades and have higher drop-out rates than non-first-generation students (Balemian & Feng, 2013; Choy, 2001; DeAngelo et al., 2011; Engle, 2007; Ishitani, 2006; Pascarella et al., 2004; Riehl, 1994; Soria & Stebleton, 2012). Compared to non-first-generation students, first-generation college students differ in many ways and face a number of unique academic and non-academic challenges that factor into their educational success (Bui, 2002; Gibbons et al., 2011; Inman & Mayes, 1999; Orbe, 2008). Research by Pascarella et al. (2004) refers to the *psychological climate* associated with being a first-generation student, finding that first-generation students are different and experience college quite differently from non-first-generation peers, which translates to the observed achievement differences among the two student populations. According to Pascarella et al. (2004), first-generation students experience greater difficulty participating in on-campus activities and interacting with peers and instructors due to the majority of them live off campus, work more hours and take fewer course credits than their non-first-generation peers. Given that the majority of first-generation college students come from minority and low-income families (Bui, 2002; Horn, Nunez, & Bobbitt, 2000; Lohfink & Paulsen, 2005; Scherer & Anson, 2014; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996), the academic challenges experienced by these underrepresented populations often overlap.

In his analysis of three nationally-representative longitudinal studies – the National Education Longitudinal Study, the Beginning Postsecondary Students Longitudinal Study and the Baccalaureate and Beyond longitudinal study, Choy (2001) identified several factors he determined were instrumental in driving the demonstrated deficits in college persistence and

achievement outcomes of first-generation students. To summarize, Choy concluded first-generation students:

- were less academically prepared for admission to a 4-year college;
- were most likely to leave a 4-year institution before the second year and were more likely to withdraw at each subsequent year;
- reported lower educational aspirations;
- reported receiving less parental support and assistance (i.e., financial) in reaching educational goals; and
- lacked sufficient knowledge about cost and financing education.

As Choy (2001) indicates, low achievement outcomes for first-generation students are largely due to academic challenges experienced prior to entering the postsecondary institution. First-generation students have significantly lower high school GPAs, college entrance exam scores, rates of attempting and passing advanced placement (AP) courses, and demonstrate lower overall academic preparation in STEM and other core subject areas (Balemian & Feng, 2013; Pascarella et al., 2004; Riehl, 1994) placing them at a disadvantage even before reaching the postsecondary institution. Consequently, students with poor academic performance and preparation during high school enter college with lower educational expectations and are less likely to persist and complete a college degree (Choy, 2001; Engle, 2007; Ishitani, 2006; Pascarella et al., 2004; Terenzini et al., 1996). This is not surprising given research by Ishitani (2006) also indicated that low parental expectations were commonly reported by first-generation students, and this factor was directly associated with student drop-out rates.

This lack of academic preparation is also illustrated by the documented need for the majority of first-generation students to complete remedial coursework to become ready for the academic rigor of 4-year institutions (Choy, 2001; Balemian & Feng, 2013; Engle, 2007).

Students referred to these courses generally lack college-level reading, writing and mathematics skills, which is associated with greater difficulty in handling a standard course load in college (Lau, 2003), jeopardizing their retention and degree completion (Balemian & Feng, 2013). Research by Fike and Fike (2008) also found that students who either failed or did not enroll in their “prescribed” reading, writing, or mathematics developmental courses were more likely to withdraw than those who passed.

It is evident that first-generation students enter postsecondary institutions already at a disadvantage compared to their non-first-generation peers, which contributes to greater difficulties transitioning to higher education. Understandably, the limiters to success persist once they matriculate, with the greatest level of challenge generally encountered during the first year (Choy, 2001; Ishitani, 2006) when first-generation students’ lower academic skills are confronted by heightened academic rigor (Collier & Morgan 2008; Jean, 2010; Pike & Kuh, 2005; Soria & Stebleton, 2012).

Research by Jean (2010) indicated first-generation students perceived themselves as less successful in adjusting to the academic demands of college compared to their non-first-generation peers. They perceived themselves as less prepared for college and less knowledgeable and skilled on effective study strategies. A qualitative study by Collier and Morgan (2008) investigating student and faculty course work expectations further substantiated this. First-generation students reported experiencing more problems with time management, devoting enough time to successful coursework completion, and in adequately understanding expectations for a course. First-generation students also reported they utilized fewer outside resources that could assist them with meeting course demands.

First-generation students are also characterized as less academically and socially engaged during their college careers (Engle & Tinto, 2008; Pike & Kuh, 2005; Soria & Stebleton, 2012), which have been linked to academic performance outcomes (Engle & Tinto, 2008; Krause & Coates, 2008). Research by Soria and Stebleton (2012) and Pike and Kuh (2005) found first-generation students reported significantly lower levels of academic and social engagement during their first year of college. They contributed less to class discussion, asked fewer questions in class, had fewer interactions with faculty (Soria & Stebleton, 2012) and made less progress in learning and intellectual development over the first year (Pike & Kuh, 2005) compared to non-first-generation students.

Research also suggests there are psychosocial differences that separate first-generation students from their non-first-generation peers, which play a role in achievement outcomes. Research by Bui (2002) identified specific psychosocial struggles of first-generation students in addition to their personal concerns over academic preparedness. Bui found that first-generation college students feared failure more often and expressed more worry over financial issues associated with attending college compared to non-first-generation students. The concerns expressed by first-generation students may be traced to their low social and cultural capital associated with postsecondary education, which significantly impairs their ability to be successful in college (Collier & Morgan, 2008; Pascarella et al., 2004; Soria & Stebleton, 2012). Students' from families with a college background have greater familiarity with the academic climate and expectations of higher education. This knowledge aids in better mastery of the college student role (Pascarella et al., 2004; Soria & Stebleton, 2012). Collier and Morgan (2008) found that compared to non-first-generation students, first-generation students reported they lack basic knowledge of the culture of higher education, which can hinder them in having

access to helpful resources and information that would assist them in an easier transition to college (Lohfink & Paulsen, 2005; Pascarella et al., 2004; Soria & Stebleton, 2012).

Unfortunately, students who come from families in the lowest income bracket with the least educated parents report being the least knowledgeable about cost and financing education. These students are also the least likely to receive assistance from their parents in pursuing a college education (Choy, 2001; Sparkman, Maulding, & Roberts, 2012). Consequently, first-generation students often face significant hardships with little college-related knowledge and low social support, significantly placing them at a disadvantage compared to their continuing-education peers (Bandura, 1986; 1997; 1999). The review of the research indicates that first-generation students face a number of challenges that threaten their academic success at 4-year institutions, with the first year as the time needing the greatest attention.

Affective Factors

Although a vast amount of research indicates academic success in college necessitates a certain level of prior ability, other variables even beyond background characteristics further differentiate students who persist and ultimately achieve from those who do not (Kitsantas, 2002; Kitsantas et al., 2008; Lucio et al., 2012; Zimmerman & Schunk, 2008). Affective factors in this context correspond to emotions, values, and attitudes toward educational situations, events, and tasks. Research demonstrates a clear influence of positive and negative affect on performance outcomes. Positive affect and high interest toward academics and the educational environment are associated with high motivation for learning (Bye, Pushkar, & Conway, 2007; Hidi, 2000) and facilitate better information processing (Isen, Daubman & Gorgoglione, 1987) and self-regulated learning skills (Hidi & Ainley, 2008; Pekrun, 2009), all known to foster academic success. Since emotional reactions associated with the academic context influence the appraisals

students make about situations and tasks they face (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987), contributing to academic-oriented behavioral patterns and performance (Cassady & Boseck, 2008; Linnenbrink, 2006; Schutz & Lanehart, 2002; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005), the following section reviews two affective factors integral to this discussion: 1) academic-related anxieties; and 2) attitude and interest toward college and learning.

Academic-related anxieties. Although research suggests low to moderate levels of anxiety serve a facilitative function with academic performance by initiating motivational and self-regulatory strategies to meet the stressor (Shipman & Shipman, 1985), research demonstrates that academic-related anxieties can be debilitating, negatively impacting student performance and achievement outcomes (Barrows et al., 2013; Beilock, 2008; Bembenuddy, 2008; Cassady, 2010; Cassady & Johnson, 2002; Chapell et al., 2005; Lynch, 2006; 2010; Seipp, 1991; Zeidner, 1990; Zeidner & Matthews, 2005). Anxiety experienced within the academic context can be domain specific (e.g., math or writing anxiety) or span across a broad range of academic tasks and subjects (e.g., performance anxiety, school phobia; Cassady, 2010). Although more recent research has investigated the negative influences of academic anxiety in general (Cassady, 2010; Crede & Kuncel, 2008), test anxiety is most commonly targeted in achievement literature as a pervasive issue among students profoundly affecting academic achievement (Crede & Kuncel, 2008; Hembree, 1988; Seipp, 1991).

In his meta-analysis of 562 studies of American students from elementary through college, Hembree (1988) concluded that test anxiety hindered academic performance at each educational level. Another meta-analysis by Seipp (1991) reviewed 126 studies and found that

students with higher levels of test anxiety scored approximately one-half a standard deviation lower on measures of achievement than students with lower levels of test anxiety.

More recently, a study by Chapell et al. (2005) revealed similar results regarding the relationship between test anxiety and student performance outcomes. In a large sample of 5,551 college students, Chapell examined relationships among test anxiety and cumulative GPA. Results revealed a moderately significant negative relationship between test anxiety scores and GPA. Students categorized as high test-anxious earned significantly lower GPAs than students who were moderate and low test-anxious. This difference was observed among both male and female undergraduate students, although females reported higher levels of test anxiety overall. Lower test-anxious students in this study scored on average a third of a letter grade higher (in GPA) than students reporting higher levels of test anxiety.

Although research presented above supports the longer-term consequences of test-anxiety on college student achievement, a study by Barrows and colleagues (2013), demonstrated test anxiety affects academic performance in the short-term as well. In their study investigating relationships among college student levels of test anxiety, self-efficacy and exam performance, they found a significant negative relationship between test anxiety and exam performance. Regression analyses revealed that students with lower levels of self-efficacy and higher test anxiety tended to perform the poorest on exams, compared to their less anxious, self-efficacious peers. Overall, these findings provide further support for the urgency in recognizing test-anxious learners, as it is evident test anxiety begins to impact the success of students early in their academic studies. A more recent meta-analysis conducted by Crede and Kuncel (2008) investigated the relationships of academic-specific anxiety and study skills to academic performance. Their examination of 344 studies revealed that academic-specific anxiety was an

important negative predictor of academic achievement. They further noted that motivation toward academic studies and use of study skills demonstrated the strongest relationships to college achievement and suggested that the impact of anxiety on academic performance may be mitigated by study attitudes, habits and motivation consistent with the proposed Transactional Stress and Coping framework (Folkman et al., 1986; Folkman & Lazarus, 1985; Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987).

Research by Bembenutty (2008) also substantiated the powerful impact of test anxiety on performance. Additionally, he found self-efficacy and self-regulation to also be important predictors of student performance, a finding supported by Bandura's classic research (1977; 1993; 1997). In a two-part study investigating a sample of 451 and 427 undergraduate students respectively, Bembenutty (2008) found a significant main effect of test anxiety, where higher levels of test anxiety were associated with lower levels of self-efficacy, less cognitive strategy utilization and poorer course outcomes. Higher degrees of self-regulation were also found to predict better achievement outcomes; however this relationship was independent of test anxiety. Although the results did not support an interaction effect of self-regulation or self-efficacy with test anxiety, they demonstrated marked differences between the academic study skills and self-efficacy beliefs of students reporting differing levels of test anxiety. These findings are corroborated by other lines of research demonstrating that effective study habits, self-regulation, self-efficacy and enhanced motivation can counter the effects of anxiety and lead to more favorable outcomes (Hsieh et al., 2012; Schunk et al., 2008; Talib & Sansgiry, 2012). Greater self-doubt and worry toward performance evaluations contribute to lower levels of self-efficacy (Bandura, 1977; 1993; 1997), increasing the potential for negative cognitive appraisals that induce perceived threat, raising anxiety in the learner (Carver & Scheier, 2005; Cassady &

Boseck, 2008; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005). However, confidence in one's abilities to perform tends to increase with greater use of effective cognitive and emotive-coping strategies (Bandura & Schunk, 1981), essentially modifying the original threat-appraisal into perceiving the stressor as now manageable, which can drive down test anxiety (Cassady & Boseck, 2008; Nelson & Knight, 2010; Zeidner & Matthews, 2005).

Research targeting specific subgroups of at-risk college students provides insight into the profound influence of academic-related anxieties on academic performance outcomes. Ethnic minority college students tend to experience greater levels of academic-related anxiety, which uniquely contributes to lower academic performance (Cole, Matheson, & Anisman, 2007; Flowers, Bridges, & Moore, 2011). The negative impact of academic anxieties on achievement is also more pronounced in students with poor learning and cognitive skills (Bembenutty, 2008; Crede & Kuncel, 2008; Matthews et al., 2006; Zeidner & Matthews, 2005; Tobias 1985). Learners who are less prepared for managing the rigor of college-level academic work experience higher levels of apprehension about academics (Complete College America, 2011; Scherer & Anson, 2014) and performance suffers.

Despite investigations into these student characteristics and subgroups, research to date has neglected to examine the relationship between academic-related anxieties and performance outcomes in first-generation college students. Given the overlap in characteristics among these student subgroups and the reality that first-generation college students experience heightened risk for academic failure above other student populations (Balemian & Feng, 2013; Choy, 2001; Engle, 2007; Pascarella et al., 2004), it is imperative research directs attention to investigating academic-related anxiety as a contributing factor to poor outcomes within this particular subgroup. For anxious learners, research provides mixed results in determining what factors may

mitigate the negative effects of test anxiety on performance outcomes, which provides room for future investigation. Regardless, it is evident that test anxiety has a profound effect in achievement outcomes in combination with other person and behavioral factors.

Attitude and interest toward college and learning. A student's general optimistic attitude and interest toward the learning and college environment are other affective factors that influence academic achievement outcomes (Albaili, 1997; Chang et al., 2011; Chemers et al., 2001; Gerardi, 2006; Schiefele, 1991). Although research on these constructs is sparse, findings substantiate their role in academic performance. Compared to students who report more positive, optimistic college-oriented attitudes, research finds that students who maintain more negative, pessimistic attitudes are likely to experience adjustment difficulties (Chang et al., 2011; Chemers et al., 2001; Stewart et al., 1997), engage in fewer coping activities that support learning (Balkis, 2013; Stewart et al., 1997), demonstrate poorer achievement (Albaili, 1997; Chang et al., 2011; Chemers et al., 2001; Crede & Kuncel, 2008; Gerardi, 2006), and exhibit higher drop-out rates (Gerardi, 2006). Similar results are also observed in studies investigating indicators of student interest in educational tasks and goals (Crede & Kuncel, 2008; Schiefele, 1991).

Research by Chang et al. (2011) investigated the academic-oriented optimism, adjustment and performance outcomes of 338 undergraduate students. The results revealed that academic-oriented optimism was an important predictor of cumulative GPA, explaining 11% of the variance in GPA alone. In their meta-analysis, Crede and Kuncel (2008) also established that favorable attitudes associated with academic study and environment were a strong predictor of academic performance in combination with study habits and study skills.

Research by Gerardi (2006) demonstrated similar results, but found that attitude toward college may be particularly important in underrepresented student populations. In a study

comprised of minority, low-SES freshman undergraduate students, Gerardi investigated student attitudes toward college and measures of college performance outcomes via cumulative GPA and credits earned over their college career. Results indicated that positive attitude toward college was an important indicator of student GPA and completion. Overall, for every one point increase in student attitude (i.e., more positive), there was a one-sixth letter grade increase in GPA. Those students who reported the least favorable attitudes earned lower GPAs, fewer credits and were more likely to drop out of the institution. This may be one factor that explains the poorer achievement outcomes observed in first-generation college students as this underrepresented student population reports substantially lower college aspirations and expectations (Choy, 2001; Engle, 2007; Ishitani, 2006; Pascarella et al., 2004; Terenzini et al., 1996).

Other research indicates that the effects of positive attitude, optimism and interest on student achievement outcomes appear to be mediated by the coping styles enacted by students (Chemers et al., 2001). In their study of 373 first-year undergraduate students, Chemers and colleagues investigated the role optimism played in student expectations and performance outcomes. They found that levels of optimism and self-efficacy were moderately, positively correlated. Optimism also was related to academic performance and student adjustment, through its effects on student's challenge versus threat evaluations. Students who reported they were highly optimistic also demonstrated more adaptive coping strategies and positive academic expectations, which contributed to better academic outcomes. This indicates that student optimism assists in better adjustment to the college environment, contributing to more positive achievement outcomes.

Schiefele (1991) examined interest in learning and education within the college population in a comprehensive investigation comprised of six separate studies. Results revealed that high interest was positively associated with more use of effective learning strategies, finding that high interest students engaged in deeper levels of processing and invested more time and effort on tasks. Additionally, he found that degree of interest was more predictive of quality of course experience above other factors (i.e., ability, achievement motivation). Beyond learning strategy use, research by Bye et al. (2007) found that interest is also predictive of both positive affect toward education and intrinsic motivation- a factor found to positively predict achievement outcomes (D'Lima et al., 2014; Lynch, 2006; 2010; Pintrich, Smith, Garcia, & McKeachie, 1993; Prospero & Vohra-Gupta, 2007).

Research to this point has sporadically investigated the role of attitudes and interest toward learning within the context of academic achievement. Although research suggests interest and attitude toward learning influence academic achievement outcomes in college students from vulnerable populations (e.g., low SES; Gerardi, 2006), to date these relationships have yet to be investigated with specific attention given to the first-generation college student population. Given that the majority of first-generation college students come from more vulnerable student populations (e.g., ethnic minority, low SES; Bui, 2002; Horn et al., 2000; Lohfink & Paulsen, 2005; Scherer & Anson, 2014; Terenzini et al., 1996) and many enter postsecondary institutions with low college expectations and aspirations (Choy, 2001), investigations of this nature are necessary. It is plausible to conclude that attitude toward learning may be one factor that explains the poorer achievement outcomes observed in first-generation students, thus this factor warrants further investigation.

Self-Regulated Learning

Self-regulated learning (SRL) has been conceptualized by a number of theoretical frameworks to explain how individuals address task and environmental demands within the academic context via a variety of academic-oriented strategies. Using a social-cognitive conceptual framework presented by Zimmerman and Schunk (2008; 2011; Zimmerman, 1989; 2000), SRL refers to the cognitive abilities, academic-oriented volitional strategies and motivation students direct toward meeting academic demands and goals. SRL is integral to higher student achievement (Bussey, 2011) as academic success outcomes are largely attributed to students' self-regulation ability (Bembenutty, 2008; Bussey, 2011; Kitsantas, et al., 2008; Robbins et al., 2004; Zimmerman, 2011; Zimmerman & Schunk, 2008; 2011). Research consistently demonstrates the differences observed between low-and high-achievers are attributed to their ability to self-regulate, with students who are better self-regulators enjoying greater academic success (Hofer, Yu, & Pintrich, 1998; Kitsantas, Winsler, & Huie, 2008; Robbins et al., 2004; Zimmerman & Schunk, 2008). Based upon the preponderance of research demonstrating the integral role of SRL in achievement and its learner-driven, proactive, responsive nature toward personal control of outcomes, SRL can be characterized as a collection of adaptive student coping strategies in response to the demands and situations found in academia (McInerney, 2011; Pintrich & Zusho, 2002; Zimmerman, 2011). Consistent with the SRL model presented above, two primary factors of self-regulation are generally identified (motivation and self-regulated learning strategies).

Motivation. Motivation is the process wherein a person initiates, directs, sustains and maintains behavior in order to attain a goal (Schunk, 2008; Zimmerman, 2011; Zimmerman & Schunk, 2008). According to Zimmerman and Schunk's model of self-regulated learning (SRL),

motivation is a key factor (Bussey, 2011; Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008) and is believed to be the central agent behind SRL that promotes goal-directed academic activity (Schunk et al., 2008), with higher levels of motivation linked to increases in student attention, effort and persistence even in time-consuming and complex tasks (Zimmerman, 2011). Motivation, according to this model, serves a regulatory function by providing the necessary drive to initiate and engage in effective and effortful learning strategies that ultimately yield more favorable outcomes (Pintrich & Zusho, 2002; see Wolters et al., 2011 and Zimmerman, 2011 for review). Motivation also is associated with effective study strategy selection and persistence (Prat-Sala & Redford, 2010; Vansteenkiste et al., 2004; Wolters, 1998) and consistently has been established as one of the key factors predictive of academic achievement (Allen et al., 2008; Crede & Kuncel, 2008; D'Lima et al., 2014; Lei, 2010; Robbins et al., 2004; Yip, 2007; 2009).

A meta-analysis by Crede and Kuncel (2008) of 344 studies investigated the role of study habits, skills, motivation and attitudes on first-year college student GPA. Results revealed that motivation, defined in this study as general motivation for succeeding in school and performing tasks related to academic achievement, had the strongest relationship to GPA above all other variables examined. Motivation had a moderate, positive relationship with overall GPA, indicating those students who reported higher levels of motivation at the beginning of the year also tended to demonstrate higher achievement outcomes at the end of the first year. Research by Marrs, Sigler, and Hayes (2009) substantiated this finding in a sample of undergraduate students examining motivation and academic performance. Their analyses showed moderate, positive relationships between motivation and course grade ($r = .33$) and motivation and first-year GPA ($r = .51$). Of all non-cognitive factors examined, motivation was the only significant

factor in differentiating students who earned passing or failing grades in the course. In a study comparing high and low-achieving undergraduate students, Yip (2009) also demonstrated that high-academic achievers reported significantly higher levels of motivation compared to low-achieving students. Follow-up analyses revealed that motivation was an important, significant discriminant factor in explaining the difference between low and high-achieving students.

Research on motivation has often delineated the construct into two specific types, *intrinsic* and *extrinsic*. Intrinsic motivation refers to the desire to engage in learning tasks for mere reward from working on the task or other reasons such as curiosity, challenge and mastery of information without expectation of an external reward (Pintrich et al., 1991). Students are characterized as intrinsically motivated when they self-initiate and independently engage in academic tasks for inherent satisfaction and find these activities reinforcing for their own sake (Brown, 2007). Conversely, extrinsic motivation within the academic context refers to engaging in a behavior in order to obtain external rewards such as social approval, privileges or good grades (Brown, 2007; Sansone & Smith, 2000) or to avoid some form of external punishment (e.g., failing grade; Brown, 2007). Extrinsically-motivated students often necessitate the lure of rewards or favorable outcomes to facilitate engagement in academic-oriented behaviors (Lei, 2010).

Intrinsic and extrinsic motivation have been investigated, with meaningful relationships established between the type of motivation, academic persistence and achievement outcomes (see Lei, 2010 for a review). Research investigating intrinsic motivation has demonstrated a consistently positive relationship with effective study strategy use and academic success (D'Lima et al., 2014; Lei, 2010; Lynch, 2006; 2010; Pintrich et al., 1993; Prat-Sala & Redford, 2010; Prospero & Vohra-Gupta, 2007; Vansteenkiste et al., 2004; Wolters, 1998). The research

surrounding the impact of extrinsic motivation on academic performance provides a less clear picture. Although a number of studies indicate extrinsic motivation negatively impacts the use of study strategies and achievement (Prat-Sala & Redford, 2010; Prospero & Vohra-Gupta, 2007; Wolters, 1998), others have demonstrated more positive outcomes (D'Lima et al., 2014; Lynch, 2006; Wolters, 1998).

Experimental studies have found that when students were placed within an intrinsically-motivating condition, they demonstrated deeper levels of processing, earned higher grades and persisted compared to students in the extrinsic condition (Vansteenkiste et al., 2004). Although students may not necessarily be intrinsically motivated in the beginning of their academic pursuits or task-related demands, research suggests improved performance outcomes can still be realized if students are able to shift motivation toward a more intrinsic orientation.

Prat-Sala and Redford (2010) investigated motivation orientations and study strategies (i.e., surface, deep processing) in first-year undergraduate students. They found that type of motivation was correlated with the elected study strategies of the students. Intrinsically-motivated students reported higher use of deeper levels of information processing, compared to students who reported higher extrinsic motivation. Those higher in extrinsic motivation engaged more frequently in surface-level information processing. In a study of undergraduate college students, Wolters (1998) found that students who reported higher levels of intrinsic motivation utilized more effective cognitive study strategies (i.e., organization, elaboration, critical thinking, metacognitive strategies) compared to their more extrinsically-motivated peers. Intrinsic motivation was a significant positive predictor of students' cognitive strategy use and course grade. Although extrinsic motivation was not predictive of effective cognitive study strategies, Wolters found that it was also a significant predictor of final course grade. Results also supported

significant but weak positive relationships between cognitive study strategies and grade outcomes (elaboration, $r = .17$; critical thinking, $r = .23$; and metacognition, $r = .24$).

D'Lima et al. (2014) investigated group differences in their research on intrinsic and extrinsic motivation and academic performance. In a sample of 591 undergraduate students, they found that both intrinsic and extrinsic motivation were positively associated with academic performance. Intrinsic and extrinsic motivation also differed between males and females; females reported higher levels of extrinsic motivation. Similar performance outcomes were observed by Lynch (2006) in his examination of 501 undergraduate students. Results revealed extrinsic motivation along with self-efficacy were significant predictors of course grades for first-year students; however, this relationship was not observed in the upper level students.

Research conducted by Prospero and Vohra-Gupta (2007) provides support for the positive relationship of intrinsic motivation in first-generation students. In their study comparing first-generation to non-first-generation undergraduate students, they found that intrinsic motivation was a significant contributor to academic achievement in only the first-generation students. Their results also revealed that extrinsic motivation and amotivation contributed significantly to lower achievement outcomes among first-generation students but not for non-first-generation students. These findings suggest that motivation may be a more critical factor in differing levels of academic achievement for first-generation college students than their non-first-generation peers.

As the research indicates, students who possess higher levels of extrinsic motivation tend to utilize less effective or fewer study strategies toward academic work (Prat-Sala & Redford, 2010; Prospero & Vohra-Gupta, 2007; Wolters, 1998); yet, in some cases extrinsic motivation corresponds to better performance outcomes, especially in first-year students (D'Lima et al.,

2014; Lynch, 2006; Wolters, 1998). One plausible explanation for these differences may be that extrinsically-motivated students engage in basic study strategies involving surface level processing (Prat-Sala & Redford, 2010; Vansteenkiste et al., 2004) as a short-term solution to satisfy course requirements and pass exams for a desired course grade. However, these strategies become less effective over time particularly with more complex material (Lynch, 2006). Therefore, learning is impaired resulting in poorer performance long-term for extrinsically-motivated individuals. It is those intrinsically-motivated students that demonstrate higher interest and persistence toward their academic activities (Hidi, 2000; Sansone & Smith, 2000; Vallerand & Bissonnette, 1992) over the long term. Consequently, students with higher levels of intrinsic motivation ultimately reap the long-term benefits academically from sustained effective strategy use and interest in academic-related tasks.

Self-regulated learning strategies. Beyond the integral role of motivation, cognitive and behavioral strategies are two other essential components of the social-cognitive SRL framework (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011) that profoundly influence academic achievement over the long-term (Nota et al., 2004; Robbins et al., 2004). Students who actively take notes in class, organize information, engage in deeper processing of the material, effectively manage their study time, prepare for formal assessment events, demonstrate academic discipline (i.e., on-task effort), and are resourceful in seeking help demonstrate high self-regulated learning skills that are associated with better academic performance outcomes (Bembenutty, 2008; George et al., 2008; Kitsantas et al., 2008; Nota et al., 2004; Robbins et al., 2004; 2006). More adept self-regulated learners also evaluate the efficacy of the cognitive strategies they employ in response to academic-task demands and adapt their approaches as necessary for goal attainment, resulting in performance and achievement gains (Pintrich &

Zusho, 2002). Thus, these self-regulated learning strategies serve an adaptive function for students (McInerney, 2011). Although the research has identified a myriad of self-regulatory cognitive and behavioral strategies that are documented to support success in academics, the following review of the literature addresses two broad domains of literature (i.e., cognitive abilities, volitional strategies) that are instrumental to the current study.

Cognitive abilities. Information processing is comprised of the enduring and stable cognitive resources students utilize to process information (Winne, 2001). Information processing is believed to be involved in all cognitive activities such as comprehension, reasoning, problem solving and self-regulation (Matlin, 2009). Therefore, changes in these key components impact one's ability to adequately process information and ultimately affect overall intellectual functioning. Students who lack basic cognitive abilities and skills helpful to thinking and processing information experience greater difficulty completing academic tasks and are more likely to leave the postsecondary institution (Alarcon & Edwards, 2012). Therefore, cognitive abilities can either enhance or detract from success on academic tasks (Finn et al., 2014) and ultimately impact attainment of one's educational goals. Students possess a variety of self-regulatory cognitive abilities. Those self-regulatory cognitive abilities include: summarizing information, meaningfully organizing information, applying the information, self-assessing, and self-monitoring for understanding (Weinstein & Mayer, 1986). To remain concise, only those abilities of interest to this study will be addressed in the following review of the literature: concentration and comprehension monitoring.

Concentration. Attentional control is a cognitive process that involves selective or sustained concentration on an environmental stimulus (Kyndt, Cascallar, & Dochy, 2012) and is another self-regulation ability essential to effective information processing (Fougnie, 2008).

When attention is directed toward information in one's environment, processing of information proceeds more efficiently (Sperling & Weichselgartner, 1995) allowing for better learner performance. Research on attention reveals it is positively associated with academic performance outcomes (Redick & Engle 2006; Riccio, Lee, Romine, Cash, & Davis, 2002; Weinstein & Palmer, 1990). Consequently, for those individuals who experience difficulty concentrating in the academic environment or on academic tasks, distractibility becomes a hindrance to performance (Dietz & Henrich, 2014; Fernandez-Castillo & Gutierrez-Rojas, 2009; Keogh et al., 2004; McDonald, 2013; Zeidner & Matthews, 2005) as their cognitive resources are diverted away from information that may be pertinent to their learning.

Prior research has found evidence that worry and ruminating thoughts associated with evaluations of student academic performance (e.g., test anxiety) distract students from their ability to adequately concentrate on their performance tasks, interrupting processing efficiency (Fernandez-Castillo & Gutierrez-Rojas, 2009; Zeidner & Matthews, 2005) and adversely affecting achievement outcomes (Keogh et al., 2004). In one investigation of this relationship with a college student population, Keogh et al. (2004) found that students who self-reported high levels of worry regarding an impending examination (i.e., high test-anxious), also reported higher threat-appraisals, negatively impacting their ability to concentrate. Consequently, both their degree of distraction and worry significantly predicted academic performance, with increased levels of distraction and worry corresponding to poorer exam performance.

More recent research on concentration and distractibility in students has centered around student engagement in distracting activities during class or study sessions (Dietz & Henrich, 2014; McDonald, 2013). In one experimental study by McDonald (2013), college students were assigned to three different texting-behavior conditions over the course of a semester. At the

conclusion of the semester, frequency counts of texting during class were collected and compared to final course grades. After controlling for measures of prior ability (ACT and high school GPA) and attendance, frequency of texting was a significant predictor of final course grade, with those students who reported more texting behaviors earning significantly lower grades in the course. Another study by Dietz and Henrich (2014) yielded similar results finding that students randomly assigned to a texting condition during a learning event performed significantly worse on a follow-up quiz compared to those in the no-texting condition.

Over prolonged periods of time, students who become distracted from necessary academic-oriented behaviors conducive to their learning experience poorer outcomes as well. Robbins et al. (2006) conducted a large-scale study investigating 2-year and 4-year college students on the effects of various psychosocial and background variables on student achievement. When measures of prior achievement (i.e., ACT scores, high school GPA) and background variables were accounted for, academic discipline (i.e., sustained effort toward academic tasks) remained a consistent, significant positive contributor in explaining achievement outcomes in first-semester and first-year GPA. Those students who reported high levels of sustained effort toward their school work earned higher first- and second-semester GPAs.

Comprehension monitoring. Monitoring understanding to identify gaps in knowledge is an important cognitive strategy vital to self-regulation (Weinstein, Meyer, Husman, Van Mater Stone, & McKeachie, 2006). Comprehension monitoring (i.e., metacognitive monitoring) is an effortful process that requires students to monitor their learning processes and knowledge of presented information, and determine whether these are adequate in meeting their performance goals (see Winne, 2011 for review). Research suggests that undergraduates tend to engage in poor monitoring and cognitive control (Wiley, Griffin, & Thiede, 2005), often influenced by an

impaired ability to utilize prior knowledge within new learning situations (e.g., Shapiro, 2008) and activate appropriate strategies to enhance learning (e.g., Aleven et al., 2006; Aleven & Koedinger, 2002). However, for those students who accurately evaluate their understanding of material, they tend to effectively direct their future study activities toward more productive means of comprehending information that is unlearned, solidifying knowledge (McKeachie & Svinicki, 2006; Winne, 2011) and improving performance outcomes (Thiede, Anderson, & Theriault, 2003).

In a sample of college students obtained from a university in Spain, Cano (2006) investigated the relationship between comprehension monitoring and academic performance within his factor analysis of the Learning and Study Strategies Inventory (LASSI; Weinstein, Schulte, & Palmer, 1987). Results revealed that comprehension monitoring was significantly positively associated with first-year and final-year academic performance outcomes (i.e., academic year cumulative GPA). However, results of regression analyses indicated that the significant influence of comprehension monitoring became irrelevant when other variables were included into the predictive model. According to Cano's research, affective strategies (i.e., motivation, attitude) and goal-oriented strategies (i.e., test strategies) were more impactful to student achievement than comprehension monitoring.

Research by Thiede and colleagues (2003) paints a different picture, suggesting metacognitive monitoring positively influences self-regulation of study behaviors and test performance in college students. In their experimental study, college students engaged in a text-reading task of six different text passages via computer delivery, rated their level of comprehension of the texts and then completed a post-test on each. The students were divided into three conditions: 1) one group received instructions immediately after each text prompting

them to generate keywords associated with the passage; 2) the second group received delayed instructions to generate keywords after all six passages were reviewed; and 3) the third group (control) received no prompts for keyword generation. Once the students completed the initial set of post-tests, they received global feedback on the scores of their post-tests (not specific items), were allowed to re-visit any text passages for rereading purposes, providing them the opportunity for self-regulation of study. All students completed another post-test for each text passage. Analyses revealed that performance on the first series of tests was similar across the three groups. However, results indicated that of those students who demonstrated more strategic selection of passages for re-study, performance dramatically increased. Performance outcomes remained relatively unchanged for those students who selected few to no passages for re-study purposes.

Volitional strategies. Another dimension of self-regulated learning strategies is broadly identified as volitional (i.e., active study) strategies, where the learner is actively engaged in developing better understanding of the academic material of interest through behavioral study practices. These active study strategies have predictably been identified repeatedly to contribute to higher academic achievement (Karpicke, Butler, & Roediger, 2009; Marrs et al., 2009; Plant, Ericsson, Hill, & Asberg, 2005; Zimmerman, 2000; 2004). Although it is important that students spend adequate time engaging in active study activities, research finds that study time is not necessarily the key factor in determining performance outcomes. In Plant et al.'s (2005) extensive review of the literature, they found that time spent studying was a relatively poor predictor of college student success, instead they noted it is the utilization of *effective* study strategies during that time that is most imperative to promoting greater achievement. The following describes effective active study strategies supported by the literature.

Marrs et al. (2009) investigated the relationship of student study strategies and course performance in a sample of college students enrolled in an introductory psychology course. Results from the study revealed that although motivation was the most important predictor of student achievement, study strategies (i.e., self-testing, test preparation) accounted for 31% of the variance in course grades after the effect of prior achievement (i.e., ACT and high school GPA) was removed. Students who engaged in effective strategies associated with testing personal knowledge of material, selecting key information from text, studying in preparation for assessment, and managing study time earned significantly higher course grades.

More specifically, research also finds that when students are actively engaged in note-taking and analyzing and processing information, this aids in memory and learning (Heller & Marchant, 2015; McKeachie & Svinicki, 2006; Peverly, Brobst, Graham, & Shaw, 2003). Peverly et al. (2003) conducted an experimental study to examine performance on a test of reading passage comprehension between students assigned to a no-note-taking and note-taking condition. Students were given a passage and asked to study the material, allowing them as much time as they wanted. Students in the note-taking condition were specifically instructed to take notes on the provided text. When ready, students completed a test of recall and recognition on the assigned passage. Students in the note-taking group scored significantly higher on both the free recall and recognition portions of the test. In addition, both overall time spent studying and total number of notes generated during study were found to positively influence performance outcomes.

Active study strategies that challenge students to do more beyond re-reading their textbooks and generating notes are also classified as effective strategies for enhanced learning (Karpicke et al., 2009). One study by Heller and Marchant (2015) investigated the impact of a

self-regulated learning study packet between two groups of college students in an introductory psychology course. They found that students who followed a self-regulated learning protocol requiring routine utilization of active study strategies (i.e., elaboration, self-testing, generation of notes, personal application of material) over a semester earned higher exam and final course grades than students with no self-regulated learning strategy prompts.

Elaborative rehearsal. Elaborative rehearsal is an active study strategy wherein students engage in purposeful, deeper processing of material by expanding upon new information and relating the information to something they already understand (Craik & Lockhart, 1972).

Research supports elaborative rehearsal as an active strategy that contributes to better performance outcomes (Hall, 2001; Hall, Hladkyj, Perry, & Ruthig, 2004; Hamilton, 2004; Harris & Dean-Qualls, 2000; Heller & Marchant, 2015; Hofer et al., 1998; Nückles, Hübner, & Renkl, 2009; Simpson, Olejnik, Yu-Wen Tam, & Supattathum, 1994).

Harris and Dean-Qualls (2000) found evidence supporting the efficacy of elaborative rehearsal in increased memory performance. In their experimental study comparing younger and older adults segregated into maintenance and elaborative rehearsal conditions, no significant differences were observed between the differing age groups in performance outcomes; however, strategy-use was a significant factor. Results revealed those individuals who utilized elaborative rehearsal as their memory strategy demonstrated superior performance on tests of working memory and reading comprehension compared to those in the maintenance rehearsal condition.

In another experimental study, Simpson et al. (1994) investigated results on student exams comparing students who were in either a maintenance or elaborative rehearsal condition. Students were separated into two groups, one who engaged in rote rehearsal of information presented in preparation for an exam, while the other students utilized an elaborative rehearsal

strategy. Results revealed significantly better performance outcomes in students assigned to the elaborative rehearsal condition. They also found that specific approaches employed within the elaborative rehearsal condition also influenced performance, with those who better-organized and created more complete rehearsals demonstrating better performance.

Nückles and colleagues (2009) conducted an experimental study examining the effects of writing information associated with material and performance on a test of comprehension in undergraduate students. Students watched a 30-minute video-taped lecture and were separated into five different groups, each receiving differing cognitive prompts for writing about the lecture material. One group served as the control group and received no direct instructions for note-taking, the remaining four groups received detailed instructions to either a) organize the information, b) organize and elaborate upon the information, c) organize, elaborate, and monitor understanding of the information, or d) organize, elaborate, monitor and plan for how to improve understanding if the student was experiencing difficulty comprehending the material. After the 30-minute note-generation period ended, all students were given a text-copy of the lecture to revise their notes as necessary. All students then completed a post-test measuring recall and comprehension. Results revealed that students who were in the organizing and elaboration condition demonstrated better post-test performance than those in the control group and organization-only condition. Not surprising, students in the more advanced writing conditions also performed better (Nückles et al., 2009).

Results from a longitudinal study by Hall et al. (2004) provided evidence supporting the long-term efficacy of elaborative learning strategies. In their study, Hall and colleagues investigated the role of elaborative learning (i.e., deeper processing) and achievement outcomes. Students watched a video lecture presenting information on attributional retraining and then

completed an aptitude test and elaborative rehearsal measure. For comparison purposes, researchers separated students into “high elaborator” and “low elaborator” groups using a median split and followed the students’ academic performance over an eight-month period. Those students originally categorized as “high elaborators” engaged in more written processing of the attributional retraining video compared to “low elaborators”. Over the long-term “high elaborators” also outperformed the “low elaborators”, earning significantly higher course grades and end-of-year GPAs. Hall (2001) investigated the relationship between processing strategies and ability measures (i.e., total SAT, cumulative college GPA) in a sample of 202 undergraduate college students enrolled in introductory psychology courses. Students completed the Study Process Questionnaire indicating by self-report the learning approaches (i.e., surface, deep, achieving) they routinely utilized during study activities. Results revealed additional evidence supporting deeper processing as a positive predictor of college student cumulative GPA along with SAT scores.

Visualizations. Students who actively generate visual representations of presented text or verbal information are utilizing another effective self-regulated learning strategy associated with better understanding of material (Yen, Lee, & Chen, 2012; Zimmerman & Kitsantas, 2005) and learning performance (Miller, 2011). These student-generated visual elements often include drawings, sketches, charts, diagrams, or tables of the course material (Weinstein & Palmer, 1990). According to Miller (2011), visually-represented information adds to the “vividness” or impact of the information on human memory, increasing the likelihood it will enhance retention over the long-term.

Yen et al. (2012) conducted a study with college freshmen enrolled in a computer network course. Students were randomly assigned to two curriculum conditions, one that

required students to engage in concept-mapping using an image-based approach, while the control group created text-based concept maps of presented material over a six-week period of time. Although there were no significant differences observed in the learning outcomes (i.e., achievement test) of the two groups, results revealed that upon evaluation of the student-generated materials, those students who utilized the image-based concept-mapping strategy demonstrated more in-depth and complex understanding of the material compared to those tasked with creating text-only concept maps.

A mixed-methods study with a sample of eight-grade students in a science course yielded similar results. Hsieh and Cifuentes (2006) assigned groups of students to three conditions, a visual-generation group using paper and pencil, a visual-generation group using computers, and a control group not engaged in visual-generation of material. All students attended a 100-minute workshop where they watched four 25-minute science-related video lectures in their classroom. Students were then allowed class time to answer essay questions associated with the material and study for a post-test. Students assigned to the control group self-selected study strategies to complete the essays and study for the exam. Students assigned to the paper-visualization group were taught how to create visualizations to aid their understanding and were allowed adequate time to construct their visualizations to complete the essays and study for the exam. The final group completed the same task, however, engaged in computer-generated visualizations. All notes generated were collected for further analysis of quality and depth of processing. Results revealed that engaging in visualization activities contributed to greater performance regardless of the method used, with both visualization groups scoring significantly higher on the post-test measure than the control group but not differing from each other. Interviews following the performance measure also revealed that students assigned to both visualization conditions

reported more positive attitudes when asked to reflect on the study process than those in the control condition. Furthermore, data collected through review of students' notes and study time demonstrated that those engaged in the visualization tasks were more purposeful in their study approach compared to the control group (Hsieh & Cifuentes, 2006).

Self-testing. Self-testing is another active study strategy that has been identified as an effective self-regulation learning strategy important to support learning and performance. The “testing-effect” is supported by a preponderance of evidence that demonstrates active and frequent engagement in self-questioning promotes retrieval of information, and those students who incorporate this practice while studying enjoy improved academic performance compared to others who do not utilize this strategy (Heller & Marchant, 2015; Karpicke et al., 2009; McDaniel, Agarwal, Huelser, McDermott, & Roediger, 2011; Roediger, Agarwal, McDaniel, & McDermott, 2011; Roediger & Karpicke, 2006; Stewart, Panus, Hagemeyer, Thigpen, & Brooks, 2014). According to McKeachie & Svinick (2006), these strategies prompt self-assessment over material, provide students with feedback on their comprehension and help direct their study efforts and promote further learning.

Although research on the college student population is limited in this area, there is evidence that self-testing among graduate-level students aids in enhanced performance. In a study of pharmacy students, Stewart et al. (2014) provided online quizzes to students in a pharmacy course with the opportunity to take them voluntarily and receive corrective feedback following answer submission. Those students who utilized the online quizzing option as an elective learning strategy earned significantly higher grades than students who did not. West and Sadoski (2011) further substantiate the positive effect of self-testing in the academic performance of first-year medical students. In their investigation, they found that study skills

employed by students were better predictors of first-semester GPA than aptitude measures (i.e., MCAT). More specifically, along with time management, self-testing was a positive predictor of first-semester performance.

Time and study management. Another self-regulated learning skill closely linked to study strategies is effective time and study management. The relationship between student ability to effectively manage study time and academic achievement has been well-documented by the research (Bembenutty, 2008; George et al., 2008; Kitsantis et al., 2008; Schmitz & Wiese, 2006). In their meta-analysis, Crede and Kuncel (2008) substantiate the importance of both time management and study habits in college student achievement predictors. Of all variables measured, both study habits and skills were found to be significant positive predictors of academic performance. Students who reported at the beginning of their college career that they consistently engage in activities associated with studying and effectively manage their study time demonstrated higher first-year GPA; this effect was observed even when traditional achievement predictors (i.e., high school GPA, college entrance exam scores) were accounted for.

Kitsantis et al. (2008) found a significant impact of time management on college student outcomes in their investigation of self-regulation and ability predictors. Using a sample of 243 students, their study examined the predictive relationships among student ability measures (i.e., ACT/SAT, high school GPA), self-reported self-regulation strategies (i.e., time management), motivational beliefs (i.e., self-efficacy), affective factors (i.e., test anxiety) and academic performance. Regression analyses revealed that time and study management was a positive predictor of first-year and second-year cumulative GPA. Student ability measures (i.e., high school GPA, SAT scores), time management and self-efficacy were all significant positive predictors, accounting for 47% of the variance in first-year college achievement. Time

management alone explained 12% of the variance in first-year college achievement. However, when all variables were introduced to the model to predict second-year achievement, time management and student ability measures retained their predictive value, explaining 48% of the variance, while self-efficacy was no longer a significant contributor. Collectively, Kitsantas and colleagues (2008) found that student self-perceptions of ability (i.e., self-efficacy) play a significant role in first-year student success, but become less salient over time in college. Instead, student time management skills reported at the beginning of their college education continue to be an important predictor of long-term academic achievement.

Consequently, for those students who report tendencies toward procrastination, the results are not as favorable (Balkis, 2013; George et al., 2008; Grunschel et al., 2013). George et al. (2008) investigated the relationships between time spent on activities and student success of 231 Canadian undergraduate students. In their study, students tracked their daily activities in a time diary, recording time spent studying, sleeping and engagement in various active and passive leisure activities. Students also responded to indicators of time management skills on a self-report questionnaire. Results from the multiple regression analyses predicting performance revealed effective time management, determined by total hours studying and self-report time management skills, was a significant positive predictor of semester GPA and overall total success (combined self-assessment and GPA values). Increases in both reported time management skills and actual study time corresponded to higher personal evaluations of success and higher GPA, while those who exhibited patterns consistent with procrastination demonstrated poorer academic success.

In their study investigating 554 undergraduate students, Grunschel et al. (2013) extended the analysis of procrastination by identifying that students could be grouped into different types

of delayers based upon distinct differences in the underlying causes of their academic delay. Some students were characterized as those who tended to delay academic tasks because they experienced worry, anxiety or discontent associated with their academic studies. Other students were characterized as those who were successful pressure-seeking types. High levels of academic procrastination were found among those students who fell into the worry, anxious, discontent type. These students also demonstrated poor self-regulatory skills, which coupled with their high-procrastination tendencies, undermined their performance. Conversely, students grouped into the other categories simultaneously demonstrated effective self-regulated learning skills. Although these students delayed their academic work similar to the other delayers, performance was not adversely impacted as self-regulatory skills served a compensatory function.

Student variations in self-regulated learning (SRL). In spite of the vital role SRL plays in college student achievement, research finds that most college students are either poor or inconsistent self-regulators (Lee, Lim, & Grabowski, 2010; Peverly et al., 2003). As discussed, self-regulated learning strategies are just one domain of academic engagement for which first-generation students show deficits compared to their peers. Investigations into the academic-oriented activities of first-generation students reveal lower levels of engagement in academic activities (Pike & Kuh, 2005; Soria & Stebleton, 2012) and difficulties with both time and resource management (Collier & Morgan, 2008).

Research by Pascarella et al. (2004) confirmed self-regulation deficits were common among first-generation students. However, their study also illustrated that students who became more academically engaged over time reaped significant achievement benefits. That is, as growth in academic and classroom engagement were observed in the first-generation students,

corresponding gains were noted in performance measures. Pascarella et al. (2004) concluded that these experiences act in a compensatory manner, contributing to achievement gains with time at the university in first-generation students. These results also illustrate that self-regulation strategies can be gradually learned or improved, despite prior experience and practices.

In spite of the challenges faced by underrepresented populations in higher education, research suggests that academic-oriented cognitive and behavioral strategies serve as a primary support to generate positive outcomes. In their qualitative study, Phinney and Haas (2003) noted that for students from ethnic minority groups, the majority of whom were first-generation students, the use of proactive self-regulation – or active coping- skills (i.e., problem solving, planning, more time studying, using resources) in response to academic-related stress seemed to play a mitigating role in these students' lives. Conversely, in the same population, those who reported less proactive coping strategies (i.e., procrastination) were more commonly used by students who also reported unsuccessful adjustment to the university and lower achievement outcomes.

Although research highlights the important contribution of SRL strategies to academic achievement, no single variable provides the best explanation for variations in college student performance. Rather as Plant et al. (2005) indicate, models designed to explain college achievement outcomes must comprise of a combination of factors including previous achievement, academic ability, self-regulation, and quality of strategies selected. Drawing from key contributions of Social Cognitive Theory (Bandura, 1986; 1997; 1999; 2006), the framework presented by Snow et al. (1996) recognizes the distinct yet interrelated nature of cognitive, conative, and affective factors and provides an additional model through which student academic achievement may be conceptualized. Invariably, both this view and Social Cognitive Theory

provide a solid case for recognizing the impact of person-oriented and environmental variables on student performance and supporting the need for a multivariate approach to assessment. As both theories suggest, in order to more precisely explain the patterns of success for students in academic settings over time and draw more accurate conclusions about predictors of academic success and risk, future investigations must examine multiple factors associated with background, personal, behavioral and environmental factors (Chamorro-Premuzic & Arteche, 2008; Lucio et al., 2012).

The landscape for investigating factors associated with college student achievement and targeting solutions to the problem is quite complex, yet there have been significant gains over the last 40 years in the research and resources devoted to the topic (Tinto, 2006). Institutions of higher education have adopted this line of research to develop strategies for diagnostic assessment as well as developing student typologies. Formalized institutional assessment allows postsecondary institutions to collect a variety of data on their students and utilize it to estimate the likelihood of academic success or failure, presumably to develop more effective intervention strategies to support success (Fike & Fike, 2008).

Formalized Institutional Assessment

Postsecondary institutions employ formal assessment practices for a number of reasons (see Peterson & Einarson, 2001 for review). First, these institutions must provide documentable evidence they meet or exceed key criteria outlined by accrediting bodies. Institutional assessment allows postsecondary institutions to examine student learning and achievement outcomes and demonstrate they meet the standards of providing effective, high-quality learning environments; all core components required for accreditation (Higher Learning Commission, 2014; Keup, 2004; Peterson & Einarson, 2001). Second, a pervasive belief exists that institutions must be able to

provide empirical, data-driven evidence to demonstrate their effectiveness in adequately meeting students' educational needs (Ekman & Pelletier, 2008) to the broader community and those considering the institution for accomplishing their own educational goals. This further substantiates the essential-nature of institutional assessment practices. Due to the role of accountability in funding structures, institutional assessment also has become the answer for calculating and demonstrating improvement in graduation and retention rates (Astin & Lee, 2003; Flick, 2014; Keup, 2004; NCSL, 2012; Peterson & Einarson, 2001; Tinto, 2006). Last, formative assessment allows institutions to measure a variety of student variables, enabling them to better predict student achievement potential and employ interventions as necessary (Hoffman Beyer & Gillmore, 2007; Kameen & Justiz, 1988; Keup, 2004).

Purposes of Institutional Assessment

To gain a better understanding of student personal and social factors associated with student achievement, two broad approaches tend to dominate formalized institutional assessment. The first approach has been designed to identify subgroups within the community of learners, essentially attempting to generate typologies of student populations. Within institutional assessment, typology studies are utilized to classify students by subgroups based upon their behaviors, values, interests and personality (Adelman, 2005; Bahr, 2010; Horowitz, 1987; Zhao, Gonyea, & Kuh, 2003). This approach has long been used to examine and categorize college students according to similarities and differences (Bahr, 2010) and is believed by some to assist educators in understanding diverse subgroups of their student population and predict student behaviors and outcomes (Kuh, 1990; Kuh, Hu, & Vesper, 2000). Although presumed adequate in identifying specific subgroups of students (Bahr, 2010), debate still persists regarding the most

appropriate methodological approaches for such investigations and their overall utility in improving student outcomes (Bahr, 2010; Kuh, 1990; Kuh et al., 2000).

The second approach to institutional assessment is designed to provide information about individual or groups of students to better describe the population of learners at an institution using a dimensional-approach. For these investigations, surveys, inventories, demographic variables and prior ability measures are utilized to examine their student population at the individual and group level, identify factors predictive of student success and risk for failure, and develop interventions to improve retention and graduation (Hoffman Beyer & Gillmore, 2007; Kameen & Justiz, 1988; Keup, 2004; Tinto, 2006). Inventories widely used with the college population include the National Survey of Student Engagement (NSSE; NSSE, 2014); College Learning Assessment (CLA and CLA+; Council for Aid to Education, 2014); College Senior Survey (CSS; HERI, 2014a); The Freshman Survey (TFS; HERI, 2014b); Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991); and the Learning and Study Strategies Inventories (LASSI and LASSI-HS; Weinstein & Palmer, 2002; 1990). These assessment tools provide quantitative means to investigate important relationships among variables and college performance, identify students' strengths and challenge-areas, and predict individual achievement outcomes (Tinto, 2006).

Utility of Institutional Assessment

There is debate over the value of using institutional assessment for the purpose of assisting colleges in improving student achievement outcomes. As previously indicated, one of the biggest perceived benefits of formalized institutional assessment includes gathering graduation and retention data to provide institutions with empirical evidence of the success of their student population. In their study surveying 1,393 postsecondary institutions, Peterson and

Einarson (2001) found that institutions reported experiencing many benefits using institutional assessment. Institutions reported that assessment information had been beneficial in prompting administrator and faculty discussions regarding initiatives to improve student outcomes and were influential in decision-making processes and improvements to student academic support services. Institutions also indicated assessment was helpful in evaluating retention and graduation rates and other indices of student performance outcomes (Peterson & Einarson, 2001). Furthermore, institutional assessment serves as a valuable tool in identifying and addressing widespread challenges associated with institutional effectiveness (Ekman & Pelletier, 2008; Kameen & Justiz, 1988; Keup, 2004; Peterson & Einarson, 2001) as it can be utilized to direct policy, curriculum and program reform (Ekman & Pelletier, 2008; Peterson & Einarson, 2001) which ultimately enhances student outcomes.

Ekman and Pelletier (2008) illustrate the value of institutional assessment for postsecondary institutions citing “key lessons learned” in their review. They emphasize the importance of a multifactor approach to institutional assessment, arguing that institutions often make the common mistake of using single-measure assessments (i.e., college admissions exams, high school GPA) as their sole means for projecting student learning potential or risk for failure. Instead, they assert that pairing those ability measures with other assessment inventories associated with learning attitudes and study habits offer more robust data for drawing such conclusions. Multiple institutions utilizing formalized assessment also found it to be useful in directing modifications to admissions processes, degree programs, general education curriculums and improving institutional quality overall (Ekman & Pelletier, 2008).

Institutional assessment has also been shown effective for making predictions about individual student achievement outcomes, particularly in attempts to identify student abilities and

deficiencies early-on in their college career (Crede & Kuncel, 2008; Kameen & Justiz, 1988; Keup, 2004). Students arrive at college with prior high school experiences and pre-existing background factors (i.e., family context) that directly impact their academic performance (Keup, 2004); yet institutions often fail to consider the significance of this information in explaining college persistence and success outcomes (Tinto, 2006). Early assessment of an array of student factors allows for appropriate intervention practices to be implemented with at-risk students such as coursework placement, providing appropriate resource support, and individualized advising (Kamee & Justiz, 1988). Therefore, faculty and academic advisors can utilize institutional assessment results to direct their pedagogy and personal interactions with students to enhance student learning (Ekman & Pelletier, 2008). Outcomes can improve if faculty members are privy to assessment results and motivated to purposely use the information. Peterson & Einarson (2001) found that although assessment results were widely available to faculty, faculty members generally did not utilize the information. Of those who did, they reported this influenced their teaching decisions, pedagogy and interactions with students, leading to more positive outcomes.

Overall, there is general consensus supporting the value of institutional assessment to the extent that various domains of student functioning are measured early-on using a variety of methods, and they directly examine the relationship between student performance and student's experiences at the institution (see Peterson & Einarson, 2001 for review). Keup (2004) summarizes the benefits and importance of institutional assessment while emphasizing two key points in garnering the most from these tools. First, it is critical that institutional assessment target first-year students and be utilized early in the enrollment process to identify areas of strength and need. Second, Keup stresses that institutions reap the most from the assessment

results if they are used to improve institutional policies, help students make a better transition into college and enhance institutional effectiveness.

Conclusion

Research examining the college student population clearly demonstrates the connections among pre-existing personal factors, affective responses, motivation, self-regulated learning strategies and academic achievement. A review of the literature indicates a need still exists for further investigations into the interactions among these separate factors regarding their collective influence on postsecondary success (Bandura, 1986; 1997; 1999; Snow et al., 1996; Tinto, 2006). First-year, ethnic minority and first-generation students comprise student subgroups that necessitate specific attention, since threats to academic achievement are even more pronounced. In particular, these student populations experience heightened levels of stress associated with adjusting to college life and rigorous academic demands (Balemian & Feng, 2013; Barrows et al., 2013; Budney & Paul, 2003; Choy, 2001; Crede & Kuncel, 2008; Dressler, 1991; Engle, 2007; Pascarella et al., 2004) and often lack sufficient preparation in how to effectively cope with these challenges (Balemian & Feng, 2013; Choy, 2001; Collier & Morgan, 2008; Engle, 2007; Jean, 2010; Pascarella et al., 2004; Riehl, 1994; Soria & Stebleton, 2012).

Investigating the multitude of predictive factors in isolation is of little value, as research undoubtedly suggests explanatory frameworks predicting student achievement must take into account a myriad of factors (Bandura, 1986; 1997; 1999; Snow et al., 1996; Tinto, 2006). The Lazarus and Folkman Transactional Stress and Coping framework (1984; 1987; Lazarus, 1993a; 1993b) has demonstrated explanatory validity in stress-coping investigations of physical and mental illness and specific challenges unique to particular populations. To date, scarce research has utilized this model to explain stress-appraisals and coping in the academic context (e.g.,

Giacobbi et al., 2004). This review of the literature provides substantial evidence supporting the utility of the Lazarus and Folkman framework in recognizing the interrelated nature of personal factors (i.e., gender, ethnicity, prior achievement, first-generation status), cognitive appraisals (i.e., academic anxiety, attitude toward learning), motivation and self-regulated learning strategies (i.e., active study strategies, time management) and how these collectively contribute to observed variations in student achievement outcomes. Student characteristics interact with social situations, prompting students to develop appraisals of academic events or situations. In instances of perceived threat (i.e., academic anxiety), students often select maladaptive strategies (i.e., procrastination) in an attempt to cope with the stressor, leading to less favorable outcomes (Cassady & Boseck, 2008; Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987; Linnenbrink, 2006; Schutz & Lanehart, 2002; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005). One unique feature incorporated into the Lazarus and Folkman framework for this investigation is the integration of motivational regulation and self-regulated learning strategies as adaptive coping responses (McInerney, 2011; Pintrich & Zusho, 2002; Zimmerman, 2011). Consistent with the body of research, it is hypothesized these adaptive forms of coping serve as a protective buffer, mitigating the potential negative influence of stress-appraisals and instead contributing to improved academic achievement.

Fortunately, many postsecondary institutions possess the capability to examine their student populations at the student-level, collecting measures of prior achievement, student demographic information, and evidence of student tendencies in learning strategies and attitudes through formal assessment approaches. However, too often investigations have focused on select indicators of student performance or limited number of predictors without taking into consideration the impact of other variables (Astin & Lee, 2003; Hoffman Beyer & Gillmore,

2007; Keup, 2004; Peterson & Einarson, 2001; Tinto, 2006). The Transactional Stress and Coping framework (1984) provides a means to explore the multitude of factors identified in the research as important to college student achievement. Although this information is important to individual students, it also serves a vital function for institutions as a diagnostic or prescriptive tool in identifying student areas of strength or weakness and evaluating the efficacy of interventions developed to improve academic achievement (Ekman & Pelletier, 2008; Kameen & Justiz, 1988; Keup, 2004; Peterson & Einarson, 2001; Tinto, 2006). It is with that intention the proposed study builds upon the body of literature and incorporates the Transactional Stress and Coping model to explain the nature of relationships among student variables and first-year academic achievement outcomes.

CHAPTER III

METHODOLOGY

As suggested by the review of the relevant literature, there exists a strong need for further investigation of factors influential in first-year college achievement outcomes. The purpose of this study was to examine the predictive value of student background characteristics, prior achievement indicators, cognitive appraisals of academic stressors, and study and learning strategy variables in explaining first-year college student achievement. A proposed academic-oriented stress appraisal-coping framework guided the investigation of these relationships. The following sections provide detailed explanations in how the participants were selected, instrumentation, and what procedures were employed for data collection and analysis purposes.

Participants

The participants in the study consisted of full-time, first-time first-year undergraduate students from a Midwestern 4-year public university. The sample population specifically included students who enrolled at the institution during years 2004 through 2012. This particular institution enrolls on average 16,000 undergraduate students per year, with 23% of the student population comprised of first-time first-year students. Of this population, 99.5% attend full-time, 96% are considered traditional-aged students (ages 18-25) and 86% reside on-campus. Achievement outcome indicators for this institution reveal an average fall-to-fall persistence rate of 79% for first-time first-year students and a 5-year graduation rate of 56%, which are above national averages compared to similar institutions (ACT, 2014; NCES, 2014).

The resulting number of participants in this study was $N = 29,431$, with a mean age of 19.1. Of these first-time first-year participants, approximately 58% were female, 7% self-reported as an ethnic minority and an estimated 34% were identified as meeting the criteria for

first-generation students. For the purposes of this study, students were identified as first-generation if they were from a family in which neither parent or guardian earned a college degree. These participants scored on average a 523 on the Math and 519 on the Verbal portions of the SAT exam and earned an average high school GPA of 3.28. See Table 3.1 for demographic and achievement information.

Table 3.1

Participant Demographics and Means for Achievement Indicators Included in Study

Year	N=	% Female	% Ethnic Minority	% First Generation	H. S. GPA	SAT Math/Verb	First Year GPA
2004	3,108	58%	6%	38%	3.25	522/518	2.22
2005	3,090	57%	7%	38%	3.24	523/523	2.18
2006	3,378	56%	7%	36%	3.21	517/510	2.23
2007	3,335	58%	8%	36%	3.22	524/519	2.27
2008	3,487	58%	7%	33%	3.23	523/515	2.29
2009	3,483	58%	9%	32%	3.28	524/517	2.26
2010	3,244	60%	*	32%	3.33	533/527	2.22
2011	2,991	60%	*	31%	3.32	524/522	2.18
2012	3,315	60%	*	29%	3.36	523/519	2.81 ^a
Total/Avg	29,431	58%	7%	34%	3.28	523/519	2.30
<i>Note.</i> *Data not available for this particular year at the individual student level. ^a value deviated significantly in this particular year from other years. Investigation into potential underlying causes yielded no viable explanation.							

Procedures and Measures

Building the dataset for this study required the merging of multiple archival institutional data systems. The first data file contained student responses to the Learning and Study Strategies Inventory-High School version (LASSI-HS; Weinstein & Palmer, 1990) gathered during their

initial orientation to the university (occurring in the summer prior to courses beginning). These data were merged with institutional data sources managed by the university's Office of Institutional Effectiveness (OIE) with additional cooperation from the Office of Financial Aid to form the final data file utilized for all analyses. The OIE facilitates, collects, analyzes and interprets all data associated with the institution and student population. The data used for this study were routinely collected by the university during the course of the student's academic career. For merging of all data sources, the LASSI-HS data set collected during the freshman orientation event was submitted to the Assistant Provost for the OIE. The LASSI-HS data set included identifying information for each subject (name and student ID), which the OIE staff utilized to link to the remaining data in the university data management system. The specific data sources outlined below were acquired through multiple mediums, including students' demographic information, university and high school academic records, student Free Application for Federal Student Aid (FAFSA) applications, and responses to attitude or satisfaction measures completed while enrolled at the university.

College Achievement

In this study, the primary dependent variable in the investigated model was college achievement. To determine success in college achievement and performance, first-year college cumulative grade point averages (GPA) were used. First-year cumulative GPA, as reported by official university records, included the calculated grade point average for all courses taken within the first 12 months of student enrollment at the university. The university utilizes a GPA range of 0 to 4.0. First-year GPA also included those students who withdrew from the institution after the first semester enrolled. Approximately 11% of the study participants (all full-time at

Fall semester enrollment) completed 15 or fewer credit hours at the completion of the first full academic year, providing a rough estimation of the number of students who withdrew.

Pre-Existing Personal Factors

Background factors. Three personal background variables (i.e., gender, ethnicity, first-generation status) were incorporated in the analyses for this study. Gender has been found to be a significant predictor in explaining college achievement outcomes (Alon & Gelbgiser, 2011; DeBerard & Julka, 2000; DeBerard et al., 2004; Harackiewicz et al., 2002; Kitsantas et al., 2008) with females generally outperforming males in postsecondary education. Therefore, students' self-reported gender as identified in their official university record was included as a predictor variable in the proposed model. Research also provides substantial evidence indicating ethnicity is a significant predictor of college achievement outcomes, with lower retention and degree completion rates for students from ethnic minority groups (ACE, 2008; 2011; Borman & Overman, 2004; Gordon & Yowell, 1994; Harper, 2009; 2012; Harris & Herrington, 2006; Jones et al., 2010; Kamee & Justiz, 1988; Kuh et al., 2007; Toldson, 2012). Consequently, students' ethnic minority status as coded in their official university record was included as a predictor variable in the proposed model.

Furthermore, research indicates first-generation students struggle academically in their pursuit of a college degree (Balemian & Feng, 2013; Choy, 2001; DeAngelo et al., 2011; Engle, 2007; Ishitani, 2006; Pascarella et al., 2004; Riehl, 1994; Soria & Stebleton, 2012); therefore, first-generation status as identified in each student's FAFSA application was included as a predictor variable in the proposed model. Research demonstrates the influence these background variables have on college academic achievement outcomes, warranting investigation in this study. Although family income is also associated with academic achievement, the majority of

students who satisfy the first-generation criterion tend to also come from low-income families, resulting in significant overlap (Bui, 2002; Horn et al., 2000; Lohfink & Paulsen, 2005; Scherer & Anson, 2014; Terenzini et al., 1996). As such, the primary analyses were conducted without explicit inclusion of the separate variable of family income.

Prior achievement indicators. High-school grade point average (H. S. GPA) and college entrance exam scores consistently serve as two of the best predictors of first-year college achievement (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Robbins et al., 2004; Zypher et al., 2007). For the purposes of this study, a latent factor identified as *prior achievement* comprised of student H. S. GPA and college entrance exam scores (i.e., SAT Math, SAT Verbal) was proposed for the model. High-school GPA was reported on a scale ranging from 0 to 4.0, although some participants graduated from high schools which allowed for GPA calculations greater than 4.0. Of the participants in this study, 0.8 percent earned a H. S. GPA exceeding 4.0, with the maximum value reaching 4.88. All original H. S. GPA values were retained in their original form for the purposes of this study given they were the actual data entered into the data file by the OIE. Of the participants in this study, 87.5% completed the SAT college entrance exam.

LASSI-HS

Students in the sample responded to Likert-type survey questions on the LASSI-HS (Weinstein & Palmer, 1990) during an orientation session prior to beginning their first academic semester. The LASSI-HS is a 76-item self-report assessment tool that targets student academic behaviors and perceptions associated with learning and study strategies. The instrument measures students' academic-oriented cognitive (i.e., concentration), conative (i.e., motivation), affective (i.e., academic-related anxiety) and behavioral (i.e., self-testing) factors believed to

contribute to academic performance. Students are asked to respond to each item using a 5-point Likert-type scale with the extremes marked by "not at all like me" or "very much like me." The full list of the LASSI-HS items is provided in Appendix A.

LASSI instruments (Weinstein & Palmer, 1990; 2002; Weinstein et al., 1987) are widely used in institutional assessment to broadly capture the characteristics of students new to postsecondary institutions, evaluate students for more individualized intervention, and measure the impact of interventions employed with students. Utilized with incoming college students, the LASSI-HS functions as a barometer, measuring the thoughts and skills of students who are transitioning into postsecondary education. The obtained scores are then used for diagnostic and prescriptive purposes (Weinstein & Palmer, 1990).

According to Weinstein and Palmer (1990), the LASSI-HS items form 10-subscales that yield reliability coefficients ranging from .68 to .82 (see Table 3.2). The norms for the LASSI-HS were developed from a diverse sample of 2,616 high school students.

Table 3.2

LASSI-HS Subscales, Sample Items, Items Included in Subscales and Estimates of Reliability (Weinstein & Palmer, 1990)

LASSI-HS Subscale	Sample Item and Items included in the Subscales	α
Anxiety	<i>I worry that I will fail my classes.</i> Items: 1, 9, 25, 31, 35, 53, 56, 62	.82
Attitude to Learning	<i>I would rather not be in school.</i> Items: 5, 14, 18, 29, 37, 44, 50, 68	.74
Concentration	<i>I pay attention fully when studying.</i> Items: 6, 11, 38, 42, 45, 54, 60, 67	.82
Information Processing	<i>I change the material I am studying into my own words.</i> Items: 12, 15, 23, 32, 39, 46, 66, 75	.80
Motivation	<i>I am up-to-date in my class assignments.</i> Items: 10, 13, 16, 28, 33, 40, 48, 55	.78
Selecting Main Ideas	<i>I try to identify the main ideas when I listen to my teacher teaching.</i> Items: 2, 8, 59, 71, 76	.71
Self-Testing	<i>I look over my notes before the next class.</i> Items: 4, 17, 21, 26, 30, 36, 64, 69	.74
Study Aids	<i>When they are available I go to study or review sessions.</i> Items: 7, 19, 24, 43, 49, 52, 61, 72	.68
Testing Strategies	<i>I have trouble understanding just what a test question is asking.</i> (reverse coded) Items: 20, 27, 34, 51, 58, 63, 70, 74	.81
Time Management	<i>I make good use of study hours after school.</i> Items: 3, 22, 41, 47, 57, 65, 73	.77

Weinstein and Palmer (1990; 2002) asserted these subscales merged into three broad domains that represent student abilities: *skill*, *will*, and *self-regulation*. The authors determined these domains based upon theoretical assumptions rather than empirical evidence. Subsequent empirical research has investigated and challenged the originally-proposed structure of the 10-subscales and broad domains, resulting in alternative factor structures that offer better statistical representations of the domains and subscales. A number of studies have investigated the three-

latent factor structure of the LASSI using the 10-subscales as indicators (Cano, 2006; Prevatt, Petscher, Proctor, Hurst, & Adams, 2006; Stevens & Tallent-Runnels, 2004; Yip, 2012), finding alternative models fit the data better than the original Weinstein and Palmer skill, will, and self-regulation domains. Although these results challenged the validity of the LASSI three-latent factor structure, all of these attempts to explore the factor structure of the LASSI presumed the original 10-subscales in the instrument were empirically sound. As such, those analyses were conducted merely with subscale values, rather than exploring the underlying construct formation for the separate subscales. Although the LASSI is a widely-used assessment, the authors of this instrument have provided little empirical evidence demonstrating the validity of the 10-subscales (Weinstein & Palmer, 1990; 2002; Weinstein et al., 1987). Subsequent research examining the validity of the instrument has yielded mixed results.

In a study investigating students enrolled in college developmental courses, Nist, Mealey, Simpson, and Kroc (1990) found the LASSI to be a good predictor of academic achievement in the general population of college students but lacked predictive value in students who participated in a developmental-studies program prior to admission. Similarly, a study conducted by Deming, Valeri-Gold, and Idleman (1994) found the LASSI to be limited in its predictive validity of achievement for developmental-level college students. However, more recently Lawson (2009) found in his investigation of first-semester, at-risk college students the LASSI was a significant predictor of first-semester and first-year college GPA.

Research has also revealed mixed results in the predictive validity of the specific LASSI subscales over others. Cano (2006) investigated the LASSI factor structure and its predictive value to college achievement with a sample of 527 college freshmen and 429 college seniors. Results revealed an alternative three-factor solution of the 10-subscales (affective strategies, goal

strategies, comprehension monitoring strategies) provided a better fit to the data than Weinstein and Palmer's (1990) skill, will and self-regulation solution. He found that affective strategies (i.e., subscales Time Management, Motivation, Concentration, Attitude, Self-Testing) and goal strategies (i.e., subscales Concentration, Attitude, Anxiety, Test Strategies, Selecting Main Ideas) were statistically significant predictors of both freshman and senior college GPA.

Comprehension monitoring, comprised of subscales Information Processing, Self-Testing, Study Aids and Selecting Main Ideas, was not a significant predictor. Other research examining the college student population has found predictive validity in favor of the following subscales: Anxiety and Test Strategies (Flowers et al., 2011); Time Management and Self-Testing (West & Sadoski, 2009); and Motivation (Marrs et al., 2009). A recent meta-analysis by Crede and Kuncel (2008) investigating learning and study strategy inventories across multiple samples of college student populations concluded that the LASSI consistently demonstrated high concurrent, construct and predictive validity. Their analyses supported the utility of the LASSI in identifying study habits, skills, attitudes and specific factors predictive of college student academic performance outcomes compared to other available assessment tools, particularly in predicting first-year GPA.

More recent research has examined the latent factor structure of the ten LASSI-HS subscales using the individual items as indicators (Finch, Cassady, & Jones, *in press*), finding empirical support in favor of alternative item-sets representing 10-subscales that vary from those of Weinstein and Palmer (1990). Finch et al. (*in press*) examined the factor structure of the LASSI-HS at the item-level drawing from a sample of 18,102 first-time college students from data obtained over a broad time frame (years 1996 through 2012). Using both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), they offered a 10-factor solution that

deviated from the originally-proposed Weinstein and Palmer (1990) solution that provided a better fit to the data. Revised subscales and reliability estimates resulting from the Finch et al. (*in press*) factor solution are provided in Table 3.3. The 10-factor structure proposed by Finch et al. was utilized in this study. Examination of the model proposed for this study included all ten factors, but several of those were proposed to compose latent factors central to this investigation.

Table 3.3

LASSI-HS Revised Subscales, Sample Items, Items Included in Subscales, and Estimates of Reliability (Finch et al., in press)

Revised Subscale	Sample Item and Items included in the Subscales	α
Anxiety	<i>I worry that I will fail my classes.</i> Items: 1, 9, 20, 25, 31, 35, 53, 56, 62	.85
Negative Attitude to Learning	<i>I would rather not be in school.</i> Items: 18, 37, 50, 68	.71
Concentration	<i>I find it hard to pay attention during class. (reverse coded)</i> Items: 6, 38, 42, 45, 54, 67	.87
Elaborative Rehearsal	<i>I change the material I am studying into my own words.</i> Items: 12, 15, 23, 32, 39, 46, 66, 75	.82
Motivation	<i>I am up-to-date in my class assignments.</i> Items: 5, 10, 11, 13, 16, 28, 33, 40, 44, 73	.83
Comprehension Monitoring	<i>When I take a test I realize that I studied the wrong material.</i> Items: 2, 27, 34, 51, 58, 59, 70, 71, 74, 76	.88
Self-Testing	<i>When studying for an exam, I think of questions that might be on the test.;</i> Items: 17, 21	.85
Active Study Strategies	<i>When they are available I go to study or review sessions.</i> Items: 4, 7, 19, 24, 26, 30, 36, 55, 57, 61, 64, 69, 72	.81
Visualizations	<i>I make drawings or sketches to help me understand what I am studying.;</i> Items: 49, 52	.73
Time Management	<i>I make good use of study hours after school.</i> Items: 3, 22, 41, 47, 65	.79

Negative cognitive appraisal. The proposed *negative cognitive appraisal* (NCA) latent variable for the model was constructed using the Anxiety (9 items; $\alpha = .85$) and Negative Attitude to Learning (4 items; $\alpha = .71$) subscale item indicators identified in the Finch et al. (*in press*) factor solution. This latent variable was proposed to represent negative affective states that influence students' cognitive appraisals toward educational settings (e.g., academic work, distaste for learning). Students who experience anxious or negative thoughts in response to academic demands or specific academic requirements (i.e., test-taking), often become overwhelmed, experience greater levels of stress and appraise situations as threatening (Spielberger & Vagg, 1995). Consistent with the Transactional Stress and Coping model (Lazarus & Folkman, 1984; 1987), these beliefs create a perceptual lens through which situations, events and demands are appraised as stressful or threatening. These negative cognitive appraisals of academic-related events or situations can create cognitive interference (Zeidner & Matthews, 2005), prompt modifications in students' goals, and influence coping reactions, contributing to selection of maladaptive coping responses (Lazarus & Folkman, 1984; 1987). Therefore, of those students who experience negative cognitive appraisals, academic performance suffers because these students often do not engage in academic strategies conducive to coping with academic demands and achieving learning goals (Balkis, 2013; Cassady & Boseck, 2008; Lazarus & Folkman, 1984; 1987; Spielberger & Vagg, 1995; Stewart et al., 1997; Zeidner & Matthews, 2005).

Self-regulated learning (SRL). The ability to self-direct academic learning plays a crucial role in academic performance outcomes (Bembenutty, 2008; Bussey, 2011; Kitsantas et al., 2008; Robbins et al., 2004; Zimmerman & Schunk, 2008). Self-regulated learning necessitates cognitive abilities, academic-oriented volitional strategies and motivational

regulation toward meeting academic demands in order for students to attain more successful outcomes (Bussey, 2011; Zimmerman, 1989; Zimmerman & Schunk, 2008). Research consistently suggests that the ability to self-regulate is what explains differences observed in achievement outcomes, with poor self-regulators demonstrating lower performance than their self-regulating peers (Hofer et al., 1998; Kitsantas et al., 2008; Robbins et al., 2004; Zimmerman & Schunk, 2008). Utilizing the revised LASSI-HS subscales presented by Finch et al. (*in press*), two latent variables representing self-regulated learning were tested in the model: 1) *motivational regulation*; and 2) *self-regulated learning (SRL) strategies*.

Motivational regulation. *Motivational regulation* was a latent variable comprised of the 10-item indicators for the Motivation subscale ($\alpha = .83$) for the LASSI-HS (Finch et al., *in press*). Motivation has been identified as a key factor in SRL (Bussey, 2011) and is believed to be the agent behind SRL that promotes goal-directed academic activity (Schunk et al., 2008). Motivation also is associated with effective study strategy use (Prat-Sala & Redford, 2010; Vansteenkiste et al., 2004; Wolters, 1998) and consistently has been found to predict academic achievement (Allen et al., 2008; Crede & Kuncel, 2008; D’Lima et al., 2014; Lei, 2010; Robbins et al., 2004; Yip, 2007; 2009). Considered to be a critical component of SRL that significantly impacts achievement, *motivational regulation* was included in the proposed model acting as a moderator that influences the effect of negative cognitive appraisals (NCA) on achievement outcomes. Although student NCA may threaten achievement, those students reporting higher levels of motivational regulation may still achieve more successful outcomes than those who are less motivated.

Self-regulated learning (SRL) strategies. Cognitive abilities involving information processing, comprehension, and problem solving impact overall intellectual functioning (Alarcon

& Edwards, 2012; Currie et al., 2012; Matlin, 2009). Students who mentally organize information into a meaningful structure, apply the information, make it meaningful to them, self-question and monitor their understanding are utilizing important cognitive and metacognitive self-regulated learning strategies (Zimmerman, 2000; 2004); as a result, they demonstrate better achievement outcomes (Alarcon & Edwards, 2012; Finn et al., 2014; Weinstein & Mayer, 1986). Active-study strategies (i.e., volitional strategies) employed by self-regulated learners also directly contribute to higher academic achievement (Karpicke et al., 2009; Schmitt et al., 2007; Zimmerman, 2000; 2004). Taking notes in class, elaborative rehearsal (i.e., deeper processing), effective time management, preparation for formal assessment and utilizing available social resources effectively exemplify high self-regulated learning and are associated with better performance outcomes (Bembenutty, 2008; George et al., 2008; Kitsantas et al., 2008; Robbins et al., 2004). Self-regulated learning strategies also serve an adaptive function as they represent learning approaches utilized in response to challenges students may experience in academia (McInerney, 2011).

Considered to be a significant contributor to achievement outcomes, *self-regulated learning (SRL) strategies* was included in the proposed model acting as a moderator that influences the effect of negative cognitive appraisals (NCA). Although student NCA may directly threaten achievement, those who still employ positive self-regulated learning strategies may ultimately achieve more successful outcomes compared to those who do not. *Self-regulated learning (SRL) strategies* was proposed to be a latent variable comprised of the following LASSI-HS subscales (Finch et al., *in press*): Elaborative Rehearsal ($\alpha = .83$), Comprehension Monitoring ($\alpha = .88$), Active Study Strategies ($\alpha = .82$), Visualizations ($\alpha = .71$), Self-Testing

($\alpha = .86$), Concentration ($\alpha = .87$), and Time Management ($\alpha = .79$), which all identify positively with SRL.

Plan of Analysis

The purpose of this study was to examine the predictive value of student background characteristics, prior achievement, appraisals and study and learning strategy variables in explaining first-year college student achievement guided by an academic-oriented stress appraisal-coping framework. Using the Mplus statistical software package version 7.11 (Muthén & Muthén, 2013), confirmatory factor analyses (CFA) were first employed to evaluate fit of the proposed latent variable measurement models included in the hypothesized academic-oriented stress appraisal-coping model. Structural equation modeling (SEM) analyses were then utilized to explore the nature of the relationships among the variables and test the utility of the proposed model in predicting the outcome variable (see Figure 3.1 for depiction of the proposed conceptual model). Using these approaches, this study investigated the following research questions and hypotheses:

RQ1: Do gender, ethnicity and first-generation status (i.e., personal background factors) predict first-year college student achievement?

H1: Gender will predict first-year college student achievement, with females outperforming males in first-year cumulative GPA.

H2: Ethnicity will not uniquely add to the explanation of first-year cumulative GPA due to the high correlation with first-generation status.

H3: First-generation status will predict first-year college student achievement, with first-generation students demonstrating lower first-year cumulative GPA compared to non-first-generation students.

RQ2: After controlling for student background factors, does prior achievement predict first-year college student achievement?

H4: After controlling for student background factors, prior achievement will be a strong positive predictor of first-year cumulative GPA.

RQ3: After controlling for student background factors and prior achievement, does negative cognitive appraisal (NCA) predict first-year college student achievement?

H5: After controlling for student background factors and prior achievement, NCA will predict first-year cumulative GPA, with increases in NCA predicting lower first-year achievement.

RQ4: Do self-regulated learning (SRL) strategies moderate the relationship between negative cognitive appraisal (NCA) and first-year college student achievement?

H6: Self-regulated learning (SRL) strategies will moderate the effect of NCA and first-year college student achievement, buffering the negative influence of NCA on first-year cumulative GPA.

RQ5: Does motivational regulation moderate the relationship between negative cognitive appraisal (NCA) and first-year college student achievement?

H7: Motivational regulation will moderate the effect of NCA and first-year college student achievement, buffering the negative influence of NCA on first-year cumulative GPA.

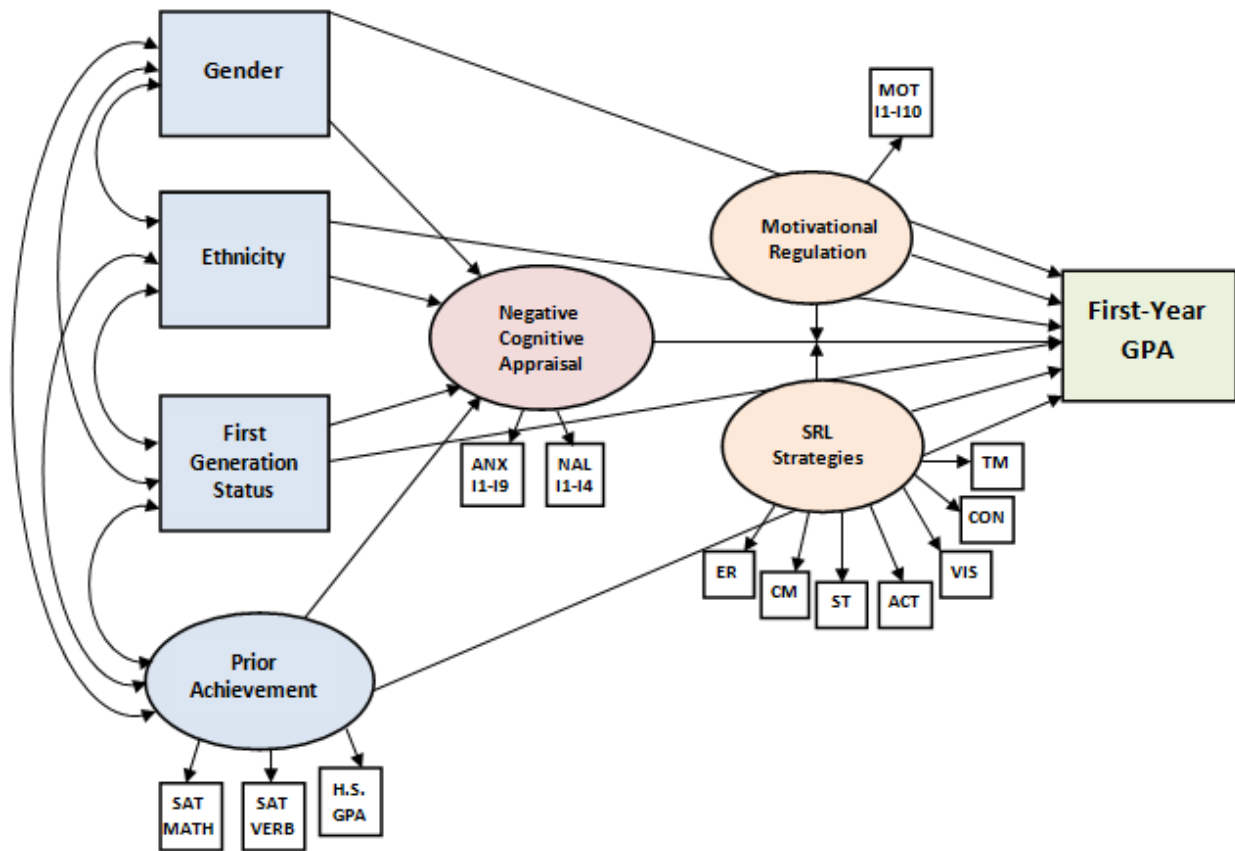


Figure 3.1. The proposed conceptual model depicting the research questions.

CHAPTER IV

RESULTS

The purpose of this study was to examine the predictive value of student background characteristics, prior achievement and study and learning strategy variables in explaining first-year college student achievement. Using an established model of stress-appraisal and coping within an academic context, the final hypothesized model tested direct, indirect and moderated influences across nine years. Preliminary analyses were conducted to obtain descriptive statistics, correlations among the variables and estimates of reliability on the LASSI-HS subscales. A series of confirmatory factor analyses (CFA) were utilized to assess the fit of the latent variables included in the measurement model for this study (i.e., prior achievement, negative cognitive appraisal, motivational regulation, self-regulated learning strategies). Where appropriate, exploratory factor analyses (EFA) were employed to investigate the nature of the proposed latent factor structures if the CFA results yielded poor measurement model fit. Lastly, structural equation modeling (SEM) was utilized to investigate the relationships among the study variables and their relative influences on first-year college achievement in an attempt to assess the viability of the hypothesized model and answer the research questions.

Preliminary Analyses

Missing Data Analysis

An initial review of the full data file was necessarily focused on examining the data to determine the nature of any missing data. Review of missing values within the variables suggested the data to be missing at random (MAR; Graham, 2009; Schlomer, Bauman, & Card, 2010). Percentages of missing data for the majority of variables included in this study were within a reasonable range, from no missing data for gender identification (0% missing) to 12.5%

for SAT scores (which was anticipated due to the use of ACT as an alternative entrance examination). Ethnicity was the only variable with an elevated level of missing data, with 35% of the sample missing this information. Exploration of this variable revealed that the high rate of missing data was due to the absence of ethnicity data for all students entering the university in years 2010 through 2012. As the university diversity rates did not adjust significantly during the time frame for this study, those missing data were considered missing completely at random relative to the effect on the analyses in this study. I am confident the data did not satisfy the expectations for missing not at random (MNAR) as there was no identifiable pattern where missingness was related to the variable itself (e.g., ethnicity data was missing by year and not believed to be influenced by a participant's particular race; Graham, 2009; Schlomer et al., 2010).

Upon this determination that data were MAR, the remaining analyses were conducted employing the full-information maximum likelihood for structural equation modeling (FIML SEM) method. This specific solution estimates parameters and implied values for missing data based upon the available complete data and is the preferred method in handling missing data in research investigations that utilize structural equation modeling (SEM) analyses (Graham, 2009; Schlomer et al., 2010). Given the large sample size ($N = 29,431$) in this research study with a large number of complete cases to draw from ($n = 12,108$), this solution provided the best performance compared to other missing value methods (Graham, 2009; Schlomer et al., 2010).

Descriptive Statistics for Variables in Study

Descriptive statistics for all variables of interest to this study are provided in Table 4.1 along with correlations among the variables and the reliability coefficients calculated for each LASSI-HS subscale. Results of the correlation analyses revealed nearly all relationships reached

statistical significance. This was not surprising due to the large sample size in this study; even very weak relationships observed among variables are likely to be statistically significant within studies including large sample sizes (Cohen, 1988). Therefore, although significance testing is an essential component of interpretation, examination of the strength of observed relationships (i.e., effect size) and the practical utility of the relationships proves more useful in evaluating their relative importance (Wilkinson & APA Task Force on Statistical Inference, 1999). For this purpose, guidelines provided by Cohen (1988) were utilized to determine if the relationships among the variables were considered *weak* ($r < .30$), *moderate* ($r < .50$), or *strong* ($r \geq .50$).

Background factors. Of the participants in the study, 58% were female, 7% self-reported membership to an ethnic minority group, and approximately 34% were first-generation students (see Table 3.1 for review of participant demographics). As reported in Table 4.1, of these background factors, gender and first-generation status had the strongest relationships with first-year college GPA, although these significant relationships were considered weak. Gender was positively correlated with first-year college GPA ($r = .07, p < .001$). Females earned on average higher first-year GPAs ($M = 2.35, SD = .83$) compared to males ($M = 2.22, SD = .85$) although the observed difference was weak, $F(1,29318) = 151.65, p < .001, \eta^2 = .01$. Non-first-generation student status was also associated with higher first-year GPA ($r = -.07, p < .001$; $M=2.34, SD= .82$), while first-generation student status corresponded with lower first-year GPA ($M=2.21, SD= .87$). Although the difference between the two groups on first-year GPA was statistically significant, the effect was quite small, $F(1,26610) = 141.22, p < .001, \eta^2 = .01$. Although analyses indicated a statistically significant correlation existed between ethnicity and

Table 4.1

Descriptive Statistics, Correlations, and Reliability Estimates Among Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 First -Year College GPA	1																
2 Gender	.07	1															
3 Ethnicity	-.04	.00	1														
4 First-Generation Status	-.07	.02	.03	1													
5 H.S. GPA	.20	.19	-.08	-.05	1												
6 SAT Math	.04	-.21	-.10	-.10	.41	1											
7 SAT Verbal	.02	-.04	-.09	-.12	.35	.53	1										
8 Anxiety	.03	.19	.00	.02	-.18	-.35	-.35	1									
9 Negative Attitude to Learning	-.03	-.18	-.03	-.02	-.14	-.01	-.08	.22	1								
10 Motivation	.15	.23	.01	.01	.38	.06	.05	-.24	-.54	1							
11 Concentration	.06	.04	.03	.02	.23	.06	.09	-.40	-.50	.59	1						
12 Comprehension Monitoring	-.01	-.07	-.01	-.02	.19	.22	.35	-.66	-.37	.41	.57	1					
13 Active Study Strategies	.08	.25	.04	-.01	.17	-.08	-.01	-.04	-.42	.53	.48	.30	1				
14 Elaborative Rehearsal	.01	-.01	.01	-.03	.07	.10	.19	-.18	-.28	.25	.25	.33	.50	1			
15 Visualizations	.04	.17	-.01	-.02	.08	.03	.01	.02	-.13	.11	.13	.06	.37	.33	1		
16 Self-Testing	.04	.06	.00	.02	.11	.03	.03	-.10	-.22	.34	.25	.26	.49	.41	.19	1	
17 Time Management	.09	.14	.03	.01	.19	-.06	-.07	-.19	-.40	.56	.66	.36	.58	.23	.21	.26	1
Mean	2.30				3.28	523.2	518.5	2.52	2.01	4.08	3.28	3.64	3.23	3.40	2.61	3.65	2.93
Standard Deviation	.84				.44	76.1	75.6	.75	.69	.58	.80	.69	.59	.67	1.08	.97	.80
Skew	-.58				-.02	.32	.45	.34	.93	-.97	-.33	-.50	-.03	-.07	.35	-.47	.00
Kurtosis	.29				-.69	-.01	.17	-.28	1.09	1.81	-.27	.12	-.01	-.18	-.62	-.32	-.42
Reliability Est. (Cronbach's α)								.85	.71	.83	.87	.88	.82	.83	.71	.86	.79

Note. Background variables were dummy-coded for analysis purposes. For Gender, females = 1 and males = 0; for Ethnicity, ethnic minority = 1 and ethnic majority = 0; for First-Generation Status, first-generation student = 1 and non-first-generation student = 0. First-Year College and High School GPA are reported on a 0.00-4.00 scale. SAT scores ranged from 200-800. All LASSI-HS subscale means ranged from 1.00-5.00. Given the power of the study, *p* value estimates have been removed.

first-year college GPA, the relationship was negligible ($r = -.04$, $p < .001$). Results indicated that ethnic minority membership was associated with lower first-year college GPA ($M = 2.12$, $SD = .81$) compared to ethnic majority membership ($M = 2.25$, $SD = .82$), $F(1,19138) = 31.41$, $p < .001$, $\eta^2 = .00$.

Prior achievement. Regarding measures of prior achievement, results revealed that students entered the institution with an average SAT Math score of 523 ($SD = 76.1$), SAT Verbal score of 519 ($SD = 75.6$), and average H. S. GPA of 3.28 ($SD = .44$). As expected and supported by the literature (Crede & Kuncel, 2008; Kobrin & Patterson, 2011; Robbins et al., 2004), both SAT Math ($r = .41$, $p < .001$) and SAT Verbal ($r = .35$, $p < .001$) scores shared moderate positive correlations with H. S. GPA. Results of the correlation analyses indicated there was a positive, but weak, correlation between H. S. GPA and first-year college GPA ($r = .20$, $p < .001$). It was anticipated that the strength of the correlation would have been greater; however, analyses also revealed negligible correlations among SAT Verbal and SAT Math scores and first-year college GPA (see Table 4.1)

LASSI-HS subscales. The ten subscales identified from the LASSI-HS in recent research (Finch et al., *in press*) were examined for internal consistency, group trends, relationships among each other, and with first-year college GPA. All ten subscales met basic conventions for internal consistency, with only Negative Attitudes to Learning (NAL, $\alpha = .71$) and Visualizations ($\alpha = .71$) falling below an internal consistency value of .79 (see Table 4.1). Correlations among the ten subscales ranged from weak to moderate, confirming the basic expectations of the function of the scale. To illustrate overall student population trends in the LASSI-HS variables, simple descriptive review of the subscale averages (set to common scale) illustrates that students fell in a primarily average range for each subscale, with lower values for Anxiety and Negative

Attitudes to Learning and higher values for Motivation characterizing the current sample (see Figure 4.1). Finally, review of the relationships among the LASSI-HS subscales and first-year college GPA revealed weak to negligible relationships (see Table 4.1).

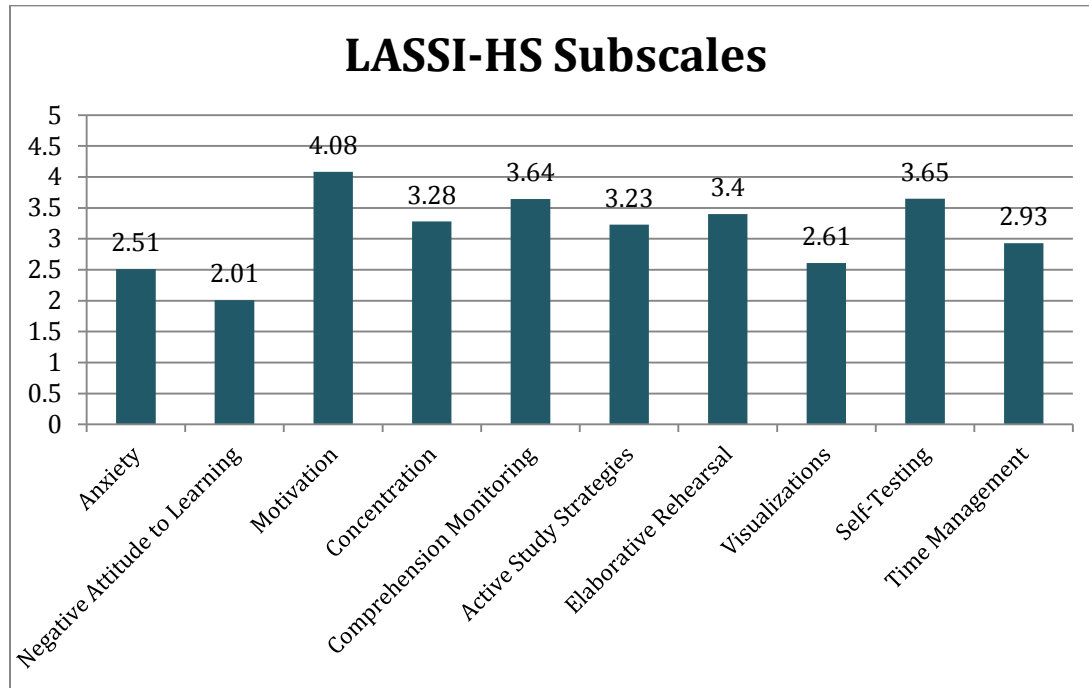


Figure 4.1. Illustration of LASSI-HS subscale means.

Lastly, relationships among the LASSI-HS subscales were investigated to identify any potential multicollinearity issues. Although some strong, significant relationships existed among certain subscales (e.g., Concentration with Time Management, $r = .66$, $p < .001$; Concentration with Motivation, $r = .59$, $p < .001$; Time Management with Active Study Strategies, $r = .58$, $p < .001$) no correlations exceeded .70, minimizing concern over potential multicollinearity among variables included in this study.

Assessing Measurement Model Fit

Overview of the analyses. Prior to testing the hypothesized structural equation model, confirmatory factor analyses (CFA) were conducted using the Mplus statistical software

package version 7.11 (Muthén & Muthén, 2013) and with the full information maximum likelihood (FIML) estimation method to investigate whether the data fit the factor structures of the four theoretically-proposed latent variables in this study. Guidelines provided by Kline (2011) were utilized to determine model fit. A model was considered to have *adequate* model-to-data fit if it met the following criterion: Root Mean Square Error of Approximation (RMSEA) $\leq .08$, Comparative Fit Index (CFI) $\geq .90$, Tucker Lewis Index (TLI) $\geq .90$, and Standardized Root Mean Square Residual (SRMR) $\leq .08$. Root Mean Square Error of Approximation (RMSEA) $\leq .05$, Comparative Fit Index (CFI) $\geq .95$, Tucker Lewis Index (TLI) $\geq .95$, and Standardized Root Mean Square Residual (SRMR) $\leq .08$ were the criterion used to determine if the model had *good* model fit. Due to the large sample size in this study, the chi-square goodness-of-fit test was not considered in determining model fit. The chi-square test is highly sensitive to sample size ($N \geq 5,000$), leading to test failure or model rejection when large samples are used (Jöreskog & Sörbom, 1996; Kline, 2011). Although model-fit guidelines provide definitive values to assess model-to-data fit, a certain degree of researcher judgment is necessary when considering all available fit statistics. According to Kline (2011), there is no statistical “gold standard” in model-fit analysis that automatically leads to an objective decision regarding model fit. Therefore those values outlined above were considered rules of thumb in guiding assessment of model fit.

For measurement models that did not meet adequate or good model-fit criteria, additional analyses were required to determine if the primary model could be employed for testing the study hypotheses. Specifically, an iterative process of exploratory factor analyses (EFA) followed by CFA was employed to identify if another factor solution provided a better statistical representation of the proposed constructs in the hypothesized structural equation model in this

study. To accomplish this, three samples were drawn from the dataset to first investigate then cross-validate the factor structure of the proposed constructs. The data file was initially split in two, with one group of cases utilized for the EFA and the other utilized for follow-up CFA analyses. Two randomly-assigned, equal-sized samples from one group of cases were utilized to conduct parallel EFAs to identify those indicators that best represented the construct of interest and ensure stability of the EFA results (Horn, 1965). Assuming both EFAs yielded similar results, a CFA was employed with the other group of cases using the EFA-supported solution as a necessary follow-up to cross-validate the fit of the newly-identified model structure (Brown, 2006; Byrne, 2012). Once confirmed by the CFA, the new factor structure was substituted into the hypothesized model.

Prior achievement. Confirmatory factor analysis was utilized to determine whether the data fit the latent variable *Prior Achievement* comprised of student H. S. GPA, SAT Math, and SAT Verbal scores (see Figure 4.2). Standardized values (z-scores) for each indicator were calculated and used in the CFA. Results of the CFA indicated the tested measurement model was a saturated model: $\chi^2(0) = 0.00$, $\chi^2/df = 0.00$, $p < .001$; RMSEA = .00; CFI = 1.00; TLI=1.00; SRMR=.00; AIC=207063.75; BIC=207138.35. Model saturation occurs when there are as many estimated parameters as there are data points (UCLA, 2014). In such a case, indices assessing goodness-of-fit are not applicable since the model is considered to have perfect fit (UCLA, 2014). Although there is no solution to address this issue, saturated models have been found to not pose a problem for later assessment of the structural equation model fit (Muthén & Muthén, 2013; UCLA, 2014); therefore, *Prior Achievement* was retained for use in the proposed model.

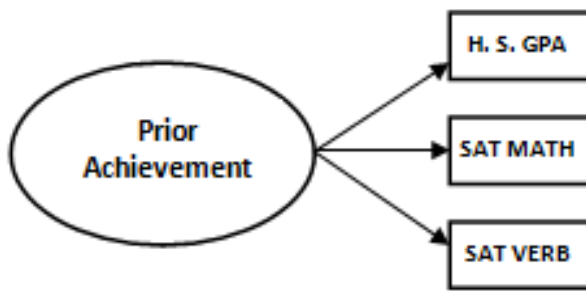


Figure 4.2. Confirmatory factor analysis for Prior Achievement latent variable.

Negative cognitive appraisal (NCA). Confirmatory factor analysis was employed initially to assess whether the data fit the proposed measurement model for *Negative Cognitive Appraisal* (NCA) comprised of the Anxiety (ANX; 9 items) and Negative Attitude to Learning (NAL; 4 items) LASSI-HS subscale item indicators (Finch et al., *in press*). The model did not fit well: $\chi^2(65) = 25151.78$, $\chi^2/df = 386.95$, $p < .001$; RMSEA = .12; CFI = .79; TLI = .75; SRMR = .09; AIC = 1023036.30; BIC = 1023359.59.

Due to poor model fit for NCA, exploratory factor analyses (EFA) were utilized on two samples of the dataset as follow-up measures investigating the nature of the NCA factor structure. The EFA employed the nine Anxiety and four Negative Attitude to Learning items proposed in the CFA, using an oblique geomin rotation (Browne, 1972; 2001; Yates, 1987). Geomin rotation is the default method in Mplus (Muthén & Muthén, 2013) and is considered superior to other methods when the potential for cross-loadings (adding to factor complexity) may exist (Browne, 1972; 2001; Yates, 1987). Results of the two EFAs were nearly identical across all fit statistics and factor loadings, supporting stability of the results (Horn, 1965). As such, the results from one EFA are provided in Table 4.2. According to the EFA, a two-factor solution for the 13 items provided a better fit to the data than the proposed single-factor NCA solution: $\chi^2(53) = 491.33$, $\chi^2/df = 9.27$, $p < .001$; RMSEA = .04; CFI = .98; TLI = .97;

SRMR=.02; AIC=167784.45; BIC=168115.26. Using guidelines provided by Tabachnick and Fidell (2013), a factor loading greater than or equal to .30 was determined to be associated with the particular factor and was used to interpret the identified factor solution. The results indicated the individual items from the Anxiety and Negative Attitude to Learning subscales clearly loaded on two distinct factors (see Table 4.2).

Table 4.2.

Geomin Rotated Factor Loadings from EFA Investigating NCA Factor Structure

Item	Factor 1	Factor 2
NAL I1	.636	-.040
NAL I2	.497	.048
NAL I3	.647	.079
NAL I4	.709	-.004
ANX I1	.078	.398
ANX I2	-.054	.379
ANX I3	.219	.484
ANX I4	-.091	.510
ANX I5	-.003	.746
ANX I6	.095	.577
ANX I7	.001	.803
ANX I8	-.158	.817
ANX I9	.043	.776

Note. Reported values represent Geomin rotated factor loadings. Only those loadings $\geq .30$ were determined to load on the factor and are identified here in bold.

The nature of the factor structure for NCA is not surprising given Finch et al. (*in press*) identified Anxiety and Negative Attitude to Learning as measuring two separate constructs by the LASSI-HS. However, there existed good theoretical rationale based upon the review of the literature for proposing one latent factor (NCA) as an adequate representation of the data within the hypothesized structural equation model. As discussed in the review of the literature, these

two constructs are associated with negative affective states that are believed to function similarly in their influence on student threat appraisals (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987), prompting maladaptive forms of coping and impeding student success outcomes (Cassady & Boseck, 2008; Chang et al., 2011; Chemers et al., 2001; Crede & Kuncel, 2008; Gerardi, 2006; Kitsantas, 2002; Kitsantas et al., 2008; Linnenbrink, 2006; Lucio et al., 2012; Schutz & Lanehart, 2002; Weinstein & Palmer, 1990; Zimmerman & Schunk, 2008). Therefore, it was presumed they may represent similar cognitive states wherein students perceive their learning tasks and educational environments through an unfavorable and threatening lens (Cassady & Boseck, 2008; Linnenbrink, 2006; Schutz & Lanehart, 2002; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005). Results from the initial CFA and follow-up EFA indicated this was not the case, finding the subscales represented quite different constructs in this sample population.

Upon investigation of the individual items associated with each subscale, the original plan of analysis to include both subscales was abandoned. The items for each subscale diverged greatly. For example, an item utilized for the Anxiety subscale identifies a cognitive appraisal (i.e., “I worry that I will fail my classes”). Items measuring Negative Attitudes toward Learning reflect general attitudes or preferences (i.e., “I would rather not be in school”), which are quite different. It was determined that the measurement model for NCA would require revision and only include the nine Anxiety subscale item indicators. For the purposes of this study, the role academic-related anxieties play as mechanisms affecting student cognitive appraisals and their relative influence on student achievement were of greater interest to the researcher. Additionally, the Lazarus and Folkman theoretical framework (1984) along with other similar models provide research supporting the substantial influence of academic-related anxieties on student cognitive

appraisals, coping responses and achievement outcomes (Cassady & Boseck, 2008; Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987; Spielberger & Vagg, 1995; Zeidner & Matthews, 2005) whereas research on the influence of negative attitudes toward the learning environment provides a less clear picture. Consequently, the latent variable NCA was renamed to *Anxious Appraisal* to more accurately reflect the nature of the new measurement model.

A follow-up CFA was conducted for cross-validation purposes (Brown, 2006; Byrne, 2012) on a subset of the sample population to determine if the Anxiety item indicators provided good measurement fit and supported this conclusion. The model for *Anxious Appraisal* had good model-data fit: $\chi^2(27) = 2251.28$, $\chi^2/\text{df} = 83.38$, $p < .001$; RMSEA = .06; CFI = .97; TLI=.96; SRMR=.03; AIC=475585.38; BIC=475798.61. As such, the newly-defined *Anxious Appraisal* latent factor using the nine Anxiety item indicators (see Figure 4.3) was substituted into the proposed structural equation model.

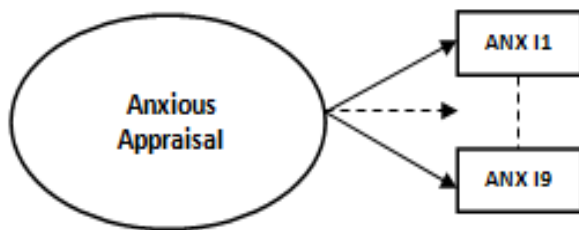


Figure 4.3. Confirmatory factor analysis for Anxious Appraisal latent variable.

Motivational regulation. Confirmatory factor analysis (CFA) was conducted to examine whether the data fit the proposed *Motivational Regulation* latent variable comprised of the nine Motivation subscale item indicators from the LASSI-HS (Finch et al., *in press*). Results from the CFA indicated the model achieved adequate fit: $\chi^2(35) = 6479.44$, $\chi^2/\text{df} = 185.13$, $p < .001$; RMSEA = .08; CFI = .92; TLI=.89; SRMR=.04; AIC=705375.57; BIC=705624.26.

As such, the *Motivational Regulation* latent factor (see Figure 4.4) was retained for use in the proposed model.

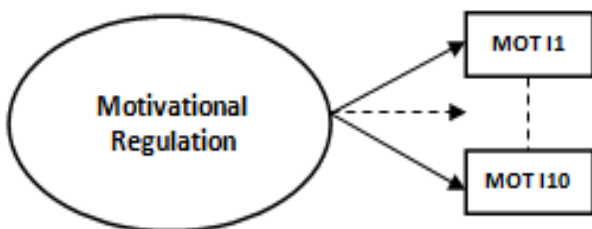


Figure 4.4. Confirmatory factor analysis for Motivational Regulation latent variable.

Self-regulated learning (SRL) strategies. A confirmatory factor analysis was initially conducted to assess whether the data fit the theoretically-proposed measurement model for *Self-Regulated Learning (SRL) Strategies* comprised of the following seven LASSI-HS subscales as indicators (Finch et al., *in press*): Elaborative Rehearsal, Active Study Strategies, Visualizations, Self-Testing, Comprehension Monitoring, Concentration, and Time Management. The model did not fit well: $\chi^2(14) = 18067.96$, $\chi^2/df = 1290.57$, $p < .001$; RMSEA = .21; CFI = .73; TLI = .60; SRMR = .09; AIC = 431430.54; BIC = 431604.63.

Given the model did not achieve adequate fit, exploratory factor analyses (EFA) using an oblique geomin rotation (Browne, 1972; 2001; Muthén & Muthén, 2013; Yates, 1987) were employed on two samples of the dataset as follow-up measures investigating the potential factorial structure of the seven subscales. Results of the two EFAs were nearly identical across all fit statistics and factor loadings, supporting stability of the results (Horn, 1965). As such, the results from one EFA are provided in Table 4.3. According to the EFA, two potential factor solutions emerged. Although a two-factor solution was investigated, model-fit statistics indicated the two-factor solution did not achieve adequate fit: $\chi^2(8) = 675.94$, $\chi^2/df = 84.49$, $p < .001$; RMSEA = .13; CFI = .94; TLI = .84; SRMR = .04; AIC = 69880.08; BIC = 70055.21. However, the

three-factor solution for *SRL Strategies* achieved good model fit and provided the best statistical representation of the data compared to the proposed single-factor *SRL Strategies* solution: $\chi^2(3) = 83.35$, $\chi^2/df = 27.78$, $p < .001$; RMSEA = .07; CFI = .99; TLI=.95; SRMR=.01; AIC=69297.49; BIC=69505.06.

Table 4.3.

Geomin Rotated Factor Loadings from EFA Investigating SRL Strategies Factor Structure

Subscale	Factor 1 (Volitional/Active)	Factor 2 (Cognitive)	Factor 3 (Time Mgmt)
Visualizations (VIS)	.432	-.179	.065
Elaborative Rehearsal (ER)	.761	.010	-.182
Self-Testing (ST)	.606	.003	-.017
Active Study Strategies (ACT)	.624*	-.005	.368
Comprehension Monitoring (CM)	.205	.760	.001
Concentration (CON)	-.004	.611	.532
Time Management (TM)	.005	.330	.785*

Note. Reported values represent Geomin rotated factor loadings. Only those loadings $\geq .30$ were determined to load on the factor and are identified in bold.

*Indicates subscale was determined to be associated with factor due to relatively strong factor loading ($>.60$) compared to other factor loadings ($<.40$; Henson & Roberts, 2006).

Using guidelines provided by Tabachnick and Fidell (2013), a factor loading greater than or equal to .30 was determined to be associated with the particular factor and was used to interpret the identified factor solution. As indicated in Table 4.3, three subscales had factor loadings greater than .30 across multiple factors. In this case a certain degree of judgment is advised for determining how the loadings should be interpreted (Matsunaga, 2010). A variety of approaches can be utilized (Matsunaga, 2010), however, the decisions for this study were guided by Henson and Roberts' (2006) recommendations for employing a .6/.4 criterion. According to this criterion, if the loading on one factor exceeded .6 and fell below .4 on other factors, then the

factor with the higher loading was considered primary to that factor. Using this guideline, the results indicated the seven subscales (except for Concentration) distinctly loaded on three separate factors (see Table 4.3).

Since this was a theoretically-derived construct based upon Zimmerman and Schunk's social-cognitive model of Self-Regulated Learning (SRL; 2008; 2011; Zimmerman, 1989; 2000), it was hypothesized these items would meaningfully group together in measuring student self-regulatory abilities via one construct. Although SRL has been characterized as a collective of adaptive coping strategies all positively contributing to academic success outcomes (Bembenutty, 2008; Bussey, 2011; Kitsantas et al., 2008; McInerney, 2011; Robbins et al., 2004; Zimmerman, 2011; Zimmerman & Schunk, 2008; 2011), specific components of SRL identified in the literature include motivational regulation (already distinct in this study), cognitive abilities, and volitional (i.e., active behavioral) strategies (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011).

Review of the items underlying the subscales used in these factor analyses at the item level provided insight into the factorial differentiation that made the single-factor solution for self-regulated learning strategies unviable. It appears that the subscales were measuring three distinct groups of self-regulation abilities: a) cognitive processes associated with self-regulated learning (i.e., comprehension monitoring, concentration); b) volitional or active study and learning behavioral practices (i.e., visualizations, elaborative rehearsal, self-testing, active study strategies); and c) timing of study engagement and management of study time-on-task (i.e., time management). As indicated by the review of the literature, cognitive processing abilities function independently from active study and learning behavioral practices (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011). While monitoring one's knowledge of material over time

and directing one's focused attention toward material are important SRL skills, they often serve as driving forces behind the behavioral strategies activated for performance and goal attainment (Pintrich & Zusho, 2002). A student's cognitive abilities facilitate information processing during active study (Alarcon & Edwards, 2012; Snyder, 2000) and can enhance or detract from effective study strategy use (Finn et al., 2014).

The second dimension of self-regulated learning strategies corresponds to volitional strategies, or the learner's active engagement in behaviors that enhance understanding of the academic material and completing academic tasks. Therefore, these specific strategies are considered a form of problem-focused, adaptive coping (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987) since individuals engage in active strategies to directly address task demands placed upon them in the academic context.

The final component distinct from the prior two also makes sense as time management has been argued to be a different form of self-regulatory ability from active study and learning behavioral strategies. According to Plant et al. (2005), a student's determination of when and how long to study (i.e., time management) differs from deliberate engagement in particular active study behaviors, with distinct influences on achievement outcomes observed. Specifically, effective time management does not necessarily indicate appropriate utilization of *effective* study strategies by the learner (Plant et al., 2005). Thus, the two components of effective time and study management and effective study strategy use can be viewed as distinct skill-sets.

Although good theoretical rationale existed for proposing one latent factor (*SRL Strategies*) as an adequate representation of these subscales, the nature of the 3-factor structure for *SRL Strategies* makes sense when considering the key components of Zimmerman and Schunk's SRL framework (Zimmerman, 1989; 2000; Zimmerman & Schunk, 2008; 2011).

Given the results of the EFA and the goals of the current research study to explore the predictive value of adaptive, problem-focused academic-oriented forms of coping, the original plan of analysis to include all seven subscales was abandoned. Of particular interest to this study were student-initiated active behavioral strategies directed toward meeting the academic-oriented challenges (i.e., test anxiety, task demands) present in the educational environment, facilitating academic success. It was determined those indicators which directly capture student active study and learning behaviors (see Factor 1 in Table 4.3; i.e., Visualizations, Elaborative Rehearsal, Self-Testing, Active Study Strategies) would be the only subscales included. For the purposes of this study, the role of academic-related active coping strategies were of greater interest as the literature supports these adaptive forms of problem-focused coping as substantial contributors to higher academic achievement (Karpicke et al., 2009; Marrs et al., 2009; Plant et al., 2005; Zimmerman, 2000; 2004). Furthermore, this conceptualization maintained consistency with the Lazarus and Folkman identification of problem-focused coping as key to more favorable outcomes, where active behavioral strategies are employed in response to perceived threat (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). Consequently, the latent variable SRL Strategies was renamed *Active Coping Strategies* to more accurately reflect the nature of the new measurement model.

A follow-up CFA was conducted for cross-validation purposes (Brown, 2006; Byrne, 2012) on a subset of the sample population to determine if the four subscale indicators had good measurement fit for *Active Coping Strategies* and supported this conclusion. The model for *Active Coping Strategies* had adequate model-data fit: $\chi^2(2) = 489.66$, $\chi^2/\text{df} = 244.83$, $p < .001$; RMSEA = .11; CFI = .97; TLI = .91; SRMR = .03; AIC = 172355.09; BIC = 172449.85. As such, the newly-defined *Active Coping Strategies* latent factor using the four subscale indicators (i.e.,

Visualizations, Elaborative Rehearsal, Self-Testing, Active Study Strategies; see Figure 4.5) was substituted into the structural equation model for the primary analyses.

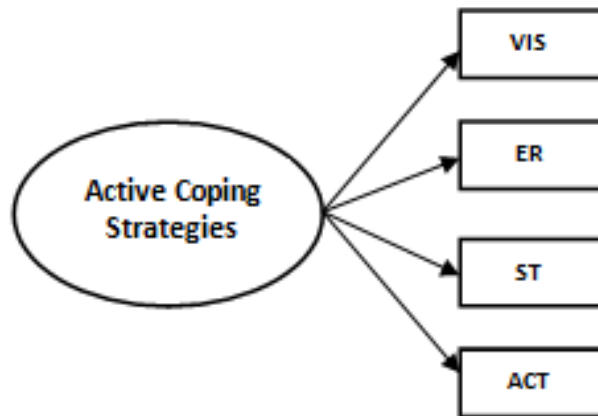


Figure 4.5. Confirmatory factor analysis for Active Coping Strategies latent variable.

Primary Analyses Using Structural Equation Modeling

Overview of the Analyses

Once all preliminary analyses were completed and revisions were made to initially-proposed latent variables, structural equation modeling (SEM) analyses using the Mplus statistical software package version 7.11 (Muthén & Muthén, 2013) with the full-information maximum likelihood for structural equation modeling (FIML SEM) method were utilized to answer the research questions. Specifically, this study explored the nature of the relationships among the variables and tested the utility of these variables in predicting first-year college GPA. Structural equation modeling (SEM) is the preferred statistical approach to analysis when hypothesized relationships among observed and latent variables are believed to be complex (Bollen, 1989). To best serve the purpose of the current study, a series of SEM analyses were conducted in order to address each research question, corresponding hypotheses and ultimately

test the utility of the proposed model in predicting first-year college student achievement. To determine model fit, the model-fit indices and guidelines described by Kline (2011) were utilized. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values were also evaluated for model-fit comparisons, wherein smaller AIC and BIC values are considered more desirable (Kline, 2011). To further examine the strength of relationships (i.e., weak, moderate, strong) between the variables, the guidelines provided by Cohen (1988) were utilized. The following sections describe results of these analyses in answering the main research questions of interest to this study.

Pre-Existing Personal Factors and Academic Achievement

Research questions 1 and 2 sought to identify the predictive influence of student background factors (i.e., gender, ethnicity, first-generation status) and prior achievement indicators on first-year college student achievement outcomes. As depicted in Figure 4.6, Model A represented the direct path model investigating the direct effects of student background and prior achievement on first-year college cumulative GPA. Results from the SEM fit statistics for Model A indicated the model did not have good fit: $\chi^2(9) = 4187.17$, $\chi^2/df = 465.24$, $p < .001$; RMSEA = .13; CFI = .78; TLI = .55; SRMR = .06; AIC = 359494.29; BIC = 359709.82 (see Table 4.4 for summary of model fit statistics).

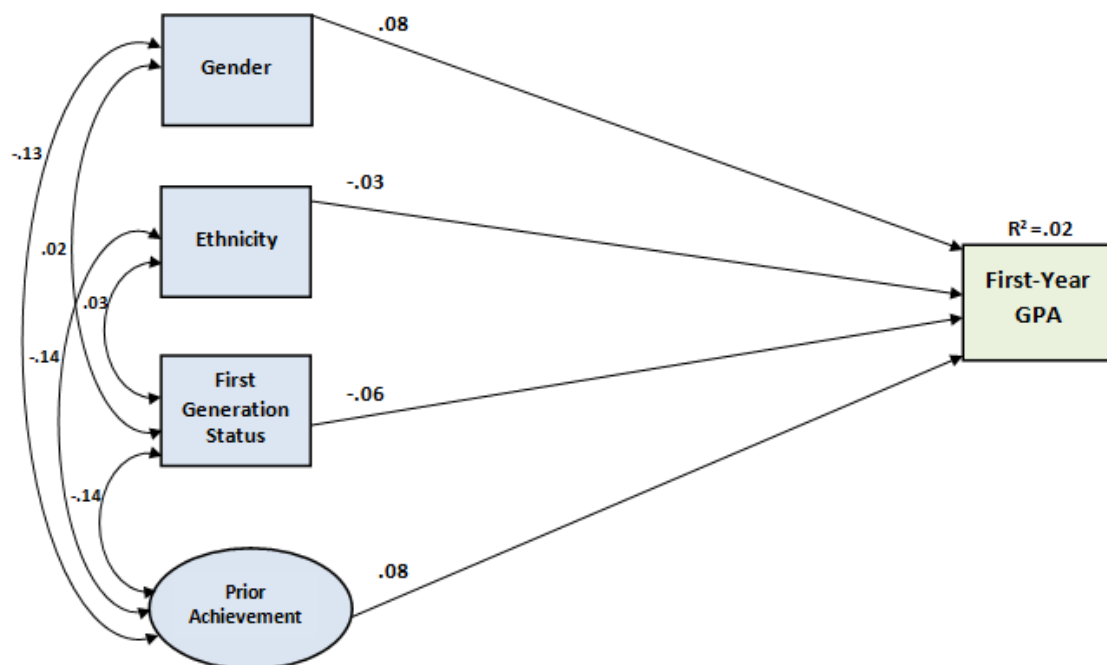


Figure 4.6. Model A. Direct path model illustrating the relationships between student background factors, prior achievement and first-year college student achievement. All categorical variables were dummy coded for analyses purposes. For Gender, females = 1 and males = 0; for Ethnicity, ethnic minority = 1 and ethnic majority = 0; for First-Generation Status, first-generation student = 1 and non-first-generation student = 0. All reported standardized coefficients and R^2 values were significant at $p < .001$.

Although the model did not fit to the data, the influence of particular variables on first-year college GPA was also of particular interest in this study. According to the results of the direct path model (see Figure 4.5), all parameters were significant at $p < .001$. Student background factors and prior achievement accounted for 2% of the variance explained in first-year college student GPA ($R^2 = .02$, $p < .001$). It was hypothesized (H1) that gender would predict first-year college achievement, with females outperforming males in first-year cumulative GPA. Based upon the results, although the value was weak, hypothesis 1 was supported. Gender was a statistically significant predictor of first-year college GPA ($\beta = .08$) as female status was associated with higher achievement outcomes, although the influence of gender on achievement was considered weak. Hypothesis 2 proposed that ethnicity would not uniquely add to the explanation of first-year cumulative GPA due to the high correlation with

first-generation status. According to the results, ethnicity did uniquely explain first-year cumulative GPA ($\beta = -.03$) with ethnic minority status related to lower first-year GPA outcomes, although this relationship was considered weak. Furthermore, the relationship between ethnicity and first-generation status was quite weak ($r = .03, p < .001$). It was also hypothesized that first-generation status would predict first-year college achievement, with first-generation students demonstrating lower first-year cumulative GPA compared to non-first-generation students. Based upon the results, Hypothesis 3 was supported. First-generation status was a statistically significant predictor of first-year college GPA ($\beta = -.06$) as first-generation status was associated with lower GPA, although the influence of this factor on achievement outcomes was weak.

In response to research question 2, it was hypothesized (H4) that prior achievement would be a strong positive predictor of first-year cumulative GPA once the influence of background factors was removed. Although prior achievement was a statistically significant predictor of first-year student GPA ($\beta = .08$), the relationship was not as strong as expected. The results indicated the relationship was weak; therefore, hypothesis 4 was not supported.

Overall, the SEM results for Model A indicated that the model did not achieve adequate fit in predicting first-year college student GPA. Although all model parameters and variance explained in first-year GPA reached statistical significance, the relationships were all considered weak. Therefore, although pre-existing personal factors (i.e., gender, ethnicity, first-generation status, prior achievement) were statistically significant predictors of first-year college GPA, their relative influence on the outcome variable was minimal and provided little practical utility.

Anxious Appraisal and Academic Achievement

Research question 3 sought to identify the predictive influence of anxious appraisal on first-year college student achievement outcomes when the effects of all pre-existing personal

factors were removed. To answer this question, an initial SEM investigated the direct predictive relationship between first-year GPA and anxious appraisal. As depicted in Figure 4.7, the results from the SEM fit statistics indicated the model achieved good fit: $\chi^2(35) = 3425.71$, $\chi^2/df = 97.88$, $p < .001$; RMSEA = .06; CFI = .97; TLI = .96; SRMR = .03; AIC = 781281.49; BIC = 781530.18. Additionally, the results confirmed that anxious appraisal was a statistically significant, although weak, predictor of first-year college GPA.

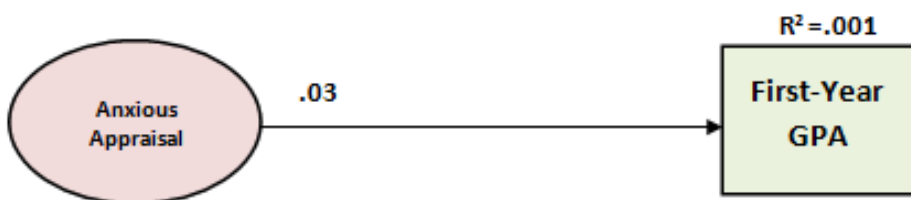


Figure 4.7. Model illustrating direct path between anxious appraisal and first-year college achievement. Reported standardized coefficient was significant at $p < .001$; R^2 value was significant at $p = .01$.

As depicted below in Figure 4.8, Model B then represented a fully mediated model specifically addressing research question 3. Results from the SEM fit statistics for Model B indicated the model achieved adequate fit: $\chi^2(98) = 11753.49$, $\chi^2/df = 119.93$, $p < .001$; RMSEA = .06; CFI = .91; TLI = .89; SRMR = .04; AIC = 1063325.58; BIC = 1063773.23 (see Table 4.4 for summary of model fit statistics).

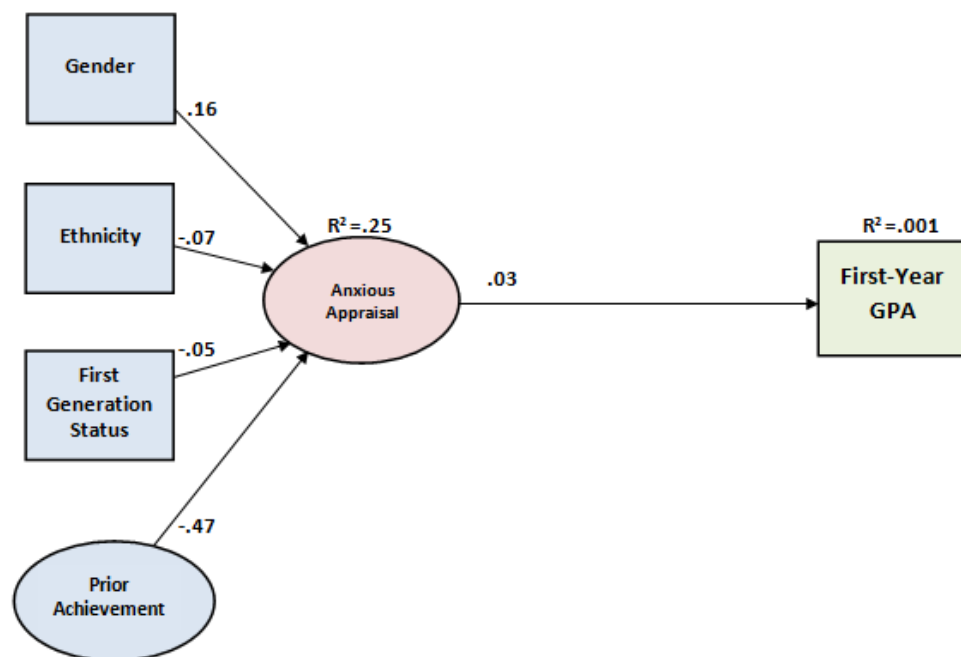


Figure 4.8. Model B. Fully mediated model illustrating the relationship between anxious appraisal and first-year college student achievement. All reported standardized coefficients were significant at $p < .001$; R^2 value was significant at $p = .01$.

Although the model provided an adequate fit to the data, investigating the impact of anxious appraisal on first-year college GPA beyond the influence of pre-existing personal variables was also of specific interest in this study. According to the results of the fully mediated model (see Figure 4.8), all parameters were significant at $p < .001$. When all pre-existing personal variables were accounted for, anxious appraisal was a statistically significant positive predictor of first-year college GPA ($\beta = .03$), indicating that heightened anxiety appraisals were associated with increases in GPA. Due to the nature of this relationship, hypothesis 5 was not supported as it was hypothesized that increased levels of anxiety appraisal would predict *lower* first-year GPA. The four pre-existing personal factors accounted for 25% of the variance in anxious appraisal. Of all pre-existing personal factors, prior achievement maintained the strongest relationship with anxious appraisal ($\beta = -.47$) followed by gender ($\beta = .16$). Students with higher scores on measures of prior achievement (i.e., H. S. GPA, SAT scores) tended to

report lower levels of anxious appraisal, while females demonstrated higher levels of anxious appraisal than males. Regardless of these findings, the overall impact of anxious appraisal on first-year achievement was negligible. Anxious appraisal failed to hold any true predictive value in the model due to accounting for virtually none of the variance in first-year college student GPA ($R^2 = .001, p = .01$).

For comparison purposes, a partially mediated model (Model C; see Figure 4.9) was tested to fully investigate the direct and indirect effects of the variables and determine if this model provided a better representation of the data. Results from the SEM fit statistics for Model C indicated the model achieved adequate fit: $\chi^2(94) = 11221.37, \chi^2/df = 119.38, p < .001$; RMSEA = .06; CFI = .91; TLI = .89; SRMR = .04; AIC = 1062801.46; BIC = 1063282.27 (see Table 4.4 for summary of model fit statistics).

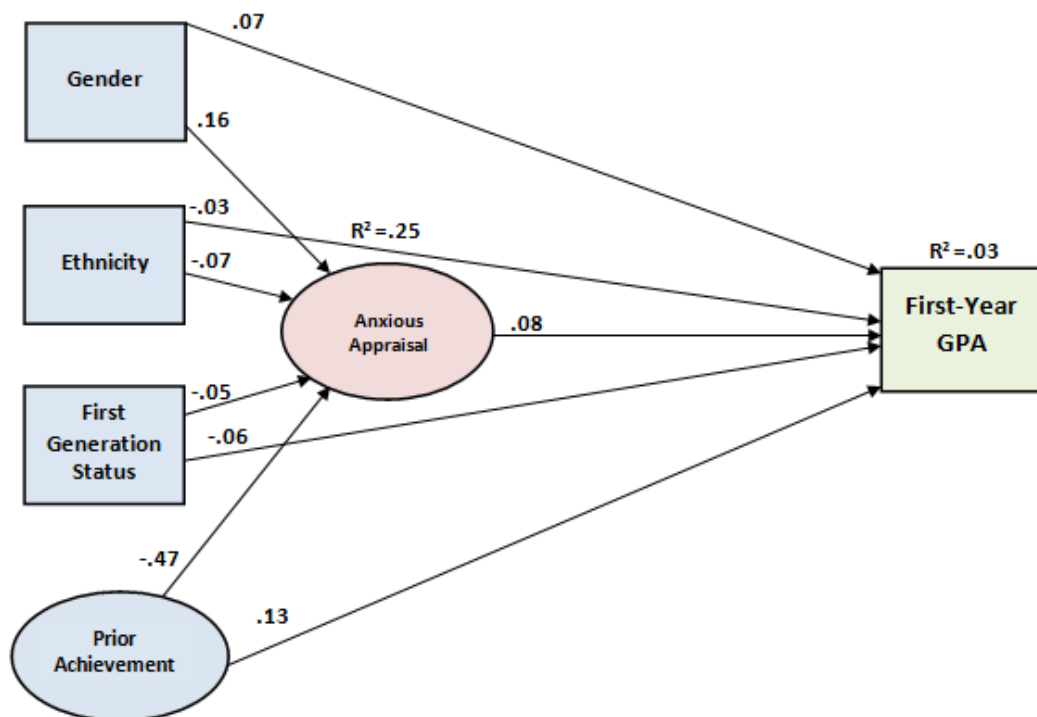


Figure 4.9. Model C. Partially mediated model illustrating the relationship between pre-existing personal factors, anxious appraisal and first-year college student achievement. All reported standardized coefficients and R^2 values were significant at $p < .001$.

Table 4.4

Summary of Model Fit Statistics

Models Investigated	χ^2	<i>df</i>	χ^2/df	RMSEA	CFI	TLI	SRMR	AIC	BIC	R^2
Model A: Direct Path Model	4187.17	9	465.24	.13	.78	.55	.06	359494.29	359709.82	.02
Model B: Fully Mediated Model	11753.49	98	119.93	.06	.91	.89	.04	1063325.58	1063773.23	.001
Model C: Partially Mediated Model	11221.37	94	119.38	.06	.91	.89	.04	1062801.46	1063282.27	.03
Model D: Active Coping Strategies as moderator	*	*	*	*	*	*	*	1319210.71	1319832.45	*
Model E: Motivational Regulation as moderator	*	*	*	*	*	*	*	1764834.46	1765605.41	*

Note. All models investigated in this study are included above. *Results derived from models testing moderator effects cannot yield all standard goodness-of-fit indicators or R^2 values; only AIC and BIC values were available for Models D and F. Bold indicates the model that statistically provided the best representation of the data based upon model-fit comparisons and AIC and BIC values.

According to the results of the partially mediated model (see Figure 4.9 and Table 4.5), all identified paths, direct and indirect, were statistically significant at $p < .001$. There were also statistically significant total effects observed for all paths ($p < .001$) when the direct paths were incorporated. Therefore, all specified paths in Model C impacted first-year college student achievement, although the degree of impact is quite weak with only 3% of the variance explained in first-year GPA. Comparing both the fully mediated Model B to the partially mediated Model C, the partially mediated model provided slightly better fit to the data due to the improved AIC and BIC values found in Model C and accounted for slightly more of the variance in first-year college student achievement ($R^2 = .03$ compared to $R^2 = .001$ in Model B). Model C also provided better fit to the data compared to the direct path tested in Model A, given that Model A failed to meet the criteria for all goodness-of-fit indices.

Overall, both Models B and C achieved adequate fit in predicting first-year college student GPA with Model C providing the better representation of the data. Although all model parameters and variance explained in first-year GPA reached statistical significance in the partially mediated Model C, the relationships were all considered weak except for the relationship between prior achievement and anxious appraisal. Therefore, although pre-existing personal factors (i.e., gender, ethnicity, first-generation status, prior achievement) and anxious appraisal had statistically significant direct and indirect effects on first-year college GPA, their relative influence on the outcome variable was minimal and provided little practical utility.

Table 4.5

Summary of Direct, Indirect and Total Effects Observed in Model C

Path/Effect	Unstandardized	SE	Standardized
<u>Direct Effects</u>			
Gender → First-year GPA	.12	.01	.07
Ethnicity → First-year GPA	-.08	.01	-.03
First-Generation → First-year GPA	-.10	.01	-.06
Prior Achievement → First-year GPA	.14	.01	.13
Anxious Appraisal → First-year GPA	.14	.01	.08
<u>Indirect Effects</u>			
Gender → Anxious Appraisal → First-year GPA	.02	.00	.01
Ethnicity → Anxious Appraisal → First-year GPA	-.02	.00	-.01
First-Generation → Anxious Appraisal → First-year GPA	-.01	.00	.00
Prior Achievement → Anxious Appraisal → First-year GPA	-.04	.00	-.04
<u>Total Effects</u>			
Gender → First-year GPA	.14	.01	.08
Ethnicity → First-year GPA	-.10	.01	-.03
First-Generation → First-year GPA	-.11	.01	-.06
Prior Achievement → First-year GPA	.10	.01	.09

Note. Unstandardized and standardized estimates provided for direct, indirect and total effects. All values were statistically significant at $p < .001$.

Self-Regulated Learning and Academic Achievement

An additional purpose of the study was to examine if two variables (i.e., motivational regulation and active coping strategies) moderated the relationship between anxious appraisal and first-year college student achievement outcomes. It was initially anticipated that motivational regulation and active coping strategies would buffer the influence of anxious appraisal on first-year GPA. Due to the complexity of testing these interactions within an SEM model, two separate SEM analyses were conducted to investigate their potential individual moderating effects. The traditional SEM fit statistics are not available via Mplus when interaction (i.e., moderator) effects are tested using specific estimation methods (Kline, 2011; Muthén & Muthén,

2013). In such cases, AIC and BIC values are evaluated in comparing relative fit to alternative models (Kline, 2011).

Active coping strategies as moderator. As depicted in Figure 4.10, Model D represented the relationships among the variables of interest with particular inclusion of the latent variable *Active Coping Strategies* to assess its viability as a moderator between anxious appraisal and first-year college GPA. Results from the SEM analyses for Model D indicated the model did not provide better fit than other models tested prior: AIC=1319210.71; BIC=1319832.45 (see Table 4.4 for summary of model fit statistics). Upon closer examination of the role of active coping strategies, active coping strategies did not buffer the influence of anxious appraisal on first-year college achievement; therefore, hypothesis 6 was not supported. This finding is not surprising given the weak influence anxious appraisal had on first-year student GPA.

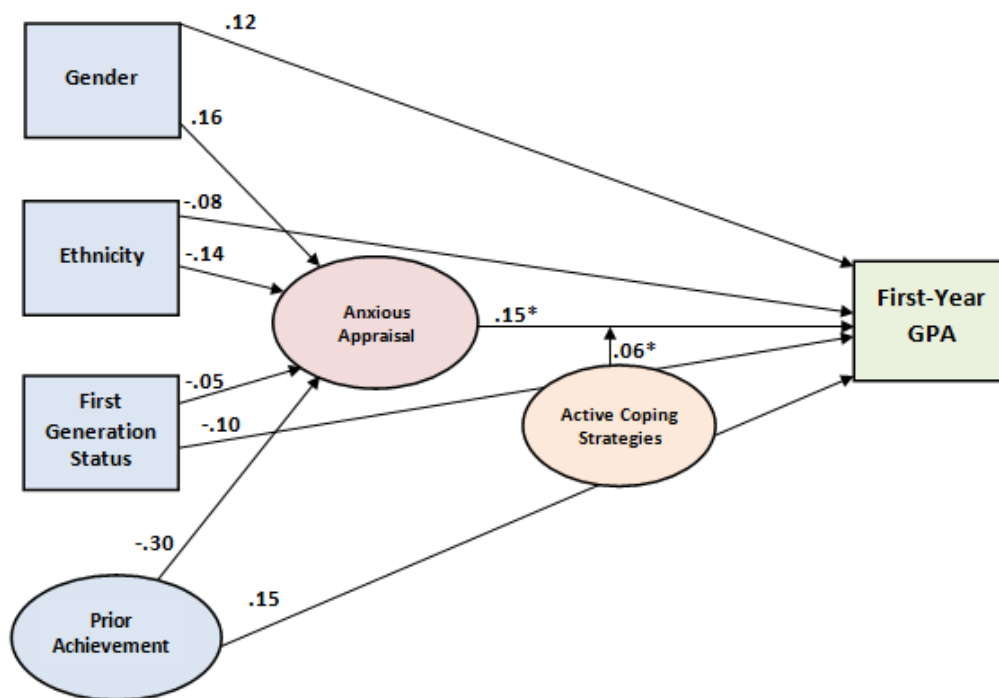


Figure 4.10. Model D. Full model testing moderation effect of active coping strategies. All path coefficients reported are unstandardized. * $p < .05$; all other values significant at $p < .001$.

Motivational regulation as moderator. As depicted in Figure 4.11, Model E represented the relationships among the variables of interest with particular inclusion of the latent variable *Motivational Regulation* to assess its viability as a moderator between anxious appraisal and first-year college GPA. Upon closer examination of the role of motivational regulation, it had a statistically significant moderating effect ($p < .001$). Motivational regulation impacted the relationship between anxious appraisal and first-year college achievement; therefore hypothesis 7 was supported. The results indicated that higher levels of motivational regulation mitigated the influence of anxious appraisal on first-year GPA. Despite this finding, results from the SEM analyses for Model E indicated the model did not provide better fit than other models tested prior: AIC=1764834.46; BIC=1765605.41 (see Table 4.4 for summary of model fit statistics). Therefore, Model E holds no power in explaining the overall influences of these factors in predicting first-year student achievement.

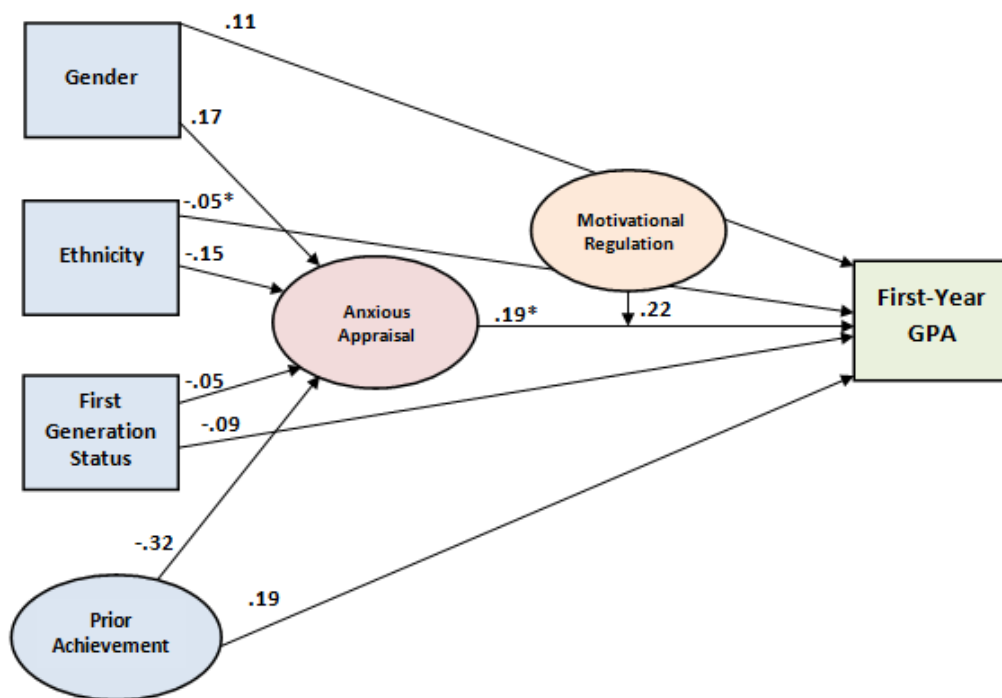


Figure 4.11. Model E. Full model testing moderation effect of motivational regulation. All path coefficients reported are unstandardized. * $p < .05$; all other values significant at $p < .001$.

Overall, Models D and E did not provide any better representation of the data compared to other simpler models tested prior. Although all parameters were statistically significant in both models assessing moderator effects, the relationships were all considered weak except for the association of prior achievement to anxious appraisal. While pre-existing personal factors (i.e., gender, ethnicity, first-generation status, prior achievement), anxious appraisal, active coping strategies and motivational regulation had statistically-significant effects on first-year college GPA, their relative influence was minimal and provided little practical utility as predictors of first-year college student achievement.

CHAPTER V

DISCUSSION

A variety of factors influence college academic achievement, and research examining these factors serves an important function for postsecondary institutions. As the research suggests, postsecondary institutions can reap a number of benefits by implementing institutional assessment practices that investigate their first-year student population across a number of variables to develop a comprehensive understanding of the students' areas of strength and vulnerability (Crede & Kuncel, 2008; Keup 2004; Tinto, 2006). This information can prove valuable in directing institutional policies and initiatives (Keup 2004; Tinto, 2006) designed to help students better transition into college and improve achievement outcomes (Dysen & Renk, 2006; Sasaki & Yamasaki, 2007).

Challenges associated with academic-oriented forms of stress and anxiety (Baillie & Fitzgerald, 2000; Bembenuddy, 2008; Cassady, 2010; Collier & Morgan, 2008; Jean, 2010; Lapsley et al., 1989; Pike & Kuh, 2005; Soria & Stebleton, 2012; Turner et al., 2012; Wei et al., 2005) coupled with limitations in effective coping strategies (Hofer et al., 1998; Kitsantas et al., 2008; McInerney, 2011; Pintrich & Zusho, 2002; Robbins et al., 2004; Zimmerman & Schunk, 2008) lie at the center of the difficulties many college students experience, which ultimately play a role in student persistence and achievement outcomes. This is particularly true for students from at-risk populations (e.g., first-generation, ethnic minorities; Balemian & Feng, 2013; Borman & Overman, 2004; Choy, 2001; Engle, 2007; Jones et al., 2010; Pascarella et al., 2004; Toldson, 2012). Postsecondary institutions continue to seek answers through formal assessment and research investigations that may provide a better roadmap toward improving the rather

stagnant graduation and retention rates observed in U.S. colleges (ACT, 2011; 2012; 2013; 2014; Tinto, 2006).

In an attempt to contribute to these efforts and add to the body of literature, the current study examined the degree of influence student background characteristics, indicators of prior achievement, anxiety-laden cognitive belief states and study and learning strategy variables had on first-year college student achievement. Informed by Lazarus and Folkman's (1984) Transactional Stress and Coping framework, a proposed academic-oriented stress appraisal-coping model was tested for viability in predicting student achievement outcomes at the conclusion of their first-year in college.

Study Findings

To summarize the general findings of this study, the results demonstrated that although all background factors (i.e., gender, ethnicity, first-generation status) were statistically significant predictors of first-year GPA, their influence on achievement outcomes was minimal. Additionally, prior achievement had a statistically significant, but weak, influence on first-year GPA. Although the direct path relationships for all pre-existing personal factors were statistically significant, the results also indicated anxious appraisal served a mediating role between these factors and first-year GPA. Thus, a partially mediated model best represented the relationships among these variables. The potential moderating effects of motivational regulation and active coping strategies did not have any meaningful impact in the self-regulatory coping models tested.

Overall, the results of the study were unexpected given the strong theoretical and empirical support for the measures utilized in the study and literature supporting meaningful and rather robust relationships among the variables. Upon closer examination of the inter-correlations and path coefficients, first-year student GPA seemed to be the key contributor to this

pattern in the results. Of all predictor variables examined in this study and tested within the prediction model, H. S. GPA (contributing to the *Prior Achievement* latent factor) was the only variable that reasonably correlated with first-year college GPA ($r = .20$); yet, this relationship was still weak overall. Motivational regulation was next with only a .15 correlation with first-year college GPA. All other correlations between the predictor variables and first-year college GPA fell below .10, which is atypical in comparison to the body of literature examining college student GPA (Alarcon & Edwards, 2013; Chapell et al., 2005; Choy, 2001; Crede & Kuncel, 2008; DeBerard et al., 2004; Harackiewicz et al., 2002; Jones et al., 2010; Kitsantas et al., 2008; Kowitlawakul et al., 2013; Lynch, 2006; 2010; Randsell, 2001; Robbins et al., 2004; Wolters, 1998; Zypher et al., 2007). Naturally, the influence of these variables on first-year college achievement, particularly within a complex model predicting this outcome, would undoubtedly be minimal regardless of the utility of the hypothesized model. Detecting any potential moderator effects within such a model is especially difficult since there is very little effect to be moderated (Frazier, Tix, & Barron, 2004). Ultimately, the first-year GPA outcome variable did not function as expected, thus posing problems in arriving at the results expected in this study.

Closer examination and inquiry into why first-year college GPA functioned quite different than anticipated (Chapell et al., 2005; Choy, 2001; Crede & Kuncel, 2008; Harackiewicz et al., 2002; Kitsantas et al., 2008; Kowitlawakul et al., 2013; Lynch, 2006; 2010; Randsell, 2001; Robbins et al., 2004; Zypher et al., 2007) for this particular sample yielded no evidence of a data-based source for the pattern difference. In essence, variations among student performance levels at the end of the first-year of college were unrelated to traditional indicators, suggesting greater randomness in performance than generally anticipated. One critique of higher education that may prove valuable in explaining the odd pattern of results regarding first-year

GPA may come from the proposal that limited learning is taking place on college campuses and college students are left *academically adrift* (Arum & Roska, 2011). This research points to trends observed in the demands placed upon college students and their achievement outcomes (Arum & Roska, 2011; Arum, Roska, & Cho, 2011; Pascarella, Blaich, Martin, & Hanson, 2011). This avenue of research discovered that the majority of students reported spending less time reading and preparing for their college courses, finding that on average the typical full-time student spent 13-15 hours per week on his studies. Further, an estimated 40-51% had not written what amounted to 20 or more pages of papers during the academic school year. Despite evidence of diminished time and task-study engagement, grades remained relatively unaffected. Upon closer investigation, the researchers found that these achievement numbers were not necessarily associated with deficiencies in student study habits; instead, they were more closely related to students facing less stringent or demanding requirements in their courses. Essentially, students were able to adequately meet the demands of their courses with about half as much time devoted to their studies compared to students attending college a decade prior (Arum & Roska, 2011; Arum et al., 2011). Consequently, the odd characteristics demonstrated in the first-year GPA may be related to a trend such as this. Specifically, what students are required to do, what they actually do and how they feel about it are not necessarily brought to task in higher education (Arum & Roska, 2011; Arum et al., 2011; Pascarella et al., 2011) - which may be exacerbated in the first year of college when the majority of courses are core requirements (Smith & Wertlieb, 2005; Tinto, 2001). If students are not effectively challenged in these introductory-level courses, the influence of prior achievement, appraisal of educational threat, and self-regulation strategies may very well be masked because there is little perceived need to engage (Arum & Roska, 2011; Arum et al., 2011; Pascarella et al., 2011).

While the pattern of results did not follow typical convention, access to this large and complex set of data representing students' experiences over the course of one academic year still provides useful information about the role of institutional assessments in supporting student success. As such, the findings are discussed within the context of the proposed model, while also reviewing areas of potential continued inquiry to isolate the prospective use of variables such as those used in this study.

Pre-Existing Personal Factors and Academic Achievement

Of the three background factors (i.e., gender, ethnicity, first-generation status) investigated in this study, gender status was the most reliable predictor. Female status was associated with higher first-year college student achievement. This finding is consistent with other research suggesting females demonstrate a significant performance advantage over males in college (Alon & Gelbgiser, 2011; DeBerard & Julka, 2000; DeBerard et al., 2004; Harackiewicz et al., 2002; Kitsantas et al., 2008). While this study found the influence of gender on first-year college GPA was minimal regardless of the models tested, other research indicates gender has greater impact on first-year academic achievement (Deberard & Julka, 2000) and serves as a robust predictor of academic achievement across the first two years of postsecondary education when the influence of other variables is removed (Kitsantas, Winsler & Huie, 2008).

The effect of ethnicity and first-generation status functioned as expected, with both ethnic minority and first-generation status associated with lower first-year GPA. Again, the limited degree of influence on first-year GPA was surprising given the extensive body of research finding these student sub-groups are considered high-risk for academic failure compared to other students (ACE, 2008; 2011; Balemian & Feng, 2013; Borman & Overman, 2004; Choy, 2001; DeAngelo et al., 2011; Harper, 2009; 2012; Harris & Herrington, 2006; Jones et al., 2010; Kuh et

al., 2007; Pascarella et al., 2004; Soria & Stebleton, 2012; Toldson, 2012). Large achievement gaps associated with performance outcomes, retention and graduation rates between these groups have been observed in postsecondary education. This is not surprising given these students often enter college ill-prepared for the academic rigor in postsecondary education and experience greater difficulty in transitioning to the college environment (Balemian & Feng, 2013; Choy, 2001; Collier & Morgan 2008; Engle, 2007; Ishitani, 2006; Jean, 2010; Pascarella et al., 2004; Terenzini et al., 1996). However, some lines of research suggest that greater achievement outcomes may be realized in students from at-risk populations who have an adequate support system in place, have positive high school experiences, value education, report high self-efficacy and motivation, and utilize effective learning and study strategies (Bridges, 2010; Cavazos et al., 2010; Ceballo, 2004; Harper, 2009; 2012; Moore et al., 2003; Morales, 2008; 2010; Oh & Reynolds, 2014; Phinney & Haas, 2003; Zalaquett, 2005). Therefore, the possibility exists that a large number of those students from this sample representing at-risk populations entered the institution with these abilities and support mechanisms, facilitating their academic success.

While an extensive body of research exists demonstrating the predictive value of indicators of prior student achievement (i.e., H. S. GPA, SAT Math, SAT Verbal) in projecting student success in postsecondary education (Alarcon & Edwards, 2013; DeBerard et al., 2004; Harackiewicz et al., 2002; Kowitlawakul et al., 2013; Randsell, 2001; Robbins et al., 2004; Zypher et al., 2007), the results from this study illustrate a different picture. As anticipated, H. S. GPA, SAT Math and SAT Verbal values were all moderately positively correlated with one another and served as good indicators of the latent factor prior achievement. However, the overall influence of prior achievement on first-year student GPA was uncharacteristically weak. Some lines of research have found the strong influence of H. S. GPA and college entrance exam

scores on college student achievement dwindles over subsequent years in postsecondary education (Zypher et al., 2007) in lieu of other important predictors (e.g., personality factors). Although this pattern was observed in the research, it does not account for the minimal role of prior achievement on first-year achievement.

Drawing from the proposed trend in higher education linked to *academically adrift* students (Arum & Roska, 2011), a reasonable explanation for the atypical relationship among all study variables and first-year GPA can be conceptualized. The body of research demonstrates that ethnic minority and first-generation students struggle adjusting to the demands and rigor believed to be present in the college educational environment (Balemian & Feng, 2013; Choy, 2001; Collier & Morgan 2008; Engle, 2007; Ishitani, 2006; Jean, 2010; Pascarella et al., 2004; Terenzini et al., 1996). Research also finds that ethnic minority and first-generation students are more likely to experience greater stress and challenges with completing their school work due to high rates of living off campus and maintaining external employment in order to financially support their education (Pascarella et al., 2004), impeding access to valuable campus resources. Furthermore, students demonstrating challenges in cognitive abilities and lower academic performance during their high school careers (as reflected by H. S. GPA and SAT values) are found to experience lower levels of achievement in postsecondary education (Choy, 2001; DeBerard et al., 2004; Engle, 2007; Fike & Fike, 2008; Harackiewicz et al., 2002; Ishitani, 2006; Lau, 2003; Pascarella et al., 2004; Terenzini et al., 1996). Given these challenges, if few demands and lower expectations are placed upon students in their course curricula, requiring less time and effort to meet academic task demands (Arum & Roska, 2011; Arum et al., 2011; Pascarella et al., 2011), the traditional gaps observed among at-risk students and traditionally high-performing students may not be as evident. As the observed student performance levels

were relatively low, this may also indicate students disengaged from the content and learning environment (Bryson & Hand, 2007) or employed avoidance-based strategies instead (Akgun, 2004; Chang, 1998; Lazarus, 1993a; Lazarus & Folkman, 1984). Such responses to academic requirements and the educational environment also hinder academic success (Akgun, 2004; Balkis, 2013; Bryson & Hand, 2007; Carver & Scheier, 2005; Chang, 1998; George et al., 2008; Grunschel et al., 2013; Pascarella & Terenzini, 2005; Robbins et al., 2006; Tinto, 2006).

Anxious Appraisal and Academic Achievement

Research also supports the influence of academic anxiety and negative attitude toward learning on student motivation, self-regulated learning and achievement outcomes (Kitsantas, 2002; Kitsantas et al., 2008; Lucio et al., 2012; Weinstein & Palmer, 1990; Zimmerman & Schunk, 2008). Both negative emotional responses were anticipated to comprise a latent factor addressing negative cognitive appraisals toward the academic environment (Spielberger & Vagg, 1995) and subsequently lead to impaired student performance (Balkis, 2013; Cassady & Boseck, 2008; Lazarus & Folkman, 1984; 1987; Spielberger & Vagg, 1995; Stewart et al., 1997; Zeidner & Matthews, 2005). Results from the confirmatory factor analysis in this study revealed these two affective factors did not converge to create the *Negative Cognitive Appraisal* construct as expected. Review of the data illustrated that the best solution was to remove the negative attitudes toward learning portion of the LASSI-HS (Finch et al., *in press*), and focus only on the anxiety construct.

As expected, student background factors and prior achievement were related to students' academic anxiety – accounting for 25 percent of the variance in anxious appraisals. Consistent with the trends in this sample, research indicates that females consistently report higher levels of both test and general forms of academic anxiety (Chapell et al., 2005; Gast, 2013; Heller &

Cassady, 2015; Lynch, 2006; 2010; Ross-Gordon, 2003). Furthermore, these data confirmed studies illustrating ethnic minority groups report heightened levels of academic-related anxiety (Cole, Matheson, & Anisman, 2007; Flowers et al., 2011). While research has yet to effectively examine the role of academic-related anxieties in first-generation students, the results of this study are consistent with trends observed in at-risk students who face similar challenges in adjusting to the college environment (Balemian & Feng, 2013; Choy, 2001; Engle, 2007; Pascarella et al., 2004). For those students who enter college with deficits in learning and cognitive ability, higher levels of academic anxiety are common (Bembenutty, 2008; Crede & Kuncel, 2008; Matthews et al., 2006; Zeidner & Matthews, 2005; Tobias 1985). A moderate relationship was also observed in the current study between prior achievement and anxious appraisal where high levels of prior achievement were associated with a lower degree of anxious appraisal ($\beta = -.47$).

Research investigations have observed student self-doubt and worry toward academic performance evaluations often prompt negative, anxiety-appraisal states, impairing student performance and overall achievement (Cassady, 2010; Cassady & Johnson, 2002; Zeidner, 1990; Zeidner & Matthews, 2005). It is not surprising then that the large body of research on academic-related anxieties demonstrates a reliable link to decrements in achievement outcomes (Barrows et al., 2013; Beilock, 2008; Bembenutty, 2008; Cassady, 2010; Cassady & Johnson, 2002; Chapell et al., 2005; Lynch, 2006; 2010; Seipp, 1991; Zeidner, 1990; Zeidner & Matthews, 2005). Given the wealth of research in this area, the minimal and *positive* association between anxious appraisal and first-year student academic achievement was not anticipated in this study. It is still unclear why student anxious appraisals had such limited influence on first-year achievement; however, two explanations may provide plausible rationale for such findings.

Revisiting the concern over the weak relationships between the variables and first-year student GPA values in this study, the recent research on low-demand/low-expectation college learning environments (Arum & Roska, 2011; Arum et al., 2011; Pascarella et al., 2011) provides one explanation for these findings. If demands and expectations within the academic environment are relatively low, the anxious-appraisal ratings students provided prior to the start of the first year may not match the actual learning environment that is leading to the first-year GPA outcomes. That is, the students' tendency toward anxious appraisal is informed by experiences before entering the college setting – data collected after exposure to a semester or more of the academic requirements may illustrate a different degree of anxiety, when their expectancies have been reshaped (Lazarus & Folkman, 1984; 1987; Spielberger & Vagg, 1995). Alternatively, when subjected to such a learning environment, the level of stress required to activate coping resources may not have been achieved in this setting. According to the Yerkes-Dodson law (1908), low levels of arousal or anxiety correspond to less effort expended in addressing the task or situation. In most circumstances this should result in poorer performance outcomes (Easterbrook, 1959; Yerkes & Dodson, 1908). This would be expected particularly in academia where reduced effort is often penalized in the form of low scores and poorer grades. However, for educational environments where consequences are not reliably associated with student effort, performance outcomes may not necessarily suffer. In this regard, anxious appraisal may have little to no influence in first-year achievement outcomes. Alternatively, if students do experience a certain degree of anxiety, they may instead disengage from the learning environment as a means to avoid or escape (Lazarus, 1993a; Lazarus & Folkman, 1984) the anxiety-provoking task or situation (Carver & Scheier, 2005; Cassady, 2010). Such avoidance-reactions may reduce the internal experience of anxiety, however, at the cost of poorer

achievement outcomes (Akgun, 2004; Balkis, 2013; Bryson & Hand, 2007; Carver & Scheier, 2005; Chang, 1998; George et al., 2008; Grunschel et al., 2013; Pascarella & Terenzini, 2005; Robbins et al., 2006; Tinto, 2006).

Secondly, some lines of research suggest that academic-related anxieties may serve a facilitative function whereby certain levels of academic-related anxiety motivate students toward adequate preparation and quality task completion, enhancing overall performance (Shipman & Shipman, 1985). Additionally, other studies indicate that while college GPAs are negatively influenced by *high* levels of test anxiety, moderate- to low-levels of test anxiety do not significantly impact college GPA (Chapell et al., 2005). Supported by the Yerkes-Dodson law (1908) and other research (Easterbrook, 1959), moderate levels of anxiety (i.e., arousal) facilitate increased effort toward task demands, enhancing performance outcomes. It is those individuals who experience low or high levels of anxiety where performance often suffers (Easterbrook, 1959; Yerkes & Dodson, 1908). Closer investigation of student reported levels of anxious appraisal in this study revealed a mean score of 2.52 (on 1-5 scale), with 20% of the sample reporting anxious appraisal ratings 3.0-3.9 and 4% of the sample reporting levels between 4.0 and 5.0. The results indicated that the majority of students reported moderate to low anxious appraisal ratings, which is consistent with other findings (Putwain, 2008; Putwain & Daly, 2013). Taken as a whole, it is possible such appraisals had little to no impact on first-year achievement outcomes, or potentially served a facilitative rather than debilitating function in student's first-year GPA. Therefore the possibility exists that a blend of facilitative and debilitating forms of anxiety among the students in the sample may be confounding the results in this study, limiting the detection of their relative influence (Campbell & Stanley, 1971) on first-year achievement.

Self-Regulated Learning and Academic Achievement

The influence of self-regulated learning (SRL) strategies on student academic achievement is widely supported in the extant research (Bembenutty, 2008; Bussey, 2011; Kitsantas et al., 2008; Robbins et al., 2004; Zimmerman & Schunk, 2008). According to the Zimmerman and Schunk model, SRL strategies necessitate both cognitive abilities and academic-oriented volitional (i.e., behavioral) strategies to adequately meet the demands that pervade postsecondary education (Bussey, 2011; Zimmerman, 1989; Zimmerman & Schunk, 2008). SRL strategies include a wide array of abilities within the areas of cognitive and behavioral responses. Among the 10 LASSI-HS subscales (Finch et al., *in press*), seven were proposed to correspond to one construct representing all self-regulated learning strategies students may utilize. Results from the confirmatory factor analysis revealed those seven subscales did not represent the construct *Self-Regulated Learning Strategies* as proposed. Therefore, the decision was made to retain only indicators of student-directed behavioral strategies employed in response to academic task demands (i.e., visualizations, elaborative rehearsal, self-testing, active study strategies). Such strategies represent more active, adaptive forms of problem-focused coping (Akgun, 2004; McInerney, 2011; Zimmerman & Schunk, 2008; 2011) and were the most appropriate fit for the proposed model.

Prior assessment and research investigations find the LASSI inventories have strong predictive validity toward high school and college achievement outcomes (Cano, 2006; Crede & Kuncel, 2008; Flowers et al., 2011; Lawson, 2009; Marrs et al., 2009; Nist et al., 1990; West & Sadoski, 2009). The results from this study revealed the LASSI-HS indicators also lacked any meaningful association with first-year college GPA in this sample population. Specifically, active coping strategies (i.e., visualizations, self-testing, elaborative rehearsal, active study

strategies) were relatively unrelated to first-year student GPA, and failed to moderate the impact of anxious appraisal on first-year student achievement – contrary to the research (Karpicke et al., 2009; Marrs et al., 2009; Phinney & Haas, 2003; Plant et al., 2005; Robbins et al., 2004; Schmitt et al., 2007; Zimmerman, 2000; 2004). Research indicates that these active forms of coping serve an adaptive function, utilized as needed in response to academic challenges and task demands (McInerney, 2011). This is particularly true for at-risk students who use proactive self-regulatory strategies – or active coping skills (i.e., problem-solving, using resources) – in response to academic-related stress, mitigating the negative impact of academic-related stressors (Phinney & Haas, 2003).

Motivational regulation (comprised of LASSI-HS Motivation subscale indicators) was associated with first-year GPA, though the effect was minimal. Although statistically significant, the results indicated motivational regulation had a weak moderating effect in the influence of student anxious appraisals on first-year student achievement outcomes. Overall, motivational regulation positively influenced this relationship. When motivational regulation was relatively low, anxious appraisals negatively impacted first-year student GPA. However, with increasing degrees of motivational regulation, this mitigated the influence of anxious appraisals on first-year student GPA.

The positive influence of students' motivational states on academic achievement has consistently been confirmed by the body of research (Allen et al., 2008; Crede & Kuncel, 2008; D'Lima et al., 2014; Lei, 2010; Marrs et al., 2009; Robbins et al., 2004; Yip, 2007; 2009), in some cases suggesting motivation is a better predictor of achievement compared to indicators of student study strategy and time management (Crede & Kuncel, 2008; Marrs et al., 2009). This may explain the statistically significant mitigating impact of motivation regulation in the

proposed model when such an effect was not observed testing the role of active coping strategies. Motivational regulation is believed to be the driving force behind student academic activity (Schunk et al., 2008) and effective study strategy use (Prat-Sala & Redford, 2010; Vansteenkiste et al., 2004; Wolters, 1998). Therefore, motivational regulation may well serve as a meaningful contributor to student outcomes by initiating and sustaining effort toward meeting achievement goals (Schunk et al., 2008; Zimmerman, 2011; Zimmerman & Schunk, 2008) at which point active coping strategies would become relevant (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987; Pintrich & Zusho, 2002; Prat-Sala & Redford, 2010; Vansteenkiste et al., 2004; Wolters, 1998; Wolters et al., 2011; Zimmerman, 2011).

Implications and Contributions to the Research

The LASSI (Weinstein & Palmer, 1990; 2002; Weinstein et al., 1987) is a widely used assessment tool in academia for evaluating student behavioral study patterns, cognitive abilities and affective states. It also is often utilized in investigations attempting to predict student success outcomes. A number of studies (Cano, 2006; Prevatt et al., 2006; Stevens & Tallent-Runnels, 2004; Yip, 2012) have challenged the theoretically-derived broad domains (skill, will, self-regulation) believed by the authors of the LASSI to describe specific student abilities (Weinstein & Palmer, 1990; 2002; Weinstein et al., 1987). According to their conceptualization, self-regulation represents one latent factor comprised of student abilities in time management, self-testing, concentration and study aids, whereas the other subscales best represent the skill and will domains. After factor analyses prompted modifications to select proposed latent variables, the results from this study offer a new perspective that informs future lines of research in self-regulated learning (SRL). The findings indicate the factor solution for variables associated with SRL do not clearly align with the Weinstein and Palmer (1990; 2002)-identified self-regulation

domain. Instead, four distinct components appear to be relevant for SRL: motivational regulation, cognitive abilities (i.e., comprehension monitoring, concentration), volitional abilities (i.e., visualizations, self-testing, active study strategies, elaborative rehearsal) and time management. This finding is consistent with the Zimmerman and Schunk conceptualization of SRL (2008; 2011; Zimmerman, 1989; 2000) that is composed of a) cognitive abilities, b) volitional strategies and c) motivational regulation. Their framework further suggests time management skills are an additional distinct ability key to SRL whereby learners are self-directing and proactive in their study and learning efforts while utilizing their time efficiently to best accomplish their learning tasks and goals (Zimmerman, 1989; 2000; 2002; Zimmerman & Schunk, 2008; 2011). These results may provide insight to researchers intending to utilize the LASSI-HS measure in future investigations of student SRL. It is imperative that caution is taken in such investigations and researchers should examine the latent structure of the LASSI-HS to ensure it adequately represents the sample population under study. The results presented here and by other lines of research (Finch et al., *in press*) suggest researchers should investigate the LASSI-HS subscales at both the item-level for subscale representation and the overall latent structure to reap the most benefit in their analyses procedures and interpretation of results.

Although the results did not bear out in providing a meaningful comprehensive model to predict first-year college achievement, the results do highlight that a collective of background factors played an influential role in student anxious appraisals and are associated, albeit minimally, with academic achievement. Consistent with assertions by Bandura (1986; 1997; 1999) and Snow et al. (1996), multi-factor investigations are necessary in pinpointing those variables most salient to student success in college. Research widely supports the need to recognize the influence of these factors on entering college students as background variables can

influence student performance particularly for academically at-risk populations (Bean, 1990; Johnson et al., 2004-2005; Keup, 2004; Scherer & Anson, 2014; Tinto, 2006).

This study highlights the reality that assumptions made about traditional college success predictors (i.e., prior achievement) based upon even the most robust of research findings can be futile in some cases, failing to yield similar results on comparable variables. A preponderance of prior research suggested significant and robust relationships existed among a number of the variables of interest to this study. Yet, the results from this study offer little evidence in support of these relationships. Consequently, institutions of higher education should investigate the value of chosen diagnostic indicators employed for predicting student success outcomes. Although the absence of predictability in first-year student GPA in this study is surprising, it may illustrate a significant issue in postsecondary education in general, or perhaps specifically at the institution in the current study. Academic institutions may be plagued with the learning culture described by Arum and Roska (2011), whereby even standard predictors of a student's potential for success in college may be futile in determining actual success while enrolled at the institution. Research has illuminated (Arum & Roska, 2011; Arum et al., 2011) and confirmed (Pascarella et al., 2011) recent trends indicating a low-demand and low-output learning culture exists wherein students receive grades that do not accurately reflect student effort and cognitive skill. Students also may become disengaged from their learning environment or employ task-avoidant behaviors (e.g., procrastination) instead (Akgun, 2004; Bryson & Hand, 2007; Chang, 1998; Lazarus, 1993a; Lazarus & Folkman, 1984), which may not necessarily be reflected in the final grade outcomes but is nonetheless detrimental to their learning (Arum & Roska, 2011; Arum et al., 2011; Pascarella et al., 2011). If these problems persist, there are long-term consequences. As Arum & Roska (2011) found, many graduates from the academically adrift cohort entered the workforce

and civic life ill-prepared for the demands of the reality which they find themselves in and experienced difficulties adjusting.

Limitations of the Study and Directions for Future Research

A number of limitations in the current study are worth noting. First, this study took a rather global approach in testing model fit including the affective and study and learning variables across nine years of student enrollment. Doing so potentially masks intergroup differences that may exist on self-regulatory and affective measures. It is possible unique behavioral and affective patterns exist for particular groups of students. Research comparing male and female first-generation students within diverse ethnic groups reveals significant differences exist among the multitude of demographic variations (Kirkland, 2010). Other research suggests that students from diverse demographic groups perceive potential challenges to academic success uniquely and demonstrate differing degrees of self-regulated learning strategy use (Heller & Cassady, 2015; Heller & Marchant, 2015). Future work may benefit by examining additional group differences, such as declared major. Students entering the postsecondary institution declaring particular majors (e.g., chemistry) may potentially engage in qualitatively different courses or simply possess personal characteristics, levels of motivation and study habits that distinguish them from students in other degree programs (e.g., general studies; Holland, 1997; Pike, Smart, & Ethington, 2012; Smart & Feldman, 1998).

Potential differences could also exist among students who entered the institution at different time points, resulting in cohort effects (Campbell & Stanley, 1971). Although cohort effects were minimized in this study via the broad inclusion of nine years worth of student data, this approach may also confound possible differences among cohorts that differentiate them from others in meaningful ways. Overall, the potential exists for influences at the subgroup level to

play a significant role within any true comprehensive investigation of factors associated with first-year college student achievement. Future research is warranted in this area to investigate differences between particular subgroups of students to determine if different patterns exist that may separate select student groups from others in meaningful ways. Additionally, examination of each student cohort and comparison to specific institutional changes may prove valuable to the institution in discovering the impact of particular interventions or implemented policies designed to improve teacher effectiveness or student success rates.

The present study only targeted first-year student achievement. A few challenges arise from such an approach. First, the use of first-year GPA may not provide enough of an “achievement” picture for true relationships among achievement outcomes and learning and study strategy variables to be revealed. Research has found that while they are statistically significant predictors of first-year college achievement, affective states, and learning and study strategies become more important in student performance and achievement after the first year (Kitsantis et al., 2008). Arum and Roska (2011) also found that rather small differences initially observed among diverse SES and ethnic groups in learning and study strategy use during the first year of college widened significantly by the fourth year and contributed to the variations observed in achievement outcomes. Other research indicates students can develop their self-regulatory skills over time with practice and instruction (Berthold et al., 2007; Heller & Marchant, 2015; Nückles et al., 2009). The collection of the anxious appraisals, motivational regulation, and active coping strategies only one time limits the potential for examining change over time in these factors and their adjusting impact on college achievement outcomes. Furthermore, the timing of the assessment (prior to beginning coursework) may not best reflect the true nature of active coping strategies over the duration of the academic year measured in this

study. Although research demonstrates students' indications of behavioral study skills and patterns maintain predictive validity in first-year achievement (Crede & Kuncel, 2008), research also shows that certain students may not hold an accurate or realistic view toward college-level work and expectations (Smith & Wertlieb, 2005; Tinto, 2001). Therefore, the potential exists for reported levels on these subscales to not adequately represent their true behavior under normal conditions over the first-year of college study. Therefore, future research would be bolstered with follow-up assessment procedures to measure change over time and utilize results gathered at the conclusion of the first year to examine adjustments in anxiety appraisals, motivational regulation, and active coping strategies. It is possible that these data collected after significant time in the new academic context may provide more direct impact on first-year GPA. Longitudinal designs may prove fruitful in better explaining both the nature of these relationships and the influence of these factors across the students' complete academic career at the institution.

The original research plan aimed to include all LASSI-HS subscales in the investigation; however, it was necessary to abandon that plan. This constricted the potential for discovering meaningful results associated with those particular subscales not included. Future investigations should examine the role of these factors, most specifically Time Management and Negative Attitude to Learning, two factors moderately related to other variables in the present study. Time management comprises another element of self-regulated learning that has been well-documented as an important factor contributing to student achievement (Bembenutty, 2008; George et al., 2008; Kitsantis et al., 2008; Schmitz & Wiese, 2006), and in some cases is more predictive of student GPA than traditional achievement predictors (i.e., H. S. GPA, SAT scores; Crede & Kuncel, 2008; Kitsantis et al., 2008). Although research regarding negative attitudes

toward the learning environment is sparse, this factor also appears to influence academic achievement outcomes (Albaili, 1997; Chang et al., 2011; Chemers et al., 2001; Gerardi, 2006; Schiefele, 1991). Thus, future research investigations should direct attention toward the potential influence of these two particular variables on college student achievement outcomes.

Another possible avenue for future research into the impact of student behaviors should investigate the role of overall student academic engagement, or the dynamic interaction between the student and their learning environment (Bryson & Hand, 2007). Although students provided self-report information regarding those specific academic behaviors they typically utilize in meeting course demands, the frequency and effectiveness to which these are incorporated within the learning environment are less understood. Research suggests students' cognitive growth in college and academic success is frequently dependent upon their degree and frequency of academic engagement (Arum & Roska, 2011; Kraus, 2007; Kraus & Coates, 2008; Pascarella & Terenzini, 2005). Yet, this particular construct was not assessed by the LASSI-HS. Some lines of research speak to the importance of encouraging student engagement during the first-year in college (Bovill, Bulley, & Morss, 2011; Tinto, 2006); therefore, future research investigations seeking to understand the influence of student academic-oriented behaviors within the educational environment should devote specific attention to degree of student engagement.

Lastly, the present study investigated the role of problem-focused coping strategies (i.e., active coping) in achievement outcomes. Although problem-focused coping is important in explaining the relationship between responses and outcomes, this investigation neglected to explore the potential influence of emotion-focused coping, also considered important to explaining such relationships (Folkman et al., 1986; Folkman & Lazarus, 1985; Lazarus, 1993a; Lazarus & Folkman, 1984). Problem-focused coping was of particular interest to this study as it

is believed to be the most adaptive form of active coping, facilitating more favorable outcomes (Lazarus, 1993a; 1993b; Lazarus & Folkman, 1984; 1987). For this study, behavioral strategies directed at effectively addressing demands present within the educational environment were key to the research questions in this investigation. Furthermore, the LASSI-HS survey instrument does not adequately assess constructs associated with emotion-focused coping abilities. As research indicates emotional-coping responses to stress appraisals can influence outcomes as well (Saklofske, Austin, Mastoras, Beaton, & Osborne, 2012), future research should examine the role emotion-focused coping plays in first-year student achievement.

Conclusion

Institutional assessment offers several avenues to investigate the myriad of factors that contribute to student success in postsecondary education. A wide body of research emphasizes the critical nature of gathering information on those students applying and enrolling at the institution as such data can direct student prevention and intervention measures intended to increase successful achievement outcomes. Factors such as a student's record of performance (i.e., H. S. GPA, college entrance exam scores), demographic profile (i.e., gender, ethnicity, first-generation status) in addition to affective and study and learning patterns can provide valuable insight into the types of individuals who will navigate their educational paths at the given institution. Therefore, a comprehensive appreciation of student characteristics is needed for better understanding of the student population and the relative influence these factors have in student first-year achievement outcomes.

The current study attempted to provide a new model aimed at predicting first-year college success through including a comprehensive examination of the relationships among student pre-existing personal factors, stress-appraisals and coping responses. The findings from this study

failed to support any meaningful model explaining the influences of these relationships and their impact on first-year achievement. Although some statistically significant relationships were observed and provided evidence that background factors, prior achievement, anxious appraisals and self-regulated learning are associated, their influence was minimal and offered little practical utility in explaining first-year student achievement. Contrary to the body of research, the results found little influence of student background, prior achievement, affective states and self-regulated learning on first-year student achievement. This atypical finding seemed to be due primarily to the first-year student GPAs, and suggests attending to concerns related to the evaluation of student performance and achievement in the first year of college (at least at the institution in question). Exploration of this pattern with additional performance and student typology data may guide institutional decision making related to student selection, program rigor, or evaluation practices.

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Appendix A

LASSI-HS items:

1. I worry that I will fail my classes
2. I can tell the difference between more important and less important information my teacher tells me
3. I find it hard to stick to a study schedule
4. After a class, I look over my notes to help me understand the information
5. I don't care if I finish high school as long as I can get a job
6. I find that when my teacher is teaching I think of other things and don't really listen to what is being said
7. I use special study helps, such as italics and headings, that are in my textbook
8. I try to identify the main ideas when I listen to my teacher teaching
9. I get discouraged because of low grades
10. I am up-to-date in my class assignments.
11. Problems outside of school--dating, conflict with parents, etc.--cause me not to do my homework.
12. I try to think through a topic and decide what I am supposed to learn from it rather than just read it over when doing schoolwork.
13. Even when study materials are dull and not interesting I manage to keep working until I finish.
14. I feel confused and undecided as to what my educational goals should be.
15. I learn new words or ideas by imagining a situation in which they occur.
16. I come to class unprepared.
17. When studying for an exam, I think of questions that might be on the test.
18. I would rather not be in school.
19. The notes I take as I read my textbooks are helpful when I review textbook material.
20. I do poorly on tests because I find it hard to plan my work in a short period of time.
21. I try to think of possible test questions when studying my class material.
22. I only study when there is the pressure of a test.
23. I change the material I am studying into my own words.
24. I compare class notes with other students to make sure my notes are correct.
25. I am very tense when I study.
26. I look over my notes before the next class.
27. I have trouble summarizing what I have just heard in class or read in a textbook.
28. I work hard to get a good grade, even when I don't like the class.
29. I often feel like I have little control over what happens to me in school.
30. I stop often while reading and think over or review what has been said.
31. Even when I am very well prepared for a test, I feel very upset when taking it.
32. When I study a topic I try to make the ideas fit together and make sense.
33. I talk myself into believing some excuse for not doing a homework assignment.
34. When I study, I have trouble figuring out just what to do learn the material.
35. When I begin a test, I feel pretty sure that I will do well.
36. I check to see if I understand what my teacher is saying during a class period.
37. I do not want to learn a lot of different things in school. I just want to learn what I need to get a good job.
38. I am sometimes unable to keep my mind on my schoolwork because I am restless or moody.
39. I try to find connections between what I am learning and what I already know.
40. I set high standards or goals for myself in school.
41. I end up 'cramming' for almost every test.
42. I find it hard to pay attention during class.
43. I key in on the first and last sentences of most paragraphs when reading my textbooks.

44. I only study the subjects I like.
45. I am distracted from my studies very easily.
46. I try to find connections between what I am studying and my own experiences.
47. I make good use of study hours after school.
48. When work is difficult I either give up or study only the easy parts.
49. I make drawings or sketches to help me understand what I am studying.
50. I dislike most of the work in my classes.
51. I have trouble understanding just what a test question is asking.
52. I make simple charts, diagrams, or tables to pull together material in my classes.
53. While I am taking a test, worry about doing poorly gets in the way of keeping my mind on the test.
54. I don't understand some class material because I do not listen carefully.
55. I read textbooks assigned for my classes.
56. I feel very panicky when I take an important test.
57. When I decide to do schoolwork, I set aside a certain amount of time and stick with it.
58. When I take a test I realize that I studied the wrong material.
59. It is hard for me to know what is important to remember in a textbook.
60. I pay attention fully when studying.
61. I use the chapter headings as a guide to find important ideas in my readings.
62. I get so nervous and confused when taking a test that I don't answer questions to the best of my ability.
63. I memorize grammatical rules, technical terms, formulas, etc., without understanding them.
64. I test myself to be sure I know the material I have been studying.
65. I put off schoolwork more than I should.
66. I try to see how what I am studying would apply to my everyday living.
67. My mind wanders a lot when I do schoolwork.
68. In my opinion, what is taught in my classes is not worth learning.
69. I go over homework assignments when reviewing class materials.
70. I have a hard time knowing how to study for different types of subjects.
71. Often when doing schoolwork I seem to get lost in the details and can't remember the main ideas.
72. When they are available I go to study or review sessions.
73. I spend so much time with my friends that my schoolwork suffers.
74. In taking tests, writing themes, and other schoolwork, I find I have not understood what the teacher wants and lose points because of it.
75. I try to make connections between various ideas in what I am studying.
76. I have a hard time finding the important ideas in my reading.