

## ABSTRACT

Title of Dissertation:       REFRAMING RESPONSIBILITY FOR ACADEMIC  
                                      SUCCESS: A CAUSAL MODEL MEASURING THE  
                                      IMPACT OF STUDENT ATTRIBUTES IN THE FIRST  
                                      YEAR OF COLLEGE

Michele C. Murray, Doctor of Philosophy, 2006

Dissertation Directed By:   Jeffrey F. Milem, Ph.D.  
                                      Department of Education Policy and Leadership

The purpose of this single-institution study was to investigate the predictive power of student attributes in a path analytic model for academic success in the first year of college. Student attributes were defined as academic self-concept, social self-concept and self-determination; academic success was measured by cumulative college grade point average. The conceptual model tested in this study blends psychological theories of student attributes with Astin's (1991) *input-environment-outcome* (I-E-O) model, a sociological model of college impact. Using descriptive and path analytic techniques, this study contributes to assessment philosophy by demonstrating that student attributes predict academic success beyond what can be explained by prior achievement and involvement.

By examining the contributions of student attributes to academic and social involvement and to subsequent achievement, this study describes higher education as a partnership between student and institution for which both have responsibility. The findings of the study suggested at least three conclusions. First, accounting for student attributes contributes to an understanding of academic success. Rather than focus on the institution's responsibility to engage students, this study demonstrates that academic and

social involvement and achievement are products, at least in part, of students' academic self-concept and self-determination. Second, results from this study indicate that measurable change in student attributes occurs during one year, a portion of which is attributable to students' academic and social involvement. These findings substantiate previous research on the impact of involvement on students' personal development (Astin, 1994; Berger & Milem, 1999) and affirm the benefits of college attendance. Third, this study demonstrates that the effects of the environment within the classic I-E-O model (Astin, 1991) are mediated through academic self-concept.

These findings reframe responsibility for student success by highlighting students' dispositions toward the academic enterprise as the strongest predictor of involvement and success. Consequently this study offers a different perspective of students' academic and social involvement. Rather than referring to involvement as an indication of the environment (Astin, 1994; Kuh, 1991), this study suggests that involvement behaviors are a measure of students' responsibility toward their collegiate experiences. The findings of this study have implications for future research, practice, and policy.

Reframing Responsibility for Academic Success:  
A Causal Model Measuring the Impact of Student Attributes  
in the First Year of College

by

Michele C. Murray

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Advisory Committee:

Associate Professor Jeffrey F. Milem, Chair  
Associate Professor Robert G. Croninger  
Associate Professor Sharon L. Fries-Britt  
Assistant Professor Karen Kurotsuchi Inkelas  
Associate Professor Marylu K. McEwen

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## DEDICATION

For my parents, Dwight and Elodie Murray, who have always encouraged me.

and

For my husband, Chris Lewers, who helps me believe that anything is possible.

## ACKNOWLEDGEMENTS

Many people say that writing a dissertation is a lonely, solitary project...well, they are only partially correct. I am grateful for all the supporters who have surrounded me these many months—each one has made this arduous task endurable and even enjoyable.

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for all they have added to my life and look forward to celebrating the many accomplishments I know will be in their futures.

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I would also like to thank the many students who have shared their journeys with me. This study was inspired by their stories, and I feel privileged to have been even a small part of their collegiate experiences. They have taught me so much.

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## CHAPTER I

### INTRODUCTION

For over 30 years, higher education researchers have measured the effects of college attendance on students' intellectual, social and psychological development. Spurred by increasing scrutiny from state and federal lawmakers, college impact studies respond to calls for institutional accountability (Pace, 1984; Terenzini, 1994). Specifically, on-going debates over effective spending of public funds have compelled leading theorists (Astin, Kuh, Pascarella, and Terenzini, for example) to explain not only how students benefit from their academic and co-curricular experiences, but also how colleges and universities are uniquely poised to deliver these benefits. As a result, many higher education studies focus on the impact of specific programs, facilities, or other institutionally controlled environmental factors on educational outcomes, such as retention, achievement, and psychological or cognitive development.

#### Common Assumptions in College Impact Studies

The most cited model for studying college impact is Astin's (1993, 1991) *Input-Environment-Outcome* (I-E-O) model, which measures the effects of the college environment on educational outcomes while controlling for students' background characteristics at the time of entry. The I-E-O model assists the higher education community in understanding how particular interventions, such as academic advising or residence hall communities, influence outcomes, such as grades, satisfaction, or retention. Astin (1993) asserted that the best institutional metaphor for understanding higher education is the hospital. In this schema, Astin likened college students to patients



(input) who undergo some form of medical treatment (environment) in order to overcome illness (outcome). Similarly, he argued, students enter their college or university of choice, participate in the educational environment supplied by the institution, and graduate four years later better than they were when they entered. Although Astin acknowledged the major difference between college students and hospital patients, namely college students are not typically ill, he missed an obvious hole in his metaphor. In Astin's analogy, patients (the student substitute) are passive recipients of treatment. Students, unlike patients whose treatments are at the mercy of medical staff, have a particular influence over their experience such that the extent of their involvement in the academic and social environments is a function of their own determination. In other words, as autonomous beings, college students have a certain authorship over their own intellectual and social experiences—they decide if, when, and how to engage their educational environment. In fact, Astin's (1984) own theory of student involvement acknowledges that the "amount of physical and psychological energy that the student devotes to the academic experience" (p. 297) is crucial to understanding how the college environment affects student development.

Astin's hospital metaphor for higher education focuses on the institution as owning primary responsibility for the educational process, which is congruent with the public's expectations. Sentiments of students, their parents, and the public-at-large correspond with Astin's (1985) assertion that the burden of the educational process falls on the institution. In fact, an entire cottage industry of ranking colleges and universities exists based on the belief that institutional resources are the ultimate predictors of educational quality. Entities, the most prominent of which is *U.S. News & World Report*,

have carved a niche for themselves by proclaiming to measure institutional excellence. By using institutional resources as proxy measures for educational quality, these rankings purport to list colleges and universities from best to worst in terms of the education they deliver to students.

Although these ranking systems claim to determine institutional quality, Astin (1985) has opposed their resource-dependent approach. Instead, Astin has supported talent development as a more accurate assessment of educational excellence. According to Astin, the true measure of quality or excellence lies in the institution's ability to enrich students' intellectual development, such that students demonstrate cognitive growth and improvement over the course of their undergraduate program. Truthfully, every institution is beholden to make a good-faith effort toward providing the most stimulating environment possible. However, the conversation about excellence in higher education and even Astin's influential talent development overlook an influential variable in the equation: the attributes students bring to bear over their own collegiate experiences.

#### Accounting for Attributes as a Factor of Student Success

Measuring environmental factors controlled, manipulated, or planned by the institution does not account for differences in personal authorship on the student's part. Intuitively, participants in higher education believe educational outcomes are directly related to the effort students expend toward their own college experience. Nevertheless, college impact studies often cite inability to account for students' personal responsibility as a serious limitation to our understanding of how students achieve particular outcomes (Hernandez, Hogan, Hathaway, & Lovell, 1999). The result of this limitation is the

unintended impression that higher education is either a process institutions perform on students or even a brand-name commodity available for student purchase.

In their study of effective educational practices, Kuh, Kinzie, Schuh, and Whitt (2005) concluded that the best institutions “induce students to assume responsibility for their own learning” (p. 167). Furthermore, Kuh et al. suggested that the institution and the student share responsibility for engagement. In terms of shared responsibility for students’ academic success, the institution invests human and financial resources whereas the student invests time and energy (Upcraft, Gardner, & Barefoot, 2005). Finally, experience indicates involvement is an interactive arrangement that depends, at least in part, on the student and how he or she chooses to approach the collegiate experience.

Consider the following advice Brian Maraña, a member of the baccalaureate Class of 2004, gave to first-year students entering his *alma mater* in fall 2004. In an opinion he wrote for the summer orientation edition of his college’s student newspaper, Maraña (2004) counseled new students:

I have three main pieces of advice for all of you: take charge, get involved and challenge yourself. I managed to accomplish more than I could have imagined here. I took some really interesting classes, I organized some pretty big events and I made some incredible friendships. I attribute a lot of that to the fact that for the most part, I didn’t sit around waiting for things to happen.

I took charge of my academic life by knowing what courses were required, and I sought advice when I didn’t know what to do....Take charge of your extracurricular life by getting involved. Being involved allowed me to be more than just a student—it allowed me to explore who I am as a person.... Find what

you like and dislike, and as you progress through college, you'll really be able to focus on those things about which you are passionate. However, in order to find your passions, you need to challenge yourself. Stretch your mind....Get out of your comfort zone.

I might summarize everything I've been trying to say by urging you not to take your time here for granted. You are entering a time of unparalleled freedom and opportunity. Don't throw it away. Use the freedom you have to take advantage of all the opportunities [this institution] provides to grow intellectually, socially, emotionally, physically, and spiritually. Take charge. Get involved.

Challenge yourself. (p. 5)

In a few short paragraphs, Maraña's wisdom echos the conclusion Pascarella and Terenzini (2005) drew upon completing their meta-analysis of a decade's worth of college impact research: Student involvement promotes growth.

Clearly previous research (Berger & Milem, 1999; Hernandez et al., 1999; Huang & Chang, 2004; Milem & Berger, 1997) indicated that the institutional environment does influence intellectual and social development, but the role each student plays in shaping his or her own educational outcomes is less understood. Stakeholders, such as policymakers, tuition-paying students and families, employers, and accreditation agencies, have vested interests in ensuring the efficacy of a college or university's educational program. However, using performance-based assessment to judge college impact may not produce an accurate account of institutional effectiveness. It is necessary, then, to consider and control for student attributes influencing involvement. Unless these measures are included in outcomes assessment, the likelihood of achieving a

true understanding of institutional impact seems slim (Stage, 1989). Holding institutions accountable for their educational processes makes sense only if outcomes assessment controls for, or simultaneously measures, the student's role in becoming an active learner.

Engagement in the educational enterprise is a behavior that can be expressed as a function of the interaction between person and environment (Lewin, 1936). Research focusing on the student's role in the educational process raises awareness that education is not a commodity for purchase; rather it is a partnership between student and institution for which both parties have responsibility. A shift in research focus toward the student's responsibility for learning begins to hold students accountable for their educational investment (Pace, 1984). Therefore, the purpose of this research was two-fold. First, this study was designed to explore and understand how student attributes and the institutional environment affect one another in a causal model and how each contributes to academic success, as measured by cumulative grade point average. Second, this study sought to understand how student attributes change over time and how the institutional environment affects that change.

#### Theoretical Frameworks:

##### Student Attributes and Involvement

Through decades of research, much is known about the effects of college attendance on students' cognitive, behavioral and psychological growth (Pascarella & Terenzini, 1991, 2005). Furthermore, in their exhaustive appraisals of college impact studies, Pascarella and Terenzini (1991, 2005) found very little disparity between institutional environments in their ability to affect students. Instead, the real differences

in outcome measures were found within each institution and were attributable to variations in individual students' experiences. In addition, Astin's theory of involvement (1984) suggested that learning is directly related to college students' investment of physical and psychological energy. However, very little is known about the effects of student attributes, or the dimensions of self-concept, self-determination, and self-efficacy on student involvement, which, as Astin suggested, influences educational outcomes.

### *Self-determination and Self-efficacy Theories*

Generally, the student's personal influence over outcomes is an acknowledged missing link in college impact literature (Hernandez, et al., 1999). To rise above this shortcoming, Stage (1989) recommended adding to college impact models those psychological dimensions that represent student development over time. The discipline of psychology offers several interesting concepts for consideration: self-concept, self-determination (Deci & Ryan, 1985; Ryan & Deci, 2000, 2002), and self-efficacy (Bandura, 1977, 1982, 1997).

Self-concept conveys a student's estimation of his or her own abilities in comparison to those of the peer group. Self-concept can be used as a global term, or it can be divided into discrete, domain-specific areas of interest (Waugh, 2001), such as artistic ability, math/science ability, or leadership ability. For the purposes of this study, self-concept refers to academic and social self-concept.

Deci and Ryan (1985) have proposed that a person's ability to act on his or her own behalf exists on a motivation continuum ranging from a-motivation, through four levels of extrinsic motivation, and finally reaching intrinsic motivation. According to

Deci and Ryan, a person's place along the motivation continuum depends on his or her level of self-determination, which in turn is governed by feelings of competence, autonomy, and relatedness. Examining self-determination contributes to a better understanding of what responsibility belongs to the student in achieving educational outcomes.

Self-efficacy theory (Bandura, 1977, 1982, 1997), on the other hand, suggests that a person's expectations for success predict achievement. According to Bandura, people appraise their own abilities based on four environmental cues: prior performance, observation of others, verbal persuasion from a trusted other, and their emotional state at the time of appraisal (i.e., the emotional state affects one's confidence in his or her abilities). Together with measures of self-concept and self-determination, self-efficacy contributes to our understanding of a student's ability to interact with his or her collegiate environment and to experience academic success.

### Definition of Key Terms

This study relies on concepts and terms that may be unfamiliar to the reader. The following are definitions of key terms that appear throughout the study.

*Academic Self-concept:* Students' self-evaluative ratings of their ability in several academic domains comprise "academic self-concept." These ratings are relative to students' perceptions of peer ability.

*Academic Success:* This term refers to the outcome measure for this study. While numerous valid constructs exist for academic success in the first year (Upcraft, Gardner, & Barefoot, 2005), this study focuses on cumulative grade point average at the end of the first year.

*Effort:* In his work with the College Student Experiences Questionnaire (CSEQ), Pace (1984) defined student effort as a quality measure detailing “how students use the major resources and opportunities for learning and personal growth that are provided by the college for that purpose” (p. 10). For the purposes of this study, student effort refers to time-on-task engagement in the academic environment as well as quality of intellectual and social involvement.

*Involvement/Engagement:* Student involvement “refers to the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1984, p. 518). During the undergraduate experience, the physical and psychological energy a student expends affects his or her ability to engage in the academic or intellectual atmosphere, to develop relationships with faculty and peers, and to engage in the co-curricular life of the institution (Pace, 1984). For the purposes of this study, the terms “involvement” and “engagement” are used interchangeably.

*Self-determination:* Germane to this study, self-determination refers explicitly to the theory posited by Deci and Ryan (1985). Specifically, self-determination describes a person’s ability to act of his or her own volition and intrinsic motivation. Self-



determination is related to and encompasses a person's feelings of autonomy, competence, and relatedness.

*Self-efficacy:* Taken from the psychology literature, self-efficacy is one's self appraisal of personal mastery and the ability to perform given cognitive and behavioral functions (Bandura, 1977, 1982).

*Student Attributes:* "Student attributes" describes those psychological dimensions that influence the extent to which a student takes responsibility for how he or she engages the collegiate experience, academically and socially. For the purposes of this study, the concepts of self-determination, self-efficacy, and self-concept comprise student attributes.

*Social Self-concept:* Similar to academic self-concept, social self-concept refers to students' self-ratings of their interpersonal skills and abilities, relative to those of their peers.

### Purpose and Research Questions

This study describes higher education as a partnership between student and institution for which student and institution have responsibility. Therefore, the purposes of this study are two-fold: (a) to explore how initial student attributes shape student engagement with the institutional environment and how the institutional environment influences subsequent student attributes; and (b) to understand how student attributes and institutional environment contribute to academic success, as measured by grade point

average at the end of the first college year. Using path analysis to measure the direct and indirect effects of student attributes, this study proposes a causal model of academic success. The following research questions guide the study.

1. What changes in student attributes occur during the first year of college, and what environmental factors influence these changes?
2. Controlling for student background characteristics, how do initial student attributes influence academic and social involvement in the first year of college?
3. Controlling for student background characteristics and student attributes at Time 1, how do academic and social involvement impact subsequent student attributes and academic success?
4. After controlling for student background characteristics and academic and social involvement, what are the direct and indirect effects of student attributes, as measured by self-determination, self-efficacy, and self-concept, on the academic success of first-year college students?
5. Which student attributes construct (i.e., self-efficacy or self-determination) is a better predictor of academic success in the first year?

### Research Design

This research utilized longitudinal data for first-year students at a Jesuit-Catholic, comprehensive university in the mid-Atlantic region. The pretest included data from the institution's participation in the Cooperative Institutional Research Program (CIRP) and responses to an adaptation of Ryan and Deci's (2002) Basic Psychological Needs Scale

(BPNS) to measure self-determination. The institution administered these surveys simultaneously in September, 2004. The posttest consists of institutional data gathered simultaneously from Your First College Year (YFCY), the one-year follow-up to CIRP, and a second administration of the BPNS in April, 2005. Student responses to all four surveys were matched to create the final longitudinal panel.

Three major advantages suggested situating this study in Jesuit higher education. First, different environmental factors such as size, location, and control can lead to variations in student behavior (Baird, 1988; Barker, 1968; Upcraft & Gardner, 1999). By composing a single-institution study, environmental factors are suppressed so as to place greater emphasis on the contribution of student attributes toward academic success. Second, Jesuit higher education has foundational principles that are congruent with Kuh's (1991) definition of "involved colleges." As this research focuses on the effects of student attributes on educational outcomes, necessity dictates locating an institution of the type already acknowledged as having an environment that is effective at promoting student engagement. Third, the target institution supports 15 of the 20 initiatives and programs that contribute to excellence in the first year of college (Barefoot, Gardner, Cutright, Morris, Schroeder, Schwartz, Siegel, & Swing, 2005).

### Limitations

Although the design has strengths, it also presents limitations. First, the particularized locale for the study may not produce widely generalizable results. Single-institution studies limit generalizability to students attending similar institutions (Creswell, 2003). Therefore I do not expect the results of this study to represent college

students nationwide. In addition, this research examined traditional-aged, first-year students, so results are further limited to exclude adult students and students in their sophomore through senior years. Furthermore, participating students at the target institution did not reflect the racial composition of college students nationwide (at this particular institution, the Class of 2008 was 87% White), so the ability to generalize results to first-year students of color at similar institutions is limited at best.

Second, the data gathered in this study are self-reported by students. The limitations associated with self-reported data, including the possibility of inaccurate self-assessment, are well documented (Schwarz, 1999). Third, the effects of student attributes or changes in student attributes may not be apparent within the first-year of college, the period of time covered by this study (Feldman & Newcomb, 1994; Pascarella & Terenzini, 1991; Terenzini, 1994). Finally, although path analysis will describe direct and indirect effects of student attributes within the proposed causal model, path analysis cannot confirm whether or not the proposed model describing causation is correct (Klem, 1995). Rather, path analysis indicated whether or not the proposed model fit the data (Klem).

Despite these limitations, this study was worth undertaking because student attributes are essential components to understanding the process of achieving academic success, as marked by cumulative grade point average at the end of the first year.

### Significance of Study

Although this study can not answer all questions, it has immediate implications for theory and practice. With regard to theory, the research questions guiding this study

are an important first step in explaining the student-environment interaction. This research contributes to our theoretical and conceptual understanding of higher education by providing a more complete model for outcomes assessment. Astin (1991) designed the I-E-O model specifically to investigate the role of educational environments in producing educational outcomes—but almost to the exclusion of understanding the student’s responsibility to engage in his or her own educational process. The conceptual model for this study is an I-E-O model because it accounts for student background characteristics and environmental interventions. However, guided by Lewin’s (1936) work to understand behavior as a function of the interaction between a person and his or her environment, the model adds student attributes as contributing factors in influencing student learning and development. Furthermore, the literature suggested that interaction with the environment impacts the person as well (Barker, 1968; Ryan & Deci, 2000). Given these observations, the conceptual model predicts student attributes to have direct effects on involvement and indirect effects on academic success, as mediated through the environment. Moreover, the model predicts academic and social involvement to have direct effects on student attributes at Time 2 and indirect effects on academic success.

Therefore, the conceptual model for this study represents student attributes twice, first as a measure of students’ entry characteristics, which influence how students interact with the environment, and second as an intermediate outcome, indicating that participation in the educational environment may change student attributes over time. These modifications represent a slight departure from Astin’s original I-E-O, such that measuring and evaluating the role of student attributes in educational achievement is tantamount to measuring and evaluating the impact of the environment.

This contribution to theory highlights the student's responsibility to engage the learning environment and presents a more balanced set of expectations for practitioners and policymakers to consider. Furthermore, research that explains the student's role in academic success will aid current and prospective students and their families to adjust their approach to higher education. Rather than students and parents relying solely on the institution to provide an excellent product, they can use this research to understand better the responsibility for educational excellence borne by the student.

With regard to contributions to practice, this study holds particular significance for the home university and other institutions like it. Results from this study suggest improvements for delivery of first-year programs, indicate sub-populations in need of additional assistance, and recommend educational efforts to inform students of expectations for engagement. Furthermore, results indicate markers of student attributes that predict academic success. In this case, there are significant implications for how the target institution and similar others evaluate prospective students for admission. Rather than relying so heavily on high school GPA and entrance exam scores, institutions may consider these indicators relative to the prospective student's ability to take responsibility for his or her own learning. Again, shifting the focus to student attributes has implications for prospective college students and their families with regard to how students prepare for a college education.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Introduction

The primary purpose of this study was to understand the contributions of student attributes toward academic success among first-year college students within a particular institutional environment. This chapter provides the theoretical framework for the study and its conceptual model. The following pages review and analyze theoretical and research literature related to academic success within the context of college impact studies. This chapter also provides a lengthy discussion of methods for understanding college outcomes, beginning with an overview of ecological models stemming from Lewin's (1936) work on the person-environment interaction. A discussion of Astin's (1991) input-environment-outcome (I-E-O) assessment model as the primary model of college impact (Pascarella & Terenzini, 2005) follows. The I-E-O model is the foundation for the conceptual model in this study. In addition, the chapter synthesizes the theoretical and research literature related to student attributes, including self-concept (Astin, 1993), and, from the field of psychology, self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000, 2002) and self-efficacy (Bandura, 1977, 1982, 1997). Astin's (1984, 1999) theory of student involvement and Pace's (1984) work on student effort round out the literature review. Finally, the chapter closes with a presentation of variables related to studying academic success in the first year of college.

## Understanding College Outcomes

The higher education community has been responding to external pressure to provide evidence that college provides benefits in proportion with public and private investments (Terenzini, 1994). Over the years, several genres of research approach or philosophy have emerged: the ecological-environmental approach, the college impact approach, and the approach examining the process of students' personal and psychological development. The spectrum of emphasis has waxed and waned between the three approaches in a manner reflective of societal needs (Baird, 1988; Feldman & Newcomb, 1994). The research presented here draws upon aspects of all three approaches, and the following section provides an overview of two of these approaches and how they shape the current study.

### *The Ecology of Person-Environment Interaction*

Coyne and Clack (1981) defined the environment as having four components: the physical environment, or that which people perceive through one or more of the five senses; the social environment, which describes person-to-person behaviors and relationships or the characteristics of people within the environment; the institutional environment, which relates to the policies and procedures governing the environment; and the ecological environment, which refers to the interaction of the three above-listed components. It follows then, that ecological approaches to studying student outcomes begin from the perspective that people and their environments have a reciprocal relationship. First, environments have the ability to shape the behavior of those who participate within them; second, people and their behavior shape and re-create the



environment (Coyne & Clack). Much of the person-environment interaction literature stems from the work of Lewin (1936), who first suggested that behavior is a function of the person-environment interaction. Lewin suggested that the behavior of individuals in particular environments could be represented mathematically. He offered the following equation to understand human behavior:  $B = f(P \times E)$ , “where  $B$ , the behavior, is the function ( $f$ ) of the organism or person ( $P$ ) interacting with the environment ( $E$ )” (Banning, 1989, p. 54). The different ecological theories endeavor to determine the appropriate balance between person and environment: Which is more prominent—the person or the environment?

### *Notable Ecological Theories*

Walsh (1973, 1978) reviewed several ecological theories that have influenced studies in higher education. These theories differ in their emphases along the person-environment continuum, such that some theories preference the person over the environment while the converse is true for others. Three of the major theories are reviewed briefly below to provide some background.

*Barker’s Behavior Setting Theory.* From the sociological perspective, Barker (1968) emphasized the environment over the person. He suggested that the environment first selects the people who inhabit it and then shapes their behavior regardless of individual differences. Barker’s theory was based on three assumptions: first, people generally adhere to the regulations and norms associated with an environment; second, the structured pattern of the environment dictates human interaction with one another and with the environment; and third, by measuring the forces of the environment and the

behavior of the people, one may be able to understand how the two interact (Walsh, 1978). Furthermore Barker differentiated between “undermanned” and “optimally manned” settings, where undermanned settings increase the involvement of their inhabitants by having too few people to manage regular operations. Walsh (1978) notes that people in smaller, or undermanned, settings tend to be more personally productive than those in optimally manned settings.

*Need x Press Culture Theory.* Blending sociological and psychological perspectives, Stern (1970) theorized behavior as a product of the relationship between the environment (press) and the person (needs). In Stern’s theory, the person represents needs, or the tendency toward specific behaviors (Walsh, 1978), that bump into the demands, or presses, of the environment. Need-Press Theory places equal emphasis on the person and the environment to describe behavior (Walsh).

*Holland’s Personality Theory.* Leaning much more heavily on psychology, Holland’s (1973) Personality Theory suggested that behavior results from an interaction between the environment and the personalities of those who inhabit it. Holland’s six personality types (as defined by differences in personal attributes) are related to behavioral differences and, ultimately for Holland, vocational choice. Furthermore, people select environments that fit or match their personalities, and a good person-environment fit leads to greater success.

Although the foregoing ecological theories do not play prominently or contribute substantially to the current study, it is helpful to keep them in mind as a backdrop for the current study. The ecological approaches do provide a perspective on the balance

between person and environment when attempting to describe or predict behavior. Furthermore, their emphasis on the person-environment interaction was the basis for suggesting psychological measures as an important addition to the standard college impact model.

### *Studying College Impact*

Pascarella and Terenzini (1991, 2005) divided studies of college student change into two families: developmental and college impact. Whereas developmental theories and models describe student movement through various stages of growth and maturation, college impact models “emphasize change associated with the characteristics of the institutions students attend...or with the experiences students have while enrolled” (2005, p. 18). This study builds upon college impact theory by adding psychological measures to Astin’s Input-Environment-Outcome model as the basis for studying student change.

### *The I-E-O Model: Astin’s Assessment Methodology*

The 1980s and 1990s brought increased scrutiny of higher education (Astin, 1991). State and federal legislators called for increased student assessment as a means to achieve greater accountability for colleges and universities. The call for accountability suggested a public distrust for the quality of education in the nation’s colleges and universities. Astin noted, “public pressures to use more competency testing or outcomes assessment reflects a concern about how much students are actually learning in our colleges and universities” (p. 4). Spurred by increasing public demand for accountability, Astin proposed a methodology for improving assessment in higher education.

With his text, *Assessment for Excellence*, Astin (1991) aimed to make assessment in higher education more accurate and more practical to stakeholders. According to Astin, the outcome of true assessment (which includes not only information gathering and measurement, but also evaluation of that information) should be improvement of the educational process. More precisely, Astin proffered that “the basic purpose of assessing students is to enhance their educational development...[and] advance the educational mission of our colleges and universities” (p. 4). To this end, Astin introduced and explained his successful input-environment-outcome (I-E-O) assessment model, so practitioners and researchers of higher education might pinpoint with greater accuracy those environmental factors that lead to better educational quality.

*The I-E-O Model.* Astin (1991) first developed the input-environment-outcome model in the early 1960s through his work with John L. Holland. The two studied why certain colleges and universities graduated more students who pursued doctoral work than others. In their investigation, Astin (1962) found that characteristics of entering first-year students were far more important predictors of advanced education than any institutional environmental factor—a finding contrary to previous research. Three lessons emerged from Astin’s (1991) early work with Holland: (a) to measure educational impact, the researcher must evaluate outcomes relative to student input measures; (b) the researcher must consider all input variables that may influence the outcome; and (c) input and outcome data are more instructive when considered against elements of the educational environment (pp. 17-18).

These observations led Astin (1991) to create the input-environment-outcome model, a “very simple, yet...powerful framework for the design of assessment activities

and for dealing with even the most complex and sophisticated issues in assessment and evaluation” (p. 16). For the purposes of the I-E-O model, *input* refers to student characteristics at time of college entry; *environment* refers to institutional interventions, including educational programs and student experiences; and *outcome* refers to student achievement, development, or growth (Astin, 1991; Pascarella & Terenzini, 1991, 2005). An asset of the I-E-O model is the ability to measure the relationship between the institutional environment and the educational outcome, while controlling for differences in students’ personal qualities (Astin, 1991; Pascarella & Terenzini, 1991). In other words, using the I-E-O model allows the researcher to account for student background characteristics that otherwise exert influence on outcomes, thereby isolating the environmental variables of interest in order to measure their educational impact.

*Benefits of the I-E-O Model Compared to Other Assessment Strategies.* Since its introduction, the I-E-O model has been influential in college impact studies (Pascarella & Terenzini, 1991, 2005), perhaps because the I-E-O model is a more complete assessment tool than many other methodologies (Astin, 1991). According to Astin, there are four other typical assessment strategies: (a) outcome-only assessments, such as achievement tests; (b) environment-outcome assessments, such as grade point averages across inter-collegiate athletic teams; (c) input-outcome assessments, such as pre- and posttest designs; (d) and environment- or input-only assessments, such as the annual institutional rankings sponsored by U.S. News & World Report. Seemingly unbeknownst to many who rely on these assessment strategies, each of these methodologies has a particular shortcoming rendering it unfit for accurately measuring and evaluating college impact (Astin).

Compared to these assessment methodologies, the I-E-O model is more complete, allowing for measurement of the impact of environmental interventions given student skills and traits prior to interaction with the environment (Astin, 1991). Using the I-E-O model, researchers can investigate the “comparative effectiveness of different educational policies and practices” (Astin, p. 37) and be relatively sure that any variance they detect is due to the intervention and not to differences in students’ background characteristics (Astin). Upcraft, Chrissman Ishler, and Swing (2005) note that the I-E-O model “is a useful tool for identifying and estimating the effects of those college experiences over which institutions have some programmatic or policy control, such as student experiences, which can be shaped into educational advantage through an institution’s programmatic or policy concerns,” (p. 497). According to Pascarella and Terenzini (1991), Astin’s I-E-O formulation has influenced the development of the dominant models of college impact and student change: Astin’s Theory of Involvement (1985), Tinto’s Theory of Student Departure (1993), Pascarella’s General Causal Model for Assessing the Effects of Differential College Environments on Student Learning and Cognitive Development (1985), and Weidman’s Model of Undergraduate Socialization (1989).

*Relation of the I-E-O Model to the Current Study.* As suggested above, Astin’s I-E-O model provides a superior methodology for measuring and evaluating college impact. It seems fitting that any researcher whose objective is to understand which factors lead to or predict certain educational outcomes would build upon the I-E-O model. As Astin (1991) stated, the focus of I-E-O-based research is on understanding the impact of educational interventions on outcomes:

Input and outcome refer simply to the state of the person at two different time points, and environment refers to the intervening experiences. We are particularly interested in learning about environmental experiences that can be controlled or changed, since it is these experiences that offer the possibility of improving outcomes in the future. (p. 22)

Accordingly, Astin's I-E-O model is the foundation for the conceptual model I present in this investigation of factors contributing to the academic success of first-year college students. However, my research diverges from Astin's at a crucial point. Astin designed the I-E-O model specifically to investigate the role of educational environments in producing educational outcomes—but almost to the exclusion of understanding the student's responsibility to engage in his or her own educational process. In other words, Astin's I-E-O model studies the ability of the environment to involve the student while nearly disregarding the student as an actor with personal accountability for becoming involved in the academic environment. As Stage (1989) observed, without the addition of variables that describe students' psychological make-up, college impact models are insufficient to fully and reliably explain student outcomes.

Although, the conceptual model for this study of academic success in the first-year is an I-E-O model in that it accounts for student background characteristics and environmental interventions, it adds student attributes as contributing factors on par with the environment. Furthermore, the literature suggests that one's interactions with the environment impacts behavior (Barker, 1968; Lewin, 1936) and self-determination (Ryan & Deci, 2000), which ultimately influences the final achievement outcome. Therefore, the conceptual model proposed in this study suggests that the environment has direct

effects on student attributes and indirect effects on the outcome. This modification represents a slight departure from Astin's original I-E-O model, such that measuring and evaluating the role of student attributes in academic success is tantamount to the measuring and evaluating the impact of the environment.

### The First Year of College as a Particular Environment

Since the early 1980s, educators and researchers have turned their attention to the first-year of college as a critical time for transition that, if done well, leads to persistence and academic success (Barefoot, Gardner, Cutright, Morris, Schroeder, Schwartz, Siegel, & Swing, 2005; Upcraft, Gardner, & Barefoot, 2005; Upcraft & Gardner, 1989). Upcraft, Gardner, Barefoot, and associates suggested that the first year of college requires a delicate balance of challenge and support in the forms of challenging educational experiences coupled with effective programs that support the transition. Together these institutional efforts foster student growth and lead to success in the first year (Upcraft, Gardner, & Barefoot, 2005). Furthermore, LaSere Erickson and Strommer (2005) indicated that upon entering college students are typically extrinsically motivated—whether by grades, a desire to meet family expectation, and/or career aspirations. A student-centered learning environment in the first-year, they suggested, can inspire students to focus instead on the academic process and fall in love with learning. Over time, then, they become more intrinsically motivated toward their college educations. Elements of a successful first-year environment include interaction with faculty, first-year seminars, and learning communities—all of which must be specifically designed to



meet the transitional needs of first-year college students. The literature surrounding each element is discussed below.

### *First-year Seminars*

First-year seminars came into vogue in the 1980s and first emerged as University 101 or First-year Experience (FYE) courses (Upcraft & Gardner, 1989); they continue today in nearly 90 percent of all colleges and universities (Barefoot, Gardner, et al., 2005; Upcraft, Gardner, & Barefoot, 2005). Typically these FYE and University 101 seminars are credit-bearing and designed as extended orientations (Gordon, 1989), which cover standard topics, including time management, study skills, health and wellness, college survival, conflict management, and values clarification (Gordon). As the name “seminar” suggests, these courses are small—about 15 students each (Barefoot, Gardner, et al., 2005; Gordon)—and give first-year students an opportunity to engage in a more intimate, discussion-based learning environment (Stuart Hunter & Linder, 2005) heretofore reserved for upper-division students enrolled in specialized major-related courses. The small course size facilitates community-building by orchestrating increased student interaction with the instructors and with one another (Jewler, 1989). Instructors are a combination of faculty, student development administrators, and upper-division students (Gordon; Hunter & Linder), and instructor make-up is dependent upon institutional objectives and course design. FYE courses are linked to academic success measures, including grade point average, progress toward degree requirements, first- to second-year retention, and graduation rates (Barefoot, 1993).

Along side FYE courses, or perhaps in lieu of them, some institutions offer academically-focused first-year seminars. Unlike the extended orientation courses, these seminars fit into the curricular requirements for degree attainment (Gordon, 1989). Like the FYE course, the first-year academic seminar facilitates student-faculty and peer interactions and adjustment to university life. In their review of related research, Fidler and Stuart Hunter (1989) concluded that first-year seminars enhance student success, including measures such as grade point average, clarification of academic goals, and self-concept.

### *Learning Communities*

Another programmatic intervention to enhance the first-year experience is the learning community. Traditionally, learning communities consist of a semester-long cluster of two or more academic courses that are linked by theme or program area (Levine Laufgraben, 2005). By enrolling the same cohort of students, learning communities encourage peer collaboration and inter-disciplinary application of course material. Learning communities also encourage faculty collaboration, experimental or interactive pedagogies, and increased faculty-student interaction (Goodsell Love & Tokuno, 1999). Learning communities may or may not have residential components in which cohorts are housed together or clustered courses occur within the residence hall (Levine Laufgraben). In assessing the literature on outcomes related to learning communities, Levine Laufgraben concluded that enrolling in a learning community has a significant positive impact on achievement, including the intellectual and social development of first-year students.

### *Faculty and Peer Interaction*

Researchers agree: students interactions with peers and faculty have significant effects on academic success (Astin, 1993; Banning, 1989; Pascarella & Terenzini, 1991, 2005; Upcraft, 1989). With regard to interaction with faculty, Astin found a positive correlation with academic self-concept, while Pascarella and Terenzini's (2005) meta-analysis revealed that only particular types of faculty-student interactions yielded positive results. Specifically, Pascarella and Terenzini's work suggested that faculty-student interactions are associated with positive gains in academic self-concept when the interactions are substantively related to course work, but that these gains are eliminated in models that control for students' perceptions of other aspects of the institutional environment. Thus, Pascarella and Terenzini concluded that faculty-student interaction is embedded in students' perceptions of the environment. Social contact with faculty outside the classroom is positively correlated with other measures of student success, such as persistence and institutional commitment (Pascarella & Terenzini).

Specific peer interactions, including those within college residences and student clubs and organizations, have an effect over student development in the first year (Upcraft, 1989). The segregated and communal nature (many students of a particular age group living in close proximity to one another) of student residence halls creates a particular environmental press on students, such that residents have enormous influence over one another's perceptions and behaviors (Upcraft). Upcraft warned, however, of the potential for first-year residences to have a negative influence on academic and social engagement. Participation in student clubs and organizations, on the other hand, has been related to gains in social self-concept (Upcraft). These activities increase the potential for

students to develop friendships and other meaningful peer associations as well as to build upon their social and leadership skills.

### Measuring Academic Success in the First Year:

#### Grade Point Average

In measuring students' academic success, educators often rely on indicators such as grade point average and persistence through the educational system (Upcraft, Gardner, & Barefoot, 2005). Upcraft, Gardner, and Barefoot urge researchers to consider an expanded list of indicators when exploring academic success in the first year of college. Beyond successful course completion and continued enrollment, Upcraft et al. suggest growth in the following areas as potential measures of first-year student success: intellectual and academic competence, interpersonal relationships, identity development, career choice, health and wellness, spirituality, multicultural awareness, and civic responsibility. For the purposes of this study, the determinant of academic success in the first year is cumulative grade point average, which is discussed below.

As stated above, grade point average (GPA) indicates successful course completion, one of the measures often acknowledged as a standard of academic success (Astin, 1993; Upcraft, Gardner, & Barefoot, 2005). Although an imperfect measure of intellectual development due to inconsistent calculation, college grades are strong predictors of success as measured by persistence, degree attainment, and enrollment in graduate school (Pascarella & Terenzini, 2005). Whether required for entrance into academic honor societies, student leadership positions, or deans' lists, grade point average is a common criterion indicating academic achievement. Not surprisingly, many

researchers in higher education have dedicated effort to understanding which individual and environmental factors predict GPA (Pascarella & Terenzini, 1991, 2005). While studies consistently demonstrate that high school GPA and college entrance exam scores are strong predictors of college grades (Astin, 1993), other studies have indicated that grade point average is correlated with prior self-concept (Astin, 1993; Cokley, Komarraju, King, Cunningham, & Muhammad, 2003; House, 2000; Marsh, 2003; Yeung, McInerney, Russell-Bowie, Suliman, Chui, & Lau, 2000).

### Student Attributes

Colleges and universities are accountable for how they use their financial and human resources to provide academic and co-curricular programs and facilities that promote student learning (Pace, 1984). Lest the academic community and the public mistake this accountability for a one-way responsibility to provide a service to customer-students, Pace insisted that students be accountable for the effort they put toward their own learning. These sentiments are echoed by those who call attention to students' responsibility for the quality of their own education (Kuh, Gonyea, & Williams, 2005; Kuh, Kinzie, Schuh, & Whitt, 2005). In other words, student authorship is integral in measuring how students achieve educational outcomes. Nonetheless, college impact studies rarely account for students' psychological attributes in their models and measurements. Instead, researchers have recommended examining the influences of environmental factors to predict success-related outcomes (Upcraft, 2005). However accounting for their personal attributes may help differentiate why some students achieve

particular outcomes at greater rates than their peers. The following section reviews the literature pertaining to student self-concept, self-determination, and self-efficacy.

### *Self-concept*

Pascarella and Terenzini's (2005) meta-analysis of college impact research revealed that self-concept, although a loosely defined term, generally refers to students' self perceptions of competence relative to those of their peers. Self-concept, as it appears in the literature, may be designated as an input measure—prior self-concept—an outcome, or both. Although most studies use data from the Cooperative Institutional Research Program (CIRP) to study change in self-concept from first to senior year, or even post-baccalaureate years (Kezar & Moriarty, 2000; Berger & Milem, 2000; Pascarella, Smart, Ethington, & Nettles, 1987), Terenzini, Theophilides, and Lorang (1984) argued for more research devoted to year-to-year growth. The results of Terenzini et al.'s study indicated distinct change in self-concept occurs each year of college beyond the cumulative growth over four or more years.

Research also has demonstrated consistently that student involvement is a factor influencing change in self-concept (Berger & Milem, 2000; House, 2000; Kezar & Moriarty, 2000; Pascarella, Smart, Ethington, & Nettles, 1987). However, studies examining gender or racial differences in self-concept have produced mixed results: some demonstrated significant differences based on race (Astin, 1993; Berger & Milem, 2000; Cokley, Komaraju, King, Cunningham, & Muhammad, 2003; Kezar & Moriarty, 2000; Marsh & Yeung, 1998) or gender (Kezar & Moriarty, 2000; Marsh & Yeung, 1998),

while another study did not reveal any appreciable difference based on race or gender (Pascarella, Smart, Ethington, & Nettles, 1987).

Additionally self-concept can take several forms, depending on the focus of study. Whereas some researchers may study students' general self-concept, which refers to their overall self-perception (Graham & Cockriel, 1996; Waugh, 2001), others may examine particular domains of self-concept, such as academic or social (Berger & Milem, 2000; Cokley, Komarraju, King, Cunningham, & Muhammad, 2003; Kezar & Moriarty, 2000; Pascarella, Smart, Ethington, & Nettles, 1987; Terenzini, Theophilides, & Lorang, 1984; Yeung, McInerney, Russell-Bowie, Suliman, Chui, & Lau, 2000). As academic self-concept and social self-concept are treated separately in this study, the following sections review each construct individually.

#### *Academic Self-concept*

In urging higher education researchers and practitioners to include students' intellectual and academic competence in a definition of first-year student success, Upcraft, Gardner, and Barefoot (2005) concluded: "*Successful first-year students must not only get off to a good start academically and learn how to learn, but they must begin to appreciate what it means to become an educated person*" (p. 8, emphasis included). In many ways, academic self-concept captures aspects of this construct of academic and intellectual competence. Students' self-perceptions of their academic abilities and intellectual self-confidence as compared to the abilities of other students "become more positive during their college years" (Pascarella & Terenzini, 2005, p. 219). In addition, Marsh (2003) noted that academic self-concept and achievement reinforce one another,

such that prior academic self-concept impacts academic performance, which then affects subsequent self-concept. This finding provides further evidence that academic self-concept is central to understanding student success.

The body of academic self-concept literature provides evidence that academic self-concept is hierarchical, such that students may have domain-specific self-concepts that are empirically different from perceptions of their overall academic competence (Waugh, 2001; Yeung, McInerney, Russell-Bowie, Suliman, Chui, & Lau, 2000). Yeung et al. (2000) found reasonably strong support for a hierarchy of academic self-concept, such that students maintain a global academic self-concept that is separate from their self-concepts in language, business, math, and the arts. In addition, Waugh's (2001) study revealed that global academic self-concept is comprised of separate scales for students' perceptions of capability, achievement, and confidence. For the purpose of this study, academic self-concept is defined globally in relation to students' self-ratings of capability and confidence.

### *Social Self-concept*

In addition to students' intellectual and academic competence, Upcraft, Gardner, and Barefoot (2005) suggested that the definition of student success includes establishing and maintaining interpersonal relationships. Upcraft et al. pointed out: "All first-year students must develop the interpersonal skills necessary not only to build supportive relationships, but also to succeed in their many pursuits after college" (p. 8). Although objective growth in interpersonal relationships may be difficult to measure empirically, Pascarella and Terenzini (2005) offered social self-concept as an acceptable substitute.



Social self-concept pertains to students' self-ratings of their social skills, including their ability to develop and maintain same-sex friendships, opposite sex-friendships, self-confidence, and leadership ability (Pascarella & Terenzini). In their review of social self-concept studies, Pascarella and Terenzini note that social self-concept may suffer a decline during a student's transition to college but usually rebounds in the later years. Given that the transition to college may take a toll on students' social self-perceptions, this study will examine psychological and environmental factors that may contribute, either to this decline or to maintenance and even growth in student's social self-concept.

### *Related Research*

In an effort to understand how college shapes students' social and personal development, Graham and Cockriel (1996) studied a sample of 9,348 undergraduates representing 75 colleges and universities. Using exploratory factor analysis, Graham and Cockriel assessed data from the College Outcomes Survey sponsored by the American College Testing Program to determine constructs of personal and social growth during the undergraduate years. The data demonstrated that students experienced the greatest amount of personal growth in the areas of academic competence, taking personal responsibility, general knowledge, goal-setting, intellectual curiosity, and self-confidence. In addition, student responses indicated that the college environment contributed to growth in these areas as well as in perseverance and in a willingness to change. Graham and Cockriel's study revealed that students experienced less growth in spirituality, civic responsibility, and understanding others. Likewise, students rated as

low the college environment's contribution to these areas as well as to areas such as family responsibility, financial management, and participation in political elections.

In a related study, House (2000) investigated the effect of student involvement on academic self-concept. Analyzing CIRP data for 2,134 first-year students at one institution, House examined the relationship between students' academic self-concept and their involvement in academic activities during the previous year. Conducting cross-tabulations, House demonstrated that students' academic self-concept was significantly, positively related to the number of hours students spent studying, talking with teachers outside of class, volunteering, and being active in student clubs and organizations. While House's involvement construct consists of students' high school activity, this study lends credence to involvement's relationship to subsequent self-concept.

Pascarella, Smart, Ethington, and Nettles (1987) presented a causal model to understand the development of students' academic and social self-concepts. In addition, they examined racial and gender differences in those factors influencing self-concept. Pascarella et al. analyzed data from 4,597 men and women who participated in the 1971 CIRP survey as first-year students and then in the 1980 follow-up. Regression analyses in the Pascarella et al. study revealed that pre-college self-concept influenced college behavior and that involvement in college affected subsequent self-concept. In addition, the research team noted that students who attended small colleges reported higher self-concepts than their peers who graduated from larger institutions. Pascarella et al. surmised that students perceive smaller colleges and universities to be more psychologically manageable, thus resulting in a more positive correlation to self-concept development. Surprisingly, the results of this study demonstrated no appreciable racial or

gender difference in the development of academic or social self-concepts. Pascarella et al. acknowledged that the data for college involvement relied heavily on long-term memory and that the effects of racial or gender differences in the collegiate experience may have been diminished by post-baccalaureate experiences.

In a different study, Cokley et al. (2003) examined racial/ethnic differences in academic self-concept among 396 African American and 291 White students at multiple predominately White institutions (PWIs) and historically Black colleges and universities (HBCUs). Students in the study completed the academic self-concept scale along with a demographic information survey. Cokley et al. utilized principal component factor analyses to determine whether or not racial differences existed in academic self-concept constructs. Results demonstrated significant differences in academic self-concept between African American students and White students. While White students believed that effort leads to high grade point average and associated academic performance with ability, Black students related academic performance to prior academic preparation. Cokley et al.'s study indicates a need to test separate constructs of academic self-concept for different racial/ethnic groups.

Terenzini, Theophilides, and Lorang (1984) employed longitudinal data to uncover the effects of college on student's academic development as measured by academic self-concept. Using results from the 1978 CIRP survey as baseline data, the research team followed students from their first year through their junior year in college. After the third follow-up, Terenzini et al. collected longitudinal panel data for an analytic sample of 250 students at one institution. Holding constant students' entry characteristics, Terenzini et al. determined the collegiate experience had a significant,

positive impact on students' perceptions of their academic development. Furthermore, the research team noted that significant effects of college attendance on academic growth are not only cumulative, but also year-to-year. In other words, distinct and measurable academic growth occurred during each year of college attendance. Results indicated students' high school achievement and involvement were the best predictors of perceived academic growth in the first year. In subsequent years, academic self-concept emerged from previous growth as well as academic and social involvement. The Terenzini et al. study did not examine psychological variables that may impact self-concept or involvement.

### *Self-determination*

Broadly speaking, self-determination stems from the psychology of human agency, which acknowledges the self as an important actor within the environment. The person is seen as an actor who imposes upon, reacts to, and cooperates with his or her surroundings in such a way as to impact the outcome of interactions with others or with environmental systems (Little, Hawley, Henrich, & Marsland, 2002). Little and colleagues defined the "agentic self" as one who "is the origin of his or her actions, has high aspirations, perseveres in the face of obstacles, sees more and varied options for action, learns from failures, and, overall, has a greater sense of well-being" (p. 390). In other words, the psychological use of "human agency" refers to active self-regulation and decision making as opposed to submissive passivity.

Little et al.'s depiction of the agentic self as one who learns from mistakes is congruent with Emirbayer and Mische's (1998) theory of human agency as "temporally

constructed engagement” (p. 970), such that the agentic self accounts for the past, present and future in his or her actions. In the discipline of psychology, then, personal agency, then, contains the notion that a person’s past experiences can influence his/her present actions; likewise, a person can regulate present actions to be in accord with future plans. Agency suggests an integral relationship with one’s surroundings and the people, places and events found there (Emirbayer & Mische).

With this information in mind, the student begins to emerge as a key factor in outcomes related to him or her. In their theoretical piece, Little et al. (2002) contended that individuals with high levels of personal authorship (i.e., those who recognize themselves as important actors rather than passive recipients) have a greater tendency toward goal accomplishment and well-being. Conversely, those who have low levels of personal motivation to be an actor in their own lives are more likely to avoid pursuing their goals, have lower personal standards, and report lower levels of satisfaction (Little et al.).

In an effort to clarify and integrate the psychological approach to human agency, Little et al. (2002) reviewed three theories that help to explain the person-as-actor throughout the life span: Deci and Ryan’s (1985; Ryan & Deci, 2000, 2002) self-determination theory (SDT), resource-control theory (Hawley, 1999), and action-control theory (Little, 1998). Little et al. suggested that Deci and Ryan’s self-determination theory (SDT) provides an important framework for understanding personal locus of control in late adolescence and adulthood. Specifically, Little et al. identified the basic psychological needs that under gird SDT, namely autonomy, relatedness and competence, as central to the author-self. Moreover, the authors indicated that the strength of SDT lies

in its identification of these basic psychological needs as common to all people, regardless of race, culture, age, or gender. Deci and Ryan's theory is discussed in detail below.

### *Self-determination Theory*

Deci and Ryan (1985; Ryan & Deci, 2000, 2002) have posited that human beings have an innate desire for integration; that is, humans need and want to be authentic and experience themselves as their own locus of control. Accordingly, Deci and Ryan have suggested people have a need to be free from control and to experience their own human authorship, a synonym for their own self-determination. Above all, self-determination theory (SDT; Deci & Ryan; Ryan & Deci, 2000, 2002) is a theory about people's motivation to act on their own behalf. In a sense, SDT is a theory about why people do the things they do (Deci, 1995).

As stated by SDT, motivation exists on a continuum, from amotivation, or complete passivity, through stages of extrinsic motivation, and finally to intrinsic motivation. Ryan and Deci (2002) theorize that intrinsic motivation, or the urge to act out of sincere interest or inherent satisfaction, is the condition of being fully self-determined, or experiencing the self as the locus of control (Ryan & Deci, 2000, 2002). Someone who is intrinsically motivated is free from external controls and assumed to be acting in accord with his or her true, authentic self. Intrinsic motivation, then, is the hallmark of the integrated author-self. Extrinsically motivated behaviors, on the other hand, are in response to some type of control or regulation that exists, wholly or in part, outside the actor (Deci & Ryan, 1985; Ryan & Deci, 2000, 2002). Ryan and Deci (2000,

2002) have hypothesized four types of extrinsic motivation on their continuum: external regulation, action motivated by foreseeable positive or negative consequences; introjected regulation, action to increase self-esteem or to avoid guilt; identified regulation, action stimulated by personal identification and perceived as autonomous; and integrated regulation, action to obtain personally important goals or to harmonize with personally important values. Although integrated regulation is autonomous action, Ryan and Deci have separated it from intrinsic motivation due to its utilitarian nature.

According to Deci and Ryan's taxonomy of motivation, the origin of a person's motivation (its energy source and direction) indicates the level of autonomy, or self-determination (Ryan & Deci, 2000, 2002). Furthermore, intrinsic motivation and higher-end extrinsic motivation lead to greater engagement, including creative problem solving, increases in self-worth, and more efficient learning (Deci, Ryan, & Williams, 1996; Deci, Vallerand, Pelletier, & Ryan, 1991). However, motivation is also a by-product of one's interaction with the environment. SDT proposes that motivation takes place within a social context, and responds to the extent to which one's needs for autonomy, competence and relatedness are either frustrated or supported by the environment (Ryan & Deci, 2000, 2002). In their most recent discussions of SDT, Ryan and Deci (2002) suggested that autonomy, competence and relatedness are basic to human functioning and have referred to them as Basic Psychological Needs (BPN). According to Ryan and Deci (2002), these BPN are the foundation for self-determination and predicting optimal human development. Therefore, these basic psychological needs must be considered in the equation describing personal attributes that influence success.

*Basic psychological needs.* As basic psychological needs, autonomy, competence, and relatedness are central components of SDT. Moreover, Ryan and Deci (2002) identified these BPN as universally human, common to all people regardless of culture, race/ethnicity, gender, or age. Each of the basic psychological needs is delineated below.

As discussed above, autonomy is the experience of self-governance or an internal locus of control. The need for autonomy is intimately connected with one's self-determination and motivation: "When autonomous, individuals experience their behavior as an expression of the self, such that, even when actions are influenced by outside sources, the actors concur with those influences, feeling both initiative and value with regard to them" (Ryan & Deci, 2002, p. 8). The need for competence, on the other hand, does not refer to accumulated skill or knowledge, but to the desire to engage and accomplish challenging activities commensurate with capabilities (Deci & Ryan, 1985). The need for competence provides "energy for learning" (Deci & Ryan, p. 27), such that one continuously seeks new opportunities to increase skills and abilities (Ryan & Deci).

Finally, the need for relatedness, refers to the basic human need for connectedness and a sense of belonging (Ryan & Deci, 2002). Unlike autonomy and competence, the need for relatedness pertains more to the process of internalizing values and goals than it does to intrinsic motivation (Ryan & Deci). Whereas the needs for autonomy and competence drive self-determination, the need for relatedness, or the experience of being in communion with others, inspires movement through the phases of extrinsic motivation. In other words, relatedness actually fosters autonomy in that feeling supported by and



connected to significant others leads to greater security and self-worth (Deci, Ryan, & Williams, 1996).

*Self-determination and basic psychological needs within education.* As the proposed research pertains to the self-determination of college students, it is important to note SDT's alignment with theories about student development. All three basic psychological needs proffered by SDT are harmonious with classic college student development theory. Chickering and Reisser (1993) put forward a framework for college student development based on a series of seven vectors, including establishing identity, developing purpose, and managing emotions. Chickering and Reisser used vectors, as opposed to stages, to indicate location and direction of each developmental task. Three of these vectors correspond to the three basic psychological needs of autonomy, competence and relatedness (respectively, moving through autonomy, developing competence and developing mature relationships). A fourth vector, developing integrity, is the result of self-determination, according to Deci and Ryan (1985). Chickering and Reisser's classic text provides a theory of student development but does not suggest discrete variables to measure student progression along each vector. However, the convergence between these four vectors and the Deci and Ryan's basic psychological needs suggests a justification for studying SDT in the context of education and college student development.

In a departure from student change literature, particularly college impact research, self-determination theory reframes the role of the environment. Rather than viewing the environment as shaping behavior, SDT considers the environment as a social context having the ability to foster or hinder growth (Ryan & Powelson, 1991). According to

SDT, the ideal environment will satisfy the basic psychological needs, which leads to increased motivation and, ultimately, greater educational outcomes (Deci, Ryan, & Williams, 1996; Deci, Vallerand, Pelletier, & Ryan, 1991; Miserandino, 1996).

Furthermore, when students' basic psychological needs are met in the educational environment, students begin to value learning and academic success, thereby becoming truly engaged (Deci, Vallerand, Pelletier, & Ryan, 1991).

According to Ryan and Deci (2002), human well-being is rooted in experiencing autonomy, competence, and relatedness. These basic psychological needs are essential for understanding motivation (Deci, Ryan, & Williams, 1996) in that intrinsic motivation relies on a healthy psyche, which stems from meeting these needs. (Deci, Ryan, & Williams; Ryan & Deci). When the social or educational context satisfies the basic psychological needs, students are poised for greater learning and growth (Ryan & Powelson, 1991). The following section reviews recent studies exploring self-determination, including the basic psychological needs, within education.

*Related research.* In a survey of self-determination research, Reeve (2002) affirmed the use of Deci and Ryan's theory in the educational setting. According to Reeve's literature review, K-12 students with greater self-determination have higher academic achievement, higher rates of retention, and greater engagement in their educational processes. In light of these results Reeve concluded, "The quality of a student's motivation explains part of why he or she achieves highly, enjoys school, prefers optimal challenges, and generates creative products" (p. 183).

Consistent with Reeve's analysis, Miserandino (1996) found that among 77 elementary school children, perceived competence and autonomy significantly positively

predicted student engagement and grades in math and social studies. The results of her regression analyses indicated that perceived autonomy is a significant positive predictor of grades in reading, language arts, and spelling. Similarly, Connell and Wellborn (1991) studied 1,487 third through tenth graders in three separate age-related samples. Using path analysis, the team demonstrated a significant positive correlation between perceived autonomy and academic achievement as well as teacher-rated engagement. In addition, results of the study indicated that perceived competence is significantly positively related to student engagement, as measured by dedicated time and interest level. The correlations between feelings of relatedness and engagement or performance were not significant. Neither the Miserandino nor the Connell and Wellborn study indicated that the researchers controlled for background characteristics, including prior achievement.

Conversely, in studying 4,537 high school students (male: 2,280; female: 2245), Vallerand, Fortier, and Guay (1997) found that students who experienced low autonomy support also reported experiencing low levels of autonomy, competence, and relatedness. Using structural equation modeling, the research team observed that these students also reported significantly lower levels of self-determined motivation and were at significantly higher risk for high school dropout. Vallerand et al.'s study indicated gender differences such that female students reported significantly higher self-determined behavior and lower rates of dropout.

While the majority of research on self-determination and BPN concentrates on the K-12 population, a few studies indicate that self-determination is a strong predictor of academic outcomes for older adolescents and working adults as well. Investigating 834 college students in the Canadian province of Quebec, Guay, Senécal, Gauthier and Fernet

(2003) employed structural equation modeling and found that among college students, self-determination was a strong predictor of career choice, after controlling for gender. In a study of volunteerism among 121 college students and 227 adult workers, Gagné (2003) found that self-determination, specifically the basic psychological needs, had a significant positive association with volunteer persistence.

While these studies and those listed above further the literature about the relationship between self-determination and particular outcomes, not much is known about self-determination with respect to involvement, academic achievement or self-concept in higher education among college students. Furthermore, none of these studies investigates which aspects of the university environment cultivate or thwart self-determination and the basic psychological needs.

*Critique of self-determination theory.* While current research tends to support SDT as a valid framework for understanding personal locus of control in adulthood, the theory is not without its detractors. In his essay, “Self-Determination: The Tyranny of Freedom,” Schwartz (2000) warned one to evaluate SDT with a critical eye. According to Schwartz, self-determination, especially when conceived as unfettered freedom, can lead to a paralyzing and unhealthy focus on the self. Schwartz suggested that placing too much “emphasis on individual autonomy and control may be undermining a crucial vaccine against depression: deep commitment and belonging to social groups and institutions” (p. 86). Rather, Self-determination Theory’s singular focus on autonomy and choice may serve to alienate the individual from his or her need for interdependence.

### *Self-efficacy*

The field of psychology demonstrates that personal locus of control also is grounded within self-appraisal of personal mastery and one's ability to perform cognitive and behavioral tasks (Bandura, 1977, 1982), or self-efficacy. According to Bandura (1977, 1982), self-efficacy beliefs are the tools of personal authorship. Self-efficacious expectations determine the effort a person expends toward an activity as well as how long he or she will persist and how successful the outcome will be. In the words of Bandura, "self-referent thought is the mediator between knowledge and action" (1982, p. 122) because people will attempt activities, whether cognitive or behavioral, only if they reasonably assess that they are capable of accomplishing the task. Similarly, people will avoid activities when they suspect that their efforts will not be successful. Self-efficacy is an important factor in student effort because it highlights the importance of a student's beliefs about his or her own ability to succeed as a pre-cursor to academic and co-curricular involvement.

Bandura (1977, 1982) identified four personal and environmental cues from which individuals make assessments about their own self-efficacy. In order of significance, these cues are: First, people judge their ability to succeed on prior performance and accomplishment. That is, if one has excelled in a task before, he or she is likely to assume subsequent success. Second, individuals gather information about the probability of success vicariously by observing others' performance. Third, verbal persuasion from a trusted other can boost an individual's beliefs of self-efficacy. Fourth, an individual's emotional state affects his or her ability to assess capabilities, such that high stress levels can cause over- or under-estimation of expectations for success.

Bandura's work in developing self-efficacy theory has been applied to the areas of effort, persistence, achievement and satisfaction among college students. Relevant studies addressing self-efficacy among college students are summarized below.

### *Related Research*

Research on self-efficacy among college students suggests that self-efficacy is a significant predictor of educational outcomes. In all, these studies indicate that any measurement of student attributes must account for students' beliefs in their ability to successfully engage in the academic and social life of their institution. Although similar, self-efficacy is distinguishable from self-concept on one major point: the basis for self-assessment. In self-concept, assessment is comparative and measured against the abilities of one's peers. In self-efficacy, however, assessment is based on personal prior experience and the likelihood of future success. For example, Brown, Lent and Larkin (1989) researched self-efficacy as a predictor of grades and persistence among 105 first-year and sophomore students enrolled in a career-planning course for engineering majors at one institution. Brown et al. used two measures of self-efficacy: (a) students' beliefs that they will successfully complete the educational requirements for the engineering degree; and (b) their beliefs that they will persist through certain academic milestones related to their intended major. The results of the study indicated that students' assessment of their ability to achieve is a strong positive predictor of academic performance, regardless of academic aptitude. However, self-efficacy beliefs in the area of persistence moderated the effect of scholastic aptitude on academic performance. In other words, students with high self-efficacy beliefs but lower scholastic aptitude were

more likely to achieve higher academic standards than their peers who had higher scholastic aptitude but lower self-efficacy beliefs. Brown et al. concluded that self-efficacy judgments are most helpful if they are slightly exaggerated.

In their meta-analysis of self-efficacy research, Multon, Brown and Lent (1991) examined the relationships between self-efficacy and academic performance, effort, and persistence. They found, as Bandura (1977, 1982) has theorized, that self-efficacy significantly influences students' choice of academic activity, the effort they put toward those activities, and their persistence. Multon et al. defined persistence as time on task, number of tasks completed, and number of academic terms completed. Results from this study demonstrate that self-efficacy accounted for 14% of the variance for academic performance and 12% of the variance for persistence.

In a departure from viewing the effects of self-efficacy on performance and persistence, DeWitz and Walsh (2002) explored the relationship between self-efficacy and college student satisfaction. DeWitz and Walsh surveyed 312 undergraduate students enrolled in an introductory psychology course at one institution. The results of their quantitative analysis suggested that students' self-efficacy beliefs about the college experience in general are the most significant predictor of satisfaction with the college experience. More specifically, students with high college self-efficacy were found to lead happier social lives, believe that they were adequately compensated in grades for their academic work, believe that their grades matched the effort they expended toward their academics, recognize greater opportunities for involvement, participate more frequently in campus events, and perceive a higher quality of education.

Finally, Leslie, McClure, and Oaxaca (1998) investigated the effects of self-efficacy beliefs on the likelihood that college women students and students of color would choose majors in science, math, or engineering. The sample for this study included 9,628 entering first-year college students. Using items in the 1971 and 1980 Cooperative Institutional Research Program (CIRP) data files, Leslie et al. conducted factor analyses to derive composite measures of self-efficacy beliefs. These items included but were not limited to, student self-reports of math and science preparation, high school rank, high school college-preparatory program, parental occupation in science or engineering, and parental income. Multinomial logit regression analyses demonstrated that self-efficacy beliefs accurately predicted selection of science, engineering or math as the student's intended major. Moreover, Leslie et al.'s analyses revealed significant differences by race and gender. Based on self-efficacy beliefs of being well-prepared in math and science, White men are more likely than women, Asian-, and African-American students to select a major in math, science, or engineering. There was no significant difference between White men and Hispanic/Latino men in this regard.

### *Critique of self-efficacy*

Proponents of self-determination theory claim that self-efficacy's reliance on competency beliefs is not sufficient for studying motivation and performance (Connell & Wellborn, 1991; Deci, Ryan, & Williams, 1996; Deci, Vallerand, Pelletier, & Ryan, 1991). These theorists have argued that although competency beliefs are vital to motivation, motivation cannot be understood without accounting for autonomy (Deci, Ryan, & Williams, 1991). More specifically, Deci, Vallerand, Pelletier, and Ryan



(1991) concluded that motivation research cannot adequately explain important differences between extrinsically and intrinsically motivated action without considering autonomy. Connell and Wellborn (1991) suggested that the flaws in self-efficacy stem from its identification with social psychology, which emphasizes the social context in which human development takes place. They point out that social theories, such as self-efficacy, propose a “unidirectional” relationship running from the social context to the person. In other words, self-efficacy does not acknowledge “what the person brings to the negotiating table other than a history of social interaction” (Connell & Wellborn, 1991, p. 47).

### *Summary*

Self-concept is a measure of self-assessed abilities as compared to one’s peer group. Previous studies have linked self-concept and achievement, such that prior self-concept predicts grade point average. Researchers also have determined that student involvement in the educational environment predicts self-concept. However, previous research sheds little light on how other student attribute measures work with self-concept to influence academic success. Marsh (2003) noted: “implicit in our discussion is the untested assumption that the effect of prior self-concept on subsequent achievement was mediated by student characteristics such as increased conscientious effort [and] enhanced intrinsic motivation...” (p. 12). The current study brings these concepts together to understand better how student attributes intersect the institutional environment to produce educational outcomes.

The discipline of psychology supports personal locus of control within two distinct theories: self-determination and self-efficacy. Both approaches explain human motivation. Whereas self-efficacy focuses on competency beliefs and explores beliefs about the ability to succeed as a precursor to action, self-determination suggests that intrinsic motivation springs from a triad of basic psychological needs for autonomy, competency, and relatedness. Studies exploring educational outcomes, such as performance and engagement, have supported the validity and explanatory power of both self-efficacy and self-determination theories. While both theories also have their critics, they prove equally useful in understanding the underlying constructs of college student attributes toward achieving academic success.

#### Academic and Social Involvement

As a theory of college impact, Pascarella and Terenzini (2005) noted that Astin's concept of involvement balances the roles of institutional environment and active student engagement in producing student change. Through the description of his theory, Astin (1984) clearly equated involvement with student behavior:

I am not denying that motivation is an important aspect of involvement, but rather I am emphasizing that the behavioral aspects, in my judgment, are critical: It is not so much what the student thinks or feels, but what the individual does, how he or she behaves, that defines and identifies involvement (p. 298).

However, several of the questions Astin has raised for consideration refer back to the psychological determination from which involvement arises. For instance, Astin stated: "It seems clear that the effectiveness of any attempt to increase student involvement is

highly contingent on the student's perceived locus of control and attributional inclinations" (p. 307). In other words, Astin himself opened the door for including psychological measures, such as self-efficacy and self-determination, as important variables to consider when studying the effects of involvement on academic success.

Elsewhere, Astin (1984) suggested that the educational experience "must elicit sufficient student effort" (p. 301), but also that student effort depends in large part on "how motivated the student is and how much time and energy the student devotes to the learning process" (p. 301). Hernandez, Hogan, Hathaway and Lovell (1999) echoed Astin's sentiments. In their review of involvement-related literature, Hernandez et al. noted several limitations inherent in the study of student involvement. First, Hernandez et al. observed that student intentions were not considered in any of the studies they analyzed. Second, they noted that college impact depends on the quality of effort students are willing, or able, to put forward: "Students bear much of the responsibility for the extent to which involvement makes a difference in their own development and learning" (p. 195).

### *Astin's Theory of Involvement*

In an effort to create a cohesive link between disparate theories that explain how and why college student development occurs, Astin (1984) introduced student involvement theory. Remarkably straightforward, the theory focuses primarily on student behavior rather than perceptions or motivations: "student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience" (p. 297). Astin regarded student involvement theory as easy to understand

and compatible with psychological and sociological explanations of college impact. He suggested that the theory, “can explain most of the empirical knowledge about environmental influences on student development that researchers have gained over the years” (p. 297).

Five postulates comprise the basis for Astin’s theory of involvement: 1) involvement signifies an investment of psychological and physical energy in the educational experience; 2) a continuum of involvement exists along which either the same student invests a range of energy at various times, or different students invest different amounts of energy toward the same experience; 3) involvement manifests quantitative and qualitative characteristics, such that physical and psychological energy are measurable in amount of time and quality of effort; 4) a student’s educational outcomes are directly proportional to his or her involvement; and 5) the efficacy of higher education practices and policies is related to their ability to improve student involvement (1984, p. 298). Furthermore, Astin (1993) has contended that involvement measurements include those at time of student entry, such as place of residence, prospective major, and financial aid, as well as those describing student-environment interaction, such as student involvement with faculty and peers, work, and academic effort.

In many ways, Astin’s explanation of involvement mirrors Kuh’s (2005) description of student engagement: “the amount of time and effort students put into their studies and other educationally purposeful activities,” (p. 87). Although Kuh’s concept of engagement differs from Astin’s involvement in that it includes a second feature explicitly focusing on the institutional environment, the language describing both

engagement and involvement is quite similar. Therefore, for the purposes of this study, engagement and involvement are synonymous terms, and I use them interchangeably.

### *Related Research*

In their anthologies of college impact research, Pascarella and Terenzini (1991, 2005) reviewed several hundred studies linking involvement to educational gains, such as cognitive skills, subject-matter competence, and persistence. Pascarella and Terenzini's findings are as Astin (1999) suggested: "The greater the student's degree of involvement, the greater the learning and personal development" (p. 588). Several contributions to the involvement literature are discussed below.

After noting the similarities between Astin's (1984) involvement theory and Tinto's theory of student departure (1993), Milem and Berger (1997) designed a study to empirically test these theories' compatibility with one another; that is, they tested whether or not Astin's idea of involvement is a precursor to Tinto's ideas of academic and social integration, which ultimately lead to a student's decision to persist or dropout. Milem and Berger noted that Tinto's model was primarily perceptual in orientation, whereas, Astin's model was primarily behavioral. The researchers hypothesized that rather than maintain independence from one another, the models of involvement and student departure actually influenced one another.

Milem and Berger (1997) chose a private, selective, southeastern university for their research site and culled their data from three separate surveys: the CIRP Student Information Form administered during fall orientation 1995; and two locally developed surveys, one of which was administered in October, 1995 and the other in March 1996.

Using data from these three surveys, Milem and Berger constructed a longitudinal panel of 718 first-year students and conducted a multivariate path analysis to test their research questions.

Among their results, Milem and Berger found that first-year students who were not academically engaged in the fall semester were also less likely to perceive the institution as supportive, less likely to be academically engaged in the spring, and less likely to perceive their peers as supportive. Likewise, students who reported early social integration also reported academic non-engagement and were not engaged with the institution. However, social integration was a significant positive predictor of students' institutional commitment and their intent to enroll the subsequent fall semester. Their study led Milem and Berger to conclude that early student involvement was deeply connected to intent to persist: "Our findings suggest that the extent to which students become involved during their first 6 to 7 weeks of a semester are significantly related to whether they are likely to persist at the institution" (p. 398). The data also demonstrated that early involvement with faculty is a strong predictor of persistence (Milem & Berger, 1997).

In a follow-up to the study described above, Berger and Milem (1999) tested their revised model of persistence using fall 1996 enrollment data as measures of actual persistence. With the exception of the added fall 1996 enrollment figures, Berger and Milem utilized the same longitudinal panel data as Milem and Berger (1997). In addition, Berger and Milem conducted a path analysis to test the direct and indirect effects of involvement on persistence, whereas their previous work examined only direct effects.

In sum, Berger and Milem's 1999 findings indicated that involvement has indirect effects on persistence as well as direct effects. For example, students who reported noninvolvement in the fall also were likely to be uninvolved in the spring, not to be academically integrated, and were likely not to persist. Spring noninvolvement had similarly negative predictive effects on academic integration and persistence but was also a significant negative predictor of social integration.

These two studies (Milem & Berger, 1997; Berger & Milem, 1999) confirm that involvement is a predictor of academic success and that noninvolvement is a predictor of departure. These inquiries are related to the proposed research in that they indicate that involvement should be included as a variable in any examination of the factors leading to success.

Building on previous research about the effects of student involvement on academic and interpersonal gains, Huang and Chang (2004) studied the effects of involvement on third-year college students in Taiwan. Specifically, Huang and Chang were interested in understanding the relationship between academic and social involvement and identifying the level of maximum involvement at which students cease to realize academic and social benefits. Using multistage cluster sampling first to control for institution type and second to control for institution size, the researchers randomly selected education classes at each institution. The resulting sample included 627 students representing 14 different institutions.

In order to answer their first research question, Huang and Chang conducted scatter plot analysis, which indicated that the relationship between academic and co-curricular involvement is linear and positive. To address their second question, the

researchers conducted an analysis of means for students' growth in self-confidence and cognitive, communication, and interpersonal skills. All growth measures were self-reported by the student participants on Likert-type scales. Huang and Chang found that students with high academic and high co-curricular involvement reported the most gains in cognitive and communication skills, self-confidence, and interpersonal skills. In contrast, students with low academic and co-curricular involvement reported the least gains three areas: communication skills, self-confidence, and interpersonal skills. These students with low-low designations also reported the second-to-lowest gains in cognitive skills. Through their statistical analyses, Huang and Chang concluded that co-curricular involvement does not detract from academic focus. Furthermore, their results suggest that gains in cognitive and communication skills are linked to both academic and co-curricular involvement, while gains in self-confidence and interpersonal skills are more strongly connected to co-curricular than academic involvement.

Huang and Chang's study helps to establish the link between involvement and academic success. However, because their study included only a comparison of mean differences and no analyses to determine prediction or even significance of difference, more research along these lines is necessary. Furthermore, Huang and Chang's work examined Taiwanese students, and their findings may not be generalizable to students in the United States.

#### *Critique of Astin's Theory of Involvement*

Although Astin's Theory of Involvement is the focus of much research, Pascarella and Terenzini (1991, 2005) have questioned whether Astin's concepts actually meet the



definition of a theory. Whereas theories generally offer a system of predicting a phenomenon by identifying specific variables and their relation to one another (Kerlinger in Pascarella & Terenzini, 2005), Astin's involvement concepts are a set of general suppositions. To be confirmed as "theory," Pascarella and Terenzini have recommended Astin's ideas of involvement to include "detailed, systemic description of the behaviors or phenomena being predicted, the variables presumed to influence involvement, the mechanisms by which those variables relate to and influence one another, or the precise nature of the process by which growth or change occurs," (p. 54). This study will not settle the debate over the status of Astin's involvement as theory or general principle. It will, however, build upon previous studies using Astin's schema for student involvement in conjunction with his I-E-O model of college impact in order to examine factors contributing to academic success of first-year students.

### *Student Effort*

The 2004 annual report of the National Survey of Student Engagement stated that nearly half (44%) of all college students spend 10 hours or less per week studying or preparing for their academic courses (National Survey of Student Engagement, 2004). This is a far cry from the 30-40 hours per week of studying most faculty believe is necessary in order to be an effective student (National Survey of Student Engagement, 2002). In the estimation of higher education scholars, the fraction of actual study time versus recommended study time is less a function of educational program quality than of student effort and involvement.

Student effort refers to the amount of time and the quality of the mental activity college students put toward their undergraduate experiences, inside and outside the classroom (Astin, 1985; Pace, 1984). If institutions are responsible for providing an environment conducive to learning, then students are responsible for the investment of time and effort toward their own education.

According to Pace (1984), student effort begins with the student's awareness of the educational opportunities, curricular and co-curricular alike, available at his or her institution. Once a student is knowledgeable about his or her opportunities, the effort he or she makes toward participation can be measured. The amount and quality of a student's involvement with his or her own college process affects his or her ability to learn; to create and maintain relationships with faculty and peers; and to participate in academic, social, and developmental activities (Pace, 1984). In other words, student authorship is the deciding factor between whether or not a student attains a quality education.

In support of Pace's views on student effort, Arrison's (1988) study revealed that effort is significantly, positively correlated with academic achievement, as measured by grade point average. Using a mixed-methods research design, including multivariate regression analyses and qualitative interview techniques, Arrison examined the predictive ability of students' academic self-confidence on student effort and academic achievement. Arrison's sample for quantitative analyses included 418 first-year students at one institution, who completed the survey for incoming first-year students sponsored by the Cooperative Institutional Research Program (CIRP). In related analyses, Arrison explored the relationship between effort and achievement. She found significant, positive

correlations between grade point average and 6 of her 17 effort variables, including 3 related to academic, or discipline-related, effort and 3 related to co-curricular and interpersonal effort.

### *Summary*

Pace's (1984) work with the quality of student effort and Astin's (1984) theory of involvement are representative of Astin's (1991, 1993) definition of the environment. Both frameworks are strikingly similar in that they focused on the quantity and quality of student behavior within the college environment with the understanding that behaviors are directly related to educational outcomes. The works of Pace and Astin provide guidance toward operationalizing student behavior, with respect to awareness of academic and co-curricular opportunities, time spent on social and academic pursuits, and quality of effort in those activities. Although neither approach accounted for, or attempted to explain, psychological characteristics that influence students' behavior, research literature indicated that both frameworks help to explain educationally relevant outcomes, such as performance, self-concept, and persistence.

### Studying Academic Success in the First Year:

#### Literature Supporting Variables in the Study

Through his extensive work studying first-year students, Upcraft (2005) devised a thorough model for successful assessment of the first year of college. This section draws upon relevant literature to justify the inclusion of variables pertinent to studying the relationship between student attributes and academic success in the first year. As the conceptual model for this study follows Astin's (1991) preferred input-environment-

outcome (I-E-O) model for assessment, the variables appear in I-E-O order. First, I discuss variables representing students' background characteristics, including gender, race, socioeconomic status, and prior achievement. Second are student attribute variables, including academic and social self-concept, self-efficacy, and self-determination. In the conceptual model for this study student attribute variables are both input measures as well as intermediate outcomes. Last, I discuss variables related to the educational environment and collegiate experiences, including academic and social involvement.

### *Student Background Characteristics*

According to Upcraft (2005), "efforts to promote student success, both inside and outside the classroom should be based on what is known about the first-year cohort," (p. 475). In other words, student background characteristics provide the baseline for assessment. In addition, background characteristics often are related to how students interact with the educational environment and to any subsequent outcomes, so studying growth or change over the first year would be impossible without controlling for differences at time of entry (Astin, 1991). Astin (1991) recommended accounting for different types of input measures, many of which are germane to this study. Among these are: "fixed student attributes," which include demographic characteristics; "cognitive functioning," which includes prior achievement measures; and "self-ratings," which, for the purposes of this study, refer to prior self-concept.

### *Gender*

With few exceptions (Guay, Senécal, Gauthier, & Fernet, 2003; Pascarella, Smart, Ethington, & Nettles, 1987), recent studies have uncovered significant gender differences in variables relevant to this study. For example, Astin (1993) found that being female was a positive predictor of academic achievement, as measured by grade point average. With regard to the development of self-concept, a number of studies noted differences in self ratings, such that men reported higher self-confidence (Delaney, 2004) while women in the Kezar and Moriarty (2000) study reported greater gains in intellectual and social self-confidence over four years of college. In addition, among high school students, Marsh and Yeung (1998) found that despite achieving higher grades in English and math, girls reported lower math self-concepts. Gender differences are also evident in involvement, such that women report greater levels of social/peer involvement (Berger & Milem, 1999; Milem & Berger, 1997) but higher levels of academic non-engagement (Milem & Berger, 1997). Finally, with regard to measures of student attributes, Leslie, McClure, and Oaxaca (1998) reported that men experienced higher levels of math/science self-efficacy, while Vallerand, Fortier, and Guay (1997) indicated that high school girls report higher levels of self-determined motivation leading to lower levels of dropping out.

### *Race*

Some studies demonstrate racial differences among variables predicting academic success. In his longitudinal study of college effects, Astin (1993) found that being White was a positive predictor of grade point average while being Latino/a was a negative

predictor. Results from studies examining racial difference in self-concept are mixed: Pascarella, Smart, Ethington, and Nettles (1987) found no appreciable difference based on race, while others (Cokely, Komarraju, King, Cunningham, & Muhammad, 2003) revealed differences in the structure of academic self-concept constructs based on race. Similarly, the Milem and Berger (1997) study indicated racial differences in the types of student involvement that predicted persistence, such that activism was a positive predictor for African American students while social involvement was a positive predictor for White students. Finally, while few other studies explored racial differences in constructs of student attributes, Leslie, McClure, and Oaxaca (1998) noted significant differences in math/science self-efficacy beliefs based on race, such that White students were nearly twice as likely as African American and Latino students to report better-than-average preparation in math and science.

#### *First-generation Status*

While there is little to no research linking first-generation status to student attributes, Astin's (1993) work indicates that peer group SES has strong positive effects on intellectual development, indicators of academic involvement, and some environmental characteristics.

#### *Prior Achievement*

According to Astin (1993), prior achievement, as measured by high school grades and college entrance exam scores, is the single greatest predictor of college grade point

average. In addition, Marsh (2003) found prior achievement to be a significant, positive predictor of academic self-concept.

### *Student Attributes*

Intuitively a relationship between student attributes and academic success makes sense, and this supposition is supported in the literature (Astin, 1993; Kuh, Kinzie, Schuh, & Whitt, 2005; Pascarella & Terenzini, 2005). Although prior self-concept, self-efficacy beliefs, and prior measures of self-determination are technically considered background characteristics, for the purposes of this study, they belong to a separate variable category for attributes.

### *Prior Self-concept*

Student self-concept at the time of college entry is a strong predictor of subsequent achievement, as measured by GPA (Astin, 1993; Cokely, Komarraju, King, Cunningham, & Muhammad, 2003; House, 2000; Marsh, 2003; Marsh & Yeung, 1998; Yeung, McInerney, Russell-Bowie, Suliman, Chui, & Lau, 2000). In addition, prior self-concept predicts academic involvement (Astin, 1993) and social involvement (Pascarella, Smart, Ethington, & Nettles, 1987). Finally, prior self-concept significantly positively predicts subsequent self-concept (Astin, 1993; Berger & Milem, 2000; Terenzini, Theophilides, & Lorang, 1984).

### *Self-efficacy*

The results of Brown, Lent and Larkin's (1989) study led them to conclude self-efficacy is a predictor of academic performance, as measured by grades and persistence, regardless of prior aptitude levels. In other words, regardless of aptitude, students with high self-efficacy beliefs performed better than those with lower self-efficacy. In their meta-analysis of self-efficacy research, Multon, Brown and Lent (1991) arrived at a similar conclusion: self-efficacy beliefs significantly and positively predict academic performance. In a different study, DeWitz and Walsh (2002) found students' self-efficacy beliefs to have a significant, positive relationship to satisfaction with academic effort and with academic and social involvement.

### *Self-determination*

As with self-efficacy, research suggests that measures of self-determination also have a significant association with academic performance and effort. Although few studies examine the relationship between self-determination and academic success among college students, self-perceptions of autonomy and competence have a significant, positive correlation to academic achievement and teacher-rated engagement among elementary and high school students (Connell & Wellborn, 1991; Miserandino, 1996). Conversely, in a study about predictors of high school dropout, Vallerand, Fortier, and Guay (1997) found students with low levels of autonomy support, reported lower levels of autonomy, competence, and relatedness. Consequently, these students also displayed lower motivation and higher rates of drop out. My study will include measures of autonomy, competence, and relatedness as recommended by Deci and Ryan (2002).



### *First-year Experiences: Aspects of the Environment*

For the purposes of this study, environmental measures, also known as collegiate experiences, are divided into academic and social involvement. This dichotomy of involvement is consistent with Astin's (1984) theory of involvement and with previous research (Berger & Milem, 1999; Huang & Chang, 2004; Kezar & Moriarty, 2000; Milem & Berger, 1997). Both are complex constructs comprised of several different measures.

#### *Academic Involvement*

Academic involvement includes items such as faculty involvement (Astin, 1993; Berger & Milem, 1999; Milem & Berger, 1997; Pascarella, Smart, Ethington, & Nettles, 1987; Pascarella & Terenzini, 2005), in-class educational behaviors (Huang & Chang, 2004) and participation in educational initiatives such as first-year seminars and living-learning environments (Astin, 1991; Chrissman Ishler & Upcraft, 2005; Pascarella & Terenzini). This section details each aspect of academic involvement.

Students' interactions with faculty include such measures as of out-of-class interaction, visits to faculty homes, meeting with faculty during office hours, and sharing a meal and/or coffee with faculty. Almost without exception, these measures have had positive effects on students' self-concept (Astin, 1993; Berger & Milem, 2000), academic achievement (Astin, 1993; Pascarella & Terenzini, 2005) and institutional involvement (Milem & Berger, 1997). In addition, Huang and Chang's (2004) study revealed students' class-related behaviors such as attendance, taking notes, and completing

assignments on time had a significantly positive relationship with self-reported intellectual and cognitive growth.

Although few studies of student participation in educational initiatives have measured the effects of participation on grade point average, some studies have indicated that participation in specific programs has positive effects on academic success. Specifically, enrolling in first-year seminars and living in college residence halls are linked to persistence (Chrissman Ishler & Upcraft, 2005; Pascarella & Terenzini, 2005) and participation in living-learning environments is positively related to grade point average (Chrissman Ishler & Upcraft). In addition, Inkelas and Weisman (2003) found that participation in living-learning programs is a strong predictor of enjoying challenging academic pursuits. Finally, residence living in general is positively related to academic performance (Blimling, 1999) and persistence (Berger, 1997).

### *Effort*

Astin's (1993) work demonstrates that student effort, as measured by time-on-task studying, has a positive association with nearly every academic outcome he tested, including grades, persistence, and self-rated cognitive and social growth. Similarly, Pace's (1984) study on quality of student effort suggests a positive correlation between effort and learning. The effort variable in my study is patterned after Astin's work.

### *Social Involvement*

Social involvement denotes a wide array of activities, including peer interaction (Astin, 1993; Berger & Milem, 1999; Milem & Berger, 1997) and participation in social

or co-curricular activities (Astin, 1993; Berger & Milem, 1999; Milem & Berger, 1997; Huang & Chang, 2004). In general, peer interaction measures, such as discussing course content, participating in study groups, and socializing, have positive effects on social self-concept and academic development (Astin, 1993), perceptions of peer and institutional support, and subsequent involvement with faculty (Milem & Berger). However, the Milem and Berger study revealed that early peer interaction negatively influenced subsequent social integration. Participation in co-curricular activities produce mixed results. On the one hand participation in traditional social activities leads to academic non-engagement (Milem & Berger), and on the other hand, Huang and Chang (2004) reported that co-curricular involvement has a significant and positive relationship with self-rated cognitive growth and academic involvement. Astin (1993) reported that peer interaction is positively correlated with cognitive and affective development.

### Conclusion: Blending Sociological and Psychological Theories to Create a Better Model

Heretofore, this review of literature has provided an in-depth discussion of two previously disparate approaches to understanding changes in college students. The college impact models describe how the environment contributes to student outcomes while controlling for differences in student background characteristics (Astin, 1991, 1993), but overlooks how the person contributes to the environment. This study weds the sociological perspective of college impact with psychological dimensions usually reserved for understanding student development over time. In their meta-analysis of student outcomes research, Pascarella and Terenzini (2005) concluded that the best

models combine the sociological orientation with the psychological orientation. This study blended these two perspectives to create a more complete model.

This study helps to fill gaps in our understanding of how student attributes, such as self-concept and self-determination, affect educational outcomes. Specifically the current study addresses the role of student attributes in predicting academic achievement among first-year college students, net of previously established predictive factors, including prior self-concept, high school achievement, and involvement. In addition, this study builds upon our understanding of the role the psychological dimension of student attributes play in predicting involvement. The literature on self-efficacy (Bandura, 1977, 1982), self-determination (Deci & Ryan, 1985; Ryan & Deci, 2000, 2002), and self-concept have suggested that involvement is more a function of psychological attributes than of the environment.

However, Ryan and Deci (2000, 2002) also have indicated that the environment can influence self-determination. Therefore, this study was designed to help uncover how the educational experience influences change in student attributes over time. Although the current study contributes to our understanding of the role and responsibility of the individual college student in achieving educational outcomes, I note Schwartz's (2000) admonishment not to over-emphasize student attributes in such a way as to disadvantage the role of environmental factors. To address this concern, this study examined academic and social involvement along side student attributes in order to determine the relationship between the two.

This study utilized path analysis to determine the predictive ability of the direct and indirect effects of involvement on academic success as well as the impact of student

attributes on involvement and success. The following chapter describes the methodology for this study, which provides evidence for a more complete model of academic success, featuring student responsibility for engaging in the academic process.

## CHAPTER III

### METHODOLOGY

#### Introduction

Through decades of research, much is known about the effects of college attendance on students' cognitive, behavioral and psychological growth (Pascarella & Terenzini, 2005). Furthermore, in their exhaustive appraisals of college impact studies, Pascarella and Terenzini (1991, 2005) found very little disparity between institutional environments, in terms of size and control, and their ability to affect students. Instead, the major differences in effects on outcome measures were found within each institution and were attributable to variations in individual students' experiences, such as involvement with peers and faculty, residence arrangement, involvement in co-curricular activities and academic major (Pascarella & Terenzini, 1991, 2005). In addition, Pascarella and Terenzini (2005) concluded that student attributes, specifically self-concept, also contributed to educational gains. However, student attributes, or the dimensions of self-concept, self-determination, and self-efficacy, are rarely studied in combination with student involvement. Moreover, Astin's (1984) work on student involvement suggested that student involvement influences educational outcomes.

The purposes of this study were two-fold: (a) to explore how initial student attributes shape student engagement with the institutional environment and how the institutional environment influences subsequent attributes; and (b) to understand how student attributes and institutional environment contribute to academic success as measured by grade point average at the end of the first college year. This study utilized a

causal model to measure the contributions of student attributes and academic and social involvement on academic success in the first year. As such, this study examined a longitudinal panel using path analysis to investigate the direct and indirect effects of student attributes on cumulative grade point average of first-year, traditional-aged students attending a four-year religiously-affiliated, residential, comprehensive master's institution. The research questions guiding this study are:

1. What changes in student attributes occur during the first year of college, and what environmental factors influence these changes?
2. Controlling for student background characteristics, how do initial student attributes influence academic and social involvement in the first year of college?
3. Controlling for student background characteristics and student attributes at Time 1, how do academic and social involvement impact subsequent student attributes and academic success?
4. After controlling for student background characteristics and academic and social involvement, what are the direct and indirect effects of student attributes, as measured by self-determination, self-efficacy, and self-concept, on the academic success of first-year college students?
5. Which student attributes construct (i.e., self-efficacy or self-determination) is a better predictor of academic success in the first year?

This quantitative study adapted the classic input-environment-output model (I-E-O; Astin, 1977, 1991), the primary model for college impact studies. The I-E-O model

provides a formula for statistically measuring effects of the college environment on educational outcomes while controlling for students' background characteristics at the time of entry. According to Astin's (1991) definition of "inputs," self-concept, self-efficacy, and self-determination could be considered attitudes and beliefs students possess at time of entry. However, constructs for student attributes first enter the model as intermediary variables between student input and institutional environment for two reasons: (a) to separate these constructs from input variables of a demographic nature that may influence these attributes; and (b) to be consistent with assertions that self-efficacy (Bandura, 1997) and self-determination (Deci & Ryan, 1985; Ryan & Deci, 2002) are the characteristics that determine how a person engages his or her environment. The literature (Bandura; Berger & Milem, 1999; Deci & Ryan; Milem & Berger, 1997; Ryan & Deci) indicates that engaging with the environment may change the nature of a person's self-determination and self-efficacy beliefs. Indeed, Lewin (1936) theorized about behavior as a function of the interaction between a person and his or her environment, and some of the work stemming from Lewin's theory (Holland, 1973; Stern 1970) indicates that the person and the environment are equal players. In keeping with the recommendations of these theories, student attributes constructs enter the model again as mediating factors, or intermediate outcomes, between the environment and the outcomes of interest.

This chapter outlines an appropriate research methodology, beginning with a description of data analyses suitable for answering the research questions. A description of the conceptual model and the variables used in the study follows. Given that this study relied upon analyses of existing institutional data, I next describe the survey instruments,



the data collection strategies employed by the target institution, and the sample. Finally, the chapter concludes with a description of the study's limitations and delimitations.

### Data Analysis

According to Ferguson's (1959) classic text on the use of statistical analysis in education and psychology, statistical analysis should flow naturally from the research hypotheses, such that data interpretation "conforms to the rules of scientific evidence" (p. 2). Therefore, this study utilized path analysis, the data analysis technique used to determine the direct and indirect effects of self-determination (Guay, Senécal, Gauthier & Fernet, 2003; Reeve, Nix & Hamm, 2003; Vallerand, Fortier & Guay, 1997) and college student involvement (Berger & Milem, 1999; Milem & Berger, 1997). Path analysis is a statistical method rooted in multiple regression analysis, which "allows a researcher to test a theory of causal order" (Klem, 1995, p. 65) by examining the direct and indirect effects of independent variables. The conceptual model tested in this study includes both exogenous and endogenous variables. Only those variables related to student background characteristics are considered exogenous. All other variables in the model are endogenous because their values may be explained by other variables or constructs in the model (Klem).

### *Descriptive Analysis*

In order to prepare for the path analysis, I followed several steps of preliminary analyses. First, I conducted exploratory data analysis to describe the characteristics of the analytic sample (Ferguson, 1959) and to ascertain the nature of relationships between

variables of interest. Second, in order to test for response bias, I conducted missing data analysis for pivotal independent and dependent variables to determine whether the analytic sample differed significantly from the target sample on any relevant input measure, such as gender, race, first-generation status, or high school achievement, or on any other relevant measure, such as self-determination. Once I understood the impact of missing data due to incomplete cases or attrition over time, I determined whether these missing data posed any problems to interpreting the results of statistical analyses. Possible methods for managing missing data include using list- or pairwise deletions or taking steps to impute missing data from cases with complete data (Kline, 2005).

In addition to exploratory and missing data analyses, I conducted a paired samples *t* test to answer the first research question regarding possible change in student attributes during the first year. In order to determine which environmental factors influenced that change, I utilized linear regression analyses.

### *Factor Analysis*

Several theoretical concepts within the proposed conceptual model (self-efficacy, self-determination, academic involvement, and social involvement) linked to multiple survey items. Rather than entering each survey item into the model separately, I used exploratory factor analysis both to substantiate the existence of the underlying constructs and to reduce redundancy within the model. Exploratory factor analysis allows the researcher to uncover constructs for which there is no prior knowledge (Bryant & Yarnold, 1995). To ensure the factors accurately represent the data, Bryant and Yarnold recommended computing at least one goodness-of-fit index in order to measure how well

the data fit the hypothesized constructs. Although data reduction techniques reduce multicollinearity among variables in the model, use of these techniques may increase the difficulty of interpreting the results of path analysis, which relies on observed data to determine causal relationships (Klem, 1995): First, factors often consist of unobservable indicators (Klem, 2000); and second, there is no guarantee that factors identified in the model translate to constructs in the real world (Kline, 2005).

### *Path Analysis*

Conceptual models stem from the literature, which provides the justification for variable inclusion and ordering, yet the information gleaned from the model depends largely upon the researcher's choice of statistical analysis. Noting the proliferation of studies relying upon multiple regression analysis, Pascarella and Terenzini (2005) suggested that regression analysis "provides limited information about the connections between and among variables and about the causal patterns in which experiences combine to shape student change" (p. 636). Instead, Pascarella and Terenzini recommended the use of causal modeling procedures, including path analysis.

Path analysis is a predictive technique, which allows a researcher to test more than one dependent variable within a single model (Klem, 1995). Given that the literature-supported research questions about the direct and indirect effects of student attributes on academic success and the influence of attributes and involvement on one another, path analysis is an appropriate methodological choice. Although path analysis does not prove causation, it does provide for increased understanding of a phenomenon (Klem; Pascarella & Terenzini, 2005)—in this case, the effects of student attributes. Path

analytic procedures test the validity or tenability of theory, although more than one model may be consistent with any theory (Klem; Pedhazur, 1982). Path analysis is a robust test, requiring a large sample size—200-300 cases are recommended (Klem; Kline, 2005).

As an extension of multiple regression, path analysis maintains the assumptions of multiple regression: variables in the model are not related to one another, the measurement of observed variables is accurate, variables are appropriately included in the model, and no crucial variables are excluded from the model (Asher, 1983; Klem, 1995; Pedhazur, 1982). Like multiple regression, path analysis also assumes that residuals “(a) have a mean of zero; (b) are homoscedastic (i.e., have equal variances at all values of predictors); (c) are uncorrelated with each other and with the predictors; and (d) are normally distributed,” (Klem, p. 49). Klem makes explicit the other major assumptions of path analysis as well. First, path analysis assumes linearity in the model and that all hypothesized relationships move in one direction. Second, path analysis assumes that there are no interaction effects between variables.

Path analytic techniques delineate both direct and indirect relationships between variables (Asher, 1983; Klem, 1995; Pedhazur, 1982). An arrow between two variables indicates a direct relationship (Klem; Pedhazur) such that the independent variable at the arrow’s origin predicts, or is hypothesized to predict, the dependent variable at the arrow’s point. A direct relationship between variables indicates that a change in the independent variable results in a change in the dependent variable, holding all other variables constant (Asher, 1983; Sherlin, 2002). An indirect effect indicates that the relationship between two variables is mediated by one or more additional variables (Pedhazur). Depending on their placement in the model, independent variables may

exhibit direct effects only, indirect effects only, or both direct and indirect effects. The sum of direct and indirect effects for any given variable is the total effect (Klem). In addition, spurious effects arise when two endogenous variables have a common cause, and unanalyzed effects arise when two exogenous variables are correlated with one another (Klem). The sum of all four effects (direct, indirect, spurious, and unanalyzed) is the implied correlation between two variables (Klem; Pedhazur), which can be compared to the observed correlation to determine model plausibility (Klem).

To calculate the direct and indirect effects of complicated path models, Klem (1995) suggested using software packages, such as LISREL, EQS, or AMOS, specifically designed to manage the analysis. The software packages provide advantages in automated calculation of effects and goodness of fit. However, as the model of this study is exploratory in nature and relatively straightforward, I utilized a succession of multiple regressions as the preferred path analytic technique. Multiple regression analysis was the preferred method of both Asher (1983) and Klem in their explanations of path analysis: “The simplest ways to obtain the path coefficients is to employ ordinary regression techniques, providing the regression assumptions are met,” (Asher, p. 30).

Direct effects were obtained through a multiple regression analysis for each endogenous variable. Significant direct effects were noted, and then indirect effects were calculated as compound paths (Asher, 1983; Pedhazur, 1982). The indirect effect is the product of direct paths between one independent variable and the dependent variable as mediated by one or more intervening variables (Pedhazur). For example, while variable 1 (independent) may not have a direct effect on variable 3 (dependent), the two might have an indirect relationship mediated by a third variable. The indirect effect of variable

1 on variable 3 may pass through variable 2 (mediator), which has a direct effect on variable 3. The indirect effect of variable 1 on variable 3, then, is be the product of direct effects between variables 1 and 2 and between variables 2 and 3 ( $IE_{31} = DE_{21} \times DE_{32}$ ). The indirect effects were added to the direct effects to determine the total effect of each variable in the model.

### Conceptual Model

According to Klem (1995), the conceptual model is the explicit representation of the researcher's theory about the causal relationship among variables. Theory indicates which variables a researcher should include in a model for path analysis as well as the specific ordering of those variables. The previous chapter outlined the theoretical concepts, which are the foundation for this research. Astin's (1984) theory of involvement suggests that the quantity and quality of students' involvement with the university environment have tremendous impact on educational outcomes. Research confirms that involvement is related to gains in self-confidence and cognitive development, communication and interpersonal skills (Huang & Chang, 2004) and predicts academic and social integration and persistence (Berger & Milem, 1999; Milem & Berger, 1997). However, why some students get involved and others do not is less understood. Borrowing from social psychology, the concepts of self-efficacy (Bandura, 1977, 1982, 1997) and self-determination (Deci & Ryan, 1985; Ryan & Deci, 2000, 2002), and self-concept may be just the tools to explain why some students exert personal agency over their college experience to greater degrees than others. The conceptual model for this study was supported by these theoretical frameworks and blended the

learning from the effects of involvement theory and student attributes on academic success.

In an earlier version of the conceptual model, self-efficacy and self-determination were isolated in their own block at Times 1 and 2. Although no temporal difference exists between these constructs and academic and social self-concepts, self-efficacy and self-determination appeared separately because they are the primary focus of the investigation. However, the correlation study described in Chapter Four indicated that the available measures for self-efficacy were consistently correlated with academic self-concept, which violated the assumption of no multicollinearity within path analysis. Therefore, one of these variables had to be dropped from the model. Given that the factors describing self-efficacy were theoretically weaker and less robust than those representing academic self-concept, I removed self-efficacy from the model. With self-efficacy eliminated from the model, academic and social self-concepts rose to the foreground as measures of student attributes. Self-concept, then, had parity with self-determination. This change still allowed for an investigation of the direct and indirect effects of student attributes on academic success, without violating the “no multicollinearity” assumption of path analysis. The revised conceptual model (Figure 3.1) demonstrates the new placement of academic and social self-concepts in the block with self-determination at Times 1 and 2.

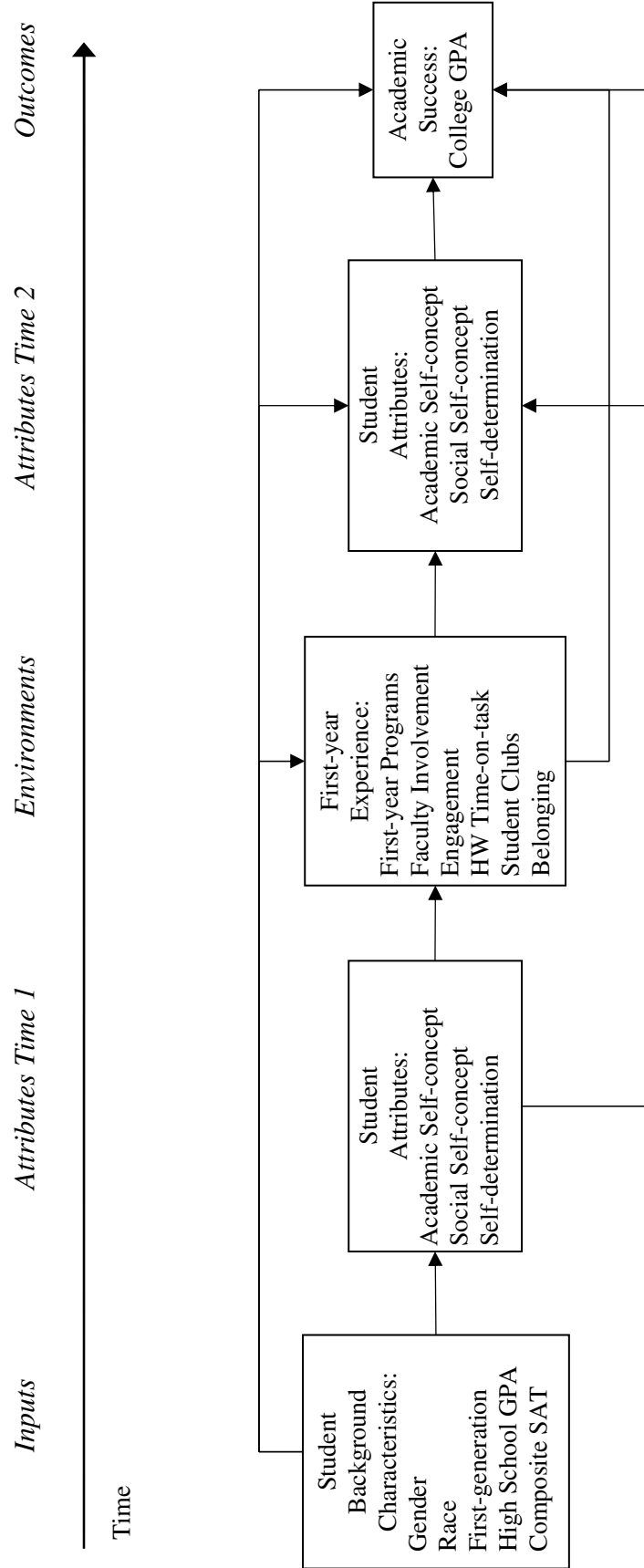
In this model, student background characteristics in block one pertain to gender, race, first-generation status, high school grade point average, and SAT composite. Path analysis indicated the direct and indirect effects of these variables on those in all subsequent blocks. In block two, student attributes refer to academic self-concept, social

self-concept, and self-determination, and analysis demonstrated their direct and indirect effects on the first-year experience, student attributes in Time 2, and college GPA. First-year experience variables in block three include enrollment in a first-year program, faculty interaction, academic engagement, homework time-on-task, participation in student clubs and organizations, and sense of belonging. Direct and indirect effects of variables in block three are measured for student attributes at Time 2 and college GPA. With the elimination of self-efficacy, student attributes in the fourth block now contain academic and social self-concept along with self-determination. Path analysis is used to determine the direct effects of these variables on college GPA, the dependent variable.

At its core, the conceptual model in Figure 3.1 is an input-environment-outcome (I-E-O; Astin, 1991) assessment model, which flows from left to right as required by path analysis (Klem, 1995). In some ways, the model is reminiscent of Tinto's (1993) Longitudinal Model for Student Departure in that the variables for both models share a similar sequence. As with Tinto's model, the conceptual model guiding this study outlines student background characteristics as a pre-cursor to understanding personal student attributes that are critical to the collegiate experience. Both models also emphasize interaction with the environment as a predictor of student change. In Tinto's model, this change is described as a chance for academic and social integration followed by a confirmation or rejection of goal commitments. In the conceptual model for this study, student change is marked by the development, or growth, of student attributes



Figure 1. Revised Conceptual Model: Student Attributes and Academic Success in the First Year of College



at Time 2. Finally, both models are longitudinal, expressing some length of time between student's input characteristics and the outcome.

The model guiding this study is recursive, such that all causal links are mono-directional, as recommended by Kline (2005) and Klem (1995). Beginning with the input block on the far left, the remainder of this section explains the logic behind the model.

### *Inputs*

Input variables are those characteristics a student possesses at time of entry (Astin, 1991); they are the qualities students bring to their collegiate experience. In college impact research, the following are widely recognized as typical input variables (Astin; Pascarella, 1985; Tinto, 1993): family and personal traits, such as gender, race/ethnicity, and first-generation status; and academic preparation, such as high school academic program and grade point average and college entrance exam scores. All of these were classified as input variables in the proposed model.

### *Student Attributes at Time 1*

Although all pre-entry attitudes and beliefs generally belong with inputs, for the purposes of this research, those measures constituting the self-efficacy and self-determination constructs are assigned their own block, entitled "Student Attributes, Time 1." The "Time 1" designation indicates that these attribute measures were taken from the pretest survey data. The nature of the proposed research is to determine what role student attributes play in academic and social involvement, and therefore, student attributes were isolated in their own block. The measures for academic and social self-concept were

comprised of students' self-assessments of ability. The self-determination variable is a composite of student self-perceptions of autonomy, competence, and relatedness, as suggested by Deci and Ryan (1985; Ryan & Deci, 2000, 2002). The literature (Brown, Lent, & Larkin, 1989; DeWitz & Walsh, 2002; Deci, Ryan, & Williams, 1996; Deci, Vallerand, Pelletier, & Ryan, 1991; Leslie, McClure, & Oaxaca, 1998; Miserandino, 1996; Multon, Brown, & Lent, 1991) suggests that these measures of student attributes have implications for how a person engages his or her environment. As such, student attributes at Time 1 directly precede the variables within the first-year experience block.

### *Environments*

According to Astin (1991), environmental variables represent aspects of involvement in the educational experience. The environment has academic and social components (Astin, 1993; Tinto, 1993), and these components have both formal and informal configurations (Tinto). The literature on student involvement suggests important environmental variables including campus residence, co-curricular activities, employment (Astin, 1984); interactions with faculty and peers (Astin, 1999); and participation in programmatic interventions for the first year, such as first-year seminars and learning communities (Chrissman Ishler & Upcraft, 2005). Although the literature suggests a benefit from residential programs (Astin, 1993; Upcraft, 1989) in the first year of college, this component is not included in the model because of the highly-residential nature of the target institution.

Involvement is also described as having quantitative and qualitative components (Astin, 1984), such that student involvement is reflected in the amount of time and energy

students devote to educational activities as well as the quality their efforts (Astin, 1984; Pace, 1984). This aspect of the first-year experience measures how much time college students devote to the academic enterprise and how well they engage their classes and coursework. Variables such as number of hours spent on homework each week and the average number of times students missed or fell asleep in class all describe the quality of student effort. An effort construct is necessary to the model because as Astin stated, “The concepts of time-on-task and effort, for example, appear frequently in the literature as key determinants of a wide range of cognitive learning outcomes” (p. 305).

#### *Student Attributes at Time 2*

Lewin’s (1936) work suggests that behavior results from an interaction between a person and his or her environment. Aside from affecting how a person interacts with his or her environment, the literature also indicates that interaction with the environment can affect a person’s self-determination (Ryan & Deci, 2000). Therefore, the model includes a second measure of the student attributes composite variables. As student attributes at Time 2 are the posttest measures of student attributes at Time 1, the model acknowledges the possibility of change over time, indicated either by increasing or decreasing levels of academic self-concept, social self-concept, and self-determination. If change occurs, statistical analyses help determine what part of attribute change is due to environmental involvement factors represented in the model. Time 2 measures were taken from the posttest survey data.

## Variables

Using a combination of survey and institutional data, this study identified a dependent outcome variable describing academic success and two sets of intermediate outcome variables: those related to academic and social involvement in the first year and those related to student attributes at Time 2. The dependent outcome variable is discussed below; all other variables follow in sequential order.

### *Dependent Variable*

#### *Academic Achievement*

Academic achievement is measured by cumulative grade point average for the 2004-2005 academic year. Grades are an often-acknowledged standard of academic success (Astin, 1993; Upcraft, Gardner, & Barefoot, 2005). The institution provided information for students' grade point averages.

### *Exogenous Variables*

#### *Student Background Characteristics*

In following Astin's (1993) I-E-O model, the hypothesized causal model accounts and controls for fixed input characteristics. Variables related to student background represent demographic information, including gender, race, and first-generation college student status (a composite indicating parents' educational attainment). Input variables also include measures of aptitude (high school GPA and college entrance exam scores). All items pertaining to student background characteristics were located in the CIRP

Student Information Form, with the exception of the college entrance exam scores, which were provided by the institution.

### *Endogenous Variables*

#### *Self-concept (Academic and Social)*

Academic and social self-concepts are composites that were constructed from self-assessment items within the CIRP (Higher Education Research Institute [HERI], 2004) and Your First College Year (YFCY, HERI, 2005) surveys. Exploratory factor analysis with students' self-ratings determined the parameters for academic and social self-concepts. Items such as academic ability, intellectual self-confidence, writing ability, and public speaking ability (Berger & Milem, 2000) were expected to load onto academic self-concept. Additional items such as computer skills, mathematical ability, and drive to achieve were also tested for inclusion in the academic self-concept construct. Items such as leadership ability, popularity, social self-confidence, and understanding of others were expected to comprise the construct for social self-concept (Pascarella, Smart, Ethington, & Nettles, 1987). Each of the items listed above was measured on a Likert-type scale, appeared in pretest form on the Cooperative Institutional Research Program's (CIRP) Freshman Survey, and had a direct posttest measure in the Your First College Year follow-up survey (YFCY).

#### *Self-determination*

The items in this category refer to the student's self-determination at Times 1 and 2. Data related to self-determination were derived from the portion of the Student

Readiness Assessment (SRA, Magis University, 2004) that incorporated the Basic Psychological Needs Survey (BPNS, Deci & Ryan, 2000). These items included student self-assessments of autonomy, competence and relatedness. Self-determination at Time 1 contributed to the understanding of the direct effect of this student attribute on academic and social involvement during the first year, while the Time 2 construct measured change over time and the influence of the college environment over student attributes. All responses for these items were rated on a Likert-type scale.

### *First-year Experience*

Items in this block refer to academic involvement and social involvement in the first year of college. Academic and social involvement were placed in the same block because they both describe the environment of the first-year experience. Academic involvement was comprised of programmatic interventions in which students may be enrolled, such as first-year seminars or learning communities, as well as a combination of composite factors derived from variables describing the student's interaction with the institution's intellectual environment. Previous research (Milem & Berger, 1997) supports developing factors of academic involvement, which include involvement with faculty and academic engagement. The variables comprising these factors mapped to items in the YFCY survey and recorded students' self-assessments, frequency and type of interaction with faculty, and behaviors associated with intellectual engagement. Responses were recorded on Likert-type scales. Academic involvement also comprises quality of effort and time-on-task items obtained from the YFCY survey. The student effort questions pertain to student self-assessments of number of hours spent studying;

frequency of submitting marginal work; and frequency of non-engaging behaviors, such as feeling bored or falling asleep in class. Together, these variables comprise composites of academic engagement and time-on-task student effort. All student effort questions are rated on a continuous scale.

Social involvement refers to students' participation in the social environment of the institution. Like academic involvement, social involvement is a composite factor derived from survey items. Previous research (Milem & Berger, 1997) supports developing factors of social involvement that include involvement with peers, sponsored student clubs and organizations and athletics (varsity, club-level, and intramural) as well as affiliation with the institution. The variables comprising these factors mapped to items in the YFCY survey which recorded students' self-appraisal of interactions with peers, participation in activities, participation in athletics and organizations, success with building social relationships, and satisfaction with sense of community. Responses were recorded on Likert-type scales.

In addition to their properties as independent variables affecting educational outcomes, variables describing the behavioral aspects of students' academic and social involvement also appear in the proposed model as intermediate outcome variables influenced by student background characteristics and student attributes at Time 1.

The operative model for this study, as displayed in Figure 3.1, includes four categories of independent variables affecting, either directly or indirectly, the dependent variable: academic achievement. A complete list of variables in this study, their associated theoretical concepts and their correspondence to specific items on the survey



instruments can be found in Appendix A. (For the specific survey instruments, see Appendices B, C, and D.)

### Instrumentation

To explore factors which influence achievement and self-concept, Marsh (2003) recommended a two-wave research design. Therefore, this study drew upon data from four survey instruments as part of a longitudinal design. These data were collected at a target institution as part of its on-going assessment activities. Two of the instruments were paired surveys from a national study of first-year students, with one survey administered at the beginning of fall semester and the second survey administered near the end of spring semester. The additional surveys, measuring self-determination, were administered concurrently with the other two in a pre-/posttest design. The target institution granted permission to analyze its data from the 2004 Student Information Form, the 2005 Your First College Year, and Student Readiness Assessment pre- and posttests gathered from its first-year students during the 2004-2005 academic year. In addition, the institution agreed to provide institutional data for the first-year cohort as a comparison against which to evaluate the analytic sample.

#### *Cooperative Institutional Research Program: Freshman Survey*

The target institution is a regular participant in the Cooperative Institutional Research Program (CIRP), which produces the Student Information Form, an annual study of the nation's first-time, first-year college students. Sponsored by the Higher Education Research Institute (HERI) at the University of California-Los Angeles, the CIRP Freshman Survey records information about student characteristics, goals, attitudes,

and expectations ([http://www.gseis.ucla.edu/heri/cirp\\_survey.html](http://www.gseis.ucla.edu/heri/cirp_survey.html)). The Freshman Survey serves two purposes: first, the data it generates stand alone as an annual snapshot of the nation's entering college students, which provide a year-to-year comparison for trend analysis; and second, the Freshman Survey is one component of a series of related surveys, which provide longitudinal data for college impact studies (Astin, 1993). In addition to compiling a national profile of incoming first-year students each year, HERI provides participating institutions with their own students' data for institutional assessment and research ([http://www.gseis.ucla.edu/heri/cirp\\_po.html](http://www.gseis.ucla.edu/heri/cirp_po.html)). The 2004 instrument (Appendix B) contained 63 items, including 21 institution-generated questions and took approximately 20 to 30 minutes to complete.

The CIRP Freshman Survey is the nation's oldest and largest empirical study of first-year college students, and the work of HERI researchers spans over three decades ([http://www.gseis.ucla.edu/heri/cirp\\_survey.html](http://www.gseis.ucla.edu/heri/cirp_survey.html); Miller, Bender, & Schuh, 2005; Upcraft, Gardner, & Barefoot, 2005). Although HERI staff no longer publish their methods for establishing reliability and validity—including content, predictive, and construct validity—for the Freshman Survey, the body of knowledge their research generates provides substantial evidence that the Freshman Survey is both valid and reliable. Data from the Freshman Survey comprise the annual profile of students reported in *The American Freshman* and have provided the data for Alexander Astin's volumes *Four Critical Years: Effects of College on Beliefs, Attitudes, and Knowledge* (1977) and *What Matters in College: Four Critical Years Revisited* (1993) as well as hundreds of journal articles, books, book chapters, and dissertations.

The target institution administered the CIRP Freshman Survey on the first day of new student orientation in September 2004. In groups of 10 to 15, first-year students met with orientation leaders who read survey instructions, distributed surveys and pencils, and then collected completed surveys; the orientation leaders returned completed surveys to their program director. Typically all first-year students, except varsity athletes participating in fall sports, attend orientation at this institution; of 960 first-time, first-year students, the response rate for the fall 2004 administration of CIRP was 92% of all first-year students.

### *Student Readiness Assessment*

In addition to the CIRP Freshman Survey, the orientation leaders distributed informed consent forms and administered the university's Student Readiness Assessment (Appendix C) to their groups of first-year students. The Student Readiness Assessment (SRA) is a combination of the Basic Psychological Needs Scale (BPNS; Deci & Ryan, 2000) and institution-sponsored administrative data.

Self-determination Theory posits that the basic psychological needs of autonomy, competence and relatedness must be satisfied in order for an individual to be self-determined (Deci & Ryan, 2000). The BPNS consists of 21 items on a Likert-type scale ranging from 1 (*not at all true*) to 7 (*very true*), which measure these three psychological needs central to Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000, 2002). The BPNS contains three subscales, one for each psychological need, with seven items per subscale, allowing the researcher to obtain separate scores for each need or to determine general need satisfaction by combining data from the three subscales

(<http://www.psych.rochester.edu/SDT/measures/needs.html>). Deci and Ryan established validity and reliability for the BPNS in their University of Rochester laboratory, and researchers have utilized the scale in a wide variety of domains, including education, health care, athletics, and work. The BPNS is available on-line at:  
[http://www.psych.rochester.edu/SDT/measures/needs\\_scl.html](http://www.psych.rochester.edu/SDT/measures/needs_scl.html).

Institutional researchers obtained permission to utilize the scale in institutional research from its authors. The BPNS was not modified in terms of language, question ordering or response scale. However, to answer other institutional questions eight additional items addressing parental involvement, perceptions of academic preparation, and place of college residence were added to the instrument. The additional items were pilot tested with four students at the institution, who provided feedback about survey length and question content. These additional questions combined with the original BPNS constitute the SRA, which has a total of 29 items. The SRA took an average of 10 to 15 minutes to complete. The response rate for the pretest version of the survey was 92%, the same as that for CIRP. The posttest response rate was 38%.

#### *Cooperative Institutional Research Program: Your First College Year*

Designed by HERI in conjunction with the Policy Center on the First Year of College, Your First College Year (YFCY) assesses the personal and academic growth of students during their first year of college (<http://www.gseis.ucla.edu/heri/yfcy.html>). As a follow-up to the Freshman Survey, YFCY collects data related to students' development since their matriculation and allows assessment of institutional programs and practices ([http://www.gseis.ucla.edu/heri/yfcy/survey\\_instrument.html](http://www.gseis.ucla.edu/heri/yfcy/survey_instrument.html)). Content

areas include academic achievement, behavior, persistence, and involvement, many of which directly correspond to questions on the Freshman Survey. After establishing validity and reliability for YFCY through pilot tests, HERI began administering YFCY nationally in 2000.

The 2005 version of Your First College Year (Appendix D) contained 56 items, including 30 institution-specific questions and took an average of 20 minutes to complete. Similar to its practices with results from the CIRP Freshman Survey, HERI provides participating institutions with their students' YFCY data for institutional assessment and research (<http://www.gseis.ucla.edu/heri/yfcy.html>). Used in conjunction with one another, the CIRP and YFCY surveys are powerful tools for assessing development and change in the first year of college (Delaney, 2004; Upcraft, Gardner, & Barefoot, 2005). The host institution granted me authorization to analyze YFCY data, along with SRA data, gathered from its first-year students during the spring of 2005.

Your First College Year is part of the second wave of data collection along with the second administration of the SRA in April 2005. First-year students received a letter from the institution's president about the importance of participating in the second round of surveys during the first week of April. During the second week of April, students received the YFCY in their campus mailboxes along with the second issue of the SRA, a second consent form, and a cover letter from Institutional Research. This mailing was followed by an e-mail announcement from their class president reminding them to complete the survey. Over a three-week period, students returned their completed surveys to advertised drop boxes, during which time reminders about the survey appeared in the student newspaper, on the campus radio station, in the daily electronic news

bulletin, and by email. As an incentive for students to return their surveys, the institution raffled two \$100 cash prizes and one iPod Shuffle® each of three weeks; only students who had completed their surveys were eligible. In an additional effort to boost the return rate, the institution sponsored an incentive program for graduate assistants living in the first-year residential areas, such that graduate assistants whose residential areas had greater than an 85% return rate were eligible for a cash prize of \$100.

The response rate for YFCY and the BPNS posttest was 38%. The institution attributed participant attrition to the change in method for survey distribution/collection. Whereas in September the institution employed a “captured audience” tactic, in April the institution relied on voluntary participation by mailing the instruments to students along with a letter requesting their participation.

The institution sent a data file containing SRA pre- and posttest data, cumulative grade point averages, SAT scores, and fall 2006 enrollment for each student to HERI to be merged with CIRP and YFCY data. The students’ university identification number was the merge point. Once all data were merged, HERI stripped students’ identification numbers from the file in order to protect students’ anonymity before returning the file to the institution.

### Sample

For the purpose of this study, I had access to data, which were part of a longitudinal study of first-year student outcomes and persistence funded by the Division of Academic Affairs at a selective and highly residential, comprehensive university in the mid-Atlantic region of the United States. The target sample was the fall 2004 entering

first-year class of 960 students. Consistent with national gender ratios for first-year students matriculating in fall 2004 (2004 CIRP Institutional Profile), the sample included 52% women students and 48% men, which promotes the generalizability of findings to first-year students at liberal arts colleges and universities of similar size and selectivity.

All members of the fall 2004 entering first-year class received four survey instruments, two pretests on the first day of new student orientation and two follow-up surveys in April 2005. The longitudinal panel for data analysis consists of participants who reasonably completed all four surveys ( $N = 202$ ). On account of the number of dependent and independent variables of interest and participant attrition between the first survey administration in September 2004 and the second in April 2005, the analytic sample includes all members of the first-year class who completed each survey instrument. In order to maintain reasonably high survey response levels, the target institution employed a process for systematic data collection. Although I could not control participant attrition as this research involves secondary data analysis, descriptive analyses allowed me to investigate whether particular types of students were more, or less, likely to respond to all four surveys.

### Delimitations

The target institution, hereafter referred to as “Magis University,” is a mid-sized comprehensive university. Magis University is one of 28 Jesuit-Catholic colleges and universities in the United States. The student body of Magis University is predominantly residential, of traditional age, and White. This study is situated in Jesuit higher education

for four reasons—one of which was related to research design, two were theoretical, and the fourth reason was practical.

First, at its core, this study was an examination of the interaction of student attributes and educational environment in the production of educational outcomes. Different environmental factors such as size, geographic location, control, and selectivity all affect student success, and variations in environment lead to variations in student behavior (Baird, 1988; Kuh, 1993; Upcraft & Gardner, 1989). Locating the study in a single institution highlighted individual student factors by eliminating environmental differences that might otherwise influence the outcome and blot out any contributions made by student attributes. Pascarella and Terenzini (1998) suggested that localized, single-institution studies are more useful in guiding the understanding of how theoretical concepts manifest themselves on an individual level. The strength of a single-institution study is in the ability to disentangle the effects of student characteristics from the environment. Teasing out the effects of student attributes, contributes to a better understanding of how the individual functions in relation to academic success prior to building a multi-institutional model. I delimited the study to a particular institution in order to isolate an educational environment so as to focus data analysis on differences in student attributes.

Pascarella and Terenzini (2005) provided further justification for choosing to locate the study at one institution when they concluded:

On just about any outcome, and after taking into account the characteristics of students enrolled, the dimensions along which American colleges and universities are typically categorized, ranked, and studied, such as type of control, size, and



selectivity, are simply not linked with important differences in net impacts on student learning, change, or development. Despite structural and organizational differences, institutions are more alike than different in their effects on students.... Rather...what happens to students after they enroll at a college or university has more impact on learning and change than the structural characteristics of the institution these students attend. (pp. 641-2)

In other words, the net effects of college attendance are similar across all institutions, and in a study of the student experience, institution type and size do not play a leading role. Therefore, a study examining the impact of student attributes on academic success at one institution contributes to the understanding of students, their learning, and their development.

The second justification for choosing a single-institution study is related to Magis University's Jesuit nature. Jesuit-Catholic higher education has a particular educational philosophy rooted in academic excellence (Biondi, 1989; Donohue, 1963; Flynn 1989; McInnes, 1989) and dedication to service and formation of the human person—spiritually, intellectually, socially, and physically (Biondi). According to Biondi, Jesuit higher education aims to affirm the dignity of the human person in the likeness of God; develop intellectual discipline, including critical thinking, language and problem-solving skills; and improve a student's ability to lead and serve his or her community. Such a philosophical approach is congruent with the development of the whole student, and it is consistent with Kuh's (1991) description of "involving colleges."

The first principle of Kuh's involving colleges is related to institutional mission. Kuh (1991, 1993) stipulated that involving colleges have clear missions that are

understood by all institutional members and that communicate high expectations for student performance. The mission, then, becomes a contract of sorts between the institution and its students. As a statement about the institutional values and goals, the mission is a philosophical representation of the ideal educational experience for its students; the mission says both “what the institution should be expected to do, but also . . . what its students should be expected to do on their own behalf” (Tinto, 1993, p. 145). Compared to other institution types, institutions with liberal arts-focused missions, such as Magis University, tend to have challenging academic programs that are intensive in reading and writing, a greater sense of community, and a higher degree of student-faculty interaction (Kezar & Kinzie, 2006), and are related to increases in cognitive and personal development (Kuh, 1993).

As a Jesuit institution, Magis University shares a common foundation in academic excellence (Biondi, 1989; Donohue, 1963; Flynn, 1989; McInnes, 1989) and a dedication to service and formation of the human person—spiritually, intellectually, socially and physically (Biondi, 1989).

The second criterion for involving colleges is a “human-scale” campus environment that also uses its location for a positive educational advantage (Kuh, 1991). In other words, the campus environment *feels* good and welcoming. Magis University prides itself on the 14:1 student-faculty ratio and its well-developed first-year programs, which connect students to their faculty advisors inside and outside the classroom.

Third, involving colleges value student involvement (Kuh, 1991). One of the hallmarks of Jesuit education is the commitment to development of the whole person, or *cura personalis* (Flynn, 1989). Active development requires participation on the part of

the institution and on the part of the student. The commitment to *cura personalis* requires Jesuit colleges and universities to involve students in their own growth on many different levels, including intellectual, spiritual and social.

Adherence to the final two values of involving colleges (mission-consistent policies and practices and faculty and staff who promote a seamless learning environment) emerges from the Jesuit tradition of care for the whole person. Jesuit institutions attract faculty, staff and administrators who understand their obligation as educators “to stir the minds and feelings of our students to consider how they should live in our society...” (Biondi, 1989, p. 99). This educational responsibility is as important outside the classroom as it is inside. Similarly, for Jesuit higher education to be effective, institutional practices and policies must reflect the philosophy that informs the mission. In these ways, Jesuit higher education as a whole strives to embody the characteristics of involving colleges on the basis of its spiritual tradition. For these reasons, Jesuit higher education was chosen as the context for this study.

The third reason for selecting a single institution in which to study the first year of college was related to Magis University in particular. Researchers at the Policy Center on the First Year of College identified 20 college initiatives and programs that contributed to excellence in the first year (Barefoot et al., 2005); Magis University had incorporated 15 of these 20 programmatic interventions, including an advising program designed for the first year, a common text, academic convocations, first-year seminars, a core curriculum with a liberal arts foundation, strong leadership and orientation programs, peer mentoring programs, learning communities, and first-year residences. By delimiting this study to an institution that met criteria for engaging first-year students, the

investigation allowed for more specific attention to students' disposition toward academic success.

The fourth, and final, reason for situating this study in a single Jesuit institution was practical. Simply stated, the sample for this study was convenient to obtain. As I am a long-time associate in the Jesuit network of institutions, I have collegial relationships with administrators at Magis University. On the basis of our association, Magis University was willing to grant access to its data.

### Limitations

Although the particularized locale allows for deeper understanding of how students interact with a specific educational environment, it also limits the generalizability of any results to students at this institution, other Catholic institutions, or possibly at liberal arts colleges. Furthermore, this research examines traditional-aged, first-year students at one selective, four-year institution with a student body that does not reflect the racial composition or socioeconomic levels of college students nationwide; Magis University draws a student population that is 87% White and economically privileged. Any attempt to generalize the results of this study beyond Catholic colleges and universities or liberal arts institutions of similar composition could be a problem.

Typically, quantitative analyses of survey data allow generalizations of results to portions of the larger population (Creswell, 2003). The survey process allows the researcher to collect a large volume of data in a short amount of time with relative ease. Additionally, the researcher can re-administer survey instruments to collect longitudinal data (as is the case in this study design) without over-taxing participants. The survey

process does have its disadvantages, however. As Schwarz (1999) warned, self-reported data may be less reliable if participants interpret questions differently from one another or from the researcher, if questions require participants to rely on their long-term memory for behavioral reports, or if the context for attitudinal questions is murky and unclear. However, I lessened the effects of student self-reporting by using data collected from solid survey instruments that have been used in multiple studies and were either nationally normed and piloted (CIRP and YFCY) or developed specifically to test theory (the BPNS portion of the SRA).

Also, although path analysis is a powerful statistical method for determining direct and indirect effects of exogenous and endogenous variables, it will not confirm or disprove a particular conceptual model; instead path analysis only allows the researcher to determine whether or not the data fit the proposed model (Klem, 1995). Klem warned the researcher to consider the possibility that several models, other than the one specified in the study, may also fit the data. However, the model proposed for this research tests relationships as suggested by theory. Whether or not another model may fit does not detract from the usefulness of testing a theoretically supported model.

The final limitations stem from the longitudinal design of this study. First, although this study was longitudinal by design, data collection only spanned participants' first year of college. It is possible that the effects of student attributes or environmental interventions took longer than one academic year to emerge (Feldman & Newcomb, 1994; Pascarella & Terenzini, 1991), or conversely that any observed change in student attributes is related to maturity (Pascarella & Terenzini). In fact, Terenzini (1994) warned that it is unreasonable to expect significant change within the first two years of

college. Second, although the institution employed participation incentives, respondent attrition occurred at a rate of 62%. Matching cases in the study's four-survey design further reduced the analytic sample to 259 cases, and the analytic sample was reduced further as 57 cases were deleted for incomplete data (total participant attrition of 78%). It is reasonable to anticipate that this level of attrition would cause the analytic sample to differ from the target sample in meaningful ways. In order to address this concern, I conducted missing data analysis.

Despite the limitations associated with survey research and quantitative methodologies, the advantages of undertaking this study to address its research questions outweighed the disadvantages. No single study can fully explain a theory or conceptual model. However, this research was a worthy pursuit because it suggests answers to important questions about the effects of student attributes on educational outcomes. Whereas typical outcomes-based research focuses on environmental interventions at the institution level, this study contributes to the understanding of which student factors may cause different students to benefit from the environment at differing rates.

### Summary

Higher education pundits (Kuh, Kinzie, Schuh, & Witt, 2005; Pascarella & Terenzini, 2005; Upcraft, Gardner, & Barefoot, 2005) persuasively reasoned that college students bear responsibility for involvement in the educational enterprise. Yet college impact studies typically focus on institutional efficacy to the exclusion of the effects of student attributes toward achieving measurable educational outcomes. The purpose of

this study was to determine the impact of college student attributes relative to academic success in the first year.

The sample for this study included first-year students at a religiously-affiliated comprehensive university in the mid-Atlantic region. A longitudinal panel of these students' responses to a series of two national and two institutional surveys comprised the dataset. To account for the personal and institutional factors leading to academic success in the first year of college, this study utilized a path analytic model to answer the research questions guiding it. Path analysis was an appropriate statistical technique for evaluating the direct and indirect effects of student attributes and institutional environment on academic success.

The following chapter presents the results of the descriptive, exploratory factor, and missing data analyses, as well as the correlation study and the research questions.

## CHAPTER IV

### RESULTS

#### Introduction

This study investigated how student attributes influence academic success in the first year of college. Specifically, descriptive analyses were used to explore characteristics of the analytic sample, and multivariate analytic techniques were used to understand how student attributes change over time. Finally, path analytic techniques were used to examine the direct and indirect effects of academic self-concept, social self-concept, and self-determination on cumulative grade point average. Changes in student attributes over time were also investigated along with factors that influence that change.

Prior to addressing the research questions, results of the exploratory factor analyses that created the variables for the model and the bivariate correlation study are reported. In addition, the final path model is presented, and missing data analysis is discussed. Finally, findings related to each research question are discussed.

#### Exploratory Factor Analysis

Principle components factor analysis was used to create factors that describe student attributes at Times 1 and 2 as well as measures of the college environment. Each factor is described in the pages that follow.



### *Student Attributes at Time 1*

Three composite variables were created to measure student attributes that may affect college grade point average, either directly or indirectly, at Time 1. These include academic self-concept, social self-concept, and self-determination.

#### *Measures of Self-concept*

Self-concept refers to a student's self-assessment of ability as compared to his or her peer group (Pascarella & Terenzini, 2005). For the purposes of this study, exploratory factor analyses were employed to create measures of academic and social self-concept using several items on the 2004 Cooperative Institutional Research Program (CIRP) Freshman Survey. Twenty-four survey items queried students to rate themselves on various traits related to different aspects of self-concept. All items were measured on a Likert-type scale (1 = Lowest 10%, 2 = Below Average, 3 = Average, 4 = Above Average, and 5 = Highest 10%). Of these 24 traits, four individual items loaded onto a construct describing academic self-concept. These traits (intellectual self-confidence, academic ability, drive to achieve, and writing ability) captured this comparative academic self-assessment. Table 1 summarizes the results of the principle components factor analysis. Factor loadings for "Academic Self-concept, Time 1" were moderately high as was the factor reliability ( $\alpha = .649$ ). Similarly, 4 of the 24 trait items represent social self-concept, including self-assessments of compassion, generosity, cooperativeness, and understanding of others. This factor had a moderately high reliability ( $\alpha = .685$ ) and factor loadings for each item were moderately high to high

(Table 2). Appendix E details a complete listing of the 24 trait items and the factors to which they belong.

Table 1

*Components of the Factor Composite: Academic Self-concept at Time 1*

Factor Components	Loadings
Self-confidence (intellectual)	.776
Academic Ability	.746
Drive to Achieve	.651
Writing Ability	.632
Alpha reliability coefficient	.649

Source: Analyses of CIRP:04, Magis University

Note. Items asked respondents to: "Rate yourself on each of the following traits as compared with the average person your age."

Table 2

*Components of the Factor Composite: Social Self-concept at Time 1*

Factor Components	Loadings
Compassion	.768
Generosity	.759
Cooperativeness	.672
Understanding of Others	.667
Alpha reliability coefficient	.685

Source: Analyses of CIRP:04, Magis University

Note: Items asked respondents to: "Rate yourself on each of the following traits as compared with the average person your age."

### *Self-determination*

The Basic Psychological Needs Scale (Deci & Ryan, 2000) contains 21 items that may be divided into three sub-scales, one each for measuring autonomy, competence, and relatedness. These sub-scales may be used independently or averaged together to create one scale for self-determination (Gagné, 2003). As this study is concerned with the larger concept of self-determination, analysis followed Gagné's example to create one factor representing self-determination using all 21 items.

Example items included: "I feel like I can pretty much be myself in daily situations," (autonomy); "Most days I feel a sense of accomplishment from what I do," (competence); and "People are generally very friendly to me," (relatedness). The items were measured on a Likert scale (1-2 = "Not true at all," 3-5 = "Somewhat true," 6-7 = "Very true"). All 21 items were tested using principle component analysis. However, unlike the Gagné (2003) study, only 19 items loaded onto the factor with factor loadings above .300. The two items with low factor loadings include "I feel pressured in my life," (factor loading = .270); and "In my daily life, I frequently have to do what I am told," (factor loading = -.071). Table 3 reports the factor loadings for the 19 items, which range from .369 to .702, and the alpha reliability for the factor ( $\alpha = .841$ ).

Table 3

*Components of the Factor Composite: Self-determination at Time 1*

Factor Components	Loadings
People are generally pretty friendly towards me	.702
I feel like I can pretty much be myself in my daily situations	.666
Most days I feel a sense of accomplishment from what I do	.626
I get along with people I come into contact	.618
People I interact with on a daily basis tend to take my feelings into consideration	.595
I really like the people I interact with	.570
I generally feel free to express my ideas and opinions	.549
†In my life I do not get much of a chance to show how capable I am	.538
†The people I interact with regularly do not seem to like me much	.523
People in my life care about me	.501
People I know tell me I am good at what I do	.495
I consider the people I regularly interact with to be my friends	.487
†I pretty much keep to myself and don't have a lot of social contacts	.478
I have been able to learn interesting and new skills recently	.474
†I often do not feel very capable	.465
†There are not many people that I am close to	.415
I feel like I am free to decide for myself how to live my life	.411
†There is not much opportunity for me to decide for myself how to do things in my daily life	.398
†Often I do not feel very competent	.369
Alpha reliability coefficient	.841

Source: Analyses of SRA:04, Magis University

Note. (†) Indicates item was recoded to achieve metric with consistent direction

### *First-year Experience*

Astin (1984) suggested that the measures of the environment include students' academic and social involvement as well as programmatic interventions. Variables describing the first-year experience included three composites (faculty interaction, academic engagement, and sense of belonging), one dummy variable indicating whether or not a student was enrolled in a special first-year academic program, and two standardized single measures of time allocation, according to Pace's (1984) concept of student effort. These items include average weekly hours for homework time-on-task and average weekly hours devoted to clubs and organizations. Items used to create these measures of the college environment appeared on the 2005 Your First College Year survey. Each factor was derived using exploratory factor analysis.

#### *Faculty Interaction*

The items considered for this factor measure other-than-classroom contact between students and faculty. The questions asked how often respondents interacted with faculty during office hours and outside class or office hours. Each was measured on a Likert scale (1 = "Never," 2 = "1 or 2 times per term," 3 = "1 or 2 times per month," 4 = "Once a week," 5 = "2 or 3 times per week," 6 = "Daily"). Results of the exploratory factor analysis are summarized in Table 4. Although factor loadings for each item were high (.841), the reliability coefficient was moderate ( $\alpha = .587$ ).

Table 4

*Components of the Factor Composite: Faculty Interaction*

Factor Components	Loadings
Interacted with faculty during office hours	.841
Interacted with faculty outside of class or office hours	.841
Alpha reliability coefficient	.587

Source: Analyses of YFCY:05, Magis University

Note. Items asked respondents: “Since entering this college, how often you...?”

*Academic Engagement*

Astin’s (1984) student involvement theory describes involvement as having quantitative and qualitative aspects. The single-item variables measuring time devoted to homework and student clubs and organizations describe the quantitative nature of involvement, while the composite variable for academic engagement portrays the qualitative nature. This composite variable also reflects Kuh’s (1991, 2005) work on student engagement, which delineates behaviors associated with active learning. Items in this factor described the number of times respondents handed in late homework, skipped class, were late to class, and turned in sub-par work. Items are scored on a Likert scale and are recoded such that 1 = “Frequently,” 2 = “Occasionally,” 3 = “Rarely,” and 4 = “Not at all.” The factor had high reliability ( $\alpha = .710$ ) with loadings ranging from .697 to .769 (Table 5).

Table 5

*Recoded Components of the Factor Composite: Academic Engagement*

Factor Components	Loadings
Turned in course assignment(s) late	.769
Skipped class	.753
Come late to class	.707
Turned in course assignments that did not reflect your best work	.697
Alpha reliability coefficient	.710

Source: Analyses of YFCY:05, Magis University

Note. Items asked respondents: “Since entering this college, indicate how often you...”

Note. All items were recoded to accurately reflect factor title.

*Sense of Belonging*

The factor describing students’ sense of belonging captures an important aspect of Astin’s (1984) social involvement and Tinto’s (1993) social integration. Two items from the 2005 Your First College Year survey comprise this highly reliable factor ( $\alpha = .813$ ) with loadings of .920 each (Table 6). Both items ask respondents the extent to which they feel a sense of belonging or affiliation with the campus community and are scored on a Likert scale (1 = “Strongly disagree,” 2 = “Agree,” 3 = “Disagree,” and 4 = “Strongly agree”).

Table 6

*Components of the Factor Composite: Sense of Belonging*

Factor Components	Loadings
I feel I am a member of this college	.920
I feel I have a sense of belonging to this college	.920
Alpha reliability coefficient	.813

Source: Analyses of YFCY:05, Magis University

Note. Items asked respondents: "Please indicate the extent to which you agree or disagree with the following statements."

*Student Attributes at Time 2*

The composite variables representing student attributes at Time 2, academic and social self-concept, self-efficacy, and self-determination, are identical to those of Time 1. Although the items are identical, the reliability and loadings for each factor are somewhat different at Time 2.

*Academic and Social Self-concept*

Items for these scales appear on the 2005 Your First College Year survey. As with Time 1, these are self-assessment items that are scored on a Likert scale with 1 = Lowest 10% to 5 = Highest 10%. The factor for academic self-concept at Time 2 has a high reliability ( $\alpha = .717$ ), with loadings between .651 and .813 (Table 7). The social self-concept factor is highly reliable ( $\alpha = .779$ ), with item loadings ranging from .725 to .795 (Table 8). Reliability for academic and social self concepts increased from Time 1.



Table 7

*Components of the Factor Composite: Academic Self-concept at Time 2*

Factor Components	Loadings	Time 1
Academic Ability	.812	
Self-confidence (intellectual)	.804	
Writing Ability	.689	
Drive to Achieve	.648	
Alpha reliability coefficient	.717	.649

Source: Analyses of YFCY:05, Magis University

Note. Items asked respondents to: "Rate yourself on each of the following traits as compared with the average person your age."

Table 8

*Components of the Factor Composite: Social Self-concept at Time 2*

Factor Components	Loadings	Time 1
Generosity	.795	
Compassion	.792	
Understanding of Others	.786	
Cooperativeness	.728	
Alpha reliability coefficient	.779	.685

Source: Analyses of YFCY:05, Magis University

Note. Items asked respondents to: "Rate yourself on each of the following traits as compared with the average person your age."

### *Self-determination*

Table 9 displays the results from the principle components analysis that created the factor for self-determination at Time 2. As with Time 1, 19 of the 21 potential items loaded onto the factor with a score higher than .30. The two items not meeting the requirements of the scale are: “I feel pressured in my life,” (factor loading = .227); and “In my daily life, I frequently have to do what I am told,” (factor loading = -.037). Reliability for the Time 2 scale is high ( $\alpha = .871$ ) and equals the reliability for self-determination at Time 1.

Table 9

*Components of the Factor Composite: Self-determination at Time 2*

Factor Components	Loadings	Time 1
People I interact with on a daily basis tend to take my feelings into consideration	.736	
I really like the people I interact with	.724	
I consider the people I regularly interact with to be my friends	.690	
People are generally pretty friendly towards me	.660	
Most days I feel a sense of accomplishment from what I do	.647	
People in my life care about me	.638	
I get along with people I come into contact	.611	
†The people I interact with regularly do not seem to like me much	.599	
People I know tell me I am good at what I do	.581	
I generally feel free to express my ideas and opinions	.578	
†I often do not feel very capable	.562	
I feel like I can pretty much be myself in my daily situations	.535	
†There are not many people that I am close to	.528	
I have been able to learn interesting and new skills recently	.525	
†I pretty much keep to myself and don't have a lot of social contacts	.509	
†Often I do not feel very competent	.493	
I feel like I am free to decide for myself how to live my life	.493	
†There is not much opportunity for me to decide for myself how to do things in my daily life	.466	
†In my life I do not get much of a chance to show how capable I am	.465	
Alpha reliability coefficient	.871	.871

Source: Analyses of SRA:05, Magis University

Note. (†) Indicates item was recoded to achieve metric with consistent direction

### *Summary of Factor Analyses*

Exploratory factor analysis was used to create multi-item composites describing key constructs in the conceptual model, including academic self-concept, social self-concept, and self-determination at Times 1 and 2. In addition, exploratory factor analysis was used to create several of the environmental measures describing academic and social involvement in the first year of college, including faculty interaction, academic engagement, and sense of belonging. In each case, the multi-item composite created a stronger, more reliable and robust measure than would have been available with a single-item measure.

### *Inter-correlations*

In order to investigate potential covariance among variables selected for the model, I computed correlations for all variables (Table 10). Generally, variables in the model were correlated only slightly with one another, with a few notable exceptions. Typical correlations were as low as  $r = -.01$  for gender and first-generation status or as high as  $r = .35$  for SAT composite and academic self-concept at Time 1. Although the correlation between race ("White" is the reference group) and SAT composite ( $r = -.22$ ) was relatively low, the significant negative relationship between the two is worth noting.

As one would expect, exceptions to the pattern of generally low correlations occurred between pre- and posttest measures of the attribute variables. Academic self-concept at Time 1 was highly correlated with academic self-concept at Time 2 ( $r = .73$ ). In addition, the Time 1 measurements of social self-concept and self-determination were moderately correlated with their Time 2 counterparts ( $r = .60$  and  $r = .52$ , respectively).

However, the pretests for each student attribute accounted for less than 100% of the variance at Time 2, indicating that the pretest values were not the sole determinants of the posttest values. A moderate correlation also existed between sense of belonging and self-determination at Time 2 ( $r = .54$ ).

The dependent variable, college grade point average, was correlated slightly with almost all variables in the model, with two exceptions. As expected, college GPA was moderately correlated with its pre-cursor, high school GPA ( $r = .46$ ). College GPA also was moderately correlated with academic self-concept at Time 2 ( $r = .44$ ).

Finally, self-efficacy at Time 1 was correlated with academic self concept at Times 1 ( $r = .47$ ) and 2 ( $r = .34$ ). In addition, the Time 2 construct for self-efficacy was moderately correlated with academic self-concept at Times 1 ( $r = .45$ ) and 2 ( $r = .44$ ). The measure of self-efficacy was consistently correlated with academic self-concept and was removed from the model because it was less robust than the measure for academic self-concept. Although several items from the CIRP Student Information Form would have contributed to a more reliable measure of self-efficacy, these items were not repeated on the Your First College Year survey. Therefore, it was unfeasible to develop a strong and reliable measure of self-efficacy at Time 2 that was equivalent to that at Time 1. Although the literature has supported a vigorous debate over which attribute construct, self-efficacy or self-determination, is a better predictor of academic success, this study was not able to contribute to the debate. Hence I abandoned the fifth research question to determine which of these constructs proves to have a greater ability to predict the outcome. From this point forward, this study only reports results for research questions one through four.

### *Summary of Inter-correlations*

With a few exceptions, variables were correlated only slightly. Moderate to strong correlations between pre- and post-test measures were anticipated. Notable correlations include the negative relationship between race and SAT composite, and the strong correlation between academic self-concept at Time 2 and college GPA.

Consistent correlations between self-efficacy and academic self-concept posed a violation of the non-multicollinearity assumption that guides path analytic techniques. As the measure of self-efficacy was less robust than the measure of academic self-concept, it was advisable to eliminate the self-efficacy construct from the model altogether. Altering the model in this way resulted in abandoning the final research question to determine whether self-efficacy or self-determination is the better predictor of academic success.

Table 10

*Bivariate Correlations*

	Gender	Race	1 <sup>st</sup> Gen	HS GPA	SAT	SC1 acad	SC1 soc	SE1
Gender	1							
Race	-0.04	1						
1 <sup>st</sup> Gen	-0.01	0.03	1					
HS GPA	0.05	-0.01	0.04	1				
SAT	-0.12	-0.22 **	0.07	0.24 **	1			
SC1 acad	-0.21 **	0.02	-0.06	0.31 **	0.35 **	1		
SC1 soc	0.02	-0.11	-0.10	0.05	-0.07	0.29 **	1	
SE1	-0.12	0.12	0.07	0.21 **	0.35 **	0.47 **	0.16 *	1
SD1	-0.06	0.11	-0.03	0.16 *	0.01	0.30 **	0.32 **	0.24 **
1yr Prog	0.13	-0.07	0.06	0.04	0.07	0.08	0.02	0.04
Faculty	0.02	-0.12	0.07	0.10	-0.17 *	0.10	-0.05	0.04
Engage	0.01	0.08	-0.09	0.22 **	-0.11	0.13	0.03	0.06
HW time	0.14 *	-0.06	0.02	0.19 **	0.05	0.07	0.06	0.13
Clubs	-0.20 **	-0.10	0.05	0.06	0.05	0.18 *	0.09	-0.04
Belonging	-0.17 *	0.12	-0.11	0.06	0.05	0.16 *	0.04	0.15 *
SC2 acad	-0.22 **	0.01	-0.04	0.30 **	0.34 **	0.73 **	0.17 *	0.34 **
SC2 soc	-0.08	-0.01	-0.21 **	-0.10	-0.04	0.20 **	0.60 **	0.15 *
SE2	-0.06	0.18 *	0.05	0.16 *	0.30 **	0.45 **	0.14	0.59 **
SD2	0.04	0.04	-0.05	0.11	-0.09	0.13	0.14	0.10
Ug GPA	0.00	0.10	0.04	0.46 **	0.31 **	0.35 **	0.07	0.12

Table 10 (continued)

*Bivariate Correlations*

	SD1	1yr Prog	Faculty	Engage	HW time	Clubs	Belonging	SC2 acad
Gender								
Race								
1st gen								
HS GPA								
SAT								
SC1 acad								
SC1 soc								
SE1								
SD1	1							
1yr Prog	0.01	1						
Faculty	0.05	0.02	1					
Engage	0.25 **	-0.12	-0.07	1				
HW time	0.13	0.08	0.16 *	0.16 *	1			
Clubs	0.07	0.32 **	0.06	-0.14	0.08	1		
Belonging	0.32 **	0.04	-0.03	0.04	-0.02	0.06	1	
SC2 acad	0.30 **	0.15 *	0.15 *	0.18 **	0.09	0.15 *	0.18 *	1
SC2 soc	0.28 **	-0.07	0.04	-0.02	0.08	0.03	0.17 *	0.21 **
SE2	0.28 **	0.00	0.02	0.08	0.17 *	-0.06	0.15 *	0.44 **
SD2	0.52 **	-0.10	0.09	0.19 **	-0.01	-0.05	0.54 **	0.19 **
Ug GPA	0.10	0.10	-0.02	0.35 **	0.15 *	0.02	-0.02	0.44 **



Table 10 (continued)

*Bivariate Correlations*

	SC2 soc	SE2	SD2	Ug GPA
Gender				
Race				
1st gen				
HS GPA				
SAT				
SC1 acad				
SC1 soc				
SE1				
SD1				
1yr Prog				
Faculty				
Engage				
HW time				
Clubs				
Belonging				
SC2 acad				
SC2 soc	1			
SE2	0.20 **	1		
SD2	0.15 *	0.27 **	1	
Ug GPA	-0.08	0.27 **	0.05	1

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p&lt;.05 \*\*p&lt;.01 \*\*\*p&lt;.001

## Missing Data Analysis

Among the limitations listed for this study in Chapter III is the high attrition between test Times 1 and 2. Although 952 first-year students enrolled in Magis University during the 2004-2005 academic year completed at least one of the four survey instruments for this study, reasonably complete data were available for only 202 students (21.2%). For the purposes of this study, “reasonably complete” refers to students who completed all four surveys, skipped very few questions, and missed no more than one item within each of the composite factors. Given the number of factors in the model, cases with data missing for more than one item per factor were eliminated from the analytic sample. Despite the high level of participant attrition, Table 11 indicated that the analytic sample varies significantly from the population on only the three measures of gender, high school grade point average, and cumulative college GPA. A *chi*-square test revealed that the analytic sample contains significantly more women (71.8%). Likewise, *t* tests indicated that the students in the analytic sample had significantly higher high school GPAs (mean *z*-score = 0.1) and college GPAs (mean *z*-score = 0.2) than students who were not included in the analyses.

Table 11

*Distribution of Analytic (N = 202) and Missing (N = 750) Samples for Selected*

*Characteristics of Magis University 2004-05 First-year Students*

Characteristics	%Analytic	% Missing	% Population
Sample	21.2	78.8	100
Gender***			
Women	71.8	58.2	61.3
Men	28.2	41.8	38.7
Race			
White	84.7	87.2	86.7
Non-White	15.3	12.8	13.3
First-generation College Student			
Yes	19.2	21.9	21.2
No	80.8	78.1	78.8
Mean z-score: High School GPA*	0.1	0.0	0.0
Mean z-score: SAT-Verbal	0.1	0.0	0.0
Mean z-score: SAT-Math	0.0	0.0	0.0
Mean z-score: Cumulative College GPA***	0.2	-0.1	0.0

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

Of the 202 cases in the analytic sample, 26 (12.9%) were missing data for at least one variable in the model. Table 12 demonstrates that nine variables have relatively small amounts of missing data. Of these nine variables, self-determination at Times 1 and 2 have the most missing data (5.0% and 5.9%, respectively). The other seven variables with missing data are missing 1% or less.

Table 12

*Number and Percentage of Cases from the Analytic Sample (N = 202) that are Missing for each of the Variables in the Analyses*

Variable	Number Complete	Number Missing	Percent Missing
Gender	202	0	0
Race	202	0	0
First-generation College Student	202	0	0
High School GPA	202	0	0
SAT Composite	202	0	0
Academic Self-concept, Time 1	201	1	0.5
Social Self-concept, Time 1	201	1	0.5
Self-determination, Time 1	192	10	5.0
First-year Programs	202	0	0
Faculty Interaction	202	0	0
Engagement	202	0	0
Student Clubs	201	1	0.5
Sense of Belonging	201	1	0.5
Self-determination, Time 2	190	12	5.9
Academic Effort: Homework Time-on-task	201	1	0.5
Cumulative College GPA	202	0	0
Academic Self-concept, Time 2	201	1	0.5
Social Self-concept, Time 2	200	2	1.0
Number of cases with data for all variables	176	26	12.9

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

Further missing data analysis reveals that these data were missing randomly (Table 13). That is, no patterns of missing data emerged, and the characteristics of

students with missing data match the characteristics of students with complete data. As cases with missing data did not differ in any significant way from those cases with complete data, the generalizability of the analytic sample to the population sample is preserved. For the purposes of this study, the random nature of missing data means that the analytic sample is representative of the population sample and that findings related to the analytic sample may be applied confidently to the population sample.

Table 13

*Distribution of Complete Cases (N = 176) and Cases with Missing Data (N = 26) for  
Selected Characteristics of Magis University 2004-05 First-year Students*

Characteristics	%Complete	% Missing	% Total
Sample	87.1	12.9	100
Gender			
Women	71.6	73.1	71.8
Men	28.4	26.9	28.2
Race			
White	86.0	77.4	84.7
Non-White	14.0	22.6	15.3
First-generation College Student			
Yes	18.2	23.1	18.8
No	81.8	76.9	81.2
High School Type			
Public	54.5	61.5	55.4
Private	45.5	38.5	44.6
Highest Degree Aspiration			
Less than Bachelors	2.6	0.0	2.3
Bachelors	7.9	0.0	6.9
More than Bachelors	88.7	100.0	90.2
Other	0.7	0.0	0.6
Institution Choice			
1 <sup>st</sup>	54.6	57.7	55.0
2 <sup>nd</sup>	29.3	34.6	30.0
3 <sup>rd</sup>	9.2	3.8	8.5
Less than 3 <sup>rd</sup>	6.9	3.8	6.5

Table 13 (continued)

Characteristics	%Complete	% Missing	% Total
Mean z-score: High School GPA	0.0	0.0	0.0
Mean z-score: SAT- Math	0.0	-0.2	0.0
Mean z-score: SAT- Verbal	0.0	0.0	0.0
Mean z-score: Academic Self-concept Time 1	0.0	-0.3	0.0
Mean z-score: Social Self-concept Time 1	0.0	0.2	0.0
Mean z-score: Self-determination Time 1	0.0	0.2	0.0
Mean z-score: Cumulative College GPA	0.0	0.0	0.0

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

Cohen and Cohen (1983) suggest pairwise deletion as a suitable technique for handling randomly missing data; however, this procedure would have reduced the sample size for some analyses below the 200 recommended for reliable path analysis (Klem, 1995; Kline, 2005). In order to preserve sample size, I imputed missing data for continuous variables since no variable had more than 6% missing data. To determine imputation values I calculated the mean scores by race and gender for each variable with missing data using one-way analysis of variance. The average value for students of the same race and gender replaced the missing values for items in the self-concept, self-determination, and engagement scales and for the variables describing involvement in student clubs and homework time-on-task.

### *Summary of Missing Data Analysis*

Participant attrition reduced the size of the population sample by nearly 80%, such that the analytic sample retained only 202 of the original 952 cases. Despite this loss, the analytic sample met the size requirements (200-300 cases, minimum) for path analysis (Klem, 1995) and differed significantly from the population sample only in gender, high school grade point average, and college GPA. Of the 202 cases in the analytic sample, 26 (nearly 13%) were incomplete; and of the nine variables with missing data, only two were missing more than one percent. Missing data for the analytic sample were hand-imputed to preserve sample size, and none of the 202 cases in the analytic sample were missing data for multiple variables.

### *Addressing the Research Questions*

The following sections present results for four of the five research questions guiding this study. (Note: Research Question Five was eliminated due to multicollinearity between composites for academic self-concept and self-efficacy.) The first section addresses research question one through mean comparisons of student attributes at Times 1 and 2. Statistically significant change is explored next through multivariate analysis of input characteristics and first-year involvement variables influencing this change. The next section presents results of the path analysis and addresses research questions two through four about the direct and indirect effects of student attributes and first-year involvement on academic success.



*Research Question One:*

*Change in Student Attributes Over Time*

The first research question is guided by the assertion that interaction with the college environment can affect student's self-determination (Deci, Ryan, & Williams, 1996; Deci, Vallerand, Pelletier, & Ryan, 1991; Miserandino, 1996; Ryan & Powelson, 1991) and self-concept (Berger & Milem, 2000; House, 2000; Kezar & Moriarty, 2000; Pascarella, Smart, Ethington, & Nettles, 1987). The first step is to determine whether or not change in student attributes takes place during the first year of college. Table 14 demonstrates results from paired-samples *t* tests, which indicate statistically significant change does occur over time for all three measures of student attributes (academic self-concept, social self-concept, and self-determination). Because I measured change in student attributes between only two points in time, I chose to use the paired samples *t* test rather than an ANOVA for repeated measures, which requires data from at least three time points. Academic self-concept shows statistically significant ( $p = .05$ ) positive change between Times 1 and 2 (mean difference = .28; percent change = 1.82) as does social self-concept (mean difference = .29; percent change = 1.87). Self-determination, on the other hand, shows statistically significant ( $p = .001$ ) negative change between Times 1 and 2 (mean difference = 7.86; percent change = 7.98). Multivariate analyses exploring the factors influencing these changes are examined in the following section.

Table 14

*Paired Samples Comparison between Pre- and Posttest Mean Scores of Computed Scales for Student Attributes (N = 202)*

	Mean	Mean Difference	Percent Change
Academic Self-concept*			
Pre-test	15.17		
Post-test	15.44	.28	1.82
Social Self-concept*			
Pre-test	15.50		
Post-test	15.79	.29	1.87
Self-determination***			
Pre-test	106.27		
Post-test	98.41	-7.86	7.98

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

#### *Academic Self-concept: Change Over Time*

Over the course of the first year of college, academic self-concept increased nearly two percent. Linear regression analyses were conducted to explain what factors contribute to the statistically significant positive change in academic self-concept over time. The blocked-entry strategy employed in these analyses is consistent with the conceptual framework presented in this study. Table 15 demonstrates the change in unstandardized coefficients as additional blocks are added to the model. While all three

blocks in the model are statistically significant, the results validate the assertion that involvement in the collegiate environment positively influences academic self-concept at Time 2 (Block 3). After controlling for input characteristics, student attributes at Time 1, and first-year experiences, only composite SAT scores ( $b = .151$ ), prior academic self-concept ( $b = .594$ ), involvement in a first-year program ( $b = .224$ ), faculty interaction ( $b = .121$ ), and academic engagement ( $b = .122$ ) contribute significantly to an increase in academic self-concept at Time 2.

Results from the regression analysis indicate the possibility of a suppression effect for SAT composite. The positive significant effect size shown by SAT composite ( $b = .275$ ) is reduced to a non-significant size ( $b = .099$ ) when academic self-concept is introduced in block 2. However, as block three was added, the effect size for SAT composite ( $b = .151$ ) increased in magnitude and became a positive significant predictor once again.

Table 15

*Coefficients for Student Background Characteristics, Prior Student Attributes, and First-year Experience Predicting Academic Self-concept at Time 2*

Independent Variable	Blocks		
	Background Characteristics (1)	Prior Student Attributes (2)	First-year Experience (3)
<b>Gender</b>			
Women	-.435**	-.150	-.198
<i>Men (ref.)</i>			
<b>Race</b>			
White	-.140	-.087	-.105
<i>Student of Color (ref.)</i>			
<b>First-generation Status</b>			
Yes	-.155	-.017	-.030
<i>No (ref.)</i>			
z-score H.S. GPA	.250***	.073	.037
z-score SAT Composite	.275***	.099	.151**
Academic Self-concept 1		.639***	.594***
Social Self-concept 1		-.043	-.014
Self-determination 1		.107*	.076

Table 15 (continued)

Independent Variable	Blocks		
	Background Characteristics (1)	Prior Student Attributes (2)	First-year Experience (3)
First-year Program			
Yes			.224*
<i>No (ref.)</i>			
Faculty Interaction			.121*
Academic Engagement			.122*
z-score HW Time-on-task			-.007
z-score Student Clubs			-.015
Sense of Belonging			.014
$R^2$	.211***	.560***	.590***
Change in $R^2$	.211***	.349***	.030*

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

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

### *Social Self-concept: Change Over Time*

Between Time 1 and Time 2, social self-concept increased nearly two percent.

Table 16 summarizes the results of the regression predicting change in social self-concept over time. After controlling only for students' background characteristics, first-generation college students report lower social self-concept ( $b = -.504$ ) than their peers who have had at least one parent attend college. After all other variables are added into the model, first-generation students still report lower social self-concept ( $b = -.339$ ) than their peers. When controlling for input characteristics, prior attributes, and first-year experiences, results indicate that students with higher average high school GPA indicate

lower social self-concept ( $b = -.156$ ). When controlling for input characteristics, prior attributes, and first-year experience, students with higher social self-concept at Time 1 experience greater social self-concept at Time 2 ( $b = .564$ ). Factors representing involvement in the first year (Block 3) did not serve as significant predictors of social self-concept at Time 2 when controlling for input characteristics and prior attributes.

Results from the regression analysis indicate the possibility of a suppression effect for high school GPA, which did not have a significant effect when it entered the model in the first block ( $b = -.084$ ). However, as blocks two and three were added, the effect size for high school GPA ( $b = -.149$  and  $b = -.156$ , respectively) increased in magnitude and became a negative significant predictor of social self-concept.

Table 16

*Coefficients for Student Background Characteristics, Prior Student Attributes, and First-year Experience Predicting Social Self-concept at Time 2*

Independent Variable	Blocks		
	Background Characteristics (1)	Prior Student Attributes (2)	First-year Experience (3)
<b>Gender</b>			
Women	-.185	-.164	-.148
<i>Men (ref.)</i>			
<b>Race</b>			
White	-.014	.036	.039
<i>Student of Color (ref.)</i>			
<b>First-generation Status</b>			
Yes	-.504**	-.352*	-.339*
<i>No (ref.)</i>			
z-score H.S. GPA	-.084	-.149*	-.156*
z-score SAT Composite	-.019	.012	.023
Academic Self-concept 1		.031	.025
Social Self-concept 1		.548***	.564***
Self-determination 1		.113	.080

Table 16 (continued)

Independent Variable	Blocks		
	Background Characteristics (1)	Prior Student Attributes (2)	First-year Experience (3)
First-year Program			
Yes			-.148
<i>No (ref.)</i>			
Faculty Interaction			.083
Academic Engagement			-.063
z-score HW Time-on-task			.079
z-score Student Clubs			-.036
Sense of Belonging			.111
$R^2$	.056*	.413***	.444***
Change in $R^2$	.056*	.356***	.031

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

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

#### *Self-determination: Change Over Time*

Unlike the two measures of self-concept, which increased during the first year of college, self-determination experienced a significant decline over the first year of college. Results of linear regression analyses investigating the factors contributing to this decline appear in Table 17. When controlling only for student background characteristics, students with higher GPAs in high school ( $b = .142$ ) report greater self-determination at Time 2. However, once all other variables in the model were added, high school GPA did not serve as a significant predictor of self-determination at Time 2. After controlling for input characteristics, prior student attributes, and first-year experiences, only gender



( $b = .318$ ), prior self-determination ( $b = .388$ ), enrollment in first-year programs ( $b = -.249$ ), and sense of belonging ( $b = .463$ ) contribute significantly to self-determination at Time 2.

Results from the regression analysis indicate the possibility of a suppression effect for gender, which did not have a significant effect in blocks one ( $b = .030$ ) or two ( $b = .125$ ). However, as block three was added, the effect size for gender ( $b = .318$ ) increased in magnitude and became a positive significant predictor of self-determination at Time 2.

Table 17

*Coefficients for Student Background Characteristics, Prior Student Attributes, and First-year Experience Predicting Self-determination at Time 2*

Independent Variable	Blocks		
	Background Characteristics (1)	Prior Student Attributes (2)	First-year Experience (3)
Gender			
Women	.030	.125	.318*
Men (ref.)			
Race			
White	.102	-.120	-.217
Student of Color (ref.)			
First-generation Status			
Yes	-.111	-.063	.095
No (ref.)			
z-score H.S. GPA	.142*	.054	.040
z-score SAT Composite	-.133	-.102	-.052

Table 17 (continued)

Independent Variable	Blocks		
	Background Characteristics (1)	Prior Student Attributes (2)	First-year Experience (3)
Academic Self-concept 1		.014	-.014
Social Self-concept 1		-.058	.000
Self-determination 1		.540***	.388***
First-year Program			
Yes			-.249*
<i>No (ref.)</i>			
Faculty Interaction			.084
Academic Engagement			.075
z-score HW Time-on-task			-.088
z-score Student Clubs			-.032
Sense of Belonging			.463***
$R^2$	.031	.295***	.503***
Change in $R^2$	.031	.263***	.208***

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

### *Summary of Research Question One*

Although academic and social self-concepts increased significantly over students' first year of college, self-determination decreased significantly. Aspects of the first-year experience contributing to the increase in academic self-concept were involvement in a first-year program, faculty interaction, and academic engagement. Results from the regression analysis predicting social self-concept did not show that any of the environmental variables served as significant predictors. Enrollment in first-year programs was a negative predictor for self-determination at Time 2, while sense of belonging was a positive predictor. Sense of belonging was a stronger predictor than the pre-test for self-determination at Time 2.

### *Research Questions Two, Three, and Four: The Direct Effects of Student*

#### *Attributes on Academic Success in the First Year of College*

This section reports the path analytic results for research questions two through four. Results are organized by the order in which blocks were entered into the model and follow Table 18, which reports the direct effects for all variables in the model. Figure 2 describes the direct effects for variables ultimately leading to significant change in academic success in the first year of college as measured by cumulative grade point average. (Note: the following variables were dropped from the model in Figure 2 because they did not make significant contributions to the outcome: First-generation student status, social self-concept at Time 1, homework time-on-task, participation in student clubs, sense of belonging, and social self-concept and self-determination at Time 2.) Finally, this section reports the indirect effects for variables in the final model.

Table 18.

*Direct Effect Coefficients for Path Analysis Predicting College GPA and Academic Self-concept at Time 2*

Variable	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Gender: Female	-.418**	.018	-.162	.171*	.055	.028	.329*	-.395*	-.306*	-.198	-.148	.318*	.056
2. Race: White	-.161	-.165	.397*	-.088	-.092	.360	-.051	-.210	.097	-.105	.039	-.217	.185
3. 1 <sup>st</sup> Generation Student	-.214	-.243	-.111	.086	.231	-.221	.041	.168	-.280	-.030	-.339*	.095	.069
4. <sup>†</sup> High School GPA	.254***	.071	.165*	-.004	.103	.210**	.151*	.030	.005	.037	-.156*	.040	.256***
5. <sup>†</sup> SAT Composite	.284***	-.058	-.072	.035	-.270***	-.224**	.027	-.005	.002	.151**	.023	-.052	.159*
6. <sup>†</sup> Academic Self-concept 1				.046	.201*	.095	.014	.122	.044	.594***	.025	-.014	-.001
7. <sup>†</sup> Social Self-concept 1				-.001	-.138	-.081	.012	.056	-.081	-.014	.564***	.000	.121
8. <sup>†</sup> Self-determination 1				.002	.028	.194**	.108	.009	.313***	.076	.080	.388***	-.106
9. First-year Programs										.224*	-.148	-.249*	.129
10. <sup>†</sup> Faculty Interaction										.121*	.083	.084	-.032
11. <sup>†</sup> Academic Engagement										.122*	-.063	.075	.262***
12. <sup>†</sup> Homework Time-on-task										-.007	.079	-.088	.039
13. <sup>†</sup> Clubs & Organizations										-.018	-.036	-.032	-.026
14. <sup>†</sup> Sense of Belonging										.014	.111	.463***	-.058

Table 18 continued.

Variable	6	7	8	9	10	11	12	13	14	15	16	17	18
15. <sup>†</sup> Academic Self-concept 2													.301***
16. <sup>†</sup> Social Self-concept 2													-.127
17. <sup>†</sup> Self-determination 2													.023
18. <sup>†</sup> College GPA													
R <sup>2</sup>	.218***	.022	.051	.039	.095*	.151***	.067	.072	.143***	.590***	.444***	.503***	.424***

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

<sup>†</sup> z-scored (standardized) variable

### *Direct Effects for Student Background Characteristics*

Table 18 describes the direct effects of student background characteristics (gender, race, first-generation status, high school grade point average, and SAT composite) on student attributes at Time 1, academic and social involvement in the first-year, student attributes at Time 2, and cumulative GPA at the end of the first year of college. The results in Table 18 demonstrate that the predicted paths for student background characteristics explained nearly 22% of the variance in academic self-concept at Time 1, but explained very little of the variance in social self-concept and self-determination at Time 1 ( $R^2 = .022$  and  $R^2 = .051$ , respectively). Of these background characteristics, only gender, race, high school GPA, and SAT composite remain in the final model. The direct effects for all background characteristics are discussed in turn below.

*Gender.* Gender had a significant direct effect on academic self-concept in that women have lower academic self-concept than men ( $b = -.418$ ) upon entering college. However, gender had no effect on social self-concept or self-determination. Gender was a significant predictor of four variables describing academic and social involvement in the first year. Specifically, women were more likely to be enrolled in first-year academic programs ( $b = .171$ ) and to spend more time on their homework ( $b = .329$ ) than their male counterparts. However, women were not as involved socially, being less likely to be involved in student clubs ( $b = -.395$ ) and to report a lower sense of belonging to the campus community ( $b = -.306$ ). Finally, although gender did not predict self-determination at Time 1, it did predict self-determination at Time 2, with women demonstrating greater self-determination ( $b = .318$ ) than men.

*Race.* Race had a direct effect on only self-determination at Time 1. White students in the analytic sample tended to report greater self-determination at Time 1 ( $b = .397$ ) than students of color.

*First-generation Status.* Within the conceptual model, first-generation students differed from other students in only one respect: they reported lower social self-concept at Time 2 ( $b = -.339$ ).

*High School Grade Point Average.* High school GPA positively predicted several variables in the model. Students who reported higher high school GPA were more likely to report greater academic self-concept at Time 1 ( $b = .254$ ), greater self-determination at Time 1 ( $b = .165$ ), greater academic engagement ( $b = .210$ ), and to spend more time doing homework ( $b = .151$ ). However, students who had higher GPAs in high school were more likely to report lower social self-concept ( $b = -.156$ ) at the end of the first year. Finally, as one would expect, students with higher GPAs in high school tended to have higher GPAs in college ( $b = .256$ ).

*SAT Composite.* The composite score for SAT college entrance exams positively predicted academic self-concept at times one ( $b = .284$ ) and two ( $b = .151$ ) and college GPA ( $b = .159$ ). However, SAT composite negatively predicted two measures of academic involvement. Students with higher SAT scores were less likely to interact with faculty ( $b = -.270$ ) and to be less academically engaged ( $b = -.224$ ).

#### *Direct Effects for Student Attributes at Time 1*

With respect to academic and social involvement in the first year of college, only academic self-concept and self-determination had any influence (Table 18). Academic

self-concept at Time 1 was a positive predictor of faculty interaction ( $b = .201$ ). Self-determination at Time 1 positively predicted academic engagement ( $b = .194$ ) and a student's sense of belonging ( $b = .313$ ). Social self-concept at Time 1 had no impact on the first-year experience. As Table 18 demonstrates, the paths predicting faculty interaction ( $R^2 = .095$ ), academic engagement ( $R^2 = .151$ ), and sense of belonging ( $R^2 = .143$ ) explain a significant amount of the variance for each. As was expected, student attributes at Time 1 positively predicted their counterparts at Time 2. Academic-self concept at Time 1 predicted academic self-concept at Time 2 ( $b = .594$ ); social self-concept at Time 1 predicted social self-concept at Time 2 ( $b = .564$ ); and self-determination at Time 1 predicted self-determination at Time 2 ( $b = .388$ ).

#### *Direct Effects for Academic and Social Involvement*

Four of the first-year experience variables describing academic and social involvement had significant influence over student attributes at Time 2 (Table 18). Enrollment in a first-year program positively affected students' subsequent academic self-concept ( $b = .224$ ) but negatively influenced self-determination at Time 2 ( $b = -.249$ ). Faculty interaction ( $b = .121$ ) and academic engagement (pink lines;  $b = .122$ ) positively influenced academic self-concept at Time 2. In addition, sense of belonging positively influenced self-determination at Time 2 ( $b = .463$ ). None of the first-year experience variables had a significant effect on social self-concept, and academic engagement was the only first-year experience variable with a significant direct effect on college grade point average ( $b = .262$ ). The paths predicting academic self-concept at Time 2 ( $R^2 = .590$ ), social self-concept at Time 2 ( $R^2 = .444$ ), and self-determination at



Time 2 ( $R^2 = .503$ ) explained a substantial percentage of the variance for each of these student attribute variables at Time 2 (Table 18).

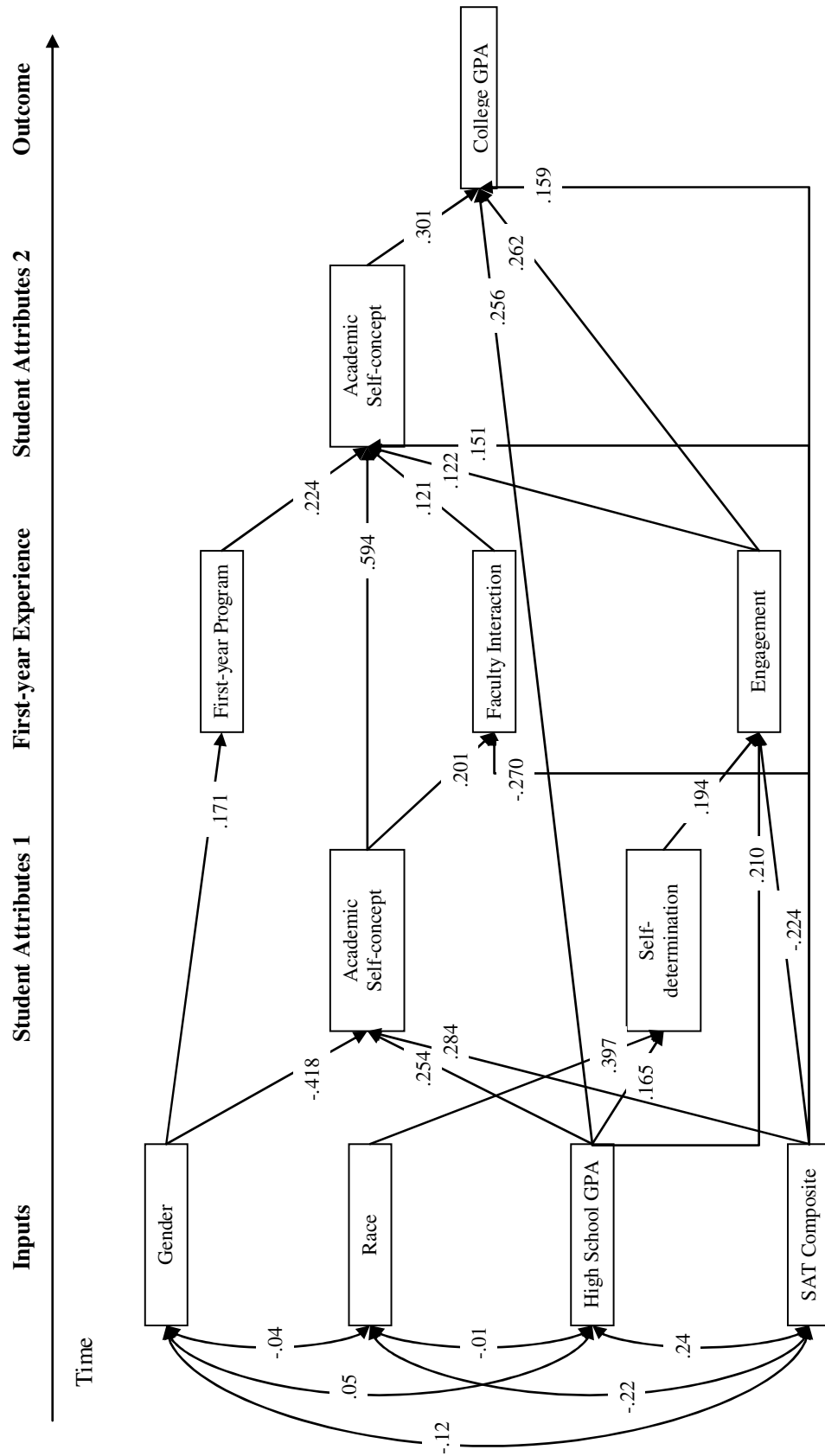
#### *Direct Effects for Student Attributes at Time 2*

Although three paths were predicted, only academic self-concept at Time 2 is a significant predictor of college GPA ( $b = .301$ ) (see pink lines in Figure 4). Table 18 demonstrates that the full model explains 42 % of college GPA ( $R^2 = .42$ ). The following sections explore significant indirect and total effects explaining college GPA and academic self-concept at Time 2, which is directly linked to college GPA.

#### *Final Direct Effects Model*

Figure 2 describes the direct effects for variables ultimately leading to significant change in academic success in the first year of college as measured by cumulative grade point average. (Note: the following variables were dropped from the model in Figure 2 because they did not make significant direct or indirect contributions to the outcome: First-generation student status, social self-concept at Time 1, homework time-on-task, participation in student clubs, sense of belonging, and social self-concept and self-determination at Time 2.) Consistent with path analytic models, from left to right Figure 2 demonstrates first the correlations between remaining exogenous input variables comprising students' background characteristics. The highest correlation was the small positive relationship between high school GPA and SAT composite ( $r = .24$ ). Following the correlation notations, Figure 2 depicts those variables that affect college GPA, either

Figure 2. Direct Effects for Independent Variables: Student Attributes and Academic Success in the First Year of College



directly or indirectly. Direct effects between variables in the final model are discussed here from left to right. Indirect effects are discussed in the next section.

Of the background characteristics only high school GPA and SAT composite had direct positive effects on college grade point average ( $b = .256$  and  $b = .159$ , respectively). Of the student attributes at Time 1, neither academic self-concept nor self-determination had direct effects on college GPA. Of the three remaining involvement measures, only academic engagement was a predictor of college grade point average ( $b = .262$ ). Finally, academic self-concept at Time 2 was a significant positive predictor of college GPA ( $b = .301$ ).

#### *Summary of Direct Effects*

Initial student attributes predicted some aspects of academic and social involvement in the first year of college. Specifically, academic self-concept at Time 1 predicted interaction with faculty, although lower SAT composite was a stronger predictor of faculty interaction. Self-determination at Time 1 predicted both academic engagement and sense of belonging, although student background characteristics aided in the prediction of these variables as well. Social self-concept did not predict any of the variables describing the first-year experience.

Academic and social involvement did have some effect on student attributes at Time 2. Specifically, academic self-concept at Time 2 was positively predicted by enrollment in first-year programs, faculty interaction, and academic engagement. Enrollment in first-year programs was a negative predictor for self-determination at Time 2, while sense of belonging was a very strong positive predictor for the same attribute.

None of the measures for academic or social involvement were significant predictors of social self-concept at Time 2. No involvement measures, with the exception of academic engagement, significantly predicted college grade point average. The findings regarding academic and social involvement are noteworthy specifically because they suggest that effects of most involvement behaviors are mediated through the student rather than directly linked to the outcome.

*Research Questions Two, Three, and Four: The Indirect Effects of Student  
Attributes on Academic Success in the First Year of College*

The relationships between variables in any model often are complicated. Path analytic models examine the more hidden indirect effects as well as the more obvious direct effects. Although only four variables in the final path model had direct effects on grade point average at the end of the first year of college, the others are related indirectly through their relationships with academic self-concept at Time 2. This section reports the results of these indirect effects. Because this study focused on the contribution of student attributes toward academic success, this section also reports the indirect effects on academic self-concept at Time 2, which itself was a significant positive predictor of college grade point average.

*Indirect Effects Predicting Academic Self-concept at Time 2*

As with college GPA, the indirect effects for academic self-concept at Time 2 are many but of small magnitude (Table 19). Being female had a small negative indirect effect on academic self-concept at Time 2 ( $b = -.221$ ), while the effect of being White

was quite small ( $b = .009$ ). High school GPA ( $b = .183$ ) and SAT composite ( $b = .114$ ) had the greatest indirect effects, albeit still small. Finally academic self-concept ( $b = .024$ ) and self-determination at Time 1 ( $b = .023$ ) also had small positive indirect effects on academic self-concept at Time 2. Table 20 shows the total effects, comprised of significant direct and indirect effects, for variables predicting academic self-concept at Time 2.

Table 19

*Statistically Significant Indirect Effects Predicting Academic Self-concept at Time 2 for Path Analysis*

	Indirect Path	Est.
1. Gender: Female		
Gender → Academic Self-concept 1 → Academic Self-concept 2		-.248
Gender → Academic Self-concept 1 → Faculty Interaction → Academic Self-concept 2		-.010
Gender → First-year Programs → Academic Self-concept 2		.037
Total		-.221
2. Race: White		
Race → Self-determination 1 → Academic Engagement → Academic Self-concept 2		.009
3. High School GPA		
High School GPA → Academic Self-concept 1 → Academic Self-concept 2		.148
High School GPA → Academic Self-concept 1 → Faculty Interaction → Academic Self-concept 2		.006
High School GPA → Self-determination 1 → Academic Engagement → Academic Self-concept 2		.004
High School GPA → Academic Engagement → Academic Self-concept 2		.025
Total		.183

Table 19 continued

	Indirect Path	Est.
4. SAT Composite		
SAT Composite → Academic Self-concept 1 → Academic Self-concept 2		.165
SAT Composite → Academic Self-concept 1 → Faculty Interaction → Academic Self-concept 2		.007
SAT Composite → Faculty Interaction → Academic Self-concept 2		-.032
SAT Composite → Academic Engagement → Academic Self-concept 2		-.026
Total		.114
5. Academic Self-concept 1		
Academic Self-concept 1 → Faculty Interaction → Academic Self-concept 2		.024
6. Self-determination 1		
Self-determination 1 → Academic Engagement → Academic Self-concept 2		.023

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

Table 20

*Statistically Significant Direct, Indirect, and Total Effects for Independent Variables in the Path Analysis Predicting Academic Self-concept at Time 2*

Variable	Total Direct Effect	Total Indirect Effect	Total Effect
1. Gender: Female		-.221	-.221
2. Race: White		.010	.010
3. 1 <sup>st</sup> Generation Student			
4. High School GPA		.183	.183
5. SAT Composite	.151**	.114	.265
6. Academic Self-concept 1	.594***	.024	.618
7. Social Self-concept 1			
8. Self-determination 1		.023	.023
9. First-year Programs	.224*		.224
10. Faculty Interaction	.121*		.121
11. Academic Engagement	.122*		.122
12. Homework Time-on-task			
13. Clubs & Organizations			
14. Sense of Belonging			

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

#### *Indirect Effects Predicting College GPA*

Table 21 lists the numerous significant indirect effects for college GPA, all of which are small in magnitude. Overall, being female ( $b = -.064$ ) had a negative indirect effect on college GPA, while being White ( $b = .023$ ) had a positive indirect effect. High



school GPA ( $b = .116$ ) and SAT composite scores ( $b = .020$ ) both had small, positive indirect effects. The positive indirect effect of academic self-concept at Time 1 ( $b = .178$ ) is three times greater than that of self-determination at Time 1 ( $b = .056$ ). Of the six variables describing academic and social involvement in the first year, only three have an indirect effect on college GPA, all of which were positive. These included enrollment in a first-year academic program ( $b = .064$ ), interaction with faculty outside the classroom ( $b = .035$ ), and academic engagement ( $b = .035$ ). Table 22 lists the total effects, comprised of significant direct and indirect effects, for variables predicting college GPA.

Table 21

*Statistically Significant Indirect Effects Predicting College GPA for Path Analysis*

	Indirect Path	Est.
1. Gender: Female		
Gender	Gender → Academic Self-concept 1 → Academic Self-concept 2 → College GPA	-.072
Gender	Gender → Academic Self-concept 1 → Faculty Interaction → Academic Self-concept 2 → College GPA	-.003
Gender	Gender → First-year Programs → Academic Self-concept 2 → College GPA	.011
Total		-.064
2. Race: White		
Race	Race → Self-determination 1 → Academic Engagement → Academic Self-concept 2 → College GPA	.003
Race	Race → Self-determination 1 → Academic Engagement → College GPA	.020
Total		.023
3. High School GPA		
High School GPA	High School GPA → Academic Self-concept 1 → Academic Self-concept 2 → College GPA	.043
High School GPA	High School GPA → Academic Self-concept 1 → Faculty Interaction → Academic Self-concept 2 → College GPA	.002
High School GPA	High School GPA → Self-determination 1 → Academic Engagement → Academic Self-concept 2 → College GPA	.001
High School GPA	High School GPA → Self-determination 1 → Academic Engagement → College GPA	.008
High School GPA	High School GPA → Academic Engagement → Academic Self-concept 2 → College GPA	.007
High School GPA	High School GPA → Academic Engagement → College GPA	.055
Total		.116

Table 21 continued

	Indirect Path	Est.
4. SAT Composite		
	SAT Composite $\rightarrow$ Academic Self-concept 1 $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	.048
	SAT Composite $\rightarrow$ Academic Self-concept 1 $\rightarrow$ Faculty Interaction $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	.002
	SAT Composite $\rightarrow$ Faculty Interaction $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	-.009
	SAT Composite $\rightarrow$ Academic Engagement $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	-.008
	SAT Composite $\rightarrow$ Academic Engagement $\rightarrow$ College GPA	-.057
	SAT Composite $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	.044
	Total	.020
5. Academic Self-concept 1		
	Academic Self-concept 1 $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	.171
	Academic Self-concept 1 $\rightarrow$ Faculty Interaction $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	.007
	Total	.178
6. Self-determination 1		
	Self-determination 1 $\rightarrow$ Academic Engagement $\rightarrow$ Academic Self-concept 2 $\rightarrow$ College GPA	.007
	Self-determination 1 $\rightarrow$ Academic Engagement $\rightarrow$ College GPA	.049
	Total	.056

Table 21 continued

	Indirect Path	Est.
7. First-year Programs		
First-year Programs → Academic Self-concept 2 → College GPA		.064
8. Faculty Interaction		
Faculty Interaction → Academic Self-concept 2 → College GPA		.035
9. Academic Engagement		
Academic Engagement → Academic Self-concept 2 → College GPA		.035

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

Table 22

*Statistically Significant Direct, Indirect, and Total Effects for Independent Variables in the Path Analysis Predicting College GPA*

Variable	Total Direct Effect	Total Indirect Effect	Total Effect
1. Gender: Female		-.064	-.064
2. Race: White		.023	.023
3. 1 <sup>st</sup> Generation Student			
4. High School GPA	.256***	.116	.372
5. SAT Composite	.159*	.020	.179
6. Academic Self-concept 1		.178	.178
7. Social Self-concept 1			
8. Self-determination 1		.056	.056
9. First-year Programs		.064	.064
10. Faculty Interaction		.035	.035
11. Academic Engagement	.262***	.035	.297
12. Homework Time-on-task			
13. Clubs & Organizations			
14. Sense of Belonging			
15. Academic Self-concept 2	.301***		.301
16. Social Self-concept 2			
17. Self-determination 2			

Source: Analyses of CIRP:04; SRA:04/05; and YFCY:05, Magis University

\*p<.05 \*\*p<.01 \*\*\*p<.001

### *Summary of Indirect Effects*

With regard to direct effects for academic success in the first year of college, only academic self-concept at Time 2 was a significant contributor. However, both academic self-concept and self-determination at Time 1 had significant positive indirect effects on college grade point average. Similarly, these time-one attributes contributed indirectly to academic self-concept at Time 2, which had a direct effect on the dependent variable. Many variables contributed indirectly to students' grade point averages in the first year, indicating a more complicated picture of academic success.

### Summary

This study used descriptive, multivariate, and path analytic techniques to answer research questions related to the impact of student attributes on academic success in the first year of college. Exploratory factor analyses were used to create composite variables describing student attributes at Times 1 and 2 as well as aspects of academic and social involvement. Missing data analyses were conducted to investigate possible problems related to the high rate of participant attrition. Although the analytic sample was nearly 80% smaller than the original population sample, results from missing data analyses indicated that the analytic sample did not differ significantly from the population sample. Therefore results from the multivariate and path analytic techniques are generalizable to the population sample. Paired-samples *t* tests and multivariate linear regression were used to explore change in student attributes over time. Finally, path analysis revealed the direct and indirect effects of student attributes on academic success, as measured by college grade point average, in the first year of college. Four variables in the final model

had significant direct effects on college GPA, while all other variables, including measures of student involvement, had indirect effects as mediated through academic self-concept at Time 2. The results presented in this chapter are discussed in the following chapter along with implications for future research and practice.

## CHAPTER V DISCUSSION

### Introduction

This study investigated the relationship between student self-responsibility and academic success in the first year of college. By incorporating psychological constructs in an I-E-O college impact model, this study explored how student attributes influence academic outcomes beyond what is already explained by aspects of the environment. Specifically, this study analyzed the direct and indirect effects of academic self-concept, social self-concept, and self-determination on cumulative grade point average. In addition, this study examined the university environment and the influence it exerts over change in and development of student attributes during the first collegiate year. Data for this inquiry were supplied by Magis University, a comprehensive Jesuit institution in the mid-Atlantic region. Magis University supplied institutional data for the entering Class of 2008, as well as access to these students' responses to the 2004 Cooperative Institutional Research Program's (CIRP) Student Information Form for first-year students, the 2005 follow-up Your First College Year, and the pre- and posttest versions of the 2004-2005 Student Readiness Assessment. These data were used to explore the following research questions:

1. What changes in student attributes occur during the first year of college, and what environmental factors influence these changes?
2. Controlling for student background characteristics, how do initial student attributes influence academic and social involvement in the first year of college?



3. Controlling for student background characteristics and student attributes at Time 1, how do academic and social involvement impact subsequent student attributes and academic success?
4. After controlling for student background characteristics and academic and social involvement, what are the direct and indirect effects of student attributes, as measured by self-determination, self-efficacy and effort, on the academic success of first-year college students?

(Note: due to consistent correlations between self-efficacy and academic self-concept, self-efficacy was eliminated from the model as the less robust construct of the two.

Therefore, I was not able to pursue Research Question Five comparing self-efficacy to self-determination, and the discussion in this chapter pertains only to Research Questions One through Four.)

This chapter reviews the findings presented in Chapter IV, draws appropriate conclusions, and offers implications for theory, practice, and future research. The leading sections summarize the analyses for each research question and the test model, which was proposed and tested in this study. The second section discusses the conclusions that may be inferred from these results, and the last sections consider the contributions to scholarship and practice as well as directions for future study. The chapter closes with final thoughts on the meaning of this study.

## Summary of Findings Related to Research Questions

### *Research Question One: Student Attributes—Change over Time*

Several meta-analyses of student change related to college attendance revealed that it may be unreasonable to expect noticeable change in student attributes within one year of college (Feldman & Newcomb, 1994; Pascarella & Terenzini, 1991, 2005). However, the results of this study indicated that students at Magis University did experience significant change in self-concept and self-determination during their first year of college. Further analyses indicated those factors that contributed to these changes. The findings for Research Question One about change in student attributes over time are discussed below.

#### *Change in Self-concept*

Self-concept refers to students' self-appraisal of abilities as compared to their peer group. Based on their findings that self-concept changes each year of college beyond the cumulative growth over four years, Terenzini, Theophilides, and Lorang (1984) suggested the need for additional research investigating year-to-year differences. This study confirms the assertions of the Terenzini et al. study and advances the understanding of change over time.

*Academic self-concept.* This study demonstrated that students' academic self-concept experienced small but significant increases over the first year of college. Several constructs in the model contribute to this change in some interesting ways. The discussion begins with the effects of student background characteristics in predicting

academic self-concept at Time 2. Although initially female students have significantly lower academic self-concept than their male counterparts, the effects of gender on academic self-concept at the end of the first year are non-existent. After adding prior student attributes and first-year experiences to the model, gender no longer played a significant role in determining academic self-concept at Time 2. This finding confirms the Pascarella, Smart, Ethington, and Nettles (1987) study which did not reveal any difference in self-concept based on race or gender.

An alternate explanation for the change in gender's effect on academic self-concept at Time 2 is the possibility a suppression effect. Specifically, introducing academic self-concept at Time 1 to the model in Block 2 may mask the effect of gender on subsequent academic self-concept (Cohen, Cohen, West, & Aiken, 2003). In other words, the relationship between gender and prior academic self-concept may be such that the presence of prior academic self-concept in the model dominates and obscures the true effect of gender on later academic self-concept.

High school grade point average saw a similar decline in its predictive ability. When considering student background characteristics alone, high school GPA was a positive predictor of academic self-concept at Time 2. However, the effects of this measure dissipated once other variables were added to the model. The composite score for SAT was the only background characteristic that retained a significant effect on academic self-concept at Time 2, which is not surprising since students who have tested well in the past may appraise their abilities at a higher level than their peers, regardless of the experiences they have.

As expected, prior academic self-concept is the strongest predictor of academic self-concept at Time 2. The results of the regression analysis confirmed that the pre- and posttest measures of academic self-concept are highly related. However, the analysis also revealed that involvement with aspects of the first-year experience, such as enrolling in a first-year program, interacting with faculty, and exhibiting engagement behaviors, have positive effects on academic self-concept over and beyond prior self-concept. Self-determination at Time 1 proved to be a significant positive predictor of academic self-concept at Time 2 when prior student attributes were added to the model. However, the effects of self-determination were eliminated once the involvement variables were added to the model. These findings are consistent with previous research (Berger & Milem, 2000; House, 2000; Pascarella, Smart, Ethington, & Nettles, 1987), which demonstrated that student involvement is a strong predictor of change in self-concept.

*Social self-concept.* As with academic self-concept, the pretest for social self-concept was the strongest predictor for the posttest measure. Despite the strength of this relationship, however, two background characteristics were significant predictors as well. First-generation status and high school grade point average both had negative effects on social self-concept at Time 2, even after all other variables were added to the model. The effects of high school GPA became significant only after prior social self-concept was added to the model, suggesting that high achieving students may be more academically focused and less likely to see themselves as socially confident from day one.

The effects of first-generation status are curious. Although the negative effect of first-generation status on social self-concept at Time 2 is mitigated slightly by prior

student attributes and first-year experiences, the negative relationship between the two remains strong throughout the model. A possible explanation for this finding could be that first-generation students have limited financial resources, which could diminish their ability to participate in social activities with their peers (Berger & Milem, 1999). However, further investigations revealed that first-generation status was not correlated with student-reported parental income (albeit an unreliable measure). Other explanations include the possibilities that first-generation students may be more academically focused and spend less time socializing with their peers and/or that they enter college with less cultural capital and understand the benefits of social involvement to a lesser degree (Lubrano, 2004; Pascarella, Pierson, Wolniak, & Terenzini, 2004). Either of these explanations may lead first-generation students to appraise their social ability at a lower level than their peers who have a family history of college attendance. Finally, this finding is a curious one because social self-concept at Time 2 is the only place where generational status makes any difference in the model. The relationship between first-generation status and other variables in the model is worthy of further investigation.

#### *Change in Self-determination*

The explanation of change in self-determination over time is less straightforward than that for self-concept. First, the most interesting and unexpected effects appeared in the last block of the model, and second, unlike either measure of self-concept, self-determination decreased significantly over the first year of college. The early positive effect of high school grade point average was mitigated by subsequent variables in the model, which is understandable considering the relatively high correlation between the

Time 1 and Time 2 measures for self-determination. The initially strong positive effect of the pretest measure for self-determination, however, was diminished by variables describing first-year involvement in the third and final block in the model. In fact, the effect of the pretest measure for self-determination was second in size, with the effect of sense of belonging having the largest effect. Although not measured explicitly, this finding may indicate a relationship between sense of belonging and the subscale of self-determination which measures relatedness.

The effect of gender, although not significant in earlier models, became significant in the third block such that women have higher levels of self-determination at Time 2 than their male counterparts. Interestingly, the predictive effect of gender in the third block was almost equal that of self-determination at Time 1. As with academic self-concept, this finding may point to a possible suppression effect. In this case, the sharp rise in the effect of gender in Block 3 may indicate a potential interaction between gender and another variable in the model (Cohen, Cohen, West, & Aiken, 2003).

Finally, enrollment in a first-year academic program was a significant negative predictor of self-determination at Time 2. Given the goals of most first-year academic programs—to facilitate meaningful connection between new students and faculty, to ease the transition to college, and to provide a challenging academic introduction to college accompanied by appropriate support systems—this finding is particularly surprising. “Enrollment in first-year programs” was a composite variable created to capture all students who participated in first-year seminars or living-learning communities. However, even in its disaggregated form, there were no apparent relationships that would

have described or explained the negative relationship between first-year program enrollment and self-determination at Time 2.

Instead, explanation may lie in one of the considerations of self-determination theory itself. As Ryan and Powelson (1991) asserted, the environment is a social context with the ability to hinder or foster growth. This viewpoint is not unlike higher education's ecological theories, which propose that behavior is explained through the person-environment interaction (e.g. Barker, 1968; Stern, 1970). Perhaps the key to understanding why enrolling in first-year programs negatively predicts self-determination at Time 2 is in the environment. Simply said, these findings suggest that some aspect of these first-year programs negatively impacts the development of autonomy, competence, and/or relatedness.

Similarly, a closer look at the environment might help explain why self-determination decreases over time while self-concept tends to increase. Previous researchers have linked change in self-determination directly to environmental interventions amongst K-12 students (Connell & Wellborn, 1991; Miserandino, 1996; Vallerand, Fortier, & Guay, 1997). Specifically, students who experienced low support for the development of their autonomy reported lower subsequent levels of autonomy, competence, and relatedness. The initial findings from this study suggest a need to understand why students who enroll in specialized programs have lower self-determination at the end of the first-year than their counterparts who were not similarly enrolled—especially when the programs are intended to aid students and their development. Perhaps the balance of challenge and support that is cited as a key component to beneficial first-year programs (Barefoot, et al., 2005; Upcraft, Gardner, &

Barefoot, 2005; Upcraft & Gardner, 1989) is off kilter such that students in these programs are receiving too much support and not enough challenge.

Other explanations for the significant decrease in self-determination for participants in first-year programs include the possibility that students referenced their high school relationships and experiences when responding to the pretest. The familiarity of the high school environment and an established peer group may have boosted students' confidence in their autonomy, competence, and/or relatedness; whereas responses to the posttest may refer to students' college experiences and relationships, which are newer and, therefore, possibly less comfortable and secure. Finally, it is possible that students participating in first-year programs have a better understanding or higher expectations of the college experience and may assess themselves against these expectations, resulting in lower self-appraisals than their non-participating peers (K. Inkelas, personal communication, May 16, 2006).

*Research Question Two: The Impact of Student Attributes on  
Involvement in the First Year of College*

Within the context of Astin's (1991) input-environment-outcome model for assessing college impact, the environment refers to any and all institutional interventions, including student experiences and educational programs. This definition of the environment is harmonious with Astin's (1984) theory of student involvement, which describes student experiences in terms of psychological and physical energy toward the educational enterprise. Included in Astin's understanding of involvement are time and quality of effort and measures of the student-environment interaction, including



interaction with peers and faculty and program participation. For the purposes of this study, the environmental measures were limited to students' involvement during the first year of college. These measures included enrollment in first-year programs, interactions with faculty outside the classroom, behaviors of academic engagement, homework time-on-task, participation in student clubs and organizations, and the development of college affiliation, or a sense of belonging. The second research question investigated the influence of student attributes on academic and social involvement. The following section reviews the findings for each involvement measure in the first year of college.

### *First-year Programs*

The student attributes tested in the model had no significant effect on first-year program enrollment. Although one might expect prior academic self-concept to play a role in students deciding to enroll in a first-year seminar or social self-concept to be a contributing factor toward joining a living-learning community, none of these psychological attributes seem to have made a difference. In fact, only gender proved to be a significant predictor of first-year programs, in that women were more likely to be enrolled than men. This is not surprising given that women have greater representation than men within the Magis University's student population. One would expect significantly higher female enrollment in an environment with more women than men students.

### *Faculty Interaction*

Of the student attributes at Time 1, only academic self-concept had any effect on student-faculty interaction outside the classroom. Prior academic self-concept was a positive predictor of faculty interaction, such that students with higher academic self-concept reported greater contact with faculty outside of classroom or office hours. This finding is consistent with that of House (2000), who examined the relationship between academic self-concept and academic involvement. House's study demonstrated that academic self-concept at the beginning of the first year of college was positively related to time spent with faculty in high school.

Other than prior academic self-concept, only SAT composite was a significant predictor of faculty interaction. In the case of SAT composite, the relationship to faculty interaction was negative, meaning that students with higher SAT scores reported less out-of-class contact with their faculty during the first year of college. This finding is similar to that of Berger and Milem (1999), who reported that students who were high achieving in high school (as represented by grade point average) had fewer interactions with faculty outside of class. Berger and Milem surmised that first-year students might be more likely to see faculty outside of class or office hours if they are experiencing academic difficulty. Along these lines, students whose college entrance exams scores were high might not have perceived connecting with faculty as a need or benefit.

### *Academic Engagement*

Prior self-determination had a significant positive effect on behaviors associated with academic engagement. This finding is consistent with Reeve's (2002) analysis of

several studies involving K-12 students. Reeve concluded that, across the board, greater self-determination leads to higher levels of engagement in the educational process.

Studying the K-12 population, Connell and Wellborn (1991) found that students who reported higher levels of self-determination were also rated as more highly engaged by their teachers. The current study extended this understanding by reproducing these findings in the college setting.

Not surprisingly, high school grade point average was a positive predictor of engagement as well. It follows logically that students who are high achieving in high school would continue their academic habits in college. Unfortunately, the same logic did not hold true for students with high SAT composite scores. Unlike high school GPA, composite SAT was a significant negative predictor of engagement. This finding is notable, if only to draw attention to the fact that testing ability did not translate into behaviors associated with academic engagement.

#### *Homework Time-on-task*

Of the background characteristics, only gender and high school grade point average were significantly associated with the number of hours students spent doing homework. Women students devoted significantly more time to homework than their male counterparts. Similarly, students who were high achieving in high school spent more time on their studies than their peers. None of the student attributes at Time 1 had a significant effect on homework time-on-task. This finding was surprising considering previous research linking academic self-concept (House, 2000) and self-determination (Connell & Wellborn, 1991) with hours spent studying.

### *Participation in Student Clubs and Organizations*

Student attributes at Time 1 were not significant predictors of student participation in clubs and organizations during the first year of college. In fact, only gender had a significant effect on participation, such that men reported greater involvement in student clubs than did women. These findings seem counterintuitive given the greater enrollment in first-year programs by women students and the expectations that social self-concept and self-determination would influence participation in student clubs. Perhaps these findings simply suggest that the end of the first year is too early to measure involvement in student clubs at Magis University.

### *Sense of Belonging*

Self-determination at Time 1 is a significant positive predictor of developing a sense of belonging in the first-year of college. Although previous research does not help in explaining this relationship, this finding is not all that surprising. The measure of self-determination used for this study accounted for students' senses of autonomy, competence, and relatedness. It is likely that students who scored higher on the self-determination pretest would also be more apt to experience affiliation with the institution.

The surprising predictor of sense of belonging was gender. Women students, although they constituted the majority of respondents and the majority of students at Magis University, felt a lower level of belonging to the institution than their male counterparts. Although not tested in this study, this discrepancy in sense of belonging could be related to the previous finding that women students in the first year of college do not participate in student organizations at the same rate as men.

### *Research Question Three: The Impact of Involvement*

The direct effects of involvement measures on student attributes at Time 2 were enumerated in the discussion of the first research question. Likewise, the discussion of involvement's impact on academic success is better understood in context. Therefore, the discussion of the effects of involvement on academic success is withheld here in favor of the discussion of research question four.

### *Research Question Four: The Direct and Indirect Effects of Student Attributes on Academic Success*

The final research question concerned the direct and indirect effects of variables in the model on college grade point average. Several constructs have direct positive effects, but a more interesting story can be found in the indirect effects. These findings are discussed below.

#### *Direct Effects on Academic Success*

Of the three student attribute measures at Time 2, only academic self-concept had a significant direct effect on academic success as measured by cumulative college grade point average. Although much of the literature treats posttest measures of academic self-concept as an outcome (Graham & Cockriel, 1996; House, 2000; Waugh, 2001), this finding is consistent with at least one previous study asserting the effects of academic self-concept on performance (Marsh, 2003). In addition, academic self-concept at Time 2 has the greatest direct effect on college GPA, followed closely by academic

engagement and high school GPA, which are followed by composite SAT score. All of these variables were positive predictors of college GPA.

The finding that academic engagement positively predicted college GPA even when accounting for student attributes is consistent with Kuh's work on student engagement (2005; Kuh, Kinzie, Schuh, & Whitt, 2005; National Study of Student Engagement 2002, 2004). Kuh's research focuses on institutional practices that increase students' engagement behaviors; however, the findings in this study suggest that student attributes are at least partially responsible for the students' dispositions toward engagement, regardless of institutional interventions. In fact, given the findings of this study, it is entirely plausible to argue that academic engagement is the behavioral manifestation of students' self-responsibility. From this perspective, institutions are to be held accountable for providing environments that challenge students in their pursuit of higher education, but students are to be held accountable for the extent to which they engage. Contrary to some of Kuh's work on student engagement, then, the behavior is more a function of the person than of the environment (Lewin, 1936).

In addition, this study's finding that prior achievement was a positive predictor of college grades is consistent with previous research (Astin, 1993; Marsh 2003). However, in his comparison of students' pre- and post-college survey responses, Astin asserted that prior achievement was the single greatest predictor of college grade point average. This study's findings were slightly different. By including student attributes as an intermediate outcome, this study found that academic self-concept at Time 2 was a slightly better predictor of academic success than prior achievement. This suggests that some of the effects of prior achievement are mediated by academic self-concept.

### *Indirect Effects on Academic Success*

Although academic self-concept at Time 2 had the greatest direct effect on academic success, many other variables in the model passed through this posttest measure to have significant indirect effects. Beginning with student background characteristics, indirect effects are discussed below.

*Student background characteristics.* In the model specified for this study, gender had three indirect paths to college GPA. The first two indirect paths passed first through academic self-concept at Time 1, for which being female was a negative predictor. Thus, two of gender's indirect paths to college grade point average favor men, which raises some concerns about how young women develop their academic self-concepts. The third path passed first through first-year programs, which enroll more women than men. This path to college GPA was a positive predictor for women.

The race variable had two indirect paths to college GPA, both of which passed through self-determination at Time 1. As White students tended to score higher on self-determination, being White was ultimately a positive predictor of college grades at the end of the first year. Race was not a significant factor anywhere else in the model, which raises several red flags. This finding may signify either that the instrument measuring self-determination does not capture this construct for students of color, or that there were some environmental circumstances—perhaps the effects of being a student of color on an overwhelmingly majority campus—that led to differences in scores. More likely, however, is the explanation that the analytic sample contained such a small proportion of students of color (so small, in fact, I was unable to tease out separate racial/ethnic groups) that the data lacked enough power to draw any substantial

conclusions with regard to race. This finding may also indicate a need for further research, given the constraints presented by the particular student population in this study and the inability to disaggregate the different racial/ethnic groups.

Aside from their direct effects on college grades, high school GPA and the composite SAT scores had several indirect effects as well. High school grades were positive predictors for academic self-concept, self-determination, and academic engagement behaviors. This finding furthers Astin's (1993) assertion that prior performance is a robust measure of academic success in college and suggests that students' academic behaviors tend to carry over from high school into college. The composite scores for college entrance exams painted a slightly different picture, however. Although SAT composite was a positive predictor for academic self-concept at Times 1 and 2, which led to a positive indirect path to college grades, it was a negative predictor of academic involvement. The negative paths through involvement nearly canceled out the positive effects of SAT composite on student attributes, which led to a nearly negligible total indirect path for SAT scores. This finding suggests that students who test well think highly of their abilities and tend to feel more authorship for their experience but do not necessarily know how to translate this self-confidence into positive behaviors. Perhaps this finding is cause for concern considering the emphasis college admission teams, high school counselors, and families place on achieving high scores on college entrance exams. The other possibility to consider is that the academic program is not challenging enough to engage students who test well. In this case, the finding becomes a concern for academic administrators and those faculty who educate first-year students at Magis University.



*Student attributes at Time 1.* The pretest measures for academic self-concept and self-determination both had indirect paths to college GPA; social self-concept did not. Academic self-concept passed through the posttest measure as well as faculty interaction, while self-determination passed only through academic engagement. The student attribute measures at Time 1 enhance what previous research suggests about students and their paths to success in college (Astin, 1993; Kuh, 2005; Kuh, Kinzie, Schuh, & Whitt, 2005). It is important to note that the effects of student attributes are apparent during the first year of college, and it would be interesting to learn if these effects hold stable, increase, or decrease over the college experience. These findings underscore the need to account for student disposition toward the academic enterprise when attempting to understand how and why students achieve certain outcomes.

*Academic and social involvement.* Three of the involvement measures had indirect effects on academic success at the end of the first year of college: enrollment in first-year programs, interaction with faculty outside the classroom, and behaviors related to academic engagement. All three passed through academic self-concept at Time 2 on their way to impacting college GPA. These findings confirm Astin's (1984) and Kuh's (2005; Kuh, Kinzie, Schuh, & Whitt, 2005; National Study of Student Engagement 2002, 2004) assertions that involvement and engagement have positive effects on achievement. These findings also suggest that the psychological and physical energy students devote to their college experiences contribute to their personal growth and development, which can, in turn, influence measures of success. Where these findings differ from previous work by Astin and Kuh is in the discovery that involvement behaviors—with the exception of academic engagement, which was discussed earlier as a manifestation of

student responsibility—do not exhibit direct effects on college GPA. Astin's I-E-O model (1991) contains a direct link between measures of the environment and the outcome. Instead, the findings of this study support the notion that environmental effects are mediated through the student *before* exerting any influence over the outcome. This point is a bit of a departure from previous research.

Homework time-on-task had no indirect effects on college grades. Taken together with the fact that homework effort also had no direct effect on college GPA, this finding raises some concerns. Immediately, this finding suggests that first-year students at Magis University see no tangible return on their investment of time spent studying. Given the data, it is possible that those students who devote more hours to studying each week than their peers do not achieve at higher rates. It is likely that students who spend more time on their homework could become discouraged that their study habits produce results no different from their peers who do not work as hard. However, it remains to be seen whether or not this discouragement would negatively affect their future academic involvement.

On another note, the range of hours devoted to homework at Magis University were consistent with the number of hours reported in the National Study of Student Engagement (2002), that is to say students spent on average fewer than 10 hours per week studying ( $M = 5.5$ ,  $SD = 1.2$ ). However, the average grade point average for students at the end of their first year at Magis University was relatively high ( $M = 3.2$ ,  $SD = 0.46$ ). This suggests at least some level of grade inflation exists at Magis University, which may distort the picture of which factors contribute to academic success and which do not.

### *Total Effects on Academic Success*

As expected from previous research (Astin, 1993), prior achievement (by way of high school grades and college entrance exam scores) are positive predictors of academic success in the first year of college. Measures of academic involvement also have a positive predictive ability, as previous research would suggest (Astin, 1993; Pascarella & Terenzini, 2005). Interestingly, though, above and beyond these typical measures, student attributes also contribute to academic success in the first year. Again, this finding suggests that adding student attributes creates a more complete model of student success.

### Conclusions

In recent decades, higher education has responded to increasing scrutiny by endeavoring to express the benefits students receive by attending college (Pace, 1984; Terenzini, 1994). Calls for greater accountability have resulted in research to demonstrate how an undergraduate education is a value-added experience worthy of federal, state, and family investments. Outcomes-based assessment purports to evaluate program and institutional quality. While these assessment efforts underscore institutional responsibility to create and maintain effective programs, they often do not include a key factor to success: the student and his or her responsibility toward earning a quality education. Even current efforts to measure students' psychological and physical investments in the undergraduate experience (e.g., the National Survey of Student Engagement) consider student effort an outcome measuring the institution's ability to engage students.

The purpose of this study, then, was to begin reframing responsibility for higher education by demonstrating one way to account for student disposition toward academic success. By examining student attributes and their contribution to academic and social involvement, and subsequently to achievement, this study describes higher education as a partnership between student and institution for which student and institution have responsibility. The findings of the study indicate the shared responsibility between student and institution. From these findings, at least four conclusions can be drawn: (a) accounting for incoming students' attributes contributes to an understanding of academic success; (b) measurable change in student attributes occurs over the space of one year; (c) academic engagement can be interpreted as the behavioral manifestation of students' collegiate responsibilities; and (d) the classic input-environment-outcome model (Astin, 1991) is enhanced by incorporating the development of student attributes as predictors.

First, personal attributes, such as self-concept and self-determination, provide an avenue for describing the student's disposition toward the educational process. Although the attributes tested in this study are not exhaustive, they at least begin to describe the psychological characteristics that influence success in college. Rather than focus on the institution's responsibility to engage students (Kuh, Kinzie, Schuh, & Whitt, 2005), this study demonstrates that academic and social involvement are products, at least in part, of matriculating students' academic self-concept and self-determination. Furthermore, together these attributes help explain success in the first year of college beyond what can be explained by prior achievement. The results of this study begin to illustrate the student as actor with responsibility for becoming engaged.

Second, this study revealed that student attributes undergo measurable change over one year. Although some of this change may be a result of natural maturation (Pascarella & Terenzini, 1991), results clearly indicated that at least part of the change is attributable to students' academic and social involvement. In this way, this study substantiates previous research on the impact of academic and social involvement on students' personal development (Astin, 1994; Berger & Milem, 1999; Huang & Chang, 2004) and affirms the benefits of college attendance. For example, change in academic self-concept over the first year of college was influenced by involvement such as enrolling in a first-year program and interacting with faculty. Likewise, growth in self-determination was influenced by developing a sense of belonging and affiliation with the institution.

In addition, the results of this study further research addressing self-determination in education, which heretofore has focused on K-12 environments. Previous researchers have examined the effects of the K-12 classroom environment on the development of self-determination (Connell & Wellborn, 1991; Miserandino, 1996). This study extends this research to the undergraduate environment and confirms that interactions with the environment influence subsequent self-determination. Finally, while the model for this study included the possibility of change in student attributes over time, a healthy skepticism questioned whether or not one academic year was long enough to observe appreciable change. The results indicated, however, that an academic year is long enough to manifest personal development, confirming Terenzini, Theophilides, and Lorang's (1984) assertion that distinct change in student attributes occurs each year.

Third, the results of this study suggest a departure from the prevailing interpretation of academic engagement. Currently the National Survey of Student Engagement measures engagement behaviors as an effect of the institutional environment. This line of research examines how aspects of the environment create atmospheres that promote student engagement. Although this research is a noble and worthy undertaking, it unintentionally de-emphasizes the student's role in becoming engaged. This study's findings indicate that engagement is, at least, just as much a function of the student as it is of the environment. In other words, this study demonstrates that student attributes predict academic engagement. In this vein, it is necessary to reframe an understanding of academic success as a shared responsibility between the student and the environment.

Finally, the results of the study confirm the inclination to incorporate students' psychological attributes in order to build a better college impact model (Pascarella & Terenzini, 2005; Stage, 1989). Although ecological perspectives of higher education (Barker, 1968; Lewin, 1936) stress the person-environment interaction as the catalyst for behavior or outcomes, college impact models rarely account for the person beyond what are typically listed as "student background characteristics." Theories explaining student involvement (Astin, 1984), involving colleges (Kuh, 1991) and student engagement (Kuh, 2005) all attempt to describe how students interact with the college environment. However, none of these accounts for *why* students become engaged academically or involved socially. Instead these theories privilege the environment as the subject of action and relegate students to the role of indirect object. In measuring college impact, it is at least equally important to understand the student as the primary actor in his or her

educational endeavors. By incorporating student attributes into existing models for student involvement, this study sought to bridge the gap between the psychological and sociological phenomena that produce college outcomes. Rather than viewing these two aspects as wholly separate, the model tested in this study blended the psychology of student attributes with the sociology of the college environment to produce a better model. Results from the study indicate that accounting for student attributes contributes to our understanding of why students become academically and socially involved.

Furthermore, while student involvement predicts at least some portion of academic success, alone it does not tell the whole story. Instead, the psychological dimensions of student attributes greatly enhance an understanding of the path to academic success. The effects of the environment on the outcome were indirect rather than direct. In other words, the environmental effects on academic success were mediated through the student (represented by academic self-concept at Time 2) rather than directly linked.

### Implications

The results of this study suggest implications for practice, policy, and theory. The following section outlines contributions to practice and policy and then offers recommendations for future research.

#### *Contributions to Practice and Policy*

This study highlights the role students play in their own academic success, including the responsibility students bear for becoming engaged in their own educational process. This approach to understanding academic success suggests at least one policy

implication and four recommendations for practice. Given the particularity of locating the study in a single institution, the recommendations for practice are tailored to meet the needs at Magis University. Certainly, the findings of this study may resonate with the climate of student achievement at other institutions, in which case faculty and administrators at those institutions also may find use for the following recommendations. Directions for practice fall into four areas: (a) education for prospective college students about the student's role in achieving academic success; (b) admission practices; (c) setting expectations for students and how they engage their own learning; and (d) attention to first-generation students. These recommendations are outlined below, followed by the policy implication that has emerged from this study.

### *Prospective Student Education*

Magis University, like many other institutions, produces a broad array of marketing materials for prospective students. Colorful, eye-catching brochures describe every aspect of the university from residential living and the fitness center to the full listing of academic majors. Although intended to inform prospective students who are preparing to choose a college community to join, these materials inadvertently may send a message that is counter-intuitive. Higher education theorists (Frank, 2001; Winston & Zimmerman, 2000) describe this phenomenon of amenities-first-marketing as the great "arms race" of higher education. In an effort to attract students to choose Magis, administrators may be feeding into a growing consumer mentality in which prospective students and their parents shop for the best amenities at the greatest value rather than looking for an institution in which the student can flourish intellectually.



In order to counter-balance the marketing materials highlighting student services and facilities, the admission staff may consider developing equally captivating tools, from additional brochures to specially designed programs for prospective students and high school guidance counselors, that describe the student's responsibility to become academically and socially involved. These developments would capitalize on the findings presented in this study which suggest that students who assume responsibility for their experience and exhibit involvement behaviors are more likely to succeed academically. As a Jesuit institution, Magis University is committed to developing the student as a whole person. Certainly well-placed messages about the student's role in achieving academic success would affirm the institution's guiding philosophy. In this way, Magis would send a clear message about the partnership it enters with each student who matriculates—a partnership in which the institution promises to provide challenging academic and social opportunities in a supportive environment and the student promises to engage. This type of communication to prospective students prepares them to understand themselves as authors of their own experience rather than consumers of goods and services.

### *Admission Practices*

Beyond early communication to prospective students about how to engage the Magis University environment, the findings of this study suggest a need for altering some admission practices. In weighing prospective student profiles, Magis University—like many other institutions across the country—considers college entrance exam scores in the admission decision. Although the results of the study indicated that the SAT composite

score predicts at least some portion of college grade point average in the first year, it is less predictive than high school grades. Furthermore, findings demonstrated that SAT composite is a negative predictor of academic involvement, including engagement behavior, which was a positive predictor of academic success. Although it is unrealistic to imagine Magis University eliminating college entrance exam scores from the student profile, it is reasonable to suggest that admission professionals reconsider the weight they assign to these scores. In addition to adjusting the prominence of entrance exam scores in the admission decision, Magis University may consider methods for ascertaining prospective students' academic self-concept and self-determination, both of which predicted different aspects of students' academic and social engagement in their first year of college. Given the results of this study, these shifts in practice have the potential to yield a student body that is better disposed to meet the demands of higher education.

#### *Setting Expectations for Involvement*

Admission practices aside, Magis University would do well to communicate high expectations for students' academic and social involvement. The findings of this study suggest that of all the involvement measures, only behaviors depicting academic engagement are directly linked to academic success in a significant manner. Therefore, Magis University could consider focusing on delineating and setting expectations for students' active engagement in their learning processes.

Setting expectations begins the process of reframing accountability for academic success to include student responsibility for engaging the academic and social environment. One approach to communicating expectations is developing rubrics for

academic and social involvement. Currently, rubrics are offered as an alternative method for assessing students' academic progress (Anderson, 1998). A rubric involves a defined set of competencies or goals as well as the dimensions or criteria for achieving them. An involvement rubric, then, might indicate "engaged learning" as a desirable competency and then list a set of behaviors associated with academic engagement, such as completing reading assignments before class and contributing to classroom discussions. In addition, a rubric also might delineate the spectrum of progress. For instance, in setting an expectation for social involvement, a rubric might define behaviors from beginning involvement, which might involve participating in a student club, attending a retreat, or serving the greater community, all the way to exemplary involvement, which might involve taking a leadership role in an organization or activity. Armed with a set of rubrics outlining desired academic and social development outcomes, students would be in a better position to see themselves as authors of their own experience. Although this recommendation for practice does not address initial student attributes that contribute to academic success, it is an environmental intervention with the potential for influencing growth and positive change in the psychological dimensions that predict success.

### *First-generation Students*

Although this was not a study focused on first-generation students, one finding stood out as deserving attention. Results from the causal model indicated that first-generation status had a negative influence over social self-concept at the end of the first year of college. Whereas first-generation status did not predict any other variable in the model (i.e., first-generation students appear to have similar experiences as those students

who have a family history of college attendance), it did negatively predict social self-concept. This finding may indicate a social atmosphere or environment that favors in some way one sub-population over another. A needs or climate assessment for first-generation students may help Magis University understand the needs of a sub-population that otherwise may remain hidden by the student culture.

*Policy Recommendation: Rethinking Approaches to Accountability*

The results of this study provide a new perspective on accountability for academic success in the first year of college. Specifically, findings indicated that the student brings his or her own psychological attributes to bear on the educational process, and these dispositions can be used to predict achievement. Given these results, it seems imperative to reframe the federal- and state-level conversations around accountability—particularly where performance-based funding is concerned. Performance-based funding is a system of “allocating resources to institutions based on the extent to which they achieve previously established goals, objectives, and outcomes” (Layzell, 1999, p. 233).

Among other indicators, Layzell (1999) listed inputs and outcomes, such as SAT scores for the entering class and retention rates, as well as “customer” needs, such as student satisfaction and employment rates for graduating seniors, as measures states commonly used to evaluate institutional effectiveness. In this way, state policymakers monitor institutional progress toward explicit goals and then often use the information to determine funding levels. Although the performance-based funding approach ensures institutional accountability to state legislators and the tax-paying public, they mistakenly place the burden of responsibility for student success squarely on the institutions

themselves. Instead, the results of this study indicate that students, by their psychological dispositions, are at least partly responsible for their own success. Whereas the institution is responsible for providing an engaging environment, students are responsible for how and when they choose to engage—academically and socially. Furthermore, performance indicators addressing student satisfaction without the caveat for student responsibility reinforces the notion of student-as-consumer of an educational product. Inadvertently, state monitoring procedures may counteract efforts to engage students as learners who *earn* rather than consume a higher education.

Given these remarks, the policy recommendation stemming from this study focuses on reframing the monitoring systems that hold institutions accountable to the public. Although this is not a recommendation to eliminate performance-based funding, it is a proposal to address the philosophical underpinnings that guide the choice of monitoring criteria. Understanding the shared responsibility between institution and student for academic success may not eliminate criteria such as effective use of human and other resources or impact on state economy. However, balancing institutional and student responsibility for learning may alter the weight given to student satisfaction and similar criteria.

### *Recommendations for Future Research*

No one study can answer all questions about a given topic. Although this study was a good first step in understanding how student attributes contribute to academic success in the first year of college, it was just that—a first step. Additional research is

needed to address some of the questions raised by the current study. This section describes five areas for investigation in the future.

First, the model in this study produced interesting results. However, further testing and tweaking of the model is required. This study examined only three non-cognitive predictors of success—academic self-concept, social self-concept, and self-determination as measured by basic psychological needs. What other student attributes would contribute to the model? Additional elements of the psychosocial dimension, such as self-understanding, intellectual orientation, self-esteem, or alternative measures of autonomy (Pascarella & Terenzini, 2005) may contribute to the model just as well as, or perhaps even better than, the three student attributes that were included. In addition, this model tested only one aspect of student success: grade point average at the end of the first year of college. Other outcomes that may suit the model include, first-to-second-year retention, successful course completion, or major declaration (Upcraft, Gardner, & Barefoot, 2005). Moreover, the model could be extended to capture academic success over four years of college, in which case the dependent variables would reflect senior-year data, such as graduation rates, cumulative undergraduate grade point average, employment rates, or graduate school acceptance rates.

With regard to the model itself, future investigators may see a need to adjust the placement of the variable describing enrollment in first-year programs. Although this study included first-year programs as a measure of involvement (Astin, 1984), other researchers (Fidler & Stuart Hunter, 1989; Stuart Hunter & Linder, 2005) make convincing arguments in another direction. Specifically, their research indicates that enrolling in first-year programs leads to greater academic and social involvement.

Therefore, a theory supports enrollment in specific programmatic interventions as an intermediate outcome with direct influence on engagement. For the purposes of testing programmatic efficacy, future researchers may modify the model presented in the current study by placing the programmatic variable between those variables describing student attributes and those describing involvement.

A second direction for future research is greater examination of the influence of race/ethnicity. The analytic sample for the current study was not diverse enough to draw substantial inferences with respect to the role of race/ethnicity in the model. Because of the small percentage of non-White students in the sample, the current study can say nothing about how well the model predicts academic success in the first year with regard to students of color. Furthermore, the students of color represented in the current analytic sample could not be disaggregated by racial or ethnic group, further limiting any understanding of how well the model works. Future researchers will want to test the model at institutions with greater diversity so as to provide more robust comparison groups by race.

The third recommendation for additional study is to develop a better understanding of student attributes that relate to success. For example, this study utilized an instrument measuring basic psychological needs (Deci & Ryan, 2000) to capture the construct of self-determination. Future researchers will want to investigate different instruments that measure self-determination and compare their results to those presented in this study. In addition, self-efficacy was dropped from the model despite the theoretical foundations that support its inclusion. Further investigation may uncover a more robust posttest measurement for self-efficacy, in which case I would recommend

reintroducing self-efficacy to the model. Future research should build upon the current study and begin to unfold the complexity surrounding student attributes that impact success. If results prove to be consistent, I recommend advocating for the inclusion of items measuring these attributes in survey instruments designed to measure college impact. The findings of this study indicate that national surveys, such as those sponsored by the Higher Education Research Institute and the National Survey of Student Engagement, would provide more complete data for outcomes assessment if they also included reliable measures of student attributes that predict success. Furthermore, these findings indicate a possible amendment of I-E-O models in which academic success is the identified outcome. Future testing of these models should include student attributes in the intermediate outcome position between measures of the environment and the outcome.

The fourth recommendation for future research is to develop a multi-level model that will contribute to an understanding of the relative impact of student attributes and institutional environment on student success. As a first step, the current study focused on understanding the contribution of student attributes toward academic success. As a result the study was delimited to a single institution in order to isolate environmental differences that may also influence success. Future researchers may choose to advance the current study by investigating the effects of student attributes within several different institutional types. A study along these lines could advance knowledge by describing how different environments influence the development of student attributes, whether different environments attract students with particular psychological traits, and how



student attributes influence academic and social involvement within different environments.

A fifth direction for future research addresses the implications of methodological choice. As a quantitative investigation, the current study accesses predictors of success only on the macro level. In order to understand the particulars of student attributes and their impact on success, qualitative analysis is a necessary companion to the current study. A qualitative methodology, such as case study, would provide insight into the experiences of students and those university educators who interact with them. By describing their own stories, students and educators may shed light onto students' processes of developing self-concept or self-determination. What programs, persons, or experiences promote growth? In what ways do students feel responsible for their own education, or conversely, in what respects do they hold the institution responsible? Other questions may describe the characteristics or experiences typical of students with high versus low student attribute levels. This level of analysis cannot be achieved through quantitative methods, yet this type of contribution is necessary to build our understanding of students and their paths to success.

## Final Thoughts

The current climate of assessment in higher education is designed to express how students benefit from college attendance and how colleges and universities are uniquely poised to provide these benefits. The current study contributes to assessment philosophy by demonstrating that student attributes predict academic success beyond what can be explained by prior achievement and involvement. Specifically, the findings suggested that prior measures of academic self-concept and self-determination directly influence students' patterns of academic and social involvement, and thereby indirectly influence achievement. Furthermore, study results demonstrated that the later measure of academic self-concept had the greatest direct effect on college grade point average and was a better predictor than prior achievement. This finding is particularly notable for two reasons: (a) inserting student attributes as an intermediate outcome between the environment and the outcome of interest adds value to the traditional I-E-O model (Astin, 1991); and (b) the effects of the environment, which are emphasized by leading higher education researchers (Astin, 1993; Kuh, 1991; 2005; Kuh, Kinzie, Schuh, & Whitt, 2005), are largely mediated through the student. These results confirm previous admonitions to wed the psychological orientation of student development theory to the sociological orientation of college impact in order to build more effective models (Pascarella & Terenzini, 2005; Stage, 1989).

In addition, this study creates implications for practice, policy, and future research. This study is an important first step in understanding how student attributes contribute to academic success in the first year of college. Further research is necessary to understand the different psychological dimensions that contribute to success as well as

the multiple measures of success they might predict. Additionally researchers who build multi-level studies based on the current research will be able to determine the relative impact of student attributes and institutional environment on student success.

With regard to policy and practice, this study's focus on the effect of student attributes on academic success indicates a need to reframe the discussions of accountability for student success. Educational efforts on the part of institutions will improve students' awareness of their role in the educational process—that while the institution provides an engaging environment, students are responsible for their own engagement. Likewise, this study suggests a need to educate policymakers on appropriate criteria for funding initiatives. Although policymakers are duty-bound to hold institutions accountable, current assessment practices unintentionally may be creating a climate where the public is encouraged to see students as consumers of an educational good rather than learners with authorship over the extent to which they engage. The results of this study underscore the need to view responsibility for student success as shared between the institution and the student. Students who see themselves as authors of their college experience are more likely to engage in meaningful ways and subsequently be in a better position to succeed.

## Appendix A

### *Definitions of Variables in the Study with Associated Theoretical Concepts*

Theoretical Concept	Variable	Definition	
			CIRP
Student background characteristics	Gender	Dichotomous variable (0 = <i>male</i> ; 1 = <i>female</i> )	Q #1
	Race/ethnicity	Composite of dichotomous variable to identify race/ethnicity (0/1): White (reference) and Students of color comprised of multiracial, African American, Native American, Asian/Pacific American, Latino.	Q #25
	First-generation student status: Mother's/Father's education	Composite of categorical variables (0 = <i>college degree</i> ; 1 = <i>no more than high school</i> ; 2 = <i>greater than high school but less than college</i> ; 3 = <i>greater than college</i> )	Q #28
	High school GPA	Continuous variable from student self-reported data. The grade scale ranges from 1 to 7, with 1 = <i>1.0 GPA or less</i> and 7 = <i>4.0 or greater</i> .	Q #7
	College entrance exam score	Z-score of composite continuous variable adding math and verbal SAT results	Inst. Data

Theoretical Concept	Variable	Definition	
Student Attributes at Time 1	Academic self-concept	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>lowest 10%</i> ; 2 = <i>below average</i> ; 3 = <i>average</i> ; 4 = <i>above average</i> ; 5 = <i>highest 10%</i> ), including academic ability, computer skills, mathematical ability, public speaking ability, intellectual self-confidence, and writing ability.	CIRP Factor analysis of items in Q #31
	Social self-concept	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>lowest 10%</i> ; 2 = <i>below average</i> ; 3 = <i>average</i> ; 4 = <i>above average</i> ; 5 = <i>highest 10%</i> ), including kindness, leadership ability, social self-confidence, and understanding of others.	Factor analysis of items in Q #31
	Self-determination	A continuous interval variable on a 7-point Likert-type scale based on student self-reported data (1-2 = <i>not at all true</i> ; 3-5 = <i>somewhat true</i> ; 6-7 = <i>very true</i> )	SRA1 Factor analysis of Q #s 1 through 21

Theoretical Concept	Variable	Definition	
			YFCY
First-year Experience	First-year programs	A categorical variable based on student self-reported data (0 = <i>no seminar</i> ; 1 = <i>extended orientation seminar</i> ; 2 = <i>academic or pre-professional seminar</i> ; 3 = <i>other</i> )	An item in Q # 17
	Faculty Interaction	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>not at all</i> ; 2 = <i>rarely</i> ; 3 = <i>occasionally</i> ; 4 = <i>frequently</i> )	Factor analysis of items in Q # 5
	Academic engagement	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>not at all</i> ; 2 = <i>rarely</i> ; 3 = <i>occasionally</i> ; 4 = <i>frequently</i> )	Factor analysis of items in Q #s 12, 18
	Homework time-on-task	A continuous variable based on student self-reported data (1 = <i>none</i> ; 2 = <i>less than 1 hour</i> ; 3 = <i>1-2</i> ; 4 = <i>3-5</i> ; 5 = <i>6-10</i> ; 6 = <i>11-15</i> ; 7 = <i>16-20</i> ; 8 = <i>21-30</i> ; 9 = <i>over 30</i> )	An item in Q #21
	Student Clubs	A continuous variable based on student self-reported data (1 = <i>none</i> ; 2 = <i>less than 1 hour</i> ; 3 = <i>1-2</i> ; 4 = <i>3-5</i> ; 5 = <i>6-10</i> ; 6 = <i>11-15</i> ; 7 = <i>16-20</i> ; 8 = <i>21-30</i> ; 9 = <i>over 30</i> )	An item in Q #21

Theoretical Concept	Variable	Definition	
			YFCY
First-year Experience	Sense of Belonging	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>strongly agree</i> ; 2 = <i>agree</i> ; 3 = <i>disagree</i> ; 4 = <i>strongly disagree</i> )	Factor analysis of items in Q # 15
Student Attributes at Time 2	Academic self-concept	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>lowest 10%</i> ; 2 = <i>below average</i> ; 3 = <i>average</i> ; 4 = <i>above average</i> ; 5 = <i>highest 10%</i> ), including academic ability, computer skills, mathematical ability, public speaking ability, intellectual self-confidence, and writing ability.	Factor analysis of items in Q #9
	Social self-concept	A continuous interval variable on a Likert-type scale based on student self-reported data (1 = <i>lowest 10%</i> ; 2 = <i>below average</i> ; 3 = <i>average</i> ; 4 = <i>above average</i> ; 5 = <i>highest 10%</i> ), including leadership ability, popularity, social self-confidence, and understanding of others.	Factor analysis of items in Q #9

Theoretical Concept	Variable	Definition	
			SRA
Student Attributes at Time 2	Self-determination	A continuous interval variable on a 7-point Likert-type scale based on student self-reported data (1-2 = <i>not at all true</i> ; 3-5 = <i>somewhat true</i> ; 6-7 = <i>very true</i> )	Factor analysis of Q #s 1 through 21
Academic Success	Cumulative GPA	Continuous variable. The grade scale ranges from 1 to 7, with 1 = <i>1.0 GPA or less</i> and 7 = <i>4.0 or greater</i> .	Inst. data



## APPENDIX B

*2004 Cooperative Institutional Research Program Student Information Form*

*Higher Education Research Institute*

000001

[illegible]

### MARKING DIRECTIONS

- Use a pencil or black or blue pen.
- Fill in the oval completely.
- Erase cleanly any marks you wish to change or "X" out mark if in pen.

☐ ☒ ☐ ☐
☒ ☒ ☐ ☐

[illegible]

1. Your sex: ☐ Male ☐ Female
2. How old will you be on December 31 of this year? (Mark one)
- |  |                                      |
|--|--------------------------------------|
| 16 or younger... <input type="radio"/> | 21-24 ..... <input type="radio"/>    |
| 17 ..... <input type="radio"/>         | 25-29 ..... <input type="radio"/>    |
| 18 ..... <input type="radio"/>         | 30-39 ..... <input type="radio"/>    |
| 19 ..... <input type="radio"/>         | 40-54 ..... <input type="radio"/>    |
| 20 ..... <input type="radio"/>         | 55 or older... <input type="radio"/> |

3. Is English your native language?  
☐ Yes ☐ No
4. In what year did you graduate from high school? (Mark one)
- |                  |                       |   |
|------------------|-----------------------|---|
| 2004             | <input type="radio"/> | Did not graduate but                      |
| 2003             | <input type="radio"/> | passed G.E.D. test. <input type="radio"/> |
| 2002             | <input type="radio"/> | Never completed                           |
| 2001 or earlier. | <input type="radio"/> | high school <input type="radio"/>         |

5. Are you enrolled (or enrolling) as a:  
(Mark one) Full-time student? . . ☒  
Part-time student? . . ☐

6. How many miles is this college from your permanent home? (Mark one)
- |                                 |                              |                                |
|---------------------------------|------------------------------|--------------------------------|
| 5 or less <input type="radio"/> | 11-50 <input type="radio"/>  | 101-500 <input type="radio"/>  |
| 6-10 <input type="radio"/>      | 51-100 <input type="radio"/> | Over 500 <input type="radio"/> |

7. What was your average grade in high school? (Mark one)

- A or A+ ☐ B ☐ C ☐  
A- ☐ B- ☐ D ☐  
B+ ☐ C+ ☐

8. From what kind of secondary school did you graduate? (Mark one)
- ☐ Public school (not charter or magnet)
  - ☐ Public charter school
  - ☐ Public magnet school
  - ☐ Private religious/parochial school
  - ☐ Private independent college-prep school
  - ☐ Home school

9. What were your scores on the SAT I and/or ACT?

SAT VERBAL .....			
SAT MATH .....			
ACT Composite .....			

10. Citizenship status:
- ☐ U.S. citizen
- ☐ Permanent resident (green card)
- ☐ Neither

11. Prior to this term, have you ever taken courses for credit at this institution?

- ☐
- Yes
- ☐
- No

12. Since leaving high school, have you ever taken courses at any other institution? (Mark all that apply in each column)
- |  | For Credit                     | Not for Credit           |
|--|--------------------------------|--------------------------|
| Yes, at a community/junior college   | <input type="checkbox"/> ..... | <input type="checkbox"/> |
| Yes, at a 4-yr. college or university  | <input type="checkbox"/> ..... | <input type="checkbox"/> |
| Yes, at some other postsecondary school (For example, technical, vocational, business) ..... | <input type="checkbox"/> ..... | <input type="checkbox"/> |

13. During your last year of high school what proportion of the time did you live with: (Mark one in each row)

	All	Most	Some	None
Mother	(A)	(N)	(S)	(N)
Father	(A)	(N)	(S)	(N)
Stepmother	(A)	(N)	(S)	(N)
Stepfather	(A)	(N)	(S)	(N)
Grandparent	(A)	(N)	(S)	(N)
Legal guardian	(A)	(N)	(S)	(N)
Other adult(s)	(A)	(N)	(S)	(N)

14. Where do you plan to live during the fall term? (Mark one)

- With my family or other relatives . . . . . ☐
- Other private home, apartment or room . . . ☐
- College residence hall . . . . . ☐
- Fraternity or sorority house . . . . . ☐
- Other campus student housing . . . . . ☐
- Other . . . . . ☐

15. Is this college your: (Mark one)

- First choice? ..... ☐      Less than third  
Second choice? ..... ☐      choice? ..... ☐  
Third choice? ..... ☐

16. To how many colleges other than this one did you apply for admission this year?

- None ☐ 1 ☐ 4 ☐ 7-10 ☐  
2 ☐ 5 ☐ 11 or more ☐  
3 ☐ 6 ☐

17. During high school (grades 9-12) how many years did you study each of the following subjects? (Mark one for each item)

[illegible]

18. Do you have a disability? (Mark all that apply)

- None ..... ☐
- Hearing ..... ☐
- Speech ..... ☐
- Orthopedic ..... ☐
- Learning disability ..... ☐
- Health-related ..... ☐
- Partially sighted or blind ..... ☐
- Other ..... ☐

19. What is the highest academic degree that you intend to obtain?

(Mark one in each column)

None .....	<input type="radio"/>	<input type="radio"/>
Vocational certificate .....	<input type="radio"/>	<input type="radio"/>
Associate (A.A. or equivalent) .....	<input type="radio"/>	<input type="radio"/>
Bachelor's degree (B.A., B.S., etc.) .....	<input type="radio"/>	<input type="radio"/>
Master's degree (M.A., M.S., etc.) .....	<input type="radio"/>	<input type="radio"/>
Ph.D. or Ed.D. ....	<input type="radio"/>	<input type="radio"/>
M.D., D.O., D.D.S., or D.V.M. ....	<input type="radio"/>	<input type="radio"/>
J.D. (Law) .....	<input type="radio"/>	<input type="radio"/>
B.D. or M.Div. (Divinity) .....	<input type="radio"/>	<input type="radio"/>
Other .....	<input type="radio"/>	<input type="radio"/>

20. Are your parents: (Mark one)

- Both alive and living with each other? .. ☐
- Both alive, divorced or living apart? ... ☐
- One or both deceased?..... ☐

21. How much of your first year's educational expenses (room, board, tuition, and fees) do you expect to cover from each of the sources listed below? (Mark one answer for each possible source)

	None	Less than \$1,000	\$1,000-2,999	\$3,000-5,999	\$6,000-9,999	\$10,000+
Family resources (parents, relatives, spouse, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My own resources (savings from work, work-study, other income)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aid which need not be repaid (grants, scholarships, military funding, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aid which must be repaid (loans, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other than above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. What is your best estimate of your parents' total income last year? Consider income from all sources before taxes. (Mark one)

<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000-59,999
<input type="radio"/> \$10,000-14,999	<input type="radio"/> \$60,000-74,999
<input type="radio"/> \$15,000-19,999	<input type="radio"/> \$75,000-99,999
<input type="radio"/> \$20,000-24,999	<input type="radio"/> \$100,000-149,999
<input type="radio"/> \$25,000-29,999	<input type="radio"/> \$150,000-199,999
<input type="radio"/> \$30,000-39,999	<input type="radio"/> \$200,000-249,999
<input type="radio"/> \$40,000-49,999	<input type="radio"/> \$250,000 or more

23. Current religious preference: (Mark one in each column)

	Yours	Father's	Mother's
Baptist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buddhist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Church of Christ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eastern Orthodox	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Episcopalian	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hindu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Islamic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jewish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LDS (Mormon)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lutheran	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methodist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Presbyterian	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quaker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roman Catholic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seventh Day Adventist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unitarian/Universalist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
United Church of Christ/Congregational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Christian	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Religion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
None	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Do you consider yourself a Born-Again Christian?

☐ Yes ☐ No

25. Please indicate your ethnic background. (Mark all that apply)

White/Caucasian	<input type="checkbox"/>
African American/Black	<input type="checkbox"/>
American Indian/Alaska Native	<input type="checkbox"/>
Asian American/Asian	<input type="checkbox"/>
Native Hawaiian/Pacific Islander	<input type="checkbox"/>
Mexican American/Chicano	<input type="checkbox"/>
Puerto Rican	<input type="checkbox"/>
Other Latino	<input type="checkbox"/>
Other	<input type="checkbox"/>

26. For the activities below, indicate which ones you did during the past year. If you engaged in an activity frequently, mark (F). If you engaged in an activity one or more times, but not frequently, mark (O) (Occasionally). Mark (N) (Not at all) if you have not performed the activity during the past year. (Mark one for each item)

	Frequently	Occasionally	Not at all
Attended a religious service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was bored in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participated in organized demonstrations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tutored another student	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studied with other students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was a guest in a teacher's home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank beer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank wine or liquor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all I had to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed volunteer work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Played a musical instrument	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asked a teacher for advice after class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed politics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Voted in a student election	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socialized with someone of another racial/ethnic group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Came late to class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used the Internet for research or homework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed community service as part of a class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used a personal computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed religion/spirituality:			
In class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked on a local, state, or national political campaign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintained a healthy diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stayed up all night	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Missed school because of illness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. For each item, please mark Yes or No:

	Yes	No
Did your high school require community service for graduation?	<input type="radio"/>	<input type="radio"/>
Have you participated in:		
A summer research program?	<input type="radio"/>	<input type="radio"/>
A health science research program sponsored by a university?	<input type="radio"/>	<input type="radio"/>

28. What is the highest level of formal education obtained by your parents? (Mark one in each column)

	Father	Mother
Grammar school or less	<input type="radio"/>	<input type="radio"/>
Some high school	<input type="radio"/>	<input type="radio"/>
High school graduate	<input type="radio"/>	<input type="radio"/>
Postsecondary school other than college	<input type="radio"/>	<input type="radio"/>
Some college	<input type="radio"/>	<input type="radio"/>
College degree	<input type="radio"/>	<input type="radio"/>
Some graduate school	<input type="radio"/>	<input type="radio"/>
Graduate degree	<input type="radio"/>	<input type="radio"/>

29. In deciding to go to college, how important to you was each of the following reasons? (Mark one answer for each possible reason)

	Very Important	Somewhat Important	Not Important
My parents wanted me to go	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not find a job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wanted to get away from home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To be able to get a better job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To gain a general education and appreciation of ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was nothing better to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To make me a more cultured person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To be able to make more money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To learn more about things that interest me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To prepare myself for graduate or professional school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get training for a specific career	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To find my purpose in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. How would you characterize your political views? (Mark one)

☐ Far left

☐ Liberal

☐ Middle-of-the-road

☐ Conservative

☐ Far right

31. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (Mark one in each row)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Academic ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artistic ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compassion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperativeness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Courage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive to achieve	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forgiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generosity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kindness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematical ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public speaking ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religiousness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (intellectual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (social)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. Mark only three responses, one in each column.

- (M) Your mother's occupation  
(F) Your father's occupation  
(Y) Your probable career occupation

NOTE: If your father or mother is deceased, please indicate his or her last occupation.

Accountant or actuary	Y	F	M
Actor or entertainer	Y	F	M
Architect or urban planner	Y	F	M
Artist	Y	F	M
Business (clerical)	Y	F	M
Business executive (management, administrator)	Y	F	M
Business owner or proprietor	Y	F	M
Business salesperson or buyer	Y	F	M
Clergy (minister, priest)	Y	F	M
Clergy (other religious)	Y	F	M
Clinical psychologist	Y	F	M
College administrator/staff	Y	F	M
College teacher	Y	F	M
Computer programmer or analyst	Y	F	M
Conservationist or forester	Y	F	M
Dentist (including orthodontist)	Y	F	M
Dietitian or nutritionist	Y	F	M
Engineer	Y	F	M
Farmer or rancher	Y	F	M
Foreign service worker (including diplomat)	Y	F	M
Homemaker (full-time)	Y	F	M
Interior decorator (including designer)	Y	F	M
Lab technician or hygienist	Y	F	M
Law enforcement officer	Y	F	M
Lawyer (attorney) or judge	Y	F	M
Military service (career)	Y	F	M
Musician (performer, composer)	Y	F	M
Nurse	Y	F	M
Optometrist	Y	F	M
Pharmacist	Y	F	M
Physician	Y	F	M
Policymaker/Government	Y	F	M
School counselor	Y	F	M
School principal or superintendent	Y	F	M
Scientific researcher	Y	F	M
Social, welfare or recreation worker	Y	F	M
Therapist (physical, occupational, speech)	Y	F	M
Teacher or administrator (elementary)	Y	F	M
Teacher or administrator (secondary)	Y	F	M
Veterinarian	Y	F	M
Writer or journalist	Y	F	M
Skilled trades	Y	F	M
Laborer (unskilled)	Y	F	M
Semi-skilled worker	Y	F	M
Unemployed	Y	F	M
Other	Y	F	M
Undecided	Y	F	M

33. Mark one in each row:

- 1 Disagree Strongly  
2 Disagree Somewhat  
3 Agree Somewhat  
4 Agree Strongly

There is too much concern in the courts for the rights of criminals	4	3	2	1
Abortion should be legal	4	3	2	1
The death penalty should be abolished	4	3	2	1
Marijuana should be legalized	4	3	2	1
It is important to have laws prohibiting homosexual relationships	4	3	2	1
Racial discrimination is no longer a major problem in America	4	3	2	1
Realistically, an individual can do little to bring about changes in our society	4	3	2	1
Wealthy people should pay a larger share of taxes than they do now	4	3	2	1
Colleges should prohibit racist/sexist speech on campus	4	3	2	1
Same-sex couples should have the right to legal marital status	4	3	2	1
Affirmative action in college admissions should be abolished	4	3	2	1
The activities of married women are best confined to the home and family	4	3	2	1
Federal military spending should be increased	4	3	2	1
Colleges have the right to ban extreme speakers	4	3	2	1
If two people really like each other, it's all right for them to have sex even if they've known each other for only a very short time	4	3	2	1
The federal government should do more to control the sale of handguns	4	3	2	1

34. Below is a list of community service/volunteer activities. Indicate which of these you participated in during high school. (Mark all that apply)

None	<input type="checkbox"/>	Elder care	<input type="checkbox"/>	Community improvement/construction	<input type="checkbox"/>
Tutoring/teaching	<input type="checkbox"/>	Hospital work	<input type="checkbox"/>	Conflict mediation	<input type="checkbox"/>
Counseling/mentoring	<input type="checkbox"/>	Substance abuse education	<input type="checkbox"/>	Service to my religious community	<input type="checkbox"/>
Environmental activities	<input type="checkbox"/>	Other health education	<input type="checkbox"/>	Other community service	<input type="checkbox"/>
Child care	<input type="checkbox"/>	Services to the homeless	<input type="checkbox"/>		

35. During your last year in high school, how much time did you spend during a typical week doing the following activities?

Hours per week:	None	Less than 1 hour	1-2	3-5	6-10	11-15	16-20	Over 20
Studying/homework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Socializing with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Talking with teachers outside of class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exercise or sports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working (for pay)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volunteer work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student clubs/groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watching TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household/childcare duties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reading for pleasure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Playing video/computer games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prayer/meditation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

36. Do you have any concern about your ability to finance your college education? (Mark one)

- None (I am confident that I will have sufficient funds) ☐  
Some (but I probably will have enough funds) ☐  
Major (not sure I will have enough funds to complete college) ☐

37. Below are some reasons that might have influenced your decision to attend this particular college. How important was each reason in your decision to come here? (Mark one answer for each possible reason)

	Very important	Somewhat important	Not important
My relatives wanted me to come here	Y	S	N
My teacher advised me	Y	S	N
This college has a very good academic reputation	Y	S	N
This college has a good reputation for its social activities	Y	S	N
I was offered financial assistance	Y	S	N
The cost of attending this college	Y	S	N
High school counselor advised me	Y	S	N
Private college counselor advised me	Y	S	N
I wanted to live near home	Y	S	N
Not offered aid by first choice	Y	S	N
This college's graduates gain admission to top graduate/professional schools	Y	S	N
This college's graduates get good jobs	Y	S	N
I was attracted by the religious affiliation/orientation of the college	Y	S	N
I wanted to go to a school about the size of this college	Y	S	N
Rankings in national magazines	Y	S	N
Information from a website	Y	S	N
I was admitted through an Early Action or Early Decision program	Y	S	N
A visit to the campus	Y	S	N



<b>ARTS AND HUMANITIES</b>		<b>PHYSICAL SCIENCE</b>	
Art, fine and applied	1	Astronomy	43
English (language and literature)	2	Atmospheric Science (incl. Meteorology)	44
History	3	Chemistry	45
Journalism	4	Earth Science	46
Language and Literature (except English)	5	Marine Science (incl. Oceanography)	47
Music	6	Mathematics	48
Philosophy	7	Physics	49
Speech	8	Statistics	50
Theater or Drama	9	Other Physical Science	51
Theology or Religion	10	<b>PROFESSIONAL</b>	
Other Arts and Humanities	11	Architecture or Urban Planning	52
<b>BIOLOGICAL SCIENCE</b>		Home Economics	53
Biology (general)	12	Health Technology (medical, dental, laboratory)	54
Biochemistry or Biophysics	13	Library or Archival Science	55
Botany	14	Medicine, Dentistry, Veterinary Medicine	56
Environmental Science	15	Nursing	57
Marine (Life) Science	16	Pharmacy	58
Microbiology or Bacteriology	17	Therapy (occupational, physical, speech)	59
Zoology	18	Other Professional	60
Other Biological Science	19	<b>SOCIAL SCIENCE</b>	
<b>BUSINESS</b>		Anthropology	61
Accounting	20	Economics	62
Business Admin. (general)	21	Ethnic Studies	63
Finance	22	Geography	64
International Business	23	Political Science (gov't, international relations)	65
Marketing	24	Psychology	66
Management	25	Social Work	67
Secretarial Studies	26	Sociology	68
Other Business	27	Women's Studies	69
<b>EDUCATION</b>		Other Social Science	70
Business Education	28	<b>TECHNICAL</b>	
Elementary Education	29	Building Trades	71
Music or Art Education	30	Data Processing or Computer Programming	72
Physical Education or Recreation	31	Drafting or Design	73
Secondary Education	32	Electronics	74
Special Education	33	Mechanics	75
Other Education	34	Other Technical	76
<b>ENGINEERING</b>		<b>OTHER FIELDS</b>	
Aeronautical or Astronautical Eng.	35	Agriculture	77
Civil Engineering	36	Communications	78
Chemical Engineering	37	Computer Science	79
Computer Engineering	38	Forestry	80
Electrical or Electronic Engineering	39	Kinesiology	81
Industrial Engineering	40	Law Enforcement	82
Mechanical Engineering	41	Military Science	83
Other Engineering	42	Other Field	84
		Undecided	85

39. Please indicate the importance to you personally of each of the following: (Mark one for each item)

(E) Essential (V) Very Important (S) Somewhat Important (N) Not Important

Becoming accomplished in one of the performing arts (acting, dancing, etc.) ..... (E) (V) (S) (N)

Becoming an authority in my field ..... (E) (V) (S) (N)

Obtaining recognition from my colleagues for contributions to my special field ..... (E) (V) (S) (N)

Influencing the political structure ..... (E) (V) (S) (N)

Influencing social values ..... (E) (V) (S) (N)

Raising a family ..... (E) (V) (S) (N)

Having administrative responsibility for the work of others ..... (E) (V) (S) (N)

Being very well off financially ..... (E) (V) (S) (N)

Helping others who are in difficulty ..... (E) (V) (S) (N)

Making a theoretical contribution to science ..... (E) (V) (S) (N)

Writing original works (poems, novels, short stories, etc.) ..... (E) (V) (S) (N)

Creating artistic work (painting, sculpture, decorating, etc.) ..... (E) (V) (S) (N)

Becoming successful in a business of my own ..... (E) (V) (S) (N)

Becoming involved in programs to clean up the environment ..... (E) (V) (S) (N)

Developing a meaningful philosophy of life ..... (E) (V) (S) (N)

Participating in a community action program ..... (E) (V) (S) (N)

Helping to promote racial understanding ..... (E) (V) (S) (N)

Keeping up to date with political affairs ..... (E) (V) (S) (N)

Becoming a community leader ..... (E) (V) (S) (N)

Integrating spirituality into my life ..... (E) (V) (S) (N)

Improving my understanding of other countries and cultures ..... (E) (V) (S) (N)

Working to find a cure to a health problem ..... (E) (V) (S) (N)

40. What is your best guess as to the chances that you will: (Mark one for each item)

(V) Very Good Chance (S) Some Chance (L) Very Little Chance (N) No Chance

Change major field? ..... (V) (S) (L) (N)

Change career choice? ..... (V) (S) (L) (N)

Participate in student government? ..... (V) (S) (L) (N)

Get a job to help pay for college expenses? ..... (V) (S) (L) (N)

Work full-time while attending college? ..... (V) (S) (L) (N)

Join a social fraternity or sorority? ..... (V) (S) (L) (N)

Play varsity/intercollegiate athletics? ..... (V) (S) (L) (N)

Make at least a "B" average? ..... (V) (S) (L) (N)

Participate in student protests or demonstrations? ..... (V) (S) (L) (N)

Transfer to another college before graduating? ..... (V) (S) (L) (N)

Be satisfied with your college? ..... (V) (S) (L) (N)

Participate in volunteer or community service work? ..... (V) (S) (L) (N)

Seek personal counseling? ..... (V) (S) (L) (N)

Communicate regularly with your professors? ..... (V) (S) (L) (N)

Socialize with someone of another racial/ethnic group? ..... (V) (S) (L) (N)

Participate in student clubs/groups? ..... (V) (S) (L) (N)

Strengthen your religious beliefs/convictions? ..... (V) (S) (L) (N)

Participate in a study abroad program? ..... (V) (S) (L) (N)

41. Do you give the Higher Education Research Institute (HERI) permission to include your ID number should your college request the data for additional research analyses? ☐ Yes ☐ No

The remaining ovals are provided for questions specifically designed by your college rather than the Higher Education Research Institute. If your college has chosen to use the ovals, please observe carefully the supplemental directions given to you.

42. (A) (B) (C) (D) (E) 49. (A) (B) (C) (D) (E) 56. (A) (B) (C) (D) (E)

43. (A) (B) (C) (D) (E) 50. (A) (B) (C) (D) (E) 57. (A) (B) (C) (D) (E)

44. (A) (B) (C) (D) (E) 51. (A) (B) (C) (D) (E) 58. (A) (B) (C) (D) (E)

45. (A) (B) (C) (D) (E) 52. (A) (B) (C) (D) (E) 59. (A) (B) (C) (D) (E)

46. (A) (B) (C) (D) (E) 53. (A) (B) (C) (D) (E) 60. (A) (B) (C) (D) (E)

47. (A) (B) (C) (D) (E) 54. (A) (B) (C) (D) (E) 61. (A) (B) (C) (D) (E)

48. (A) (B) (C) (D) (E) 55. (A) (B) (C) (D) (E) 62. (A) (B) (C) (D) (E)

THANK YOU!

## APPENDIX C

### *Student Readiness Assessment*

# Student Readiness Assessment

Thank you for participating in this voluntary survey. The information we gather will help us further our understanding of college students. By virtue of completing this survey and providing your student identification number, you are certifying that you are at least 17 years of age. Please understand that your responses will be used for research purposes. Your ID number will be kept confidential and will be used only to link your responses from various surveys. Once all data files are merged, your ID number will be removed, and your responses will be virtually anonymous. There are no known risks for participating in this survey, and the results will not benefit any student individually.

Student ID Number: \_\_\_\_\_

## Part A

1. Please indicate your residence:

\_\_\_\_\_ Campion      \_\_\_\_\_ Hopkins Court      \_\_\_\_\_ Newman      \_\_\_\_\_ Southwell  
 \_\_\_\_\_ Butler      \_\_\_\_\_ Hammerman      \_\_\_\_\_ Commuter

2. If you live in a special first-year community (e.g. Alpha House, Collegium, Gonzaga House, Honors Housing, etc.), please indicate which one:

\_\_\_\_\_

## Part B

Please read each of the following items carefully, thinking about how it relates to you *right now*. Using the scale below, indicate how true each statement is for you *currently* as you begin your college experience.

1	2	3	4	5	6	7
not at all true		somewhat true				very true

1. I feel like I am free to decide for myself how to live my life.
2. I really like the people I interact with.
3. Often, I do not feel very competent.
4. I feel pressured in my life.
5. People I know tell me I am good at what I do.
6. I get along with people I come into contact with.
7. I pretty much keep to myself and don't have a lot of social contacts.
8. I generally feel free to express my ideas and opinions.
9. I consider the people I regularly interact with to be my friends.
10. I have been able to learn interesting new skills recently.

not at all true		somewhat true			very true	
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7

over →

	not at all true		somewhat true			very true	
	1	2	3	4	5	6	7
11. In my daily life, I frequently have to do what I am told.	1	2	3	4	5	6	7
12. People in my life care about me.	1	2	3	4	5	6	7
13. Most days I feel a sense of accomplishment from what I do.	1	2	3	4	5	6	7
14. People I interact with on a daily basis tend to take my feelings into consideration.	1	2	3	4	5	6	7
15. In my life I do not get much of a chance to show how capable I am.	1	2	3	4	5	6	7
16. There are not many people that I am close to.	1	2	3	4	5	6	7
17. I feel like I can pretty much be myself in my daily situations.	1	2	3	4	5	6	7
18. The people I interact with regularly do not seem to like me much.	1	2	3	4	5	6	7
19. I often do not feel very capable.	1	2	3	4	5	6	7
20. There is not much opportunity for me to decide for myself how to do things in my daily life.	1	2	3	4	5	6	7
21. People are generally pretty friendly towards me.	1	2	3	4	5	6	7
22. My parent/s support/s my decisions.	1	2	3	4	5	6	7
23. I am concerned that I may not do as well as I'd like to in college.	1	2	3	4	5	6	7
24. I feel I can talk to my parent/s about most things.	1	2	3	4	5	6	7
25. The courses I took in high school adequately prepared me to succeed in college.	1	2	3	4	5	6	7
26. I am worried about living up to the expectations of my parent/s.	1	2	3	4	5	6	7
27. I am academically prepared for college-level courses.	1	2	3	4	5	6	7

Thank you for participating.

Please return your completed surveys in the envelope provided.

.....



APPENDIX D

*2005 Your First College Year*

*Higher Education Research Institute*



9. How would you describe the racial/ethnic composition of the following groups? (Mark one for each item)

	All or nearly all racial/ethnic minorities	Mostly racial/ethnic minorities	Half white and half racial/ethnic minorities	Mostly white	All or nearly all white	Not applicable
High school you last attended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Neighborhood where you grew up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends you socialize with in college	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your informal study groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clubs/organizations to which you belong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Place of work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Since entering this college, how successful have you felt at: (Mark one for each item)

	Completely Successful	Somewhat Successful	Unsuccessful
Understanding what your professors expect of you academically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing effective study skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adjusting to the academic demands of college	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing your time effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting to know faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing close friendships with other students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilizing campus services available to students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (Mark one for each item)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Academic ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artistic ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compassion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperativeness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive to achieve	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forgiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generosity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematical ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public speaking ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religiousness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Risk-taking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (intellectual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (social)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to work as part of a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Critical thinking skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analytical/problem-solving skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Since entering this college, how often have you: (Mark one for each item)

	Frequently	Occasionally	Not at all
Attended a religious service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt bored in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participated in organized demonstrations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studied with other students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank beer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank wine or liquor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all you had to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed volunteer work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed politics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socialized with someone of another racial/ethnic group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Come late to class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed religion/spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used the Internet for research or homework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used the library for research or homework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked on a local, state, or national political campaign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintained a healthy diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Missed school because of illness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Indicate the importance to you personally of each of the following: (Mark one for each item)

	Essential	Very Important	Somewhat Important	Not Important
Becoming accomplished in one of the performing arts (acting, dancing, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming an authority in my field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obtaining recognition from my colleagues for contributions to my special field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influencing the political structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influencing social values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Raising a family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having administrative responsibility for the work of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being very well off financially	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helping others who are in difficulty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making a theoretical contribution to science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing original works (poems, novels, short stories, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating artistic work (painting, sculpture, decorating, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming successful in a business of my own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming involved in programs to clean up the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing a meaningful philosophy of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in a community action program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helping to promote racial understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keeping up to date with political affairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming a community leader	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Integrating spirituality into my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working to find a cure for a health problem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving my understanding of other countries and cultures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reading a newspaper to be informed of national and global issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving the health of minority communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Since entering this college, how often have you felt: (Mark one for each item)

	Frequently	Occasionally	Rarely	Not at all
Lonely or homesick .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Worried about meeting new people .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Isolated from campus life .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Unsafe on this campus .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Worried about your health .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Intimidated by your professors .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
That your courses inspired you to think in new ways .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
That your job responsibilities interfered with your schoolwork .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
That your family responsibilities interfered with your schoolwork .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
That your social life interfered with your schoolwork .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Concerned about life after college .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Family support to succeed .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N

15. Please indicate the extent to which you agree or disagree with the following statements: (Mark one for each item)

	Strongly Agree	Agree	Disagree	Strongly Disagree
I have been singled out because of my race/ethnicity, gender, or sexual orientation. ....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
I see myself as part of the campus community. ....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
I have heard faculty express stereotypes about racial/ethnic groups in class .....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
The admission/recruitment materials I received accurately portrayed the campus .....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
I feel I am a member of this college. ....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
Faculty here are interested in students' personal problems .....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
There is a lot of racial tension on this campus ....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
Most students here are treated like "numbers in a book" .....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
There is strong competition among most of the students for high grades .....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
Faculty here are interested in students' academic problems .....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
I feel I have a sense of belonging to this college ..	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S
Faculty feel that most students here are well-prepared academically. ....	<input type="radio"/> S	<input type="radio"/> A	<input type="radio"/> D	<input type="radio"/> S

16. To what extent have you experienced the following with students from a racial/ethnic group other than your own? (Mark one for each item)

	Very Often	Often	Sometimes	Seldom	Never
Dined or shared a meal .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Had meaningful and honest discussions about race/ethnic relations outside of class ..	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Had guarded, cautious interactions .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Shared personal feelings and problems .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Had tense, somewhat hostile interactions. ....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Had intellectual discussions outside of class ..	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Felt insulted or threatened because of race/ethnicity .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Studied or prepared for class .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Socialized or partied .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N
Attended events sponsored by other racial/ethnic groups .....	<input type="radio"/> V	<input type="radio"/> O	<input type="radio"/> S	<input type="radio"/> L	<input type="radio"/> N

17. Since entering this college have you: (Mark all that apply)

Changed your career choice .....	<input type="checkbox"/>
Decided to pursue a different major .....	<input type="checkbox"/>
Declared your major .....	<input type="checkbox"/>
Joined a social fraternity or sorority .....	<input type="checkbox"/>
Enrolled in an honors course .....	<input type="checkbox"/>
Played varsity/intercollegiate athletics .....	<input type="checkbox"/>
Enrolled in a remedial/developmental course .....	<input type="checkbox"/>
Transferred from another institution .....	<input type="checkbox"/>
Enrolled in a formal program where a group of students takes two or more courses together (e.g., FIG, learning cluster, learning community, linked courses) .....	<input type="checkbox"/>
Taken a college course or seminar specifically designed to help first-year students adjust to college (e.g., freshman seminar, student success seminar, University 101) .....	<input type="checkbox"/>
Voted in the 2004 presidential election .....	<input type="checkbox"/>
Participated in a health science research program sponsored by this college .....	<input type="checkbox"/>
Intended to major in a Health, Biomedical, or Behavioral Science .....	<input type="checkbox"/>
Joined a pre-professional or departmental club .....	<input type="checkbox"/>
Participated in an academic enrichment/support program for racial/ethnic minority students .....	<input type="checkbox"/>

18. Since entering this college, indicate how often you: (Mark one for each item)

	Frequently	Occasionally	Rarely	Not at all
Turned in course assignment(s) late .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Spoke up in class .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Discussed course content with students outside of class .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Skipped class .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Received tutoring .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Worked on a professor's research project .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Turned in course assignments that did <u>not</u> reflect your best work .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Participated in intramural sports .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Had difficulty getting along with your roommate(s)/housemate(s) .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Sought personal counseling .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Went on a date .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Received negative feedback about your academic work .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Received advice and guidance about your educational program from a professor .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Received emotional support and encouragement from a professor .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Read a newspaper .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Witnessed academic dishonesty/cheating .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Went home for the weekend .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Worked with an academic advisor to select your courses .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Received advice/counseling from a junior or senior .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Received advice/counseling from another first-year student .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Fell asleep in class .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Had difficulty getting into the courses you needed. ....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N
Read newspaper articles as part of a class .....	<input type="radio"/> F	<input type="radio"/> O	<input type="radio"/> R	<input type="radio"/> N



19. Compared with when you entered this college, how would you now describe your: (Mark one for each item)

	Much Stronger	Stronger	No Change	Weaker	Much Weaker
General knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge of a particular field or discipline	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge of people from different races/cultures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religious beliefs and convictions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to get along with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of the problems facing your community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of national issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of global issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to make your own decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to conduct research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. How would you characterize your political views? (Mark one)

Far left ☐ Liberal ☐ Middle-of-the-road ☐ Conservative ☐ Far right ☐

21. Since entering this college, how much time have you spent during a typical week doing the following activities? (Mark one for each item)

	None	Less than 1 hour	1 - 2	3 - 5	6 - 10	11 - 15	16 - 20	21 - 30	Over 30
Attending classes/labs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studying/homework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socializing with friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercising or sports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Partying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working (for pay) on campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working (for pay) off campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student clubs and groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watching TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Household/childcare duties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reading for pleasure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commuting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing video/computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prayer/meditation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surfing the Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicating via e-mail, Instant Messenger, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. What is your current grade average (as of your most recently completed academic term)? (Mark one)

A (3.75 - 4.0) ☐ A-, B+ (3.25 - 3.74) ☐ B (2.75 - 3.24) ☐ B-, C+ (2.25 - 2.74) ☐ C (1.75 - 2.24) ☐ C- or less (below 1.75) ☐ I do not receive grades in my courses ☐

23. Please rate your satisfaction with this institution on each of the aspects of campus life listed below. (Mark one for each item)

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Amount of contact with faculty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities for community service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relevance of coursework to everyday life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relevance of coursework to future career plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall quality of instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Campus social activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall sense of community among students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall college experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. If you could make your college choice over, would you still choose to enroll at your current (or most recent) college? (Mark one)

☐ Definitely yes  
☐ Probably I would  
☐ Probably not  
☐ Definitely no  
☐ Don't know

25. Do you have any concern about your ability to finance your college education? (Mark one)

☐ None (I am confident that I will have sufficient funds)  
☐ Some (but I probably will have enough funds)  
☐ Major (not sure I will have enough funds to complete college)

26. What do you think you will be doing in Fall 2005? (Mark one)

☐ Attending your current (or most recent) institution  
☐ Attending another institution  
☐ Not attending any institution

27. Do you give the Higher Education Research Institute at UCLA permission to include your ID number should your college request the data for additional research analyses?

☐ Yes ☐ No

The remaining ovals are provided for questions specifically designed by your college rather than the Higher Education Research Institute. If your college has chosen to use the ovals, please observe carefully the supplemental directions given to you.

28. A B C D E 38. A B C D E 48. A B C D E  
 29. A B C D E 39. A B C D E 49. A B C D E  
 30. A B C D E 40. A B C D E 50. A B C D E  
 31. A B C D E 41. A B C D E 51. A B C D E  
 32. A B C D E 42. A B C D E 52. A B C D E  
 33. A B C D E 43. A B C D E 53. A B C D E  
 34. A B C D E 44. A B C D E 54. A B C D E  
 35. A B C D E 45. A B C D E 55. A B C D E  
 36. A B C D E 46. A B C D E 56. A B C D E  
 37. A B C D E 47. A B C D E 57. A B C D E

Thank You!



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## APPENDIX E

### *2004 Cooperative Institutional Research Program Student Information Form*

#### *Higher Education Research Institute*

#### *Components of the Factor Composite: Self-concept*

Factor Components	Loadings
Academic Self-concept	
Self-confidence (intellectual)	.776
Academic Ability	.746
Drive to Achieve	.651
Writing Ability	.632
Social Self-concept	
Compassion	.768
Generosity	.759
Cooperativeness	.672
Understanding of Others	.667
Self-esteem	
Self-understanding	.783
Emotional Health	.676
Self-confidence (social)	.625
Forgiveness	.522
Leadership Self-concept	
Leadership Ability	.747
Creativity	.644
Public Speaking Ability	.589
Courage	.554

Factor Components	Loadings
Spirituality	
Religiousness	.916
Spirituality	.903

Source: Analyses of CIRP:04, Magis University

Note. Items asked respondents to: “Rate yourself on each of the following traits as compared with the average person your age.”

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