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Honors and high-ability students: Factors that predict academic efficacy, critical thinking skills, and academic goals

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Honors and high-ability students: Factors that predict academic efficacy, critical thinking skills, and academic goals

by

Jessica Lynn Moon

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Education (Educational Leadership)

Program of Study Committee:
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Iowa State University

Ames, Iowa

2012

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Dedication

This dissertation is dedicated to my family.

To my parents, Jim and Jackie Moon, who have given me *everything*.

And to my sister and brother-in-law, Jennifer and Brett Tjaden, and their children Ben and Drew (who, so far, have put up with all my attempts to make them smart).

I love you all.

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ABSTRACT

The purpose of the quantitative study was threefold: (a) to examine high-ability students in and outside an honors program at a midwestern comprehensive university to determine differences in background and demographic characteristics between honors participants and nonparticipants of similar ability; (b) to determine differences in academic self-efficacy and in- and out-of-class engagement between honors participants and nonparticipants of similar ability; and (c) to examine major influences on high-ability student GPA, reported use of critical thinking skills, academic efficacy, and academic goals. Eight research questions guided the study. Astin's (1993) Input–Environment–Output (I–E–O) model was utilized for the study's conceptual framework.

Statistically significant differences were found between honors students and honors-eligible nonparticipants in cumulative ACT scores, high school and college GPA, and parental education levels as well as in levels of academic efficacy, academic goals, and exposure to diverse perspectives. Regression analyses uncovered numerous meaningful predictors of GPA, reported use of critical thinking skills, academic efficacy, and academic goals on the part of high-ability students. The findings of this study provide implications for policy and practice as well as opportunities for future research related to high-ability student learning and engagement.

CHAPTER 1. INTRODUCTION

Higher education has long been recognized as an investment in one's future. More than simply degree attainment or career preparation, the college experience is also understood to be an important avenue for personal growth and self-improvement. This is particularly true for the high-ability student who seeks to gain as much as possible from the college years. Participation in honors programs is one way high-ability students can enrich their academic experience. Honors programs provide motivated students with access to resources such as "prominent faculty members, special courses and seminars, enhanced student services, and better facilities" (Long, 2002, p. 1). Honors students are provided with opportunities to make the most of their college experience.

Although honors programs differ in their features and functions, the National Collegiate Honors Council (NCHC) established "Basic Characteristics of a Fully Developed Honors Program" in 1994. Among the characteristics are the expectations that programs provide clear admission, retention, and completion criteria; curriculum features "special courses, seminars, colloquia, experiential learning opportunities, undergraduate research opportunities, or other independent-study options"; programs provide an example of high standards and a model for the entire institution; students are given a voice in the administration and governance of the program; and "the program emphasizes active learning and participatory education by offering opportunities for . . . international programs, community service, internships, undergraduate research, and other types of experiential education" ("Basic Characteristics", 2000, p. 42). Each institution's culture and mission should influence the way in which individual programs tailor their offerings, but these characteristics provide the framework for most program designs.

In an age of increasing competition among higher education providers, honors programs have become a tool with which to recruit top students. Such programs often are found at state institutions that seek to draw high-ability students from more elite, and expensive, colleges and universities. Students are promised small class sizes, increased faculty mentoring, opportunities for active learning, and the development of critical thinking skills. Anecdotal evidence of student growth through honors programming abounds, but little empirical research has been conducted on the impact of honors involvement on student learning.

Statement of the Problem

The problem this study addressed is the lack of empirical research about the impact of honors program involvement on college students. Although some limited research has been conducted related to honors retention and completion rates (Campbell, 2006; Cosgrove, 2004a), this study focused on factors that predict grade point average (GPA), academic efficacy, critical thinking skills, and academic goals.

There has long been a call among honors faculty and administrators for a stronger body of research within the field of honors education. Achterberg (2004b) pointed out that “research that addresses questions about honors education is not only needed but should be a priority within individual institutions as well as the general community of higher education” (p. 33). Her statements were made 20 years after Estess, Roemer, and Schuman each authored individual papers in a 1984 edition of *Forum for Honors*, the predecessor to the *Journal of the National Collegiate Honors Council*, which made similar assertions about the state of honors research (as cited in Achterberg, 2004b).

A comparable assessment was made in a recent article by Slavin, Coladarci, and Pratt (2008). The authors described the problem by saying:

To many, particularly those involved in honors education, the advantages of honors curricula have been and continue to be obvious. Honors students are engaged, they are challenged, and they are exposed to interdisciplinary analysis. They have a wonderful experience and achieve great things during their undergraduate careers. All of this is good; the students flourish, and the faculty have enjoyable experiences. So, what's the problem? The problem is that we have little data to support these claims. (p. 59)

Unfortunately, little advancement has been made in the body of honors literature despite many calls throughout the years for advanced research. Questions about the value, impact, and need for honors programming still persist.

Purpose of the Study

The purpose of this quantitative study was threefold: (a) to examine high-ability students in and outside of an honors program at a midwestern comprehensive university to determine differences in background and demographic characteristics between honors participants and nonparticipants of similar ability; (b) to determine differences in academic self-efficacy and in- and out-of-class engagement between honors participants and nonparticipants of similar ability; and (c) to examine major influences on high-ability student GPA, reported use of critical thinking skills, academic efficacy, and academic goals. This study was intended to make a meaningful contribution to the limited body of honors literature and to help educators understand what benefits students gain from honors participation.

Research Questions

Given the threefold purpose articulated above, this study sought to answer the following research questions:

1. What are the background and demographic characteristics of the students who participated in the study?
2. Are there statistically significant differences in gender, race/ethnicity, cumulative high school GPA, composite ACT score, average level of parental education, college classification year, transfer credit hours, and cumulative college GPA between honors participants and nonparticipants of similar ability?
3. Are there statistically significant differences in reported levels of academic self-efficacy and in- and out-of-class engagement (as measured by active and collaborative learning, critical thinking skills, diverse perspectives, reflective learning, student and faculty interaction, and student relationships) between honors participants and nonparticipants of similar ability?
4. What background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors predict academic achievement as measured by cumulative college GPA?
5. What background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors predict the degree to which students report employing critical thinking skills?
6. What background characteristics and college experiences influence students' academic efficacy?

7. What background characteristics and college experiences influence students' academic goals?
8. How do high-ability students characterize their involvement in, or their decision not to participate in, a collegiate honors program?

Methodological Approach

This study employed a quantitative research methodology using a post-positivist approach. Creswell (2009) explained that post-positivism counters the positivist idea of absolute truth found through research, a particularly difficult threshold to meet when studying human behavior. The problems explored through post-positivism “reflect the need to identify and assess the causes that influence outcomes . . . the intent is to reduce the ideas into a small, discrete set of ideas to test” (p. 7). This approach was appropriate for this study given the interest in understanding what influence honors program involvement has on student learning.

The sample included high-ability students from a midwestern comprehensive institution. A survey instrument was employed using items from the National Survey of Student Engagement (NSSE) and the Patterns of Adaptive Learning Survey (PALS) as well as linked institutional data. Astin's (1993) Input–Environment–Output (I–E–O) model provided a useful conceptual framework for examining the variables and constructs that impact critical thinking and academic achievement.

Theoretical Framework

It was important to provide a theoretical grounding for this examination of high-ability students. Creswell (2009) defined theory as “an interrelated set of constructs (or variables) formed into propositions, or hypotheses, that specify the relationship among

variables” (p. 51). Several theories provided a framework to help explain the relationships among variables examined in this study.

In the 1986 publication, “The Forms of Capital,” Bourdieu delineated two forms of capital that contribute to an individual’s pursuit of status, position, or economic well-being: social and cultural capital. Although others have advanced their own interpretations of capital widely used in educational research (Coleman, 1988; Lin, 2001), the work of Bourdieu forms the framework for this study. Bourdieu “defined social capital as the aggregate of actual or potential resources linked to possession of a durable network of essentially institutionalized relationships of mutual acquaintance and recognition” (Dika & Singh, 2002, p. 33). Through the social networks to which one belongs, one is granted connections, support, and resources that help with attainment of future positions or status. The family or larger network’s role in the delivery of social capital is crucial in Bourdieuan philosophy. This study examined levels of parental education to determine the influence of this important form of social capital on the academic growth of high-ability students.

The concept of self-efficacy, first introduced by Albert Bandura in the 1970s, is widely used in educational research (Siegle, Rubenstein, Pollard, & Romey, 2010). Bandura (1989) said of self-efficacy, “Among the mechanisms of personal agency, none is more central or pervasive than people’s beliefs about their capabilities to exercise control over events that affect their lives” (p. 1175). Self-efficacy theory plays an important role in the academic success of college students; research “has shown a positive relationship between self-efficacy beliefs and academic performance” (Siegle et al., 2010, p. 93). Academic efficacy was examined for its effect on high-ability student learning.

In order to fully understand the influence of academic engagement on high-ability student outcomes, it was crucial to include a discussion of Astin's (1984) theory of involvement in this study's framework. Astin (1999) defined involvement as "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). Student learning and growth is related to the degree of involvement a student has in that learning endeavor. Astin (1999) noted several examples of involvement that result in higher than average changes in student characteristics, among them participation in an honors program, which increased self-esteem and satisfaction in several areas. Given this study's interest in honors program involvement and the impact on achievement and critical thinking, Astin's (1999) theory of involvement provided a clear basis for the examination of academic engagement variables.

The three distinct theories summarized here together form a solid theoretical framework. As applied to this study, these theories hold that parental education as social capital, student concept of academic self-efficacy, and student involvement in academically engaging behaviors will influence academic achievement and the development of critical thinking skills.

Significance of the Study

Public stakeholders, including those with funding oversight, have increased their level of scrutiny of educational institutions in recent years (Kuh & Ewell, 2010). As Glenn, Hebel, and Brainard (2010) described it, "As the price of college continues to outpace both inflation and the growth of average family incomes, students, parents, and policymakers are demanding to know just what families are getting for their money" (p. A1). Given the current fiscal challenges in higher education and their impact on policy and programming

decisions, it is important to pursue research in this area to determine whether students are benefitting from institutional investments in honors programs.

Given the dearth of research on the impact of honors programs (Achterberg, 2004b; Slavin et al., 2008), this study holds significant implications for the body of honors-related scholarship. The study's design allowed for multiple comparisons between characteristics held by honors participants and nonparticipants, a methodological technique not present in many previous studies. Additionally, the study advances a new model to explain outcomes and investigate unique differences between honors participants and nonparticipants. Previous studies in the field have not utilized a conceptual model in which background characteristics, college motivation, and in- and out-of-class engagement factors are used to predict academic achievement, use of critical thinking skills, academic efficacy, and academic goals.

This study resulted in new insights regarding the factors that contribute to meaningful student outcomes. In particular, identifying the degree to which honors involvement influences students to engage in meaningful academic behaviors provides useful information to college leaders. Expanding the knowledge base about the impact of honors program involvement can help those in higher education to maximize the potential of our most able students.

Definitions of Terms

The following are definitions of key terms used for this study:

Academic achievement: a quantitative measurement of learning as indicated by cumulative college GPA.

Academic efficacy: a form of self-efficacy (Bandura, 1989) encompassing one's beliefs about one's ability to influence or control learning.

Academic engagement: an orientation toward learning characterized by active outward behaviors as well as cognitive features such as motivation, interest, and commitment.

Active learning: instructional approaches characterized by such things as student initiative, engagement, and interaction rather than passive reception of academic material.

Critical thinking: "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (Facione, 1990, p. 2).

Critical thinking skills: the components of critical thinking characterized by mental activities such as observation, analysis, synthesis, critique, and application.

High-ability student: an academically gifted student recognized through institutional criteria such as grades, test scores, writing ability or a combination thereof.

Honors program: an undergraduate program that provides specialized academic and social opportunities to enhance the educational experience of high-ability students.

Honors student: an undergraduate student of high ability who participates in a collegiate honors program.

Honors-eligible nonparticipant: an undergraduate student, also of high ability, who does not participate in a collegiate honors program.

Summary

This study adds to the small body of work that has been done regarding honors program involvement and attempts to provide new information about the impact of honors

involvement on high-ability student learning. Chapter 2 provides a thorough review of the literature related to honors programming and key variables including in- and out-of-class engagement, academic self-efficacy, academic achievement, and critical thinking. Chapter 3 presents a complete discussion of the methodological orientation of the study including sampling procedures, instrumentation, and statistical analyses. Chapter 4 provides an explanation of results. Chapter 5 concludes the dissertation with a discussion of the results and their significance to honors education and the academic community at large.

CHAPTER 2. REVIEW OF THE LITERATURE

Introduction

The purposes of this study were to (a) examine high-ability students in and outside an honors program at a midwestern comprehensive university to determine differences in background and demographic characteristics between participants and nonparticipants of similar ability; (b) determine differences in self-efficacy and in- and out-of-class engagement between participants and nonparticipants of similar ability; and (c) examine major influences on GPA, critical thinking skills, academic efficacy, and academic goals. This chapter summarizes the pertinent literature that provided a foundation for the study.

The review of literature opens with an overview of honors programming in the United States including a discussion of historical roots, common program characteristics, and relevant empirical research. Next, an examination of work related to the key independent variables is presented including research on in- and out-of class engagement and academic self-efficacy. The review concludes with an analysis of the study's dependent variables of academic achievement and critical thinking.

Honors Overview

Honors programs have become an increasingly popular way for institutions to address the intellectual and social needs of high-ability students. Such programs provide motivated students with access to top faculty, specialized advising and mentoring, set-aside facilities for living and learning, and curricular and co-curricular offerings (Long, 2002). Although programs are typically holistic, providing services and support to address all aspects of student development, academic offerings are paramount. Honors programs provide interactive, discussion-based courses and emphasize the development of communication and

critical thinking skills. The intent is to provide high-ability students with opportunities to make the most of their college experience, both in and outside the classroom.

History of Honors Programs

Although modern-day honors programs can trace their roots to features of the German and English models of education, the first honors program in the United States was established at Swarthmore College in 1922 (Rinn, 2006). The influx of students at the end of World War I caused a differentiation in students' ability levels that had not been seen previously in higher education. This led to a concern that "making the same requirements of all students, the brightest students were being held back and limited in their intellectual potential" (Rinn, 2006, p. 71). The Swarthmore program, designed by President Frank Aydelotte, was predicated on active rather than passive methods, a value still held by today's honors programs. Aydelotte based much of his program on the British model of education, particularly that with which he became familiar at Oxford as a Rhodes scholar. Although Swarthmore's original program was restricted to upper-level students, credit is given to Aydelotte for emphasizing "group experience in the small seminar or colloquium" (Cohen, 1966, p. 12).

Honors programs proliferated throughout the 20th century. The late 1950s saw the generation of the Interuniversity Committee on Superior Students (ICSS) led by Joseph Cohen from the University of Colorado (Rinn, 2006). The ICSS served as a predecessor to the NCHC, which was formed in 1966. NCHC continues to serve as the national professional organization for undergraduate honors programs and reported 1,200 institutional, professional, and student members during the 2010–2011 academic year

(NCHC, 2012). The 2005 edition of *Peterson's Guide to Honors Colleges and Programs* listed almost 600 honors programs across the United States (England, 2010).

The rapid growth in higher education since the 1950s has resulted in increased competition for the best and brightest students. Additionally, the importance placed on college rankings in recent years has motivated institutions to boost their reputations, often by measure of the selectivity of the student body. Honors programs help institutions entice high-ability students as well as “produce high-achieving graduates and alumni that reflect on the school” (Long, 2002, p. 4). Honors programs can reach beyond undergraduate academic offerings to serve an important role in many university functions including recruitment, retention, development, and alumni relations.

Common Characteristics

Honors programs should be responsive to the culture of their home institutions, with their structure and design serving as a reflection of the mission and values of the college or university in which they are situated. Even so, NCHC established “Basic Characteristics of a Fully Developed Honors Program” in 1994 to challenge programs to include certain key components of a meaningful honors experience. Clear admission, retention, and completion criteria; specialized curriculum; undergraduate research or independent-study options; and active learning methods are encouraged as standard elements of solid honors programs and graduates of honors programs are recognized through special awards, transcript notations, or honors degrees (“Basic Characteristics,” 2000). Consistent with these basic characteristics, Austin (as cited in Campbell & Fuqua, 2008) articulated numerous common features of honors programs, including “small classes, increased faculty interaction, research and independent study opportunities, an enriched curriculum, special honors advising, and

optional honors housing” (p. 130). Well-developed programs provide opportunities for students to grow both academically and socially.

Just as colleges and universities vary widely, the nature of individual honors programs vary as well. Program sizes range from very small to very large with some featuring only departmental honors whereas others are applicable to majors across the entire university (Tallent-Runnels, Shaw, & Thomas, 2007). In the last decade there has been a movement from honors programs to honors colleges, as evidenced by the NCHC’s 2005 approval of a set of basic characteristics of a fully developed honors college. The shift from program to college has been seen particularly at larger institutions willing to invest in a stronger, more visible commitment to honors education. Some institutions have found honors colleges to be an appealing option for donors interested in supporting the honors mission (Achterberg, 2004a).

What are the common characteristics of students who participate in honors? Exceptional academic standing is an obvious characteristic, and many programs select participants based on standard criteria such as high GPA and ACT or SAT score. Although the cut-off levels for selection vary by institution, the scores of honors students typically are higher than those of nonparticipants within a particular institution (Achterberg, 2005). Those with high grades and standardized test scores tend to have “a variety of other associated characteristics evidenced by their high school and college transcripts. Namely, they are *able, accelerated and advanced*” (Achterberg, 2005, p. 76). Achterberg (2005) went on to define these characteristics more fully, stating that such students are able to do college-level work, they have moved quickly through the standard high school curriculum, and they are likely to have taken advanced courses in high school, possibly entering college with advanced

academic credit. Achterberg (2005) summed up her assessment of honors student characteristics by saying:

An honors student should be: a highly motivated, academically talented, intrinsically inspired, advanced, and curious student who has broad interests, a passion for learning, and excitement about ideas. The student should also be sufficiently different or unique from the institutional norm as to need, indeed require, a different, more challenging curriculum and other learning opportunities to satisfy his or her drive to learn, know, and do. (p. 81)

Although standardized test scores are a common mode of selection, some program administrators advocate the selection of honors students through an interview process, believing that “so-called objective criteria for judging the quality of students fail quite miserably when it comes to predicting success in honors curricula” (Freyman, 2005, p. 23). Interviews with candidates allow selection committees to gauge Freyman’s (2005) key criteria of curiosity, academic purpose, and communication skills but admittedly can be a challenge depending on program size, staffing, and location.

A 2007 single-institution study attempted to determine ways in which honors students differed from nonhonors students (Kaczvinsky, 2007). Based on results from a Noel-Levitz survey conducted at Louisiana Tech University, this research found honors students scored higher than did nonhonors students on intellectual interests, motivation to complete college, and academic confidence. They also scored lower than did nonhonors students on the survey’s sociability scale and seemed to have similar scores on the items that measured emotional and transitional problems. These findings suggest that the academic challenge and

social support offered by honors programs are appropriate for the needs of the high-ability students they seek to serve.

Empirical Research

As noted previously, much work remains to be done to solidify the research base on honors programs. Literature reviews of past dissertation studies echo the sentiment that little results from database searches for empirical research about honors outcomes (Cosgrove, 2004a; Shushok, 2002). Many of the articles published in the *Journal of the National Collegiate Honors Council* have tended toward commentaries on selection processes, descriptions of teaching techniques, or discussions of assessment issues or administrative functions (Kaczvinsky, 2007; Lanier, 2008; Lopez-Chavez & Shepherd, 2010; Schuman, 2005). However, a handful of studies have been conducted in the last several years that provide further illumination on the impact of honors involvement on the college student experience.

Much of the empirical research in the field has focused on retention and completion rates within honors programs (Campbell & Fuqua, 2008; Cosgrove, 2004b; Slavin et al., 2008). John Cosgrove's (2004b) study compared grades, retention rates, and completion rates for three groups of students: those who completed honors program requirements (honors completers), those who were involved but did not complete program requirements (partial honors students), and students with similar entering characteristics who did not participate in an honors program (high-ability students). Cosgrove (2004b) found that "honors completers have the highest academic performance and graduation rates, and shortest time to degree completion, compared to other high ability students, including partial honors students" (p. 45). Results for partial honors students were more similar to the high-

ability nonhonors students than to the honors completers. This study may indicate that other issues, such as intensity of the honors experience or student motivation levels, may influence academic achievement and time to graduation.

Campbell and Fuqua (2008) analyzed factors that predict completion of honors requirements to determine whether established predictors of retention and completion in the wider body of literature hold true in an honors population. The study included 336 first-year honors participants from a single midwestern institution. Sixteen predictor variables were included, ranging from high school grades to socioeconomic status to first-semester use of honors facilities. The variables that exerted the greatest predictive value included first-semester college cumulative GPA, high school GPA, housing choice (honors or nonhonors), high school rank, and gender (Campbell & Fuqua, 2008). Although some of the variables found in the larger body of retention research were meaningful, the authors noted that “many of the variables associated with college persistence failed to contribute to the prediction of honors program persistence, which indicates that the college persistence theoretical framework is not entirely appropriate for the honors program setting” (Campbell & Fuqua, 2008, p. 148). The authors suggested including variables such as motivation and overall educational aspirations in future research on honors retention and completion.

Although several researchers have undertaken studies related to honors retention and completion, there are fewer examples available of empirical research about more complex learning outcomes. One key study is the foundational work represented by Astin’s (1993) *What Matters in College: Four Critical Years Revisited*, which included enrollment in an honors or advanced placement course as one of 57 involvement measures from a total of 192 variables associated with the undergraduate college experience. From national data acquired

by the Cooperative Institutional Research Program, Astin (1993) found that enrollment in honors programs was positively associated with a variety of student outcomes including “tutoring other students, bachelor’s degree attainment, self-reported growth in preparation for graduate school, degree aspirations, and enrollment in graduate or professional school” (p. 379). Additionally, enrollment in an honors or advanced placement course was positively associated with retention, reported growth in analytical and problem solving skills, drive to achieve, and the desire to contribute to scientific theory (Astin, 1993). It should be noted that, although Astin (1993) referred to honors program involvement numerous times in his study, the use of enrollment in an honors or advanced placement course as the dichotomous variable makes it difficult to ascertain the level of honors participation or the intensity of the honors experience among respondents. Additionally, Astin’s (1993) study lacked a control group of nonhonors students with which to compare.

Particularly illuminating findings stemmed from a 2002 study that compared outcomes of honors and nonhonors students (Shushok, 2002, 2006). The initial dissertation study examined 86 first-year honors students and 86 first-year nonhonors students of evenly matched ability. Honors students were found to have higher GPAs in the first year and higher retention into their second year. The study also showed that male honors students reported higher levels of engagement with faculty and overall satisfaction with college than did female honors students (Shushok, 2002).

Results from the College Student Experiences Questionnaire (CSEQ) distributed in the dissertation study showed honors and nonhonors groups engaged in extracurricular activities at the same rate, but honors students showed greater “perceived gains in the liberal arts, sciences, or technology” at a statistically significant level (Shushok, 2006, p. 88).

Students also were asked to measure their progress on items related to critical thinking and analytical skills. A composite measure was created that included the following four items from the CSEQ: (a) “thinking analytically and logically”; (b) “analyzing quantitative problems (understanding probabilities, proportions, etc.)”; (c) “putting ideas together, seeing relationships, similarities, and differences between ideas”; and (d) “learning on your own, pursuing ideas, and finding information you need” (Shushok, 2002, p. 102). In the case of measured gains in critical thinking and analytical skills, no significant difference was found between honors and nonhonors students on the composite item. This is an important previous finding given the current study’s interest in examining the critical thinking skills of high-ability students.

Shushok (2006) conducted a follow-up study to examine the same group of students from his initial dissertation study. When examining GPAs after 4 years, the two groups performed similarly: the advantage apparent for honors students after the first year was no longer present in the senior year. A 33-item survey was developed for the 2006 follow-up study, with some questions modeled after the CSEQ in order to measure engagement, participation, satisfaction, and learning gains. Similar to the 2001 results, the follow-up study showed that honors and nonhonors students reported engaging in similar types of activities, but honors males were more likely to meet with faculty during office hours and talk with them about career aspirations (Shushok, 2006). Additionally, honors students were more likely to talk about social problems or world events with peers and were more likely to be involved in academically focused activities outside the classroom. In all cases the results were more pronounced for male than for female honors students (Shushok, 2006). Shushok (2006) surmised that females may find it easier to associate with academically inclined peers

and that males find a particular advantage in an honors community that supports their academic interests.

Seifert, Pascarella, Colangelo, and Assouline (2007) cited the work of Astin (1993) and Shushok (2002) as primary studies regarding the effects of honors program involvement on cognitive development. However, they also articulated concerns with the studies' dependence on student self-reported gains and set out to use standardized measures of cognitive growth to determine the influence of honors program involvement. Seifert et al. (2007) used longitudinal data from the National Study of Student Learning, which gave them access to precollege data, three Collegiate Assessment of Academic Proficiency tests, and college experience information from the CSEQ.

Seifert et al. (2007) used honors program involvement as the sole independent variable in their study. They attempted to discover whether first-year honors students were more likely than nonhonors students to be exposed to good practices in undergraduate education and whether their scores on reading, math, and critical thinking tests were higher than those of nonhonors students. The study controlled for numerous background characteristics including gender, race, precollege academic ability, high school involvement, among many others. After controlling for background characteristics, the study found that honors students were significantly more likely to be exposed to 6 of the 20 good practices examined, including "(a) the extent of course-related interaction with peers, (b) academic effort/involvement, (c) number of textbooks/assigned readings, (d) instructor use of higher-order questioning techniques, (e) instructor feedback to students, and (f) instructor skill and clarity" (Seifert et al., 2007, p. 65). The authors noted that honors program involvement did appear to provide the first-year students with more effective and challenging instruction than

was received by their peers who did not participate in honors. However, they also pointed out in their discussion that the remaining 14 of 20 good practices examined did not show significant difference, interpreting the results as an indication that “honors students do not participate in the overall college experience in ways that significantly differ from their nonhonors counterparts” (Seifert et al., 2007, p. 69). This assessment was in keeping with Shushok’s (2006) findings that honors and nonhonors students reported similar types of engagement.

The study showed that “honors program participation had significant, positive total effects on the measure of composite cognitive development as well as on the constituent mathematics and critical thinking scores” (Seifert et al., 2007, p. 65). The authors pointed out that honors students started their academic year with higher pretest scores on these measures and, surprisingly, still displayed greater growth from pretest to posttest than did the nonhonors respondents. This increase persisted even after including measures of good practice in the regression, causing Seifert et al. (2007) to wonder whether “honors participation may have a unique quality that is not captured in our prediction model” (p. 71). Although the previously highlighted studies shed light on questions regarding honors participation, many questions about impact still remain.

Student Engagement

Much has been written in the higher education literature about the academic experiences, out-of-class activities, study behaviors, and meaningful interactions with faculty, staff, and fellow students that can contribute to academic achievement. Several seminal works serve as a guide to student engagement for the postsecondary education community (Astin, 1984, 1993; Kuh, Kinzie, Schuh, Whitt & Associates 2005; Pascarella &

Terenzini, 2005). This section of the literature review includes an explanation of the concept of engagement and a summary of key research that influenced this study.

Evolution of the Concept of Engagement

Kuh (2009) recently defined student engagement as “the time and effort students devote to activities that are empirically linked to desired outcomes of college *and* what institutions do to induce students to participate in these activities” (p. 683). This seems a rather straightforward definition, but the reality is that understanding about student engagement has developed over time. It is rooted in the work of Pace, the developer of the CSEQ in the 1980s, whose research determined that students gain more from devoting time and energy to certain purposeful task like studying and discussing substantive topics with faculty and peers (Kuh, 2009).

Astin (1984) furthered the evolving concept of engagement through his theory of involvement, which focuses on the “amount of physical and psychological energy that the student devotes to the academic experience” (p. 297). In a study of college dropouts, Astin (1984) found that factors connected to students staying in college were consistent with involvement but those connected to dropping out were consistent with a lack of involvement. Astin’s oft-cited, longitudinal studies about student behavior have empirically linked participation in numerous meaningful college activities to learning and developmental outcomes (Kuh, 2009). Further, his widely-recognized I–E–O model has served as a conceptual guide for scores of researchers interested in examining the impact of student background characteristics and college experiences on various student outcomes. Astin (1993) described the I–E–O model by saying “the basic purpose of the model is to assess the impact of various environmental experiences by determining whether students grow or

change differently under varying environmental conditions” (p. 7). Inputs include characteristics students bring into higher education institutions, environment refers to all types of academic and social experiences students engage in during college, and outcomes include student characteristics after their collegiate exposure (Astin, 1993). The I–E–O model provides a framework for examining what experiences lead to desired student and institutional outcomes.

The work of Chickering and Gamson (1987) articulated seven principles for teaching and learning at the undergraduate level. They stated that:

good practice in education: 1) encourages contacts between students and faculty. 2) develops reciprocity and cooperation among students. 3) uses active learning techniques. 4) gives prompt feedback. 5) emphasizes time on task. 6) communicates high expectations. 7) respects diverse talents and ways of learning. (p. 2)

Their seven principles of good practice were drawn from the large body of educational research available at the time and provided an additional impetus for ongoing engagement research throughout the last two decades. Numerous researchers on college impact have gone on to identify “quality of teaching, specifically clear and well-organized teaching” and “influential interactions with other students” as two additional practices that are predictive of college student growth in and outside the classroom (Seifert, Pascarella, Goodman, Salisbury, & Blaich, 2010, p. 2).

In the 1990s, researchers began to focus on ways institutions could implement good practices to positively influence outcomes such as retention, student satisfaction, and graduation rates. This led to a need for an instrument that could successfully measure key elements of student engagement at individual institutions. The compiled research on student

engagement, together with emerging institutional pressures to influence student outcomes, led to the creation of the NSSE in 1999. The NSSE is now widely used in institutions across the country to measure student engagement, and its findings “can be used by faculty and staff to improve the undergraduate experience” (Kuh, 2009, p. 686). Items from the NSSE survey make up a significant part of the instrument used in the current study.

National Survey of Student Engagement (NSSE)

A group of scholars, with the support of the Pew Charitable Trusts, developed the NSSE in response to their “charge to develop a short survey instrument focused on the extent to which students engage in good educational practices” (Kuh, 2001, p. 12). The national administration of the survey resulted in the establishment of five main benchmarks of good practice: “level of academic challenge, active and collaborative learning, student interactions with faculty members, enriching educational experiences, and supportive campus environments” (Chickering & Gamson, 1987, p. 13). The benchmarks are based on 40 survey items and were purposely selected because they represent sound educational practices that all stakeholders can recognize. Institutions can use the benchmarks to compare their individual outcomes to national figures.

Another useful set of NSSE measures are the 12 scalelets developed by Gary Pike (2006). The scalelets are taken from 50 NSSE questions and closely parallel the five benchmarks, but they are made up of “a limited number of survey questions that are related to a specific aspect of students’ educational experiences” (Pike, 2006, p. 559). The 12 constructs represented by the scalelets disaggregate the five overarching constructs of the NSSE benchmarks, making the scalelets useful for individual institutions seeking to make improvements in targeted areas.

Self-Efficacy

When discussing college student learning, it is pertinent to consider the significant impact that belief in one's abilities has on learning outcomes. Albert Bandura's (1977) widely cited work on self-efficacy plays a meaningful role in this discussion. Bandura (1977) defined self-efficacy as "the conviction that one can successfully execute the behavior required to produce . . . outcomes" (p. 193). He explained that the strength of one's self-belief will affect one's ability to cope with challenging circumstances and will influence one's level of persistence toward tasks. Persistence is important because "strong perseverance usually pays off in performance accomplishments" (Bandura, 1989, p. 1176). Bandura (1977) wisely noted that persistence and expectations alone are not enough to ensure success; underlying capabilities must be present for one to achieve meaningful outcomes. However, "given appropriate skills . . . efficacy expectations are a major determinant of people's choice of activities, how much effort they will expend, and of how long they will sustain effort in dealing with stressful situations" (Bandura, 1977, p. 194). Self-efficacy can play a part in any type of performance, but it serves a particularly interesting role in academic settings.

Influence on Academic Achievement

High levels of self-efficacy will prompt individuals to set high goals for themselves. Furthermore, it has been found that "people who believe strongly in their problem-solving capabilities remain highly efficient in their analytic thinking in complex decision-making situations" (Bandura, 1989, p. 1176). Based on this understanding of self-efficacy and its impact on ability and performance, it is reasonable that the connection has been made between student levels of academic self-efficacy and the resulting impact on learning. In fact,

“numerous studies have shown that students with a high sense of academic efficacy display greater persistence, effort, and intrinsic interest in their academic learning and performance” (Zimmerman, Bandura, & Martinez-Pons, 1992, p. 664). In a study of 102 high school students in a social studies course, perceived academic self-efficacy was found to predict final grades in the course. When combining self-efficacy with the indirect influence that comes from the goals students set, the two items accounted for 31% of the variance in course grades (Zimmerman et al., 1992).

In a survey of 149 honors students at a public university in the Northeast, students were asked their perceptions about their ability, effort, and interest in 15 different skill areas. In each of the areas, a significant correlation was found between interest in the skill and students’ assessment of their abilities (Siegle et al., 2010). Those with perceived talent in the areas of dance, music, and leadership credited effort for their high levels of performance, while those with talent in math, writing, reasoning, verbal, and leadership skills associated their success with natural ability. This indicates that personal sense of ability is important to students of high academic performance (Siegle et al., 2010).

Measuring Academic Self-Efficacy

A study by Bresó, Schaufeli, and Salanova (2011) made the connection between self-efficacy and engagement, with the authors noting that “engagement is considered the increase in motivated behaviour which derives from high levels of self-efficacy” (p. 341). Their study included 71 students at a Spanish university who participated in workshops to learn techniques for coping with exam stress or were part of a control group. All students completed a questionnaire to gauge beliefs about their ability to achieve academically through a self-efficacy scale borrowed from Midgley et al. (2000). In addition, academic

burnout and engagement were measured and performance was determined by a ratio of exams taken to exams passed. Results showed that those who participated in the intervention had higher levels of self-efficacy, engagement, and performance (Breso et al., 2011). This indicates that it is possible to design interventions that help students improve their perceived self-efficacy, which in turn can influence engagement and performance.

The self-efficacy scale used by Bresó et al. (2011) came from the larger PALS developed by Carol Midgley and colleagues (1998) at the University of Michigan. PALS includes student scales that measure goal orientation, perceptions of teachers' goals and classroom goal structure, achievement-related beliefs, attitudes, strategies, and perceptions of parent and home life. A separate set of teacher scales is available to assess teachers' perceptions of goals and efficacy at teaching (Midgley et al., 2000). Using data from multiple applications of the scales in a variety of educational settings, Midgley et al. (1998) reported a confirmatory factor analysis and review of the scales that resulted in confidence in internal consistency and validity. The team has used PALS primarily at the K–12 educational level, but the study by Bresó et al. (2011) showed the self-efficacy scale to be useful in a university setting. Additionally, the *Manual for the Patterns of Adaptive Learning Scales* (Midgley et al., 2000) pointed out that the various scales can be used all together or separated out for individual use.

Beyond the Siegle et al. (2010) study, it appears that little research has been conducted to examine the role of academic self-efficacy in high-ability college students. Shushok's (2002) dissertation included mention of the concept of expectancy theory and its impact on honors student outcomes. The author was guided by the idea of the self-fulfilling prophecy, that "what one becomes is a result of what they were told (either intentionally or

unintentionally or by what is said or left unsaid)” (Shushok, 2002, p. 49). However, no quantitative measure was used by Shushok (2002) to capture the impact of the self-fulfilling prophecy. Given this gap in the literature, inclusion of the self-efficacy scale from PALS in the current study provided a meaningful examination of the role of academic self-efficacy in high-ability student outcomes.

Academic Achievement

Much research has been conducted to identify variables that predict academic success among college students (Harackiewicz, Barron, Tauer, & Elliot, 2002; Pascarella, Wolniak, Pierson, & Terenzini, 2003; Robbins et al., 2004). Given this study’s interest in determining the impact of honors involvement on academic achievement as measured by cumulative college GPA, several key findings are summarized here.

Prior Ability

Robbins et al. (2004) conducted a meta-analysis of 109 studies to determine the relationship between psychosocial and skill factors and college outcomes. In sum, they found prior academic achievement to be the strongest predictor of GPA, whereas academic self-efficacy was the best predictor for both GPA and retention. Another study, conducted by Kitsantas, Winsler, and Huie (2008), looked at the concepts of prior ability and self-regulation. They determined that “time management strategies during the first and second year and self-efficacy during the first year contributed unique variance in predicting academic performance over and above the contribution of prior ability measures (high school GPA and SAT)” (Kitsantas et al, 2008, p. 60).

Harackiewicz et al. (2002) concurred that student ability and prior academic success are often used as predictors of collegiate success but argued that the way in which students

are motivated could also be useful predictors. Another interesting element of motivation was presented by Husman and Lens (1999) in their work on intrinsic versus extrinsic goals and immediate versus future goals. They explained that total motivation is usually the combination of intrinsic and extrinsic factors and that often those goals are future oriented. Many students go to college not for the intrinsic value, but “because they realize that education is important for their professional future” (Husman & Lens, 1999, p. 114). It is possible for students to have an intrinsic desire to learn while also recognizing that learning will contribute to their long-term professional goals.

Parents’ Educational Attainment

A number of studies have evaluated the connection between parental influences and collegiate success. Factors such as parental aspirations for their children and parental level of educational attainment have been compared to student retention and success as measured by GPA. Research has shown that higher levels of educational attainment on the part of parents correlate with higher GPAs on the part of college students (Pascarella et al., 2003; Pritchard & Wilson, 2003; Yazedjian, Toews, & Navarro, 2009). Spera, Wentzel, and Matto (2008) pointed out that “parents with high education levels are more likely to have the educational experience and resources to draw upon when helping their children achieve a college- or graduate-level education” (p. 1141). Although the connection between parental attainment and student success has been established in the general literature, it has not been considered in past studies of honors student populations.

Critical Thinking

There can be little debate that a main goal of higher education is to help students develop the ability to think critically. Tsui (1999) wrote compellingly about the importance

of fostering critical thinking among students, not just for the health of the academy but also for democratic society as a whole. She articulated the issue by stating, “Fostering critical thinking is said to be essential to safeguarding a democratic society with an able thinking citizenry and ensuring a competent workforce in an increasingly complex world” (p. 185). It appears there is wide consensus among academics about the importance of educating students to be critical thinkers and the value found in imparting such skills and knowledge. In fact, 90% of faculty nationwide cited critical thinking as their most important educational aim (Bok, 2006). Bok (2006) underscored the importance of this finding by saying, “With all the controversy over the college curriculum, it is impressive to find faculty members agreeing almost unanimously that teaching students to think critically is the principal aim of undergraduate education” (p. 109). Given the widespread agreement in academia that critical thinking is an educational imperative, it is useful to examine how critical thinking is defined.

Definition

Much has been written about critical thinking in the educational literature, and a variety of definitions of critical thinking have been put forward (Ennis, 1993; Facione, 1990; Paul & Elder, 2009). As one writer noted, “Despite . . . numerous conceptual definitions of critical thinking, it is generally safe to think of it as a form of higher-order thinking, along with analytic reasoning and problem solving” (Chun, 2010, p. 23). Pascarella and Terenzini (1991) also considered the issue of definitions, stating that, although it has been defined by various authors in a number of ways, critical thinking

typically involves the individual’s ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data

provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority. (p. 118)

Although such overarching concepts of critical thinking are useful, there is a need for educators to have a clear, shared understanding of critical thinking, including the skills and teaching tools that characterize it.

To that end, a panel was brought together by the American Philosophical Association in 1988 to achieve consensus on issues of critical thinking by using the Delphi Method (Facione, 1990). A group of 46 experts in the field was tasked with answering a series of questions, analyzing the shared responses of others, adjusting their thinking, and reaching consensus on key critical thinking skills and instructional and assessment techniques. The group spent a year and a half conducting six rounds of in-depth, systematic review (Facione, 1990). The resulting consensus statement said, in part:

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. (Facione, 1990, p. 2)

Bok (2006) commented on the precise nature of this definition, though he also conceded that there is no universally accepted definition of critical thinking. He noted that “authors often use the term more loosely . . . to refer to analytical thinking, problem solving, reflective judgment, applied logic, or practical reasoning” (p. 109).

Although coming to a consensus about the definition of critical thinking was important, the American Philosophical Association's panel of experts recognized the need to go further in their consensus building to identify central or core critical thinking skills. Not every person must be proficient in every area in order to think critically, but the group identified the cognitive skills of analysis, evaluation, inference, interpretation, explanation, and self-regulation as key abilities (Facione, 1990). Beyond these important cognitive skills, the experts agreed that certain affective qualities play a role in good critical thinking. These include characteristics such as inquisitiveness, open-mindedness, honesty in facing biases, flexibility, fair-mindedness, and diligence (Facione, 1990). It should be noted that the experts understood that many of these affective traits develop as individuals mature, so students would benefit from instructional techniques that address both the cognitive and affective elements of critical thinking.

Measuring Critical Thinking

After coming to a shared understanding of what critical thinking is, the next essential step is to examine student proficiency at putting critical thinking skills to use. There are a number of meaningful reasons to assess critical thinking. Among them are the values of diagnosing student abilities, giving them feedback and providing motivation for improvement, and helping teachers determine effective methods of instruction for critical thinking skills (Ennis, 1993). Unfortunately, numerous challenges arise in the attempt to measure gains. Ennis (1993) elucidated eight traps that educators can fall into, including administering pre- and posttests without comparing results to a control group, using multiple choice tests that are not comprehensive, and expecting meaningful changes too quickly.

A significant challenge is in designing assessments that differentiate critical thinking abilities from “domain-specific knowledge or other academic abilities (such as reading or writing)” (Facione, 1990, p. 16). Although some published tests are available, they often consist of multiple choice options, which concerns some experts. Instead, Chun (2010) described the Collegiate Learning Assessment, which utilizes performance tasks in which “separate cohorts of freshmen/first-year students and seniors complete these tasks; their open-ended responses are scored, and the change (or value added) is calculated, taking in account the students’ initial ability” (p. 23). Meanwhile, Ennis (1993) suggested that instructors could be better served by making their own tests with open-ended responses, multiple choice questions with the inclusion of student justification of their answers, essays, or performance assessment, which makes use of direct observation.

Although Chun (2010) and Ennis (1993) provided examples of direct measures, examples in the literature of using self-reported growth in critical thinking provided a basis for the use of self-reported measures in the current study. A Cooperative Institutional Research Program survey used in a study by Tsui (1999) asked students to judge their growth in the ability to think critically. The author explained the use of the self-reported growth in critical thinking by saying:

This study operates with the assumption that there is a generally shared recognition of what the term “ability to think critically” embodies when used in common parlance. Such a sentiment is evidently shared by those researchers who have employed a self-report measure for critical thinking on questionnaire surveys that have been extensively administered to college students (the 1974 survey by Pace involved over 150 institutions and the 1990 survey by Astin involved over 300 institutions). Further

credence for the use of this measure comes from some correlates of self-reported growth in critical thinking found within the CIRP data set. (Tsui, 1999, p. 190)

Similarly, Ewell and Jones (1993) explained that “self-reports of college graduates regarding their own abilities and current behaviors can be collected as indicative of actual underlying student abilities” (p. 129). They specifically cited the use of self-reports in the context of measuring critical thinking, noting the key items of students’ time allocation, their self-reported gains in certain areas, and their reactions to level of academic challenge or interest. Given this analysis of the literature, the Survey of Academic Engagement and Efficacy used in the current study asked a number of questions related to students’ self-reported use of skills commonly associated with critical thinking. The individual variables related to critical thinking skills were examined through exploratory factor analysis and used to create a composite dependent variable to represent the construct of student use of critical thinking skills.

Major Influences on Critical Thinking

Researchers have attempted to identify major predictors of critical thinking, with most attention placed on a few main categories of influence including types of courses, instructional techniques and in-class experiences, and student out-of-class behaviors (Astin, 1993; Terenzini, Springer, Pascarella, & Nora, 1995; Tsui, 1999). When focusing particularly on the types of courses students engage in, Tsui (1999) noted that “courses or programs devised to improve critical thinking have for the most part failed to demonstrate positive results,” whereas “evidence from past research suggests that courses with an interdisciplinary approach are conducive to the development of critical thinking” (p. 186). Rather than examine courses specifically designed to teach critical thinking, Tsui’s (1999)

study investigated “ordinary class experiences” and “familiar instructional techniques” (p. 188). The hope was that such a focus would provide information useful to a wide range of educators in most classroom settings. And rather than narrow the study to either course or instructional type, Tsui (1999) included 11 categories of courses and 6 categories of instructional techniques to gain further understanding about how the two interact.

A large dataset, with a sample of almost 25,000 students, from a Cooperative Institutional Research Program survey was used. The study’s dependent variable was derived from a survey item in which students self-reported their growth in the “ability to think critically” since entering college (Tsui, 1999, p. 190). Variables were entered into a regression in two blocks with 11 types of courses entered first. Nine of the course types, including writing courses, interdisciplinary courses, and honors programs, were found to have significant, positive effects. Next, the six instructional variables were entered and all were found to have significant effects. Having papers critiqued by an instructor and working on an independent research project had the largest positive effects, whereas taking a multiple choice test exerted a negative effect on self-reported growth in critical thinking (Tsui, 1999). Findings indicated that instructional techniques with significant positive effects on critical thinking, including group projects, essay exams, and class presentations, required the construction of thoughts and answers rather than simply recognizing or selecting correct answers.

The author commented that “the change in size of the betas of the course variables from step one to step two reveals that certain courses facilitate self-reported growth in critical thinking because of their affiliation with certain instructional techniques” (Tsui, 1999, p. 194). The decline in effect size for honors programs and other significant course variables

after including instructional variables indicated that the influence honors programs have on critical thinking is at least partially connected to the significant instructional techniques identified. Further, a slightly greater effect size was present for instruction type rather than course type, causing Tsui (1999) to suggest further research in this area, given that growth in critical thinking may not be “bound by the type of courses in which one enrolls but rather is more greatly affected by the mode of instruction that one encounters in his or her courses” (p. 196). This study’s findings of significant instructional techniques provide further justification for the emphasis on such techniques in most honors programs.

Terenzini et al. (1995) studied the influence of three elements of the student experience on critical thinking: course type, instructional type, and student out-of-class experiences. In keeping with college impact studies, they controlled for precollege characteristics that might affect growth in critical thinking. Data were collected from 210 students at one midwestern university using the Collegiate Assessment of Academic Proficiency (CAAP) as well as a follow-up survey at the end of the year in the form of the CSEQ. The dependent variable, critical thinking skills, was derived from the CAAP critical thinking module. Independent variables related to courses, instructional experiences, and out-of-class experiences were taken from the CSEQ.

The study found that “course-related and out-of-class experiences both made unique and statistically significant (if modest) contributions to the variance explained above and beyond that attributable to students’ precollege characteristics or other college experiences and regardless of whether initial critical thinking ability” was included (Terenzini et al., 1995, p. 32). Additionally, variables found to positively relate to gains in critical thinking were “parents’ education, the number of hours students spent studying, and the number of

nonassigned books they read during the year” (p. 34). A key limitation noted by the authors was examination of change over only one year. Other authors have noted concern that one academic semester or year may be too short a time frame to measure change in critical thinking (Astin, 1993; Tsui, 1999).

Interestingly, the way students characterized their out-of-class relationships with peers was significantly related to change in critical thinking. Those with positive, noncompetitive associations were negatively correlated with gains in critical thinking, whereas those with competitive or noninvolved peer relationships were more likely to show gains in critical thinking (Terenzini et al., 1995). Although the authors did not have a full explanation for these findings, it points to the complexity present in a college student’s experience and the multitude of factors that influence student learning. Terenzini et al. (1995) made such a point in their conclusion by stating:

These findings suggest that future research on college impacts will have to be more comprehensive in both conception and design. Failure to take into account the multiple sources of influence that span the entire college experience is likely to result in incomplete representations of the college experience, misunderstanding of the web-like character of college’s effects on students, and the underestimation of the magnitudes of those effects. (p. 36)

The attention honors programs place on both the academic and psychosocial components of the student experience is in keeping with the authors’ articulation of the complex nature of student learning.

Summary

This chapter provided a thorough review of the literature related to honors programs, their common characteristics, and the empirical research that has been conducted on honors involvement. It also included a discussion of key variables of interest in this study including student engagement, academic efficacy, academic achievement, and critical thinking. The next chapter presents a complete discussion of the methodological orientation of the study including sampling procedures, instrumentation, and statistical analyses.

CHAPTER 3. METHODOLOGY

Overview

The purpose of this study was to (a) examine high-ability students in and outside an honors program at a midwestern comprehensive university to determine differences in background and demographic characteristics between participants and nonparticipants of similar ability; (b) determine differences in self-efficacy and in- and out-of-class engagement between participants and nonparticipants of similar ability; and (c) examine major influences on GPA, critical thinking skills, academic efficacy, and academic goals. This chapter summarizes the methodological approach that was used in the study including research questions, population, instrumentation, data collection, study variables, and methods of data analysis.

Research Questions

This study sought to answer the following research questions:

1. What are the background and demographic characteristics of the students who participated in the study?
2. Are there statistically significant differences in gender, race/ethnicity, cumulative high school GPA, composite ACT score, average level of parental education, college classification year, transfer credit hours, and cumulative college GPA between honors participants and nonparticipants of similar ability?
3. Are there statistically significant differences in reported levels of academic self-efficacy and in- and out-of-class engagement (as measured by active and collaborative learning, critical thinking skills, diverse perspectives, reflective

learning, student and faculty interaction, and student relationships) between honors participants and nonparticipants of similar ability?

4. What background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors predict academic achievement as measured by cumulative college GPA?
5. What background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors predict the degree to which students report employing critical thinking skills?
6. What background characteristics and college experiences influence students' academic efficacy?
7. What background characteristics and college experiences influence students' academic goals?
8. How do high-ability students characterize their involvement in, or their decision not to participate in, a collegiate honors program?

Research Design

This study employed a quantitative research methodology using a post-positivist approach whereby researchers “hold a deterministic philosophy in which causes probably determine effect or outcomes” (Creswell, 2009, p. 7). Rather than selecting study participants randomly, a convenience sample was used to maximize the number of possible participants who met the academic standards for invitation to the institution's honors program.

Survey research was an appropriate design for this study because it “provides a quantitative or numeric description of trends, attitudes, or opinions of a population by

studying a sample of that population. From sample results, the research generalizes or makes claims about the population” (Creswell, 2009, p. 145). This study made use of a self-administered online questionnaire. This method was useful due to the ease of distribution, reasonable time to completion, and low costs associated with online surveys (Umbach, 2004). The technology-savvy nature of college students made it a good population for which to use a web-based survey.

The self-administered online questionnaire used items from the NSSE and the PALS to measure the impact of honors participation on student response to items regarding engagement and academic efficacy. Linked institutional data provided student classification, gender, high school GPA, cumulative ACT score, transfer credits, college GPA, and ethnic code. The survey was cross-sectional with data collection taking place at one point in time rather than longitudinally (Creswell, 2009). The survey data from high-ability students in this particular study will inform the broader body of educators who work with gifted students.

Setting

This study was conducted at a comprehensive, regional institution located in the Midwest region of the United States. The institution enrolls around 13,000 undergraduate and graduate students. The majority of the student body is made up of traditional-age college students, with approximately 90% coming from the state in which the university is located. The student body is predominantly White, with a multicultural student enrollment of approximately 7%. At the time of the survey, students could choose from 120 majors and 300 student organizations. Because of the high proportion of students living on and around campus, considerable attention is placed on co-curricular and extracurricular involvement on

the part of students. Although the institution offers a number of high-quality graduate programs, the primary institutional focus is to provide a high-quality undergraduate experience for students of the region.

The midwestern institution featured in the study has made a university-wide honors program available to its high-ability students for 10 years. The program enrolls approximately 5% of the institution's undergraduate student body. It offers specialized sections of the university's general education courses as well as independent study options and upper-level honors seminars. In order to graduate with a designation from the honors program, seniors must complete a three credit-hour undergraduate honors thesis. The program provides a housing option in one of the institution's residence halls and various out-of-class educational and social opportunities. The program also administers a select number of merit-based scholarships, which require recipients to be active participants in honors courses to maintain and renew their awards.

Population

The study population was made up of the high-ability students invited to participate in the institution's honors program upon their admission to the university in the 5-year period from 2007–2011. This invitation was automatically extended to students with a cumulative ACT score of 27 or better and high school class rank in the top 10% of their graduating classes. Beginning in 2009, an admission index was instituted by the institution's governing board (Appendix A). An index score of 330 was added as a second criterion for invitation to participate, so students from 2009–2011 with either a cumulative ACT score of 27 or better and a top 10% high school class rank *or* an admissions index of 330 or better were invited.

Rather than sample from this population, all students invited to participate in the honors program from 2007–2011 and who were still enrolled in the institution at the time of survey administration were included in the study population. This group of students was identified by reports from the institution’s Office of Admissions. Table 3.1 provides the number of invited students still currently enrolled in the institution from each year of the study’s time span.

Table 3.1

Currently Enrolled Students Invited to Participate in Honors Program from 2007–2011

Year	Number of students
2007	52
2008	156
2009	208
2010	181
2011	211
Total	808

During analysis, the population was divided into two subgroups: those who did not respond to the honors invitation and those who accepted the invitation to participate and became members of the honors program. This provided two groups with comparable entering academic abilities, a control group and an experimental group, which allowed for a meaningful examination of the impact of honors involvement on student outcomes.

Instrumentation

The primary data for the study was information obtained from the Survey of Academic Engagement and Efficacy (Appendix B). The survey was compiled by the principal investigator and was composed of selected items from the National Survey of

Student Engagement and the Patterns of Adaptive Learning Scales; items developed by the researcher; and linked institutional data to provide student classification, gender, number of transfer hours, college GPA, and ethnic code. The instrument consisted predominantly of questions with Likert-scale responses such as *very often to never*; *very much to very little*; *not at all true to very true*. See Appendix B for a complete version of the survey instrument.

National Survey of Student Engagement (NSSE) items made up a significant portion of the survey instrument. Permission for item usage was granted by the Indiana University Center for Postsecondary Research. NSSE was developed at Indiana University and “assesses the extent to which students at hundreds of four-year colleges and universities are participating in education practices that are strongly associated with high levels of learning and personal development” (Kuh, 2001, p. 12). The instrument relies on students to self-report their behaviors. In order to encourage the validity of self-reported information, considerable attention was given in NSSE’s design to provide questions with clear wording about activities and involvement with which students have personal experience (Kuh, 2001). When evaluating the national use of the NSSE instrument, “psychometric analyses produce acceptable levels of reliability and demonstrate reasonable response distributions for most items” (Kuh, 2001, p. 13). NSSE items selected for use in the Survey of Academic Engagement and Efficacy focused on in- and out-of-class engagement behaviors such as how often students ask questions in class, work with other students on class projects, and engage in particular types of active learning behaviors.

Patterns of Adaptive Learning Scales (PALS) was developed at the University of Michigan by Carol Midgley and colleagues “to examine the relation between the learning environment and students’ motivation, affect, and behavior” (Midgley et al., 2000, p. 2).

Permission for use of scale items was granted by Michael Middleton of the PALS research team. Midgley et al. (1998) studied the reliability and validity of the scales after their use in multiple studies:

The review of findings from our studies and others, combined with the results of the confirmatory factor analysis conducted in the present study, indicate that the scales demonstrate concurrent, construct, and discriminant validity. In addition, the scales have been found to be reasonably stable over time, and to have good internal consistency. As the results of the confirmatory factor analysis demonstrated, the scales appear to operate similarly with students of different genders and ethnicities.

(p. 126)

PALS has been used primarily in the K–12 setting but also has been used in limited application in higher education (Breso et al., 2011). Questions were slightly rephrased for the purposes of the Survey of Academic Engagement and Efficacy to reflect their use in the collegiate environment. Items selected focus on academic efficacy and mastery goal orientation by having students respond to phrases such as “I’m certain I can figure out how to do the most difficult course work” and “One of my goals in college is to learn as much as I can.”

Selected items from NSSE and PALS were combined to create a new, adapted instrument for use in this study, the Survey of Academic Engagement and Efficacy, which was organized into four main sections: (a) academic engagement and learning activities, (b) academic efficacy and goals, (c) enriched learning and quality of relationships, and (d) satisfaction and demographics. Following is a description of each section.

Academic Engagement and Learning Activities

The first section of the survey contained questions related to how often students have engaged in certain academic behaviors such as asking questions, making presentations, or talking with a faculty member about grades. This set of 22 questions measured responses with a Likert-type scale with possible responses of *very often*, *often*, *sometimes*, and *never*. The first section also contained questions about the frequency with which courses required particular learning strategies, reading and writing assignments, and the overall level of challenge in their courses. Responses were given on Likert-type scales with possible responses of *very much*, *quite a bit*, *some*, and *very little* for learning strategies; *None*, *1–4*, *5–10*, *11–20*, and *more than 20* for the reading and writing frequency questions; and a continuum ranging from 1 (*very little*) to 7 (*very much*) for the challenge question.

Academic Efficacy and Goals

The second section of the survey consisted of statements related to students' academic efficacy and mastery goal orientation such as “It’s important to me that I thoroughly understand my class work” and “Even if the work is hard, I can learn it.” A five-point Likert-type scale, with possible responses on a continuum ranging from *not at all true* to *very true*, was used to determine the extent to which students believed the statements to be true.

Enriched Learning and Quality of Relationships

This section of the survey returned to NSSE items related to out-of-class and enriched learning behaviors as well as the quality of relationships with faculty, staff, and other students. Likert-type scales again were used in this section with prompts such as *very often*, *often*, *sometimes*, and *never* for the out-of-class behaviors; *done*, *plan to do*, *do not plan to*

do, and *have not decided* for the enriched learning behaviors; and continuums ranging from 1 (*unfriendly, unsupportive, sense of alienation*) to 7 (*friendly, supportive, sense of belonging*) for the quality of relationship questions.

This section also asked students to estimate the time they spend in curricular and co-curricular learning using an eight-point scale ranging from *0 hours* to *more than 30 hours*. The section concluded with a series of questions related to the extent to which the students' experiences have contributed to knowledge, skills, and personal development in nine areas. A Likert-type scale with responses including *very much*, *quite a bit*, *some*, and *very little* was used for this final set of questions in section three.

Satisfaction and Demographics

The final section contained a number of questions related to student satisfaction with advising and their experience at the institution as a whole using a Likert-type scale with possible responses of *excellent*, *good*, *fair*, and *poor*. It also included some demographic questions including whether the student started college at this institution or elsewhere and his or her parents' level of academic attainment. The survey concluded with questions related to honors program knowledge and involvement. The complete survey can be found in Appendix B.

Data Collection

Permission was received from the study institution to distribute the Survey of Academic Engagement and Efficacy through the university's student web portal. This allowed for linking of institutional data for student classification, gender, high school GPA, cumulative ACT score, transfer credits, college GPA, and ethnic code. The primary

investigator entered the survey questions and formatted the instrument using the institution's online survey software.

Students were contacted by e-mail to notify them that they were identified as part of a select group of high-ability students and their help was needed for a research study. The e-mail contained complete instructions for accessing the online survey including a link to the web portal. Students logged in to the system using their previously assigned institutional login and password. Data were stored on a secure server. Two reminder e-mails were sent to encourage completion and improve response rate. These procedures were used because multiple contacts about a survey, perception of scarce opportunity to be involved, and requests for help have been found to increase survey response rates (Porter, 2004). The following timeline was used for survey distribution:

- November 1, 2011 E-mail with instructions and link to web-based survey
- November 9, 2011 Reminder e-mail #1
- November 15, 2011 Reminder e-mail #2
- November 18, 2011 Survey closed

The timing of emails and reminders was purposeful. Crawford, Couper, and Lamias (2001, cited in Umbach, 2004) conducted a study in which they found that "if people are going to complete a Web survey, they are going to do so in the first few hours or days" (Umbach, 2004, p. 31). Reminder e-mails were scheduled periodically in order to increase total response rate. At the conclusion of the survey period, 404 surveys were completed for a 50% response rate. Data were downloaded from the web server to an Excel file for cleaning prior to their entry into SPSS for data analysis. A coding manual was developed to associate

variable names and the numerical coding used for analysis. Open-ended responses were saved in a separate Excel file.

Variables in the Study

Independent Variables

The independent variables in this study were organized into two groups: background characteristics and college experiences. Background characteristics included the individual variables of students' race/ethnicity, gender, parental educational attainment, and number of credit hours they transferred into the institution. College experiences included the individual variables of honors program involvement and classification year as well as composite variables for academic challenge, active and collaborative learning, enriching experiences, student and faculty interaction, development of communication skills, diverse perspectives, and academic efficacy.

The individual variables were measured through institutional data or, in the case of parental educational attainment, by self-reported information provided in the survey. The composite variables were measured by student responses to various items from the survey. See Table 3.2 for a complete list of survey items related to each independent variable. Exploratory factor analyses were conducted to identify constructs resulting in composite variables.

Dependent Variables

Four outcome variables were selected for this study. The first was college GPA. This dependent variable was provided through institutional data for each student who completed the online survey. Both institutional and cumulative GPAs were available, but the cumulative average was the figure used to answer research question 4 regarding the influence

Table 3.2

Independent Variables and Data Sources

Group/variables	Data source	Coding/scale
Academic effort	Q1c,d,f,i,r,t	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
	Q3a-e	5 point scale: 1 = None; 2 = 1-4; 3 = 5-10; 4 = 11-20; 5 = More than 20
	Q4	7 point scale: 1 = very little to 7 = very much
	Q9a	8 point scale: 1 = 0; 2 = 1-5; 3 = 6-10; 4 = 11-15; 5 = 16-20; 6 = 21-25; 7 = 26-30; 8 = More than 30
Active and collaborative learning	Q1a,b,g,h,j,k	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
Enriching educational experiences	Q11	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
	Q6a	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
	Q7a-g	3 point scale: 1 = Done; 2 = Plan to do; 3 = Do not plan to do
	Q9b	8 point scale: 1 = 0; 2 = 1-5; 3 = 6-10; 4 = 11-15; 5 = 16-20; 6 = 21-25; 7 = 26-30; 8 = More than 30
Student-faculty interaction	Q1m,n,o,p,q,s	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
	Q8a-c	7 point scale: 1 = Unfriendly, unsupportive, sense of alienation to 7 = Friendly, supportive, sense of belonging
Communication skills	Q10b,c	4 point scale: 1 = Very much; 2 = Quite a bit; 3 = Some; 4 = Very little
Diverse perspectives	Q1e,u,v	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
	Q10h	4 point scale: 1 = Very much; 2 = Quite a bit; 3 = Some; 4 = Very little
Academic efficacy; academic goals	Q5a-j	5 point scale: 1 = Not at all true; 3 = Somewhat true; 5 = Very true

of background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors on academic achievement.

The second dependent variable was use of critical thinking skills. This composite variable was measured by student responses to various items from questions that asked the extent to which experiences at the institution contributed to knowledge, skills, and personal development in various areas related to critical thinking. An exploratory factor analysis was conducted as a data reduction technique in order to determine whether a critical thinking skills construct was present. The resulting construct was used as the dependent variable rather than trying to select a single variable to adequately represent the complex concept of critical thinking. The composite variable was used to answer research question 5 regarding the influence of background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors on students' reported use of critical thinking skills.

The third and fourth dependent variables were academic efficacy and academic goals. These composite variables were measured by student responses to the PALS items included in the Survey of Academic Engagement and Efficacy, which included statements related to students' academic efficacy and mastery goal orientation such as, "It's important to me that I thoroughly understand my class work" and "Even if the work is hard, I can learn it." As with the critical thinking variable, exploratory factor analysis resulted in academic efficacy and academic goals constructs that were used to answer research question 6. Table 3.3 provides a complete list of data sources related to each dependent variable.

Table 3.3

Dependent Variables and Data Sources

Group/variables	Data source	Coding/scale
Cumulative GPA	Institutional data	Continuous scale
Critical thinking skills	Q2a-e	4 point scale: 1 = Very much; 2 = Quite a bit; 3 = Some; 4 = Very little
	Q6b-d	4 point scale: 1 = Very often; 2 = Often; 3 = Sometimes; 4 = Never
	Q10d-g,i	4 point scale: 1 = Very much; 2 = Quite a bit; 3 = Some; 4 = Very little
Academic efficacy	Q5a-j	5 point scale: 1 = Not at all true; 3 = Somewhat true; 5 = Very true
Academic goals		

Data Analysis

Data were analyzed using SPSS, specifically the PASW Statistics 18 version.

Descriptive, comparative, and inferential statistics were used to answer the study's main research questions. Qualitative responses to the survey's open-ended questions were coded and analyzed to identify key themes that emerged from student responses.

Descriptive Statistics

Research question 1 sought to identify the background and demographic characteristics of the students who participated in the study. Descriptive statistics, including frequencies and cross tabulations, were utilized to describe demographic characteristics such as gender, race/ethnicity, classification, mean GPA, transfer credit hours, and average level of parental education for both honors and nonhonors students.

Comparative Statistics

The second research question asked if there are statistically significant differences between honors participants and nonparticipants regarding gender, race/ethnicity, cumulative high school GPA, composite ACT score, average level of parental education, college

classification year, transfer credit hours, and cumulative college GPA. Independent samples *t* tests “compare means of two independent samples on a given variable” (Urdu, 2010, p. 93). In this case *t* tests were used to determine statistically significant differences between honors and nonhonors students on background and demographic characteristics. Independent samples *t* tests also were used to answer research question 3 regarding statistically significant differences in academic engagement and academic efficacy between honors and nonhonors students.

Exploratory Factor Analysis

Exploratory factor analyses were conducted to determine if there were intercorrelations between variables in the data set related to academic engagement (as measured by active and collaborative learning, critical thinking skills, diverse perspectives, reflective learning, student and faculty interaction, and student relationships) and academic efficacy and goals. Exploratory factor analysis examines multiple variables and identifies those that are strongly correlated to each other (Urdu, 2010). Resulting constructs were used to create composite variables for the independent samples *t* tests that investigated research question 3. Further, the meaningful factors that emerged allowed for the inclusion of composite variables in the regression analyses used to answer research questions 4, 5, 6, and 7.

Exploratory factor analysis with varimax rotation was performed. Varimax rotation is an orthogonal rotation that attempts to “maximize the variance of factor loadings by making high loadings higher and low ones lower for each factor” (Tabachnick & Fidell, 2007, p. 620). Multicollinearity, variables that are too highly correlated, was ruled out in each correlation matrix. KMO measure of sampling adequacy and Bartlett’s test of sphericity

were used. Components with eigenvalues greater than 1.0 were extracted, and items with a factor loading of .6 or higher were maintained (Tabachnick & Fidell, 2007). Reliability coefficients were calculated for any resulting factors; Cronbach's alpha of 0.7 or higher "is considered acceptably reliable" (Urdan, 2010, p. 178).

Inferential Statistics

Hierarchical multiple regression was used to answer research questions 4, 5, 6, and 7 regarding the influence of background characteristics and college experiences on cumulative college GPA, use of critical thinking skills, and students' academic efficacy and academic goals. Regression is a technique for examining "the nature and strength of the relations between variables, the relative predictive power of several independent variables on a dependent variable, and the unique contribution of one or more independent variables when controlling for one or more covariates" (Urdan, 2010, p. 145). In the case of this study, the variables were entered in a hierarchical form, also referred to as sequential regression. This technique allows for entry of independent variables into the model in a temporal manner. As with factor analysis, correlation values were evaluated for multicollinearity. Considerations were made for adequate sample size, using the equation $N \geq 50 + 8m$ (where m is the number of IVs; Tabachnick & Fidell, 2007, p. 123).

The useful conceptual framework of Astin's (1993) I-E-O model was used as the basis for the study's regression models. Figure 3.1 provides the conceptual model for research questions 4 and 5. Four blocks of variables were entered including background characteristics, high school characteristics, college motivation, and college experiences. Figures 3.2 and 3.3 each show the conceptual models as slightly adjusted to represent the regressions used in research questions 6 and 7. Although the same four blocks of variables

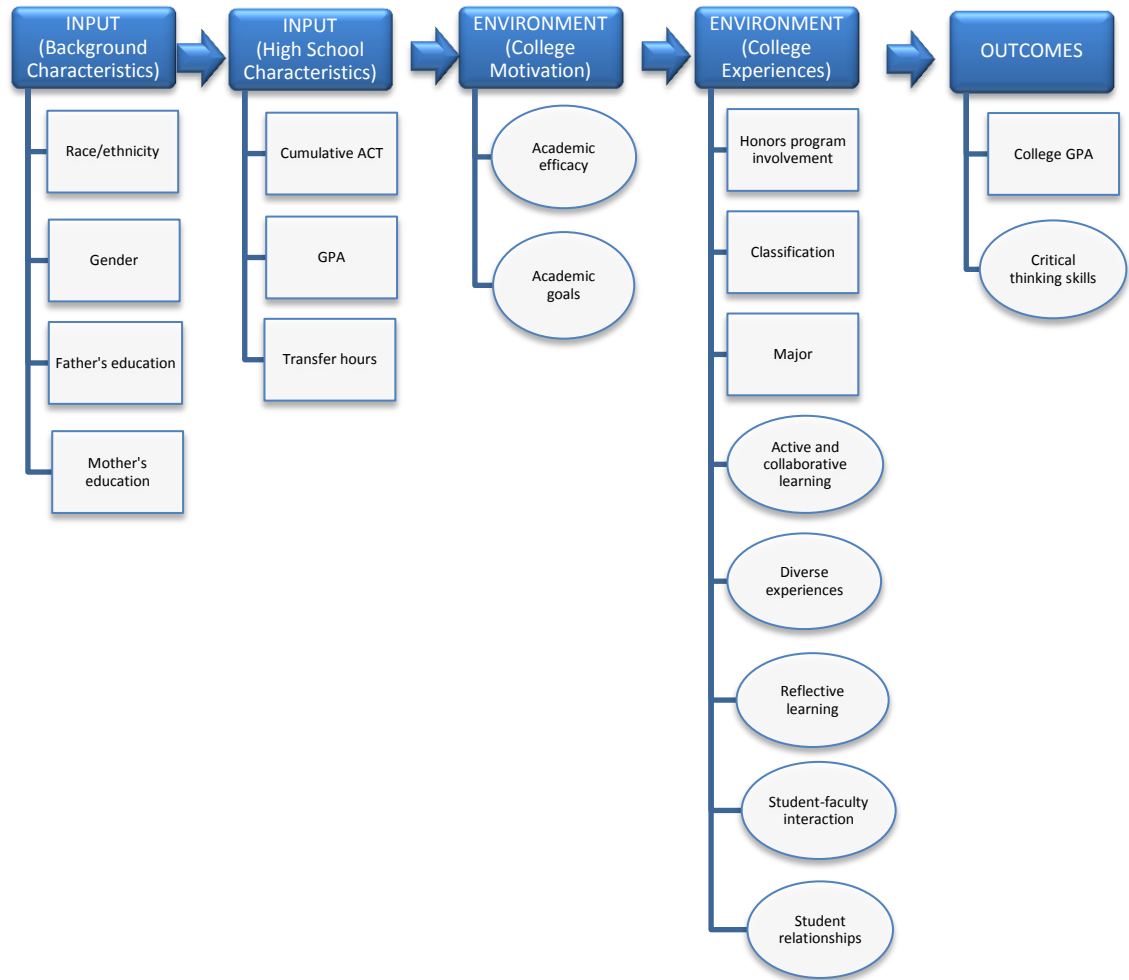


Figure 3.1. Conceptual model for GPA and critical thinking skills of honors and nonhonors students using Astin's (1993) I-E-O model.

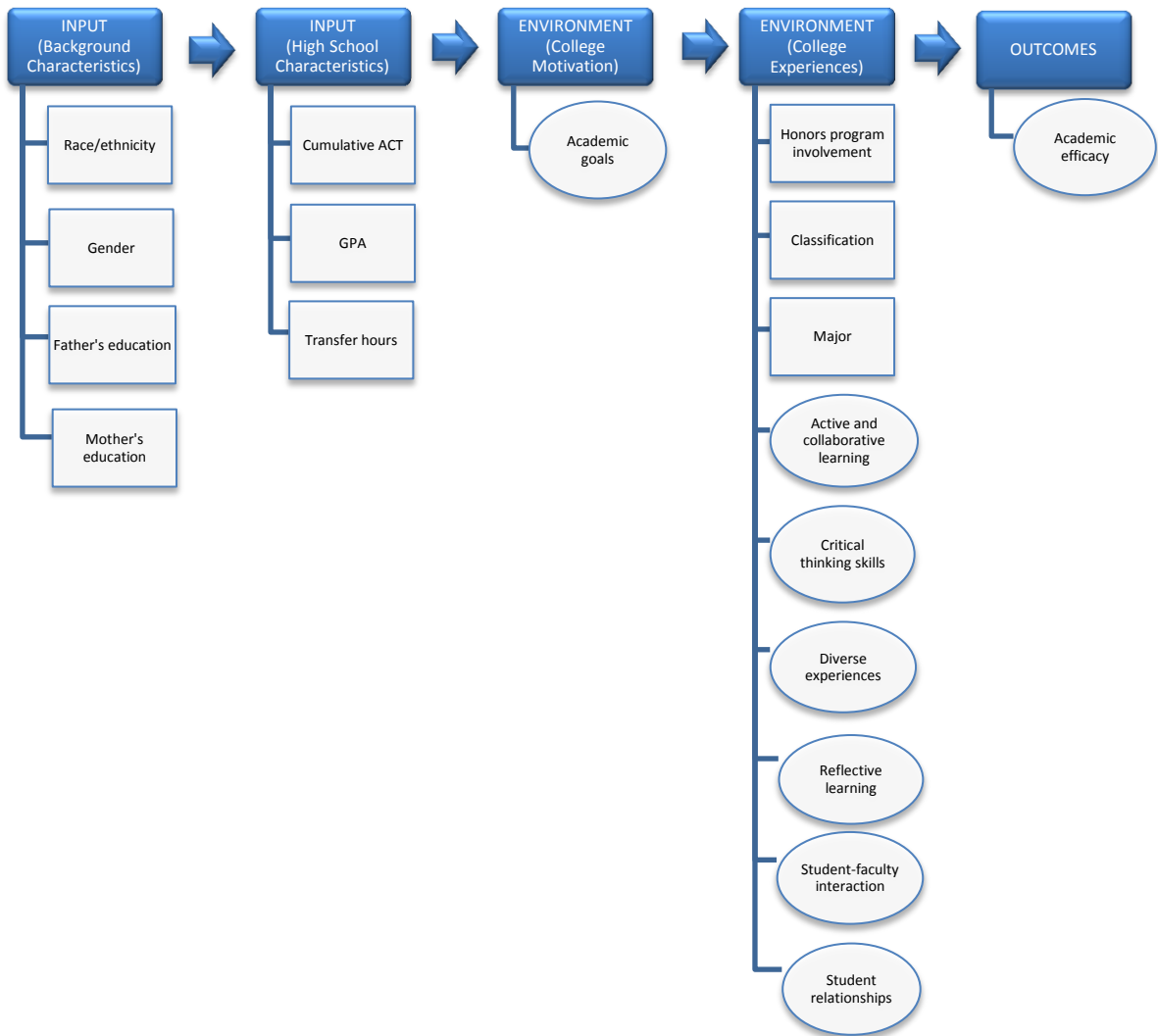


Figure 3.2. Conceptual model for academic efficacy of honors and nonhonors students using Astin's (1993) I-E-O model.

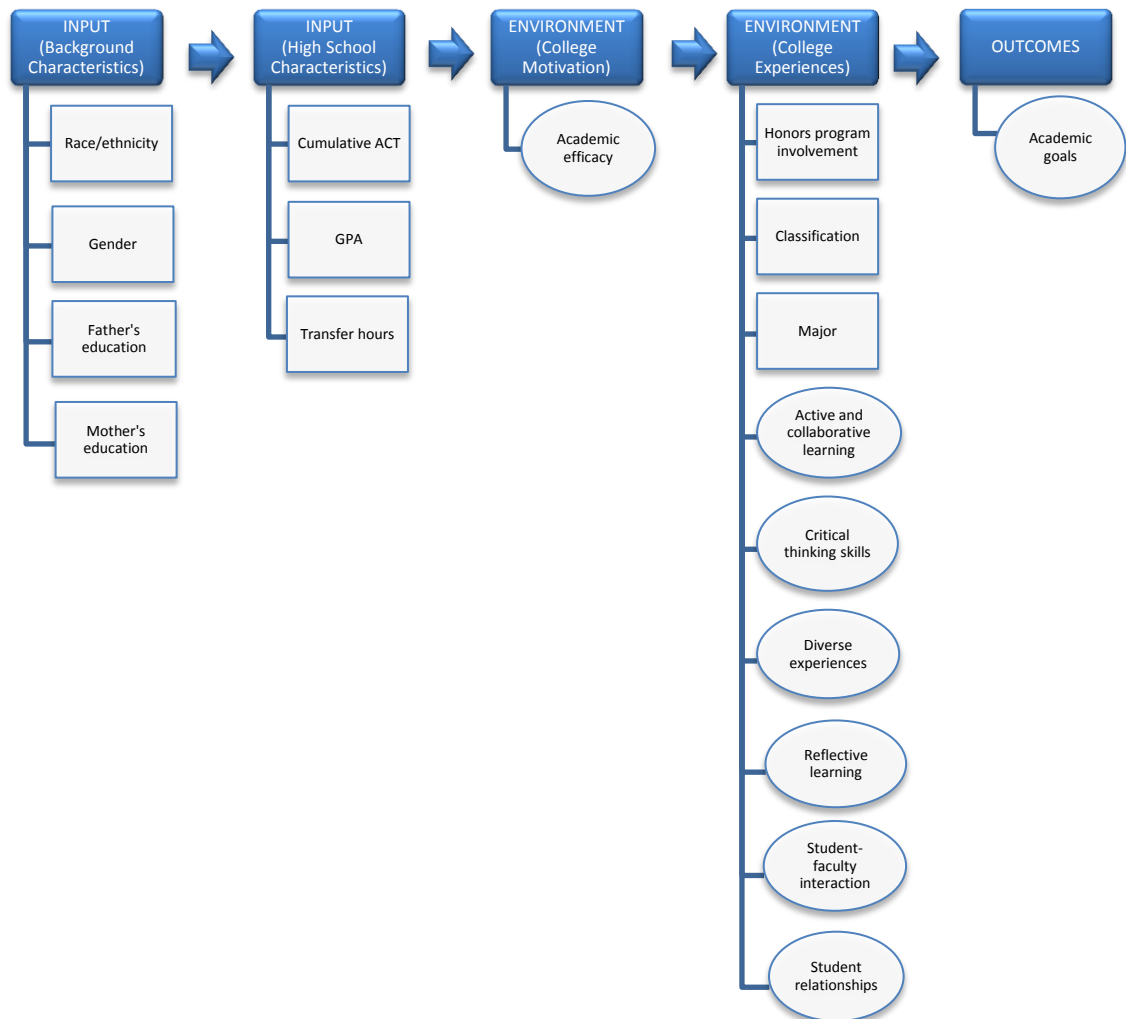


Figure 3.3. Conceptual model for academic goals of honors and nonhonors students using Astin's (1993) I-E-O model.

were entered as in the model in Figure 3.1, the college motivation block was amended to include only academic efficacy or academic goals as appropriate for the resulting dependent variable.

Qualitative Responses

Qualitative data analysis was conducted through open coding of all of the responses to two open-ended questions to identify important concepts shared by survey respondents. Focused coding used the themes that came from open coding (Esterberg, 2002). Several themes emerged in response to research question 8, “How do high-ability students characterize their involvement in, or their decision not to participate in, a collegiate honors program?” Those main themes will be explored in the following chapter.

Ethical Considerations

Studies of this type must be conducted in compliance with Institutional Review Board policies (Creswell, 2009). An application to conduct research involving human participants was approved by the Iowa State University Institutional Review Board on August 19, 2011 (Appendix C). The protocol and IRB approval was forwarded to the study institution, where it was determined that Iowa State University’s approval was sufficient and repeating the review at the participating institution was not necessary.

Limitations

Some limitations were inherent in the design of this study. Data were gathered from one midwestern institution in which the student body is rather homogenous. Respondents to the survey were predominately White, and the ratio of female to male participants was 3:1. Demographic characteristics of non-respondents were not available so possible non-response bias was not addressed.

The survey research approach used in this study presented a couple of restrictions. It was not possible for the survey instrument to include variables related to all aspects of the in- and out-of-class college student experience. Although institutional data were used in the reporting of items such as grades, majors, and standardized test scores, students self-reported a great deal of information collected in the survey. Parents' education levels and in- and out-of-class behaviors were all self-reported. Students could choose not to answer some questions, or responses could reflect individual biases or inaccurate personal reflections.

Delimitations

This study was delimited to the high-ability students who qualified for invitation to participate in an honors program at one midwestern university. An additional delimitation was that the survey was distributed only to students admitted to the institution directly out of high school. Participants were limited to those admitted in the 5-year period from 2007 to 2011 and still enrolled in the institution at the time the survey was distributed.

Summary

The purpose of this study was to examine high-ability students in and outside an honors program at a midwestern comprehensive university to determine differences in background and demographic characteristics between honors participants and nonparticipants of similar ability to determine differences in self-efficacy and in- and out-of-class engagement between participants and nonparticipants of similar ability and to examine major influences on GPA, engagement in critical thinking, and academic efficacy and academic goals. This chapter summarized the methodological approach that was used by outlining the study's research questions, population, instrumentation, data collection, study variables, and methods of data analysis. The study employed a quantitative research design. A survey,

made up of items from the NSSE and PALS, measured the impact of honors participation on student response to items regarding engagement and academic efficacy.

The next two chapters will present the results of the study outlined in this methodology section and discuss the significance of the findings and their implications for future research, policy, and practice. The information gleaned from this work was intended to increase the knowledge base about the impact of honors program participation and to inform the broader body of educators who work with gifted students.

CHAPTER 4. RESULTS

This chapter contains a thorough summary of the results of the study's data analyses. Results are provided in eight sections to correspond with the study's main research questions. The first section summarizes the background and demographic characteristics of the students who completed the survey. The second section is a summary of statistically significant differences in gender, race/ethnicity, cumulative high school GPA, composite ACT score, average level of parental education, college classification year, transfer credit hours, and cumulative college GPA between honors participants and nonparticipants of similar ability. The third section summarizes significant differences in reported level of academic self-efficacy and in- and out-of-class engagement (as measured by active and collaborative learning, critical thinking skills, diverse perspectives, reflective learning, student-faculty interaction, and student relationships) between honors participants and nonparticipants of similar ability.

Results of multiple regression analyses are found in fourth through seventh sections. The fourth section includes a summary of the background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors that predict academic achievement as measured by cumulative college GPA. The fifth section identifies the background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors that predict the degree to which students report using critical thinking skills. The sixth section summarizes the background characteristics and college experiences that influence students' academic efficacy. The seventh section of the chapter summarizes the background characteristics and college experiences that influence students' academic goals. The final section of the chapter summarizes the survey's open-ended comments.

Background and Demographic Characteristics

In response to research question 1 regarding the background and demographic characteristics of students who participated in the study, a summary of demographic characteristics of participants is provided in Table 4.1. Descriptive data by gender, race/ethnicity, marital status, high school GPA, high school class rank, cumulative ACT score, father's educational attainment, mother's educational attainment, honors program participation, classification years in college, transfer credits brought to the university, and college GPA is provided in the table.

The gender of students who participated in the study was not evenly divided: 76% ($n = 307$) were female and 24% ($n = 97$) were male. Furthermore, the vast majority of students (95.3%, $n = 385$), were White. Only 4.7% ($n = 19$) were from categories other than White, reflecting a makeup of 1.7% ($n = 7$) Hispanic, 0.7% ($n = 3$) international students, 0.7% ($n = 3$) identifying with two or more ethnicities, 0.5% ($n = 2$) African American, 0.5% ($n = 2$) Asian, and 0.5% ($n = 2$) unknown (Table 4.1). The overwhelming majority of participants described having a marital status of single (99.5%, $n = 398$).

Given the study's focus on high-ability students, it was not surprising to find the high school grades and ranks of the respondents were primarily at the high end of the spectrum. Respondents were almost evenly split between the two highest GPA categories: 46.9% ($n = 187$) in the 3.75–3.99 range and another 48.9% ($n = 195$) with a perfect 4.00 high school GPA. Accordingly, 92.1% ($n = 315$) of respondents were ranked within the top 10% of the high school class with the remaining 7.9% ($n = 27$) in the top 11–25% category. Cumulative

Table 4.1

Demographic Characteristics of Respondents

Variable	All respondents (<i>N</i> = 404)		Honors participants (<i>n</i> = 237)		Honors-eligible nonparticipants (<i>n</i> = 151)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Male	97	24.0	58	24.5	34	22.5
Female	307	76.0	179	75.5	117	77.5
Race/ethnicity						
White	385	95.3	223	94.1	146	96.7
African American/Black	2	.5	1	0.4	1	0.7
Asian	2	.5	1	0.4	1	0.7
Hispanic	7	1.7	6	2.5	1	0.7
International	3	.7	3	1.3	1	0.7
Two or more	3	.7	2	0.8	1	0.7
Unknown	2	.5	1	0.4	1	0.7
Marital status						
Not married	398	99.5	233	99.6	150	99.3
Married	2	0.5	1	0.4	1	0.7
High school GPA						
2.50–2.99	1	.3		1.0	0.7	
3.00–3.24	1	.3		1.0	0.7	
3.25–3.49	4	1.0	2	0.8	1	0.7
3.50–3.74	11	2.8	5	2.1	6	4.0
3.75–3.99	187	46.9	97	40.9	84	55.6
4.00	195	48.9	130	54.9	58	38.4
High school class rank						
11–25%	27	7.9	15	6.3	12	9.5
Top 10%	315	92.1	187	78.9	114	90.5
Composite ACT						
≤24	14	3.5	7	3.0	7	4.6
25–26	23	5.8	10	4.3	13	8.6
27–28	147	36.8	61	26.1	79	52.3
29–30	122	30.6	81	34.6	35	23.2
31–32	66	16.5	49	20.9	17	11.3
33–34	19	4.8	18	7.7		
35–36	8	2.0	8	3.4		
Father's education						
Did not finish high school	9	2.3	5	2.2	3	2.1
Graduated from high school	80	20.7	43	18.8	37	26.1
Attended some college, didn't finish	45	11.6	22	9.6	21	14.8
Associate's degree	39	10.1	22	9.6	15	10.6
Bachelor's degree	120	31.0	73	31.9	39	27.5
Master's degree	75	19.4	48	21.0	24	16.9
Doctoral degree	19	4.9	16	7.0	3	2.1

Table 4.1 (continued)

Variable	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Mother's education						
Did not finish high school	4	1.0	2	0.8	2	1.4
Graduated from high school	49	12.4	27	11.5	21	14.5
Attended some college, didn't finish	43	10.9	24	10.3	19	13.1
Associate's degree	68	17.2	31	13.2	32	22.1
Bachelor's degree	153	38.7	97	41.5	50	34.5
Master's degree	70	17.7	45	19.2	21	14.5
Doctoral degree	8	2.0	8	3.4		
Honors program participant						
Yes	237	61.1				
No	151	38.9				
Classification year						
Freshman	78	19.3	55	23.4	21	13.9
Sophomore	94	23.3	58	24.7	32	21.2
Junior	102	25.2	51	21.7	49	32.5
Senior	126	31.5	71	30.2	49	32.5
Major						
Deciding	11	2.7	5	2.1	6	4.0
Arts and humanities	84	20.8	56	23.6	25	16.6
Biological sciences	58	14.4	34	14.3	22	14.6
Business	66	16.3	28	11.8	33	21.9
Education	46	11.4	25	10.5	18	11.9
Physical science	52	12.9	35	14.8	16	10.6
Social science	47	11.6	31	13.1	15	9.9
Other	40	9.9	23	9.7	16	10.6
Transfer credits						
1–6	64	20.4	41	22.9	23	18.7
7–12	76	24.3	39	21.8	33	26.8
13–18	58	18.5	32	17.9	23	18.7
19+	115	36.7	68	37.4	44	35.8
College cumulative GPA						
≤ 2.49	2	0.5			2	1.3
2.50–2.99	5	1.2			5	3.3
3.00–3.24	24	5.9	7	3.0	15	9.9
3.25–3.49	43	10.6	23	9.7	18	11.9
3.50–3.74	101	25.0	54	22.8	43	28.5
3.75–3.99	201	49.8	135	57.0	58	38.4
4.00	28	6.9	18	7.6	10	6.6

ACT scores showed a greater variation across categories, though two-thirds of respondents ($n = 269$) had scores in the range of 27 to 30. Another 16.5% ($n = 66$) had cumulative scores of 31 or 32, 4.8% ($n = 19$) had scores of 33 or 34, and 2% ($n = 8$) of participants reported either a 35 or the highest possible cumulative score of 36 (Table 4.1).

Levels of parental education ranged from those who did not complete high school to those with doctoral degrees. Only 2.3% ($n = 9$) of respondents' fathers and 1% ($n = 4$) of mothers did not complete high school. The majority of the respondents' parents had a college degree of some kind. In the case of fathers, 60.5% ($n = 234$) had achieved an associate's, bachelor's, or master's degree and another 4.9% ($n = 19$) had earned a doctoral degree. Interestingly, mothers of respondents had an even higher overall rate of degree attainment with 73.6% ($n = 291$) having earned an associate's, bachelor's, or master's degree and another 2% ($n = 8$) having earned a doctoral degree (Table 4.1).

Examining college characteristics, 61.1% ($n = 237$) were honors program participants and 38.9% ($n = 151$) were honors-eligible at the time of admission to the institution but elected not to participate in the program or were no longer eligible to participate based on college GPA. Each classification year was represented among respondents: 19.3% ($n = 78$) freshmen, 23.3% ($n = 94$) sophomores, 25.2% ($n = 102$) juniors, and 31.5% ($n = 126$) seniors. Given the large number of academic majors represented by survey respondents, eight main categories were used to summarize majors. Of the 404 respondents, 2.7% ($n = 11$) were undecided, 20.8% ($n = 84$) were in the arts and humanities, 14.4% ($n = 58$) were in the biological sciences, 16.3% ($n = 66$) were in business majors, 11.4% ($n = 46$) were in education, 12.9% ($n = 52$) were in physical sciences, 11.6% ($n = 47$) were in social sciences, and 9.9% ($n = 40$) were in other various majors (including such areas as graphic technology,

graphic communication, computer science, metal casting, electronic media, and health promotions). NSSE major codes were used as the basis for the categorization used in this study (Table 4.1).

Many of the high-ability students who responded to the survey brought a number of transfer credits to the institution. The largest group, comprising 36.7% ($n = 115$) of the respondents, had 19 or more transfer credits on their records. Cumulative college GPAs of respondents ranged from a low of 1.83 to a high of 4.00. The low GPA of 1.83 was an outlier and, as would be expected, the majority of college GPAs trended toward the high end of the scale. Over 80% of respondents had college GPAs in the top three categories: 25% ($n = 101$) in the 3.50–3.74 range, 49.8% ($n = 201$) in the 3.75–3.99 range, and 6.9% ($n = 28$) with a perfect college cumulative GPA of 4.00 (Table 4.1).

Of the 404 survey respondents, 61.1% ($n = 237$) answered affirmatively to the question “are you currently a member of your institution’s honors program?”; 38.9% ($n = 151$) responded no and 16 responses to a third option, “I don’t know,” were recoded as missing data. Table 4.1 also provides the comparative demographic characteristics of respondents based on honors participation status.

Differences in Background and Demographic Characteristics

Research question 2 asked “Are there statistically significant differences in gender, race/ethnicity, cumulative high school GPA, composite ACT score, average level of parental education, college classification year, transfer credit hours, and cumulative college GPA between honors participants and nonparticipants of similar ability?” A comparison of means and standard deviations for a number of background and demographic characteristics of survey respondents is provided in Table 4.2.

Table 4.2

Means, Standard Deviations, and Independent Samples t Test Results of Demographic Characteristics for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>t</i>	<i>df</i>	<i>p</i>	95% CI ^a
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>				
Gender	237	0.75	0.43	151	0.77	0.42	-0.44	386	.660	-0.11, 0.07
Race/ethnicity	237	0.94	0.24	151	0.97	0.18	-0.84	286	.402	-0.07, 0.03
High school GPA	234	3.95	0.08	151	3.92	0.15	2.65	213.316	.009***	0.01, 0.06
Composite ACT	234	29.50	2.40	151	27.90	1.87	7.26	369.79	<.001***	1.16, 2.02
Father's education	229	4.41	1.64	142	3.94	1.59	2.70	369	.007**	0.13, 0.81
Mother's education	234	4.54	1.36	145	4.17	1.32	2.61	377	.009**	0.09, 0.65
Classification year	235	2.58	1.14	151	2.83	1.04	-2.19	343.431	.029*	-0.47, -0.03
Transfer credit hours	179	12.40	11.63	151	13.10	11.22	-0.62	384	.538	-3.09, 1.61
College cumulative GPA	237	3.77	0.214	151	3.62	0.35	4.75	223.373	<.001***	0.087, 0.21

^aCI = confidence interval.

p* < .05. *p* < .01. ****p* ≤ .001.

There is a notable difference in mean composite ACT scores. Honors participants had a mean score of 29.5 out of a possible score of 36, whereas nonhonors students had a mean of 27.9. Education levels of both fathers and mothers of honors participants were higher than those of honors-eligible nonparticipants. In the case of fathers, honors participants reported a mean of 4.41, indicating the average level of education was between “completed an associate’s degree” (4) and “completed a bachelor’s degree” (5). Meanwhile, honors-eligible nonparticipants reported a mean of 3.94, indicating the average level of education was between “attended college but did not complete degree” (3) and “completed an associate’s degree” (4). Mothers’ education levels also were higher for honors participants ($M = 4.54$) than for nonparticipants ($M = 4.17$), though both were in the range between “completed an associate’s degree” (4) and “completed a bachelor’s degree” (5). It is interesting to note that the mean level of education for mothers was higher than that of fathers for both honors participants and nonparticipants.

When comparing college-level characteristics, the mean cumulative college GPA for honors students was 3.77 whereas honors-eligible nonparticipants had a mean GPA of 3.62. Nonparticipants had slightly higher mean scores on classification year ($M = 2.86$) and hours of transfer credit ($M = 13.1$) than did honors participants ($M = 2.60$ and $M = 12.4$, respectively).

The results of the independent samples t tests conducted to determine any statistically significant difference in means between the two groups examined in the study also are summarized in Table 4.2. Statistically significant differences were found for five variables. Mean scores for high school GPA ($t = 2.65$, $df = 213.316$, $p = .009$); composite ACT ($t = 7.26$, $df = 369.795$, $p < .001$); father’s education ($t = 2.70$, $df = 369$, $p = .007$); mother’s

education ($t = 2.607$, $df = 377$, $p = .009$); and college cumulative GPA ($t = 4.75$, $df = 223.373$, $p < .001$) were found to be significantly higher for honors students than for honors-eligible nonparticipants. Only classification year ($t = -2.192$, $df = 343.431$, $p = .029$) was found to be higher for nonhonors participants than for honors students. The remaining background and demographic characteristics were not found to have statistically significant differences.

Differences in Academic Efficacy and In- and Out-of-class Engagement

Research question 3 asked: “Are there statistically significant differences in reported levels of academic self-efficacy and in- and out-of-class engagement (as measured by active and collaborative learning, critical thinking, diverse perspectives, reflective learning, student and faculty interaction, and student relationships) between honors participants and nonparticipants of similar ability?” The first step in answering research question 3 was to calculate mean responses on individual survey items and compare honors student means to those of honors-eligible nonparticipants.

The Survey of Academic Engagement and Efficacy was organized into four main sections: Section One—Academic Engagement and Learning Activities; Section Two—Academic Efficacy and Goals; Section Three—Enriched Learning and Quality of Relationships; and Section Four—Satisfaction and Demographics. Section One was divided into four main questions regarding the current school year. Question 1 asked students to estimate how often they engaged in certain academic and learning behaviors. Question 2 asked how much their coursework emphasized particular mental activities. Question 3 asked students to estimate how much reading and writing they had done in the current academic

year. Question 4 asked students to select a numeric representation of the extent to which exams had challenged them to do their best work.

Tables 4.3, 4.4, and 4.5 provide the mean responses and standard deviations for survey items in questions 1 through 4 for both honors participants and honors-eligible nonparticipants. Independent samples *t* tests were conducted to determine any statistically significant difference in mean responses between the two groups. Significant differences were found in the means for four items in which honors participants reported engaging in behaviors at higher levels than nonparticipants: Asked questions in class or contributed to class discussions ($t = -2.472$, $df = 303.266$, $p = .014$); Participated in a community-based project (e.g., service learning) as part of a regular course ($t = -2.478$, $df = 373.828$, $p = .014$); Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values ($t = -2.393$, $df = 323.351$, $p = .017$); and Number of written papers or reports of fewer than 5 pages ($t = 2.165$, $df = 386$, $p = .031$).

Section Two of the survey focused on academic efficacy and goals. It was made up of a single question with 10 items that asked students the extent to which they believed certain statements to be true. The mean responses and standard deviations for survey items in question 5 for both honors participants and honors-eligible nonparticipants are provided in Table 4.6. Independent samples *t* tests were conducted to determine any statistically significant difference in mean responses between the two groups. Significant differences were found in the means for four statements that honors participants believed to be true at higher levels than nonparticipants: One of my goals in college is to learn as much as I can ($t = 2.737$, $df = 271.172$, $p = .007$); It's important to me that I thoroughly understand my class work ($t = 2.127$, $df = 386$, $p = .034$); I can do almost all the work in college if I don't give up

Table 4.3

Comparison of Mean Responses to Question 1a–v for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Asked questions in class/contributed to class discussions	237	1.31	0.46	151	1.43	0.50	.014*
Made a class presentation	237	1.53	0.50	151	1.60	0.49	.195
Prepared two or more drafts of a paper or assignment before turning it in	237	1.70	0.46	151	1.75	0.43	.237
Worked on a paper or project that required integrating ideas or information	235	1.25	0.44	151	1.34	0.48	.065
Included diverse perspectives in class discussions or writing assignments	237	1.48	0.50	151	1.56	0.50	.089
Come to class without completing readings/ assignments	237	1.85	0.35	151	1.79	0.41	.124
Worked with other students on projects during class	235	1.49	0.50	149	1.47	0.50	.684
Worked with classmates outside of class to prepare class assignment	237	1.51	0.50	151	1.50	0.50	.826
Put together ideas or concepts when completing assignments/class discussions	237	1.34	0.48	151	1.36	0.48	.652
Tutored or taught other students (paid or voluntary)	237	1.71	0.45	151	1.78	0.41	.128
Participated in a community-based project (e.g., service learning)	236	1.82	0.38	151	1.90	0.29	.014*
Used an electronic medium to discuss or complete an assignment	237	1.54	0.50	151	1.51	0.50	.652
Used e-mail to communicate with an instructor	237	1.13	0.34	150	1.20	0.40	.080
Discussed grades or assignments with an instructor	237	1.52	0.50	151	1.52	0.50	1.000
Talked about career plans with a faculty member/ advisor	236	1.69	0.46	150	1.62	0.49	.200
Discussed ideas from your readings/classes w/ faculty outside of class	235	1.85	0.36	150	1.86	0.34	.671
Received prompt written or oral feedback from faculty on your performance	236	1.47	0.50	150	1.52	0.50	.343
Worked harder than you thought you could to meet an instructor's standards	237	1.52	0.50	151	1.47	0.50	.273
Worked with faculty members on activities other than coursework	237	1.78	0.41	151	1.80	0.40	.519
Discussed ideas from your readings/classes with others outside of class	236	1.38	0.49	151	1.41	0.49	.567
Had serious conversations with students of a different race or ethnicity	237	1.63	0.48	151	1.70	0.46	.142
Had serious conversations with students who are very different from you in terms of religious beliefs, political opinions, or personal values	237	1.47	0.50	151	1.59	0.49	.017*

^aMeans calculated using a response scale of 1 (*very often*), 2 (*often*), 3 (*sometimes*), and 4 (*never*).

**p* < .05

Table 4.4

Comparison of Mean Responses to Question 2a–e for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Memorizing facts, ideas, or methods from your courses and readings	237	2.03	0.88	150	2.12	0.93	.337
Analyzing the basic elements of an idea, experience, or theory	237	1.82	0.79	151	1.84	0.83	.788
Synthesizing and organizing ideas, information, or experiences	237	2.03	0.81	151	2.06	0.86	.728
Making judgments about the value of information, arguments, or methods	237	2.29	0.93	150	2.24	0.95	.631
Applying theories or concepts to practical problems or in new situations	237	1.96	0.86	151	1.81	0.81	.080

^aMeans calculated using a response scale of 1 (*very much*), 2 (*quite a bit*), 3 (*some*), 4 (*very little*).

Table 4.5

Comparison of Mean Responses to Question 3a–e and 4 for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Number of assigned textbooks, books, or book-length packs of course readings ^a	237	3.19	0.89	151	3.22	0.95	.730
Number of books read on own for personal enjoyment or academic enrichment ^a	237	1.84	0.78	151	1.87	0.87	.705
Number of written papers or reports of 20 pages or more ^a	236	1.25	0.59	151	1.26	0.61	.948
Number of written papers or reports between 5 and 19 pages ^a	236	2.05	0.75	150	1.96	0.77	.252
Number of written papers or reports of fewer than 5 pages ^a	237	3.10	1.09	151	2.85	1.04	.031*
Extent to which examinations during the current school year have challenged you to do your best work. ^b	237	2.66	1.08	150	2.83	1.32	.195

^aMeans calculated using a response scale of 1 (*none*), 2 (*1–4*), 3 (*5–10*), 4 (*11–20*), 5 (*>20*). ^bMeans calculated using a response scale of 1 (*very much*) to 7 (*very little*).

**p* < .05.

Table 4.6

Comparison of Mean Responses to Question 5a–j for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
It's important to me that I learn a lot of new concepts this year.	237	4.22	0.80	151	4.09	0.88	.126
One of my goals in college is to learn as much as I can.	236	4.50	0.67	151	4.28	0.83	.007**
I'm certain I can master the skills taught in my courses this year.	237	4.04	0.85	150	3.90	0.85	.110
I'm certain I can figure out how to do the most difficult course work.	236	3.96	0.86	151	3.82	0.94	.139
One of my goals is to master a lot of new skills this year.	236	3.98	0.89	151	3.91	0.91	.420
I can do even the hardest work in college if I try.	237	4.27	0.86	151	4.17	0.90	.282
It's important to me that I thoroughly understand my class work.	237	4.44	0.71	151	4.27	0.82	.034*
It's important to me that I improve my skills this year.	237	4.46	0.67	151	4.34	0.81	.108
I can do almost all the work in college if I don't give up.	237	4.54	0.70	151	4.38	0.76	.027*
Even if the work is hard, I can learn it.	237	4.47	0.69	151	4.29	0.81	.018*

^aMeans calculated using a response scale of 1 (*not at all true*) to 5 (*very true*).

p* < .05. *p* < .01.

($t = 2.213$, $df = 386$, $p = .027$); and Even if the work is hard, I can learn it ($t = 2.369$, $df = 386$, $p = .018$).

Section Three was divided into five main questions that asked about enriched learning and quality of relationships. Question 6 asked students to estimate how often they had engaged in certain enriching behaviors during the current school year. Question 7 asked which learning behaviors they had done or intended to do before they graduated from the institution. Question 8 asked respondents to select a numeric representation of the quality of their relationships with people at the institution. Question 9 asked for an estimate of the

hours spent each week preparing for class and participating in co-curricular activities.

Question 10 asked the extent to which the student's experience at the university contributed to knowledge, skills, and personal development in a number of areas.

The mean responses and standard deviations for survey items for questions 6 through 10, for both honors participants and honors-eligible nonparticipants, are provided in Tables 4.7 through 4.11. Independent samples *t* tests were conducted to determine any statistically significant difference in mean responses between the two groups. Significant differences were found for four items in which honors participants reported higher likelihood to engage in an activity than nonparticipants: Attend an art exhibit, play, dance, music, theater, or other performance ($t = -2.857$, $df = 330.373$, $p = .005$); Work on a research project with faculty outside of course or program requirements ($t = -3.655$, $df = 274$, $p < .001$); Study abroad ($t = -3.116$, $df = 299$, $p = .002$); and Hours spent preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities

Table 4.7

Comparison of Mean Responses to Question 6a–d for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Attended an art exhibit, play, dance, music, theater, or other performance	236	2.64	0.96	149	2.92	0.90	.005**
Examined the strengths and weaknesses of your own views on a topic or issue	236	2.45	0.79	148	2.56	0.84	.190
Tried to better understand someone else's views	236	2.24	0.76	150	2.18	0.76	.440
Learned something that changed the way you understand an issue or concept	235	2.20	0.74	150	2.15	0.79	.501

^aMeans calculated using a response scale of 1 (*very often*), 2 (*often*), 3 (*sometimes*), and 4 (*never*).

** $p < .01$

Table 4.8

Comparison of Mean Responses to Question 7a–g for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Practicum, internship, field experience, co-op experience, or clinical assignment	222	1.74	.554	141	1.58	.548	.008**
Community service or volunteer work	225	1.34	.553	144	1.39	.544	.362
Work on a research project with faculty outside of course/program requirements	173	2.13	.741	103	2.47	.738	<.001***
Foreign language coursework	209	2.23	.929	135	2.37	.879	.150
Study abroad	186	2.06	.754	115	2.33	.724	.002**
Independent study or self-designed major	183	2.72	.596	132	2.82	.516	.098
Culminating senior experience (capstone course, senior project or thesis, comprehensive exam, etc.)	229	1.83	.406	138	1.76	.516	.202

^aMeans calculated using a response scale of 1 (*done*), 2 (*plan to do*), 3 (*do not plan to do*). Original responses of 4 (*have not decided*) were recoded as missing data.

p* < .01, *p* < .001.

Table 4.9

Comparison of Mean Responses to Question 8a–c for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Relationships with other students	236	2.00	1.19	150	1.99	1.26	.943
Relationships with faculty members	236	2.53	1.18	149	2.67	1.34	.308
Relationships with administrative personnel and offices	235	3.33	1.47	150	3.42	1.49	.571

^aMeans calculated using a response scale of 1 (*friendly, supportive, sense of belonging*) to 7 (*unfriendly, unsupportive, sense of alienation*).

Table 4.10

Comparison of Mean Responses to Question 9a–b for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M^a</i>	<i>SD</i>	<i>n</i>	<i>M^a</i>	<i>SD</i>	
Hours preparing for class (studying, reading, writing, homework, etc.)	236	3.90	1.59	150	4.28	1.72	.026*
Hours participating in co-curricular activities (organizations, sports, etc.)	236	6.00	1.42	150	6.14	1.53	.392

^aMeans calculated using a response scale of 1 (>30), 2 (26–30), 3 (21–25), 4 (16–20), 5 (11–15), 6 (6–10), 7 (1–5), 8 (0).

**p* < .05.

Table 4.11

Comparison of Mean Responses to Question 10a–i for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M^a</i>	<i>SD</i>	<i>n</i>	<i>M^a</i>	<i>SD</i>	
Acquiring a broad general education	237	1.73	.697	149	1.83	.833	.213
Writing clearly and effectively	237	2.25	.884	148	2.43	.826	.051
Speaking clearly and effectively	237	2.23	.863	148	2.24	.838	.863
Thinking critically and analytically	237	1.70	.752	149	1.72	.696	.792
Analyzing quantitative problems	236	2.11	.892	149	1.99	.805	.161
Working effectively with others	237	1.99	.836	149	1.93	.803	.527
Learning effectively on your own	236	1.69	.774	148	1.72	.815	.659
Understanding people of other racial and ethnic backgrounds	237	2.46	.945	149	2.46	.904	.991
Solving complex real-world problems	237	2.18	.811	149	2.22	.837	.641

^aMeans calculated using a response scale of 1 (*very much*), 2 (*quite a bit*), 3 (*some*), and 4 (*very little*).

($t = -2.234$, $df = 384$, $p = .026$). For one item from this section, honors-eligible nonparticipants reported a higher likelihood to engage in an experience than did honors participants: Practicum, internship, field experience, co-op experience, or clinical assignment ($t = 2.676$, $df = 361$, $p = .008$).

Overall, there were 13 survey items with statistically significant differences in mean responses between honors participants and honors-eligible nonparticipants. For 12 of the 13 items, honors participants either reported stronger agreement with the efficacy or goal items or showed more likelihood to participate or greater current engagement in the high-impact activity than did nonparticipants. Means and t scores for the 13 significant items are found in Tables 4.12 and 4.13.

In order to further address research question 3, an exploratory factor analysis was conducted to determine intercorrelations between variables in the data set related to academic self-efficacy and in- and out-of-class engagement. Factor analysis was used as a data reduction technique to determine any resulting constructs, allowing for the creation of composite variables. Independent samples t tests were performed to reveal any statistically significant differences in means of the composite variables related to academic self-efficacy and in- and out-of-class engagement of honors participants and eligible nonparticipants.

Exploratory factor analysis was performed through SPSS using variables specified in Tables 3.2 and 3.3. Original NSSE benchmark items were reconfigured and used in the factor analysis to see if other constructs related to in- and out-of-class engagement would emerge for this high-ability student population (NSSE, n.d.). The Level of Academic Challenge benchmark was modified to examine possible factors related to academic effort, communication skills, and critical thinking. Similarly, the Enriching Educational

Table 4.12

Comparison of Means for Survey Items with Statistically Significant Differences in Response Between Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants			<i>p</i>
	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>n</i>	<i>M</i> ^a	<i>SD</i>	
Asked questions in class or contributed to class discussions ^a	237	1.31	0.46	151	1.43	0.50	.014*
Participated in a community-based project (e.g., service learning) ^a	236	1.82	0.38	151	1.90	0.29	.014*
Had serious conversations with students who are very different from you in terms of religious beliefs, political opinions, or personal values ^a	237	1.47	0.50	151	1.59	0.49	.017*
Number of written papers or reports of fewer than 5 pages ^b	237	3.10	1.10	151	2.85	1.00	.031*
One of my goals in college is to learn as much as I can ^c	236	4.50	0.67	151	4.28	0.83	.007**
It's important to me that I thoroughly understand my class work ^c	237	4.44	0.71	151	4.27	0.82	.034*
I can do almost all the work in college if I don't give up ^c	237	4.54	0.70	151	4.38	0.76	.027*
Even if the work is hard, I can learn it ^c	237	4.47	0.69	151	4.29	0.81	.018*
Attended an art exhibit, play, dance, music, theater, or other performance ^a	236	2.64	0.96	149	2.92	0.90	.005**
Practicum, internship, field experience, co-op experience, clinical assignment ^d	222	1.74	0.55	141	1.58	0.55	.008**
Work on research project with faculty outside of course/program requirements ^d	173	2.13	0.74	103	2.47	0.74	<.001***
Study abroad ^d	186	2.06	0.75	115	2.33	0.72	.002**
Hours preparing for class (studying, reading, writing, homework, etc.) ^e	236	3.90	1.59	150	4.28	1.72	.026*

^aMeans calculated using a response scale of 1 (*very often*), 2 (*often*), 3 (*sometimes*), and 4 (*never*). ^bMeans calculated using a response scale of 1 (*none*), 2 (*1-4*), 3 (*5-10*), 4 (*11-20*), 5 (*more than 20*). ^cMeans calculated using a response scale of 1 (*not at all true*) to 5 (*very true*). ^dMeans calculated using a response scale of 1 (*done*), 2 (*plan to do*), 3 (*do not plan to do*), and original responses of 4 (*have not decided*) were recoded as missing data. ^eMeans calculated using a response scale of 1 (*more than 30*), 2 (*26-30*), 3 (*21-25*), 4 (*16-20*), 5 (*11-15*), 6 (*6-10*), 7 (*1-5*), 8 (*0*).

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

Table 4.13

Independent Samples t Tests of Significant Survey Responses for Honors Participants and Honors-Eligible Nonparticipants

Variable	<i>t</i>	<i>df</i>	<i>p</i>	95% CI
Asked questions in class or contributed to class discussions	-2.472	303.266	.014*	-.224, -.025
Participated in a community-based project (e.g., service learning)	-2.478	373.828	.014*	-.152, -.017
Had serious conversations with students who are very different from you	-2.393	323.351	.017*	-.224, -.021
Number of written papers or reports of fewer than 5 pages	2.165	386	.031*	.022, .463
One of my goals in college is to learn as much as I can.	2.737	271.172	.007**	.062, .377
It's important to me that I thoroughly understand my class work.	2.127	386	.034*	.013, .322
I can do almost all the work in college if I don't give up.	2.213	386	.027*	.019, .315
Even if the work is hard, I can learn it.	2.369	386	.018*	.031, .332
Attended an art exhibit, play, dance, music, theater, or other performance	-2.857	330.373	.005**	-.465, -.086
Practicum, internship, field experience, co-op experience, or clinical assignment	2.676	361	.008**	.042, .275
Work on a research project with faculty outside of course/program requirements	-3.655	274	<.001***	-.518, -.155
Study abroad	-3.116	299	.002**	-.448, -.101
Hours preparing for class	-2.234	384	.026*	-.722, -.046

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

Experiences benchmark was modified to see if constructs could be found for both enrichment and diverse perspectives. The Student-Faculty Interaction and Supportive Campus Environment benchmarks were reframed as a student-faculty relationships construct. Active and Collaborative Learning was the benchmark most closely maintained in the current study. PALS scales for academic efficacy and academic goals were maintained in their original forms (Midgley et al., 2000). The progression from foundational NSSE benchmarks and

Table 4.14

Progression from Foundational Benchmarks/Scales to Anticipated and Resulting Factors

Foundational benchmarks/scales	Anticipated factors	Resulting factors
NSSE Benchmarks: Level of Academic Challenge	Academic Effort	
Active and Collaborative Learning	Active and Collaborative Learning	Active and Collaborative Learning
Enriching Educational Experiences	Enriching Educational Experiences	
Student–Faculty Interaction	Student–Faculty Interaction	Student–Faculty Interaction
Supportive Campus Environment		Student Relationships
PALS Scales: Academic Efficacy	Communication Skills	
Academic Goals	Diverse Experiences	Diverse Perspectives
	Academic Efficacy	Academic Efficacy
	Academic Goals	Academic Goals
	Critical Thinking Skills	Reflective Learning Cognitive Processing Critical Thinking Skills

PALS scales to the categories developed for the current study to the resulting factors that emerged from the exploratory factor analysis is shown in Table 4.14.

Exploratory factor analysis with principal components extraction and varimax rotation was performed, and components with eigenvalues greater than one were extracted. As noted by Tabachnick and Fidell (2007), “Kaiser’s measure of sampling adequacy is a ratio of the sum of squared correlations to the sum of squared correlations plus sum of squared partial correlations. . . . Values of .6 and above are required for good [factor analysis]” (p. 614). Therefore, KMO measure of sampling adequacy of above .6 was used as the threshold for an adequate factor and Bartlett’s test of sphericity was performed in each analysis. Each correlation matrix was examined for multicollinearity among variables,

indicated by correlations approaching 1.000 (Tabachnick & Fidell, 2007). Multicollinearity was not found to be a concern.

Nine meaningful factors emerged from the exploratory factor analysis: (a) academic efficacy, (b) academic goals, (c) student and faculty interaction, (d) cognitive processing, (e) critical thinking skills, (f) reflective learning, (g) student relationships, (h) diverse perspectives, and (i) active and collaborative learning. Items with factor loadings of 0.6 or higher were maintained with the exception of one variable that was maintained with a loading of .572 due to a close thematic connection to the other variables in the factor. Reliability coefficients were calculated for each factor. Although a Cronbach's alpha score of 0.8 or higher is ideal, alpha scores of 0.7 or better indicate acceptable reliability (Urdan, 2010). Reliability scores for the resulting factors ranged from .864 to .700. The nine factors, factor loadings, and alpha scores are displayed in Table 4.15.

Items determined to be intercorrelated through exploratory factor analysis were used to create composite variables to measure the nine constructs. An independent samples *t* test was conducted to determine any statistically significant differences in the means of the composite variables between honors participants and honors-eligible nonparticipants. Three variables were found to have statistically significant differences: academic efficacy ($t = 2.195$, $df = 384$, $p = .029$), academic goals ($t = 2.314$, $df = 384$, $p = .021$), and diverse perspectives ($t = -2.047$, $df = 384$, $p = .041$). In all three cases, honors students had lower means than nonhonors students, which indicated more frequent engagement in particular types of diverse experiences and higher levels of academic self-efficacy and goal-setting (Table 4.16).

Table 4.15

Exploratory Factor Analysis Factor Loadings

Factors	Factor loading
Academic Efficacy ($\alpha = .864$)	
Even if the work is hard, I can learn it	.845
I can do even the hardest work in college if I try	.805
I can do almost all the work in college if I don't give up	.801
I'm certain I can figure out how to do the most difficult course work	.773
I'm certain I can master the skills taught in my courses this year	.681
Academic Goals ($\alpha = .819$)	
It's important to me that I improve my skills	.802
One of my goals is to master a lot of new skills this year	.771
It's important to learn a lot of new concepts this year	.769
One of my goals in college is to learn as much as I can	.723
It's important to me that I thoroughly understand my class work	.609
Student and Faculty Interaction ($\alpha = .779$)	
Discussed grades or assignments with instructor	.834
Used email to communicate with instructor	.786
Received prompt written or oral feedback	.653
Discussed ideas from readings or classes with faculty outside of class	.602
Talked about career plans with a faculty member or advisor	.572
Cognitive Processing ($\alpha = .764$)	
Synthesizing and organizing ideas, information, experiences	.782
Making judgments about value of information, arguments, methods	.776
Analyzing basic elements of idea, experience, theory	.712
Applying theories or concepts to practical problems or new situations	.637
Critical Thinking Skills ($\alpha = .761$)	
Thinking critically and analytically	.746
Solving complex real-world problems	.701
Working effectively with others	.681
Learning effectively on your own	.680
Analyzing quantitative problems	.658
Reflective Learning ($\alpha = .749$)	
Examined the strengths and weaknesses of your own views	.844
Tried to understand someone else's views by imagining issue from their perspective	.843
Learned something that changed the way you understand an issue or concept	.715
Student Relationships ($\alpha = .748$)	
Relationships with administrative personnel and offices	.855
Relationships with faculty members	.803
Relationships with other students	.705
Diverse perspectives ($\alpha = .710$)	
Serious conversations with students of different race/ethnicity	.832
Serious conversations with students very different (religion, politics, values)	.745
Included diverse perspectives in class discussions	.698
Understanding people of other racial and ethnic backgrounds	.648
Active and Collaborative Learning ($\alpha = .700$)	
Worked with other students on projects during class	.830
Worked with classmates outside of class to prepare class assignments	.810
Made a class presentation	.638

Table 4.16

Comparison of Means of Composite Variables for Honors Participants and Honors-Eligible Nonparticipants

Variable	Honors participants			Honors-eligible nonparticipants				<i>t</i>	<i>df</i>	<i>p</i>	95% CI
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>				
Academic efficacy ^a	236	8.69	3.16	150	9.45	3.48	.029*	2.195	384	.029*	.078, 1.429
Academic goals ^a	235	8.37	2.85	151	9.11	3.30	.021*	2.314	384	.021*	.110, 1.357
Student and faculty interaction ^b	233	12.4	2.95	148	12.7	3.05	.312	-1.012	379	.312	-.937, .300
Cognitive processing ^c	237	8.09	2.62	150	7.96	2.65	.636	0.474	385	.636	-.410, .671
Critical thinking skills ^d	235	9.66	2.85	148	9.58	2.83	.771	0.291	381	.771	-.500, .674
Reflective learning ^e	235	6.89	1.83	148	6.88	2.04	.966	0.042	381	.966	-.387, .404
Student relationships ^f	235	7.85	3.20	149	8.07	3.28	.512	-0.657	382	.512	-.889, .444
Diverse perspectives ^g	237	9.90	2.84	149	10.4	2.64	.041*	-2.047	384	.041*	-1.16, -.023
Active and collaborative learning ^e	235	7.46	1.90	149	7.51	2.09	.840	-0.202	382	.840	-.450, .366

^aMeans calculated using a response scale of 5 (*very true*) to 25 (*not at all true*). ^bMeans calculated using a response scale of 5 (*very often*), 10 (*often*), 15 (*sometimes*), and 20 (*never*). ^cMeans calculated using a response scale of 4 (*very much*), 8 (*quite a bit*), 12 (*some*), and 16 (*very little*). ^dMeans calculated using a response scale of 5 (*very much*), 10 (*quite a bit*), 15 (*some*), and 20 (*very little*). ^eMeans calculated using a response scale of 3 (*very often*), 6 (*often*), 9 (*sometimes*), and 12 (*never*). ^fMeans calculated using a response scale of 3 (*friendly, supportive, sense of belonging*) to 21 (*unfriendly, unsupportive, sense of alienation*). ^gMeans calculated using a response scale of 4 (*very often*), 8 (*often*), 12 (*sometimes*), and 16 (*never*).

* $p < .05$.

Factors Predicting College Grade Point Average

Research question 4 asked, “What background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors predict academic achievement as measured by cumulative college GPA?” Hierarchical multiple regression was used to determine the predictive validity of a number of independent variables, including eight of the composite variables identified through exploratory factor analysis. Institutional data on cumulative college GPA was used as the dependent variable.

Variables were entered in block form, following the conceptual framework of Astin’s (1993) I–E–O model. Block 1 contained student background characteristics of race/ethnicity, gender, father’s educational attainment, and mother’s educational attainment. Block 2 contained high school characteristics of composite ACT score, high school GPA, and transfer credit hours. The third block, college motivation, introduced two composite variables of academic efficacy and academic goals. Finally, block 4 included college experience variables including honors involvement, deciding major, arts and humanities major, biological science major, business major, education major, physical science major, social science major, and other major. Block four also included six composite variables for student and faculty interaction, reflective learning, student relationships, diverse perspectives, active and collaborative learning, and critical thinking skills. The coefficient of determination, R^2 , was calculated to determine the degree of variance accounted for by the independent variables. Standardized regression coefficients provided the relative strength of relationships between the variables (Tabachnick & Fidell, 2007). Cases were excluded listwise, which resulted in a final sample of $n = 339$. The independent variables used in the

regression equation along with each corresponding standardized regression coefficient (β) and the overall R^2 and Adjusted R^2 are provided in Table 4.17.

Block 1: Background Characteristics

Results of the regression analysis for block 1 showed that, of the four background characteristics included, mother's educational attainment was the only statistically significant predictor of cumulative college GPA ($\beta = .195, p < .01$). This indicates that the higher the mother's level of education, the stronger the student's collegiate GPA. The background characteristics variables accounted for 2.8% of the variance of the model.

Block 2: High School Characteristics

When including the three high school characteristics in the model, mother's educational attainment remained significant ($\beta = .129, p < .05$). In addition, composite ACT score ($\beta = .143, p < .01$) and high school GPA ($\beta = .469, p < .001$) were statistically significant. The higher the student's ACT score and high school GPA, the higher that student's college GPA. Background and high school characteristics together accounted for 26.8% of the model's variance.

Block 3: College Motivation

Block 3 added the college motivation variables of academic efficacy and academic goals to the items from the prior two blocks. Academic efficacy was found to be a positive predictor of college GPA ($\beta = .218, p < .001$) along with the three variables found to be significant in the previous block: mother's educational attainment ($\beta = .151, p < .01$), composite ACT ($\beta = .096, p < .05$), and high school GPA ($\beta = .442, p < .001$). Background characteristics, high school characteristics, and college motivation together accounted for 32.8% of the model's variance.

Table 4.17

Hierarchical Multiple Regression Analyses Predicting Cumulative College Grade Point Average

Predictor	Block 1 β	Block 2 β	Block 3 β	Block 4 β
Block 1: Background Characteristics				
Race/ethnicity: 1 = white	.028	.034	.052	.077
Gender: 1 = female	.076	.065	.053	.033
Father's educational attainment	-.041	-.007	.003	-.007
Mother's educational attainment	.195**	.129*	.151**	.142**
Block 2: High School Characteristics				
Composite ACT		.143**	.096*	.068
High school GPA		.469***	.442***	.451***
Transfer credit hours		-.009	-.001	-.005
Block 3: College Motivation				
Academic efficacy			.218***	.197***
Academic goals			.069	.060
Block 4: College Experience				
Honors involvement				.112*
Undecided major				.016
Biological Science major				-.052
Business major				-.082
Education major				.082
Physical science major				-.070
Social science major				.031
Other major				-.157**
Student and faculty interaction				.100
Reflective learning				-.035
Student relationships				.009
Diverse perspectives				-.008
Active and collaborative learning				-.029
Critical thinking skills				.031
R^2	.039	.283	.346	.408
Adjusted R^2	.028	.268	.328	.365
F	3.401**	18.651***	19.367***	9.439***
ΔR^2		.244	.063	.062
ΔF		37.498***	15.968***	2.345**

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

Block 4: College Experience

The full model added 14 college experience variables to those previously tested in the first three blocks. Mother's educational attainment from block 1 remained significant ($\beta = .142, p < .01$) as did high school GPA from block 2 ($\beta = .451, p < .001$), but composite ACT dropped from the list of significant predictors. Meanwhile, the college motivation variable of academic efficacy retained its significance ($\beta = .197, p < .001$). Two college experience variables proved to be significant: honors involvement ($\beta = .112, p < .05$) and other major ($\beta = -.157, p < .01$). The positive beta coefficient indicates that participation in an honors program is a significant predictor of college GPA. The negative beta in the case of other major may indicate that majoring in the fields encompassed by the other major variable (such as graphic technology, graphic communication, computer science, metal casting, electronic media, and health promotions) is a predictor of lower GPA. However, given the variation among majors included in the category, further study is warranted to determine the influence of major type. The five positive predictors identified in the final model explained 36.5% of the variance in the dependent variable of cumulative college GPA (Table 4.17).

Factors Predicting Critical Thinking Skills

Research question 5 asked, "What background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors predict the degree to which students report employing critical thinking skills?" Again, a blocked hierarchical multiple regression was used to answer research question 5. Block 1 contained student background characteristics of race/ethnicity, gender, father's educational attainment, and mother's educational attainment. Block 2 contained high school characteristics of composite ACT score, high school GPA, and transfer credit hours. The third block, college motivation,

introduced two composite variables of academic efficacy and academic goals. Block 4 included the following college experience variables: honors involvement, classification year, deciding major, arts and humanities major, biological science major, business major, education major, physical science major, social science major, other major, and five composite variables for student and faculty interaction, reflective learning, student relationships, diverse perspectives, and active and collaborative learning. The dependent variable of critical thinking skills was a composite of five items: thinking critically and analytically, solving complex real-world problems, working effectively with others, learning effectively on your own, and analyzing quantitative problems. Cases were excluded listwise resulting in a final sample of $n = 339$. The independent variables used in the regression equation along with each corresponding standardized regression coefficient (β) and the overall R^2 and Adjusted R^2 are provided in Table 4.18.

Block 1: Background Characteristics

Results of the regression analysis for block 1 showed that, of the four background characteristics of race/ethnicity, gender, father's educational attainment, and mother's educational attainment, none of the variables were statistically significant predictors of critical thinking skills. Only 1.8% of the variance of the model was accounted for in block 1.

Block 2: High School Characteristics

No statistical significance was found after adding the block 2 high school characteristics of composite ACT score, high school GPA, and transfer credit hours to the four background characteristics. Background and high school characteristics together accounted for 2.1% of the model's variance.

Table 4.18

Hierarchical Multiple Regression Analyses Predicting Use of Critical Thinking Skills

Predictor	Block 1 β	Block 2 β	Block 3 β	Block 4 β
Block 1: Background characteristics				
Race/ethnicity: 1 = white	.042	.048	.074	.108*
Gender: 1 = female	.009	.005	-.034	.025
Father's educational attainment	-.087	-.089	-.082	-.078
Mother's educational attainment	-.104	-.104	-.068	-.062
Block 2: High school characteristics				
Composite ACT		.003	-.051	-.060
High School GPA		.071	.045	.046
Transfer credit hours		-.089	-.085	-.124**
Block 3: College motivation				
Academic efficacy			.186**	.058
Academic goals			.216***	.187***
Block 4: College experience				
Honors involvement				.011
Classification year				.147**
Undecided major				.060
Biological science major				.123*
Business major				.179**
Education major				.026
Physical science major				.186***
Social science major				.110*
Other major				.049
Student and faculty interaction				.101
Reflective learning				-.019
Student relationships				.235***
Diverse perspectives				.207***
Active and collaborative learning				.094
R^2	.029	.042	.156	.385
Adjusted R^2	.018	.021	.133	.340
F	2.528*	2.060*	6.775***	8.563***
ΔR^2		.012	.115	.228
ΔF		1.424	22.347***	8.350***

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

Block 3: College Motivation

Block 3 added the college motivation variables of academic efficacy and academic goals to the items from the prior two blocks. As had been the case in the prior two blocks, background and high school characteristics still did not have a significant impact. However, academic efficacy ($\beta = .186, p < .01$) and academic goals ($\beta = .216, p < .001$) were found to be relatively strong predictors of critical thinking skills. When adding the college motivation variables to those of background characteristics and high school characteristics, the percentage of variance accounted for increased to 13.3%.

Block 4: College Experience

Incorporation of the college experience variables into the model resulted in significant predictors. The race/ethnicity variable from block 1 became a statistically significant predictor ($\beta = .108, p < .05$) as did transfer credit hours from block 2 ($\beta = -.124, p < .01$). With a coding of 0 = non-White and 1 = White, this result indicates that being White is a positive predictor of application of critical thinking skills. The negative beta in the case of transfer credit hours denotes that the greater the number of hours a student transferred to the institution, the weaker that student's application of critical thinking skills. The academic efficacy variable from block 3 dropped out, but the academic goals variable remained statistically significant ($\beta = .187, p < .001$). The positive beta coefficient indicated that those who set higher academic goals were more likely to report the use of critical thinking skills. A number of block 4 variables were found to be significant. Classification year ($\beta = .147, p < .01$), biological science major ($\beta = .123, p < .05$), business major ($\beta = .179, p < .01$), physical science major ($\beta = .186, p < .001$), and social science major ($\beta = .110, p < .05$) were all found to be positive predictors of critical thinking skills, whereas arts

and humanities major was omitted from the regression due to multicollinearity. Additionally, the composite variables of student relationships ($\beta = .235, p < .001$) and diverse perspectives ($\beta = .207, p < .001$) were also strong, positive predictors of critical thinking skills. The 10 significant predictors identified in the final model explained 34% of the variance in the dependent variable (Table 4.18).

Factors Predicting Academic Efficacy

Research question 6 asked, “What background characteristics and college experiences influence students’ academic efficacy?” Hierarchical multiple regression was used to answer this question. Block 1 contained student background characteristics of race/ethnicity, gender, father’s educational attainment, and mother’s educational attainment. Block 2 contained high school characteristics of composite ACT score, high school GPA, and transfer credit hours. Block 3 included the college motivation item of academic goals. Block 4 consisted of the following college experience variables: honors participation, classification year, deciding major, arts and humanities major, biological science major, business major, education major, physical science major, social science major, other major, and six composite variables for student and faculty interaction, reflective learning, student relationships, diverse perspectives, active and collaborative learning, and critical thinking skills. The dependent variable of academic efficacy was a composite of five items: Even if the work is hard, I can learn it, I can do even the hardest work in college if I try, I can do almost all the work in college if I don’t give up, I’m certain I can figure out how to do the most difficult course work, and I’m certain I can master the skills taught in my courses this year. Cases were excluded listwise, which resulted in a final sample of $n = 339$. The independent variables

used in the regression equation along with each corresponding standardized regression coefficient (β) and the overall R^2 and Adjusted R^2 are provided in Table 4.19.

Block 1: Background Characteristics

Results of the regression analysis for block 1 showed that, of the four background characteristics included, none of those variables were statistically significant predictors of academic efficacy. In fact, the variance of the model accounted for in block 1 was -0.4% .

Block 2: High School Characteristics

Background characteristics remained insignificant in block 2, but high school characteristics ACT score ($\beta = .185, p < .001$) and high school GPA ($\beta = .119, p < .05$) were statistically significant predictors of academic efficacy. Background and high school characteristics together accounted for 3.9% of the model's variance.

Block 3: College Motivation

Block 3 added the college motivation variable of academic goals to the items from the prior two blocks. Composite ACT score ($\beta = .139, p < .01$) and high school GPA ($\beta = .111, p < .05$) retained their significance. Additionally, academic goals ($\beta = .491, p < .001$) was found to be a strong predictor of academic efficacy, indicating that the stronger one's academic goals, the stronger the sense of academic efficacy. When adding the college motivation variable to those of background characteristics and high school characteristics, the percentage of variance accounted for increased substantially to 27.2% .

Block 4: College Experience

Incorporation of the college experience variables resulted in only modest adjustments to the overall model. The composite ACT score ($\beta = .133, p < .01$) and high school GPA ($\beta = .113, p < .05$) remained statistically significant as did the strong predictor of academic

Table 4.19

Hierarchical Multiple Regression Analyses Predicting Academic Efficacy

Predictor	Block 1 β	Block 2 β	Block 3 β	Block 4 β
Block 1: Background characteristics				
Race/ethnicity: 1 = white	-.056	-.064	-.031	-.028
Gender: 1 = female	-.017	-.004	-.092	-.091
Father's educational attainment	-.044	-.046	-.049	-.038
Mother's educational attainment	-.033	-.068	-.016	-.019
Block 2: High school characteristics				
Composite ACT		.185***	.139**	.133**
High School GPA		.119*	.111*	.113*
Transfer credit hours		-.046	-.057	-.067
Block 3: College motivation				
Academic goals			.491***	.428***
Block 4: College experience				
Honors involvement				.002
Classification year				.074
Undecided major				.066
Biological science major				-.046
Business major				-.067
Education major				-.059
Physical science major				-.053
Social science major				-.011
Other major				-.012
Student and faculty interaction				.043
Reflective learning				.026
Student relationships				.118*
Diverse perspectives				.043
Active and collaborative learning				.013
Critical thinking skills				.061
R^2	.008	.059	.289	.351
Adjusted R^2	-.004	.039	.272	.303
F	.657	2.981**	16.775***	7.400***
ΔR^2		.051	.230	.062
ΔF		6.039***	106.68***	1.995*

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

goals ($\beta = .428, p < .001$). The only additional college experience variable found to be statistically significant was the composite variable of student relationships ($\beta = .118, p < .05$). Those who reported greater strength in their relationships with faculty, staff, or other students had a greater sense of academic efficacy. The final model explained 30.3% of the variance in the dependent variable (Table 4.19).

The connection between academic goals and academic efficacy was clearly a strong one. The correlation between the two variables was moderate at $r = .491$. Including the academic goals variable in the regression model did not violate any assumptions of multiple regression; Tabachnick and Fidell (2007) warned about issues of multicollinearity when including bivariate correlations of .7 or higher. Although including academic goals in the model was a justifiable course of action, it is worth investigating what predictors may be masked by the strong connection between goals and efficacy. The changes that occur in the model when removing the college motivation block from the regression are shown in Table 4.20. The variables included in the other blocks remained the same as did the dependent variable of academic efficacy. Cases were excluded listwise, which resulted in a final sample of $n = 341$.

Block 1: Background Characteristics (with Academic Goals Omitted)

Results of the regression analysis for block 1 showed that, as with the first academic efficacy model, none of the four background characteristics were statistically significant. The variance in the model accounted for in block 1 was -0.5% .

Block 2: High School Characteristics (with Academic Goals Omitted)

Background characteristics remained insignificant in block 2, but upon entering the high school characteristics of ACT score ($\beta = .182, p < .001$) and high school GPA ($\beta =$

Table 4.20

Hierarchical Multiple Regression Analyses Predicting Academic Efficacy (with Academic Goals Omitted)

Predictor	Block 1 β	Block 2 β	Block 3 β
Block 1: Background characteristics			
Race/ethnicity: 1= white	-.054	-.065	-.057
Gender: 1 = female	-.020	-.007	-.037
Father's educational attainment	-.039	-.041	-.017
Mother's educational attainment	-.031	-.065	-.063
Block 2: High school characteristics			
Composite ACT		.182***	.173**
High school GPA		.117*	.120*
Transfer credit hours		-.045	-.043
Block 3: College motivation			
Honors involvement			.019
Classification year			-.026
Undecided major			-.016
Biological science major			.044
Business major			.088
Education major			.069
Physical science major			.111
Social science major			.042
Other major			-.001
Student and faculty interaction			.062
Reflective learning			.135*
Student relationships			.126*
Diverse perspectives			.055
Active and collaborative learning			.043
Critical thinking skills			.163**
R^2	.007	.057	.221
Adjusted R^2	-.005	.037	.167
F	.592	2.874**	4.102***
ΔR^2		.050	.164
ΔF		5.882***	4.466***

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

.117, $p < .05$), both were statistically significant predictors of academic efficacy.

Background and high school characteristics together accounted for 3.7% of the model's variance.

Block 3: College Experience (with Academic Goals Omitted)

Composite ACT score ($\beta = .173, p < .01$), high school GPA ($\beta = .120, p < .05$), and student relationships ($\beta = .126, p < .05$) were statistically significant in the final block of the revised model, as they were in the previous version. However, removing the academic goals variable resulted in two additional composite variables emerging as significant: reflective learning ($\beta = .135, p < .05$) and critical thinking skills ($\beta = .163, p < .01$). Without the strong influence of academic goals, it became apparent that those who used reflective learning and critical thinking techniques also reported a greater sense of academic efficacy. The final model explained 16.7% of the variance in the dependent variable. It should be noted that removing academic goals from the model allowed two additional significant variables to emerge, but it also reduced the coefficient of determination (Adjusted R^2) from .303 to .167, meaning that less variance was accounted for in the revised model than in the one that included the academic goals variable.

Factors Predicting Academic Goals

Research question 7 asked, "What background characteristics and college experiences influence students' academic goals?" Hierarchical multiple regression was used to answer research question 7. Block one contained student background characteristics of race/ethnicity, gender, father's educational attainment, and mother's educational attainment. Block two contained high school characteristics of composite ACT score, high school GPA, and transfer credit hours. Block three included the college motivation item of academic

efficacy. Block four contained the college experience variables of honors participation, classification year, deciding major, arts and humanities major, biological science major, business major, education major, physical science major, social science major, other major, and six composite variables for student and faculty interaction, reflective learning, student relationships, diverse perspectives, active and collaborative learning, and critical thinking skills. The dependent variable of academic goals was a composite of five items: It's important to me that I improve my skills, One of my goals is to master a lot of new skills this year, It's important to learn a lot of new concepts this year, One of my goals in college is to learn as much as I can, and It's important to me that I thoroughly understand my class work. Cases were excluded listwise, which resulted in a final sample of $n = 339$. Table 4.21 provides the independent variables used in the regression equation along with each corresponding standardized regression coefficient (β) and the overall R^2 and Adjusted R^2 .

Block 1: Background Characteristics

Results of the regression analysis for block 1 showed that, of the four background characteristics included, only gender was found to be a statistically significant variable ($\beta = .171, p < .01$). With a coding of 0 = male and 1 = female, this result indicated that being female was a positive predictor of stronger academic goals. Block 1 accounted for 2.8% of the model's variance.

Block 2: High School Characteristics

Gender remained a significant predictor in block 2 ($\beta = .181, p < .001$). The high school characteristics of ACT score, high school GPA, and transfer credit hours were not significant predictors of academic goals. Therefore, background and high school characteristics again accounted for 2.8% of the model's variance.

Table 4.21

Hierarchical Multiple Regression Analyses Predicting Academic Goals

Predictor	Block 1 β	Block 2 β	Block 3 β	Block 4 β
Block 1: Background characteristics				
Race/ethnicity: 1 = white	-.059	-.067	-.035	-.042
Gender: 1 = female	.171**	.181***	.182***	.147**
Father's educational attainment	.006	.005	.028	.049
Mother's educational attainment	-.089	-.106	-.072	-.082
Block 2: High school characteristics				
Composite ACT		.093	.001	.025
High school GPA		.016	-.043	-.030
Transfer credit hours		.022	.045	.074
Block 3: College motivation				
Academic efficacy			.497***	.391***
Block 4: College experience				
Honors participation				.037
Classification year				-.221***
Undecided major				-.125**
Biological science major				.019
Business major				-.016
Education major				.003
Physical science major				-.077
Social science major				-.058
Other major				.029
Student and faculty interaction				.019
Reflective learning				.199***
Student relationships				-.046
Diverse perspectives				.006
Active and collaborative learning				.055
Critical thinking skills				.180***
R^2	.039	.048	.281	.407
Adjusted R^2	.028	.028	.263	.364
F	3.418**	2.400*	16.105***	9.399***
ΔR^2		.009	.232	.126
ΔF		1.041	106.676***	4.468***

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

Block 3: College Motivation

Block 3 added the college motivation variable of academic efficacy to the items from the prior two blocks. Gender retained its significance ($\beta = .182, p < .001$). Additionally, academic efficacy ($\beta = .497, p < .001$) was found to be a strong predictor of academic goals. This denoted that confidence in one's academic abilities led to a stronger set of achievement goals. Adding the college motivation variable to those of background characteristics and high school characteristics, the percentage of variance accounted for increased to 26.3%.

Block 4: College Experience

Incorporation of the college experience variables resulted in several amendments to the total model. Gender ($\beta = .147, p < .01$) and academic efficacy ($\beta = .391, p < .001$) remained statistically significant. Four additional college experience variables were statistically significant: classification year ($\beta = -.221, p < .001$), undecided major ($\beta = -.125, p < .01$), reflective learning ($\beta = .199, p < .001$), and critical thinking skills ($\beta = .180, p < .001$). The betas for classification year and deciding major were both negative. In the case of classification year, this indicates that as years in college progress, the strength of students' academic goals decreases. Being undecided on one's major is a negative predictor of establishing strong academic goals. Meanwhile, those who engaged in reflective learning and critical thinking developed stronger academic goals. The final model explained 36.4% of the variance in the dependent variable (Table 4.21).

As with the academic efficacy model, the interplay between efficacy and goals was examined. It was clear that efficacy played a strong role in determination of academic goals; however, removal of the academic efficacy variable caused the betas of significant variables to increase only slightly while the overall coefficient of determination dropped. No

additional variables were significant. This signified that, although efficacy did affect goals, other variables also played a meaningful role in the overall determination of one's academic aims.

Open-Ended Responses

Research question 8 asked, "How do high-ability students characterize their involvement in, or their decision not to participate in, a collegiate honors program?" Open-ended questions in the survey elicited qualitative student feedback to answer the study's final research question. This section provides a summary of the meaningful themes that emerged from 334 student responses to the open-ended questions.

Opting Not to Participate

Those who indicated they did not accept the invitation to participate in the honors program upon their admission to the university were asked, "Why did you opt not to participate in the honors program?" Several meaningful themes emerged from the 119 responses to this question.

Perception of extra work with inadequate benefits. Many respondents indicated that they did not participate because there were not sufficient benefits to counteract the perception of extra work. This became particularly apparent with regard to long-term benefits related to finding a job after college. Comments included: "Too much extra work that I didn't want to do and it did not affect me in the job search" and "I didn't think it would impact my future enough to be worth the extra work. I saw it as being a lot of extra work with the same degree and job opportunities as someone who did not participate."

Concerns about time commitment and/or increased stress. Another main theme came from students who expressed concern that participation in the honors program would be too time-consuming and/or an added stressor. This was captured by the comment:

I thought that it would be very time consuming and I already felt overwhelmed and nervous coming into college, I didn't know if I would have enough time to participate in it. At the time I thought it would be an additional stress.

Another respondent said, "I had little time for things other than class and work in college. I didn't want to add responsibilities if I wouldn't be able to give it my full attention and participation." An interesting subtheme within this area came from students who noted their parents encouraged them not to participate due to concerns about time constraints, difficulty, or stress.

Lack of knowledge about the program or misunderstanding of requirements.

Several students noted various reasons for not participating that stemmed from misinformation or lack of information about the honors program. Such comments included: "I was not fully aware of what it was or how it differed from a normal course of study. I was under the impression that I would have to live in a certain area and take really hard classes"; "I was unsure of what the honors program consisted of"; "I chose to live in a dorm without the honors program within"; and "I did not hear enough information about what the program entailed or what to expect, and it would have been better to speak with a representative of the program."

Lack of confidence in ability. Some students shared that they elected to not participate in the honors program due to concerns about their ability to be successful as an honors student. For instance, two telling comments were: "I wasn't sure that I would be able

to handle the workload as that was an aspect of college that I was very nervous about” and “I had not attended college yet and did not know what to expect or how hard it would be. I was concerned that I would not be able to meet the requirements.” Another respondent voiced similar concern about academic efficacy, saying, “I felt that I was in the lower part of the range of people invited. That I’m probably not as smart as the other participants and therefore that I would not feel a sense of belonging in the group.”

Impact of Membership

Students who indicated they were currently a member of their institution’s honors program were asked: “How has your membership impacted your college experience?” Noteworthy feedback was provided by 225 current honors students and is summarized in the following key themes.

Access to smaller, discussion-based courses. Respondents perceived their participation in honors courses as having an impact on their college experience. Many comments were shared relating to the classroom experience. These included remarks such as: “It has been a great experience for developing critical thinking and discussion. I’ve had a few great classes through the program, and I enjoyed the smaller class size and discussion style”; “It has allowed me to be in smaller classes that are more challenging”; “The greatest advantage I believe the honors program has offered me is the opportunity to engage in class discussion more readily due to the small class size”; and “I have had so much fun in my honors classes; they are what I thought college classes would be more like, with discussions and emphasis on learning, not repeating.”

Academic/intellectual growth. A number of students expressed the idea that honors involvement helped them to grow intellectually and enhanced their love of learning. This was represented by the statement that the honors program

greatly expanded academic horizons. More so, provided the opportunities for me to find out what I wanted to do, how I best learn, and kept me academically stimulated.

It was the foundation for all else I was able to do at this university.

Another student shared, “The honors program has a higher level of expectations for enrolled students. It has provided me with intellectual stimulation and an opportunity to develop critical thinking skills.”

No real impact. Although many students shared positive feedback regarding their honors involvement, others articulated a lack of impact on their college experience. This was demonstrated through comments such as: “I don’t think it has really changed my experience”; “Very little, unfortunately as a music major there are no honors courses offered within my major so I have done very little with the program thus far”; and “I don’t feel very involved with the honors program.”

Social connections/relationships. Another key theme related to the relationships developed through honors involvement. Friendships with like-minded students was noted as a benefit: “I lived in an honors community my first year in college, which was a wonderful living experience, as I was surrounded by a group of peers as motivated to concentrate on my studies as I was” and “I also have taken classes with other honors students, which is rewarding since they have the same values as me.” Additionally, connections to faculty were mentioned: “I’ve enjoyed the small class sizes and personal attention from the faculty. I feel like being an honors student has challenged me in positive ways and helped me to form

closer relationships with other students and professors” and “I’ve also had a chance to develop good relationships with professors who challenge me in a way that would have been difficult in a regular class, and I’ve consistently had better feedback and rapport with my honors professors.”

Defining influence. Although many students focused their comments on particular areas of benefit or influence, some expressed an overarching sense that honors involvement had played a very crucial, defining role in their collegiate experience. This idea was effectively captured by a student who voiced difficulty in imagining his or her college experience without honors participation:

My involvement in my institution’s honors program has entirely made my college experience. I have met my closest friends through the program as well as many, many others who have positively impacted my college years and my life in general. I have been academically and personally challenged and have been able to truly explore myself and my beliefs and begin defining myself and who I want to become. I could not, and frankly don’t want to, imagine my college experience without my participation in the honors program.

Summary

This chapter provided a thorough summary of the study’s results. The first two sections summarized the background and demographic characteristics of the students who completed the survey and highlighted the statistically significant differences found between honors participants and nonparticipants of similar ability. Honors respondents were found to have higher cumulative high school GPAs, composite ACT scores, parental education levels,

and cumulative college GPAs. The average college classification year was higher for respondents who were nonparticipants in the honors program.

The third section summarized significant differences in reported levels of academic self-efficacy and in- and out-of-class engagement (as measured by active and collaborative learning, critical thinking skills, diverse perspectives, reflective learning, student and faculty interaction, and student relationships) between honors participants and nonparticipants of similar ability. It was found that honors students report more frequent engagement in particular types of diverse experiences as well as higher levels of academic self-efficacy and academic goal-setting than do honors-eligible nonparticipants.

The last four sections provided results of the hierarchical multiple regressions conducted on four dependent variables. A number of independent variables were found to be statistically significant predictors of cumulative college GPA, use of critical thinking skills, academic efficacy, and academic goals. Finally, this chapter concluded with a presentation of main themes that emerged from responses to open-ended questions for those who opted not to participate in honors as well as those who were current honors members. The significance of the study's findings, as well as their implications for future research, policy, and practice, will be examined in the final chapter.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS FOR FUTURE RESEARCH, AND CONCLUSION

This chapter provides a summative discussion of the study's results and significance. First, an overview of the study is provided. This is followed by examination and discussion of the findings associated with each of the study's primary research questions. Finally, implications are presented for policy and practice and recommendations are shared for future research related to high-ability student learning and engagement.

Overview of the Study

This study sought to examine high-ability students in and outside an honors program at a midwestern comprehensive university to determine differences in background and demographic characteristics, self-efficacy, and in- and out-of-class engagement between the two groups. It also examined major influences on high-ability student GPA, critical thinking skills, academic efficacy, and academic goals. Eight research questions guided the study.

This study was undertaken in response to calls to add to the limited body of scholarly research on honors programs (Achterberg, 2004b; Slavin et al., 2008). It adds to the small body of research regarding honors program involvement and provides new information about honors involvement and high-ability student learning. Chapter 1 summarized the purpose of the study, research questions, and significance. Chapter 2 provided a thorough review of the literature related to honors programming and the key variables used in the study. Chapter 3 presented the methodological approach used in the study. Chapter 4 provided a complete summary of results. Chapter 5 concludes the study with a discussion of the results and their significance to honors education and the academic community at large.

Discussion

Background and Demographic Characteristics

A summary of background and demographic characteristics of the students who participated in the study was provided in response to research question 1. Although a number of characteristics were examined, three items are particularly noteworthy. Gender, race/ethnicity, and parental education levels of respondents will each be scrutinized for their impact on the study's results.

Gender. The gender of students who participated in the study was not evenly divided: 76% ($n = 307$) were female and 24% ($n = 97$) were male. This somewhat reflects the gender makeup of the honors program, which was 66% female and 34% male in 2010. This imbalance toward female students is likely due, in part, to the institution's overall gender breakdown which was about 60% female to 40% male in fall of 2010.

The gender ratio in the survey participation points to a possible imbalance in honors program participation throughout higher education that needs to be examined. Although previous empirical research has not studied this issue, administrators and others working within honors programming have recognized the overrepresentation of females in their programs. Future research should address this concern, particularly in light of possible differential benefits by gender. Shushok (2006) found that honors students were more likely to talk about social problems or world events with peers and were more likely to be involved in academically focused activities outside the classroom. In all cases these results were more pronounced for male than for female honors students. Shushok (2006) surmised that females may find it easier to associate with academically inclined peers and that males find a particular advantage in an honors community that supports their academic interests. If males

are apt to experience a differential advantage, it is incumbent on honors administrators to ensure high-ability male students are encouraged to engage in honors programming.

Race/ethnicity. The vast majority of survey respondents (95.3%, $n = 385$) were White. This number reflects a similar racial and ethnic makeup of the honors program at this midwestern institution in 2010. Again, this figure relates directly to the institutional profile in which 88.2% were White, 1.2% provided no response, and 3.6% were international students in 2010. This means only 7% of the institution's student body identified as a racial or ethnic minority in 2010.

Both the study institution and honors program value diversity and seek to increase the representation of racial/ethnic minorities, believing the exposure to and celebration of differences has an important educational benefit. Study results indicated that honors participants were significantly more likely to be exposed to diverse perspectives which, in turn, were significant predictors of use of critical thinking skills among high-ability students (a finding discussed in more detail below). Longo and Falconer (2003) commented on the enrichment provided to students when honors program enrollments more clearly reflect the multiple perspectives and viewpoints inherent in a diverse society. Increased understanding of human similarities and differences is a salient reason to make diversity in honors enrollment a priority. Administrators must ensure that students from traditionally underrepresented backgrounds find access to honors programs as well as provide a welcoming environment upon their entry.

Parental education. The final demographic characteristic worth considering is level of parental education, which ranged from those who did not complete high school to those with doctoral degrees. In this high-ability student population, only 2.3% ($n = 9$) of

respondents' fathers and 1% ($n = 4$) of respondents' mothers did not complete high school. The fact that 60.5% of fathers and 73.6% of mothers earned a college degree of some kind is an important finding. This study was rooted in a theoretical framework that recognized the family or larger network's role in the delivery of social capital (Bourdieu, 1986). Through the social networks to which one belongs individuals are granted connections, support, and resources that help attain future position or status. The high levels of academic attainment on the part of parents of study participants appear to reinforce the philosophy of social capital by illustrating how connections and resources for achieving a college education pass from parent to child.

Numerous studies have shown that higher levels of parental educational attainment correlate with higher GPAs on the part of college students (Pascarella et al., 2003; Pritchard & Wilson, 2003; Yazedjian et al., 2009). These findings point to the importance of providing children with early exposure to the value of higher education. Given the established connection between parental attainment and student achievement, it is not surprising that a strong majority of high-ability students in the present study came from a family background that included familiarity with higher education. However, the statistic that might be worth further consideration is that 23% of fathers and 13.4% of mothers had a high school degree or less. In other words, a meaningful number of students in the study were first-generation college students. Even with their history of academic success, institutions may find that a subgroup of high-ability students could benefit from additional support and instruction during the college transition to offset a lack of familiarity with the college process on the part of their parents.

Differences in Background and Demographic Characteristics

Research question 2 asked whether statistically significant differences exist in gender, race/ethnicity, cumulative high school GPA, composite ACT score, average level of parental education, college classification year, transfer credit hours, and cumulative college GPA between honors participants and nonparticipants of similar ability. Several statistically significant differences will be explored in this section.

Although all students in the sample met the institution's minimum academic threshold for invitation to the honors program, those who accepted the invitation and elected to participate in the honors program proved to have higher high school GPAs and composite ACT scores than students who did not choose to participate in the program. It is possible that students with higher levels of recognition from traditional measures of achievement such as standardized tests might have a greater sense of confidence in their abilities, making them more likely to participate in an optional honors experience. This is congruent with a theme that emerged from one of the survey's open-ended questions, indicating that some students opted not to participate in the honors program because of a lack of confidence in their abilities. One student said, "I felt that I was in the lower part of the range of people invited. That I'm probably not as smart as the other participants and therefore that I would not feel a sense of belonging in the group." This sentiment would explain why those with slightly lower GPAs and cumulative ACT scores self-selected out of the honors program.

Another statistically significant difference was found in college cumulative GPAs, with honors students achieving a higher average than honors-eligible nonparticipants. This finding was consistent with previous research in the field (Cosgrove, 2004a, 2004b; Shushok, 2002). It is probable that the same confidence in abilities that prompts students to be

engaged with the honors program in the first place contributes to their college achievement. The difference may also stem from the emphasis placed on achievement, including the minimum GPA required to stay involved in the honors program, or the additional support provided by the specialized learning community fundamental to the honors movement. Additional research should focus on uncovering why honors participation contributes to greater academic success as measured by GPA.

Honors students also reported higher mean averages of both father's and mother's education levels than did honors-eligible nonparticipants. As previously mentioned, higher parental educational attainment is positively correlated with higher GPAs in college (Pascarella et al., 2003; Pritchard & Wilson, 2003; Yazedjian et al., 2009). Parents with high levels of education often have experiences, information, or first-hand knowledge that can assist their college-bound students (Spera et al., 2009). In this way, parents are able to transfer their social capital to their offspring. It is possible the increased level of parental education of eventual honors students leads those parents to offer increased support and encouragement to their children. If parents communicate a higher value for the honors experience or instill a greater sense of confidence in the child regarding his or her abilities, it could make that student more likely to pursue an honors-level experience.

Differences in Academic Efficacy and In- and Out-of-Class Engagement

Research question 3 investigated statistically significant differences in reported levels of academic self-efficacy and in- and out-of-class engagement between honors participants and nonparticipants of similar ability. Factor analysis was used to establish representative constructs that could be compared through *t* tests for statistically significant differences between groups.

Given this study's reliance on items from the NSSE and PALS, the benchmarks and scales were also used as the foundation for factor analysis (Kuh, 2001; Midgley et al., 2000). PALS scales for academic efficacy and academic goals were maintained in their original forms and, as expected, emerged in the factor analysis. In fact, these scales had the two highest reliability scores of the nine resulting factors. The original NSSE benchmarks were reconfigured for the factor analysis to see whether other constructs related to in- and out-of-class engagement would emerge for this high-ability student population. In addition to the academic efficacy and academic goals factors, seven other meaningful engagement factors were identified: student and faculty interaction, cognitive processing, critical thinking skills, reflective learning, student relationships, diverse experiences, and active and collaborative learning.

Three composite variables were found to have statistically significant differences between groups: academic efficacy, academic goals, and diverse perspectives. In all three cases, the mean responses of honors students indicated more frequent exposure to diverse perspectives and higher levels of academic self-efficacy and goal-setting than did those of honors-eligible nonparticipants.

Diverse perspectives. In order to examine why honors students might have higher levels of exposure to diverse perspectives, it is helpful to revisit the individual items that make up this particular construct. The four survey items identified through factor analysis included: (a) had serious conversations with students of a different race or ethnicity than your own; (b) had serious conversations with students who are very different from you in terms of their religion beliefs, political opinions, or personal values; (c) included diverse perspectives (different races, religions, gender, political beliefs, etc.) in class discussions or writing

assignments; and (d) understanding people of other racial and ethnic backgrounds. Three of the four items that made up the construct mentioned conversation or class discussion. The honors program places an emphasis on small class sizes and interactive, discussion-based instruction, perhaps giving participants additional opportunities to examine diverse perspectives in the classroom than found in traditional courses. All academic inquiry, at its root, should expose the diversity of the human experience. However, it is possible that faculty approach honors instruction with a greater intentionality toward including multiple perspectives in the selection of seminars, delivery of course content, and facilitation of class discussions.

An examination of student demographic characteristics revealed minimal racial and ethnic diversity in the honors program and at the study institution as a whole, leading to a rather homogeneous student body in that regard. However, two of the composite items emphasized diversity of all types including gender, religion, and political beliefs. Again, the seminar format used in many of the honors sections allows for discussion and debate in which diverse viewpoints can emerge. Perhaps the honors classroom setting creates a sense of comfort in sharing religious or political views not considered mainstream or in exploring worldviews different from one's own.

Academic efficacy and goals. Honors students had higher levels of academic efficacy and academic goals than did their counterparts not participating in the honors program. This finding is consistent with another single-institution study that found honors students scored higher than did nonhonors students on motivation to complete college and academic confidence (Kaczvinsky, 2007). This relates to another theoretical basis for the study. Bandura (1989) said of self-efficacy, "Among the mechanisms of personal agency,

none is more central or pervasive than people's beliefs about their capabilities to exercise control over events that affect their lives" (p. 1175). The literature is clear that those with higher academic self-efficacy display greater commitment and connection to their learning than do those lacking self-efficacy. A personal sense of ability is clearly important to students of high academic performance (Siegle et al., 2010). The higher levels of parental education and high school academic characteristics of honors students likely also relate to the increased sense of academic efficacy observed. Prior achievement leads to confidence in one's abilities.

Zimmerman et al. (1992) found that the combination of self-efficacy and goal-setting together accounted for 31% of the variance in high school course grades. The higher levels of academic efficacy and goal-setting on the part of honors students appear to feed directly into the observed advantage those same students display in regard to college GPA. Bresó et al. (2011) found that it is possible to design interventions that help students improve their perceived self-efficacy, which in turn can influence engagement and performance. The interactive nature of honors programs may expose participants to increased support and guidance from honors faculty and staff, leading to increased academic efficacy. There is also likely an enhanced sense of positive reinforcement for achievements, given the recognition that is often built into honors practices. The support and reinforcement create a feedback loop that results in continued academic goal setting and performance on the part of honors students.

Factors Predicting College GPA

Although the discussion to this point has emphasized the difference between honors students and honors-eligible nonparticipants, attention now turns to predictors of meaningful

outcomes for all high-ability students in the study. Hierarchical multiple regression was used to examine the background characteristics, perceptions of academic self-efficacy, and in- and out-of class engagement factors that predicted four dependent variables. Research question 4 focused on the impact of those factors on academic achievement as measured by cumulative college GPA.

Five variables were found to be significant predictors of college grade point for the high-ability students in the study, explaining 36.5% of the variance: (a) mother's educational attainment, (b) high school GPA, (c) academic efficacy, (d) honors involvement, and (f) other major. Composite ACT score showed positive predictive value in earlier models but dropped out with the inclusion of college experience variables. The positive predictive value of high school GPA should come as no surprise; it is in keeping with other research that found prior academic achievement to be the strongest predictor of college GPA (Robbins et al., 2004).

Mother's educational attainment was a positive predictor of college GPA, whereas father's level of education was not statistically significant. As established through previous research, higher levels of parental educational attainment correlate with higher GPAs on the part of college students (Pascarella et al., 2003; Pritchard & Wilson, 2003; Yazedjian et al., 2009). Specifying which parent has the most impact is less definitive in previous research, often varying by which parent's history is included in the study design. In the case of the current study, it is possible that the gender imbalance on the part of respondents may have created a response bias connected to the elevated impact of mother's educational level. Over three quarters (76%) of the survey respondents were female, and it is possible they identify more closely with the parent of the same gender. Additionally, it was found that mothers had

a higher percentage of earned college degrees than did fathers; perhaps students were particularly inspired or motivated by the achievements of their college-educated mothers.

Honors participation emerged from the regression as a significant predictor of college GPA. This finding provides confirmation for other empirical studies on the impact of honors involvement, which found a significant, positive difference in GPA between honors and nonhonors students of similar ability (Cosgrove, 2004a; Shushok, 2002). As previously asserted, higher levels of parental attainment, measures of prior ability, and levels of academic efficacy all appear to have a positive predictive value in the academic achievement of honors participants. However, future research is still needed to explain, in particular, what it is about honors participation that contributes to greater academic success as measured by GPA.

A major in one of the academic disciplines encompassed by the other major variable was a predictor of lower GPA. However, it must be noted that this category contains a wide range of majors including graphic technology, graphic communication, computer science, metal casting, electronic media, and health promotions among others. The variations among these majors are significant, and the diversity of disciplines represented makes it difficult to draw definitive conclusions on the basis of this regression. Further study is warranted to determine the influence of major type on college GPA.

Factors Predicting Critical Thinking Skills

Research question 5 examined the background characteristics, perceptions of academic self-efficacy, and in- and out-of-class engagement factors that predict the degree to which students report employing critical thinking skills. The literature review presented in chapter 2 very clearly represented the challenge of not only agreeing to a universal definition

of critical thinking, but also the difficulties in measuring it (Bok, 2006; Ennis, 1993; Facione, 1990). Given the complexity inherent in studying critical thinking, a construct was used as the dependent variable rather than using a single variable to adequately represent critical thinking skills. The composite variable was made up of five items that measured the frequency with which students engaged in certain behaviors: (a) thinking critically and analytically, (b) solving complex real-world problems, (c) working effectively with others, (d) learning effectively on your own, and (e) analyzing quantitative problems. This method of asking students to self-report their critical thinking behaviors was consistent with a study by Tsui (1999), which asked students to judge their growth in the ability to think critically.

Race/ethnicity. Before college experience variables were entered in the fourth block of the regression analysis, background and high school characteristics did not prove to be significant. The inclusion of college experiences caused race/ethnicity to emerge as a significant predictor. This indicates that White students are more likely to engage in behaviors that enhance critical thinking skills than are their non-White counterparts. As previously mentioned, the study institution has a profile in which only 7% of the student body identified as a racial or ethnic minority in 2010; 88.2% were White, 1.2% provided no response, and 3.6% were international students. The study institution considers increasing the representation of non-White students to be a strategic priority and has instituted recruitment efforts to that end.

The theory of social capital may come into play with the finding that being White is a positive predictor of using critical thinking skills. It is possible that underrepresented minorities in the study come from families, secondary schools, or community situations in which they received less encouragement to engage in behaviors this study associated with

critical thinking skills. However, with 95.3% ($n = 385$) of the respondents reporting they were White, extreme caution must be used when interpreting this finding. The significance of this variable may be due to the small number of minorities in the sample. Future research needs to examine this issue in a more diverse population.

Transfer credit hours. The greater the number of hours a student transferred to the institution, the weaker that student's application of critical thinking skills. All students who participated in this study entered the institution as first-year students directly from high school. Therefore, any transfer credit brought to the institution was earned through dual enrollment while in high school, Advanced Placement or other test credit, or through summer or online instruction from an outside institution. It is possible that for this population, completing transfer credits was motivated by an interest in earning additional credit hours to speed the time to graduation rather than an interest in educational enrichment. Those with particularly high numbers of transfer credits might be uniquely focused on completing their degrees for the extrinsic value and, therefore, be less likely to engage in the kind of challenging learning behaviors this study characterized as critical thinking skills.

Academic goals. The regression analysis also showed that those who set higher academic goals were more likely to report use of critical thinking skills. In order to fully understand this finding, it is worth disaggregating the construct to examine the individual survey items that made up the concept of academic goals. The survey asked students to rate their agreement with a number of statements: it's important to me that I improve my skills; one of my goals is to master a lot of new skills; it's important to learn a lot of new concepts; one of my goals is to learn as much as I can; and it's important to me that I thoroughly understand my class work. Rather than setting goals motivated by extrinsic rewards or

external recognition, this conceptualization of academic goals examines the intrinsic value of learning for the sake of self-improvement. Therefore, it is reasonable that those who value challenging themselves academically to learn concepts, master skills, and thoroughly understand their class work would also be more likely to report the level of engagement in learning that the use of critical thinking skills represents.

Classification year. Classification year was a positive predictor of use of critical thinking skills, which makes intuitive sense. As students advance through years in school, it should be more likely that they have increasingly practiced critical thinking skills. Well-known theories of college student development explain the advanced intellectual development one would expect to see in students as they gain advanced standing (Evans, Forney, & Guido-DiBrito, 1998). This finding is reassuring in the light of recent concerns within higher education that students are not being significantly changed as they move through their college years (Arum & Roksa, 2011).

Majors. Certain academic disciplines were positive predictors of the use of critical thinking skills; these included majors in biological science, business, physical science, and social science. It is reassuring to find that most fields of academic study promote and encourage the use of critical thinking skills, a finding one would expect to emerge. Perhaps the most troublesome finding is that students who majored in education were not found to use critical thinking skills at a higher rate than other students. This inevitably leads one to ask why education majors, who should place an exceptionally high value on academic inquiry, do not report more frequent use of critical thinking skills. Education majors should be continually exposed to coursework that emphasizes pedagogical techniques that encourage learners to use the skills encompassed by this construct. In order to prepare future teachers to

educate a new generation of learners, education preparation programs must challenge college students to engage in critical thinking activities themselves.

Student relationships. An exploratory factor analysis identified a student relationships construct which was a strong, positive predictor of critical thinking skills. The construct encompassed students' perceptions of their relationships with administrative personnel and offices, faculty members, and other students. It is conceivable that strong relationships throughout the institutional community provide students with the feeling of challenge and support necessary to engage in critical analysis and higher order thinking skills. Working effectively with others was also a component of the construct used as the critical thinking skills dependent variable. Working with others has a social or relational component that could be aided by the strength of one's interpersonal relationships. However, that does not account for the other elements of the construct that are more internal in nature such as learning effectively on one's own and thinking critically and analytically. It is possible that those reporting stronger relationships with faculty, staff, and other students are more likely to be engaged members of their campus community. That engagement and commitment to the institution may translate into more serious levels of dedication to a student's entire collegiate experience, including meaningful academic inquiry.

Diverse perspectives. Another construct identified by exploratory factor analysis was a significant positive predictor of use of critical thinking skills. The diverse perspectives composite focuses on conversations and interactions that cause one to look at things from new angles and consider experiences from someone else's point of view. The concepts of analysis, discussion, and interaction included in the critical thinking skills construct are also inherent in the behaviors captured by diverse perspectives. It appears that diversity of

thought and experience are good vehicles for the application of critical thinking. It is not a surprise that consideration of the many differences inherent in human diversity would inspire students to consider ideas from multiple perspectives and evaluate concepts more deeply and analytically.

This finding supports the notion that increasing diversity in honors programs, or in any academic setting, will result in a more enriching educational experience (Longo & Falconer, 2003). It also lends support to the efforts of faculty, staff, and administrators who actively seek to include diverse perspectives in their work, whether that takes place in classroom instruction or in outside-of-class learning opportunities. Diversity of experience can be represented in any number of ways including age, sexual orientation, gender, disability, race/ethnicity, socioeconomic status, country of origin, or any other unique viewpoint. The key element in this finding is that students actively engage in discussion or conversation around differences, resulting in more robust application of critical thinking skills.

Factors Predicting Academic Efficacy

Research question 6 sought to understand the background characteristics and college experiences that influence students' academic efficacy. Overall, the results associated with this research question were not surprising. The background characteristics of composite ACT score and high school GPA were significant positive predictors of academic efficacy. It was expected that prior academic success would result in a sense of confidence in one's abilities. The academic goals variable was also a strong predictor of academic efficacy. Those two items were moderately correlated, and it is reasonable to assume that those who report higher levels of intrinsic achievement goals would likely report confidence in their

academic abilities. The only additional college experience variable found to be a statistically significant predictor of academic efficacy was the composite variable of student relationships. This showed that students who reported greater strength in their relationships with faculty, staff, or other students had a greater sense of confidence in their academic abilities. Again, this finding might be related to the level of challenge and support provided by close relationships with members of the campus community.

There is clearly a connection between academic goals and academic efficacy. The correlation between the two variables was moderate at $r = .491$, which did not preclude the variable from being included in the regression. Even so, the lack of other significant predictors of academic efficacy raises the question of whether the academic goals variable might mask the influence of other meaningful influences. Another regression was run that omitted academic goals but maintained the other background, high school, and college experience variables. Composite ACT score, high school GPA, and student relationships were still found to be significant predictors, as discussed above. However, the removal of the academic goals variable resulted in the emergence of two additional significant composite variables: reflective learning and critical thinking skills. Similar to the critical thinking skills variable described earlier, the reflective learning variable is made up of items that signify the use of higher order thinking skills: examined the strengths and weaknesses of your own views; tried to understand someone else's views by imagining issue from their perspective; and learned something that changed the way you understand an issue or concept. The positive predictive value of these two composite variables indicates that those who engage in deep thinking and critical analysis have a greater sense of confidence in their academic

abilities. The act of analyzing and reflecting on one's learning has a positive impact on academic self-esteem.

Although removing academic goals from the model allowed two additional significant variables to emerge, it also reduced the variance explained from 30.3% when the academic goals variable was included to 16.7%. Including academic goals explains a much higher portion of the academic efficacy variable, but it masks the significance of reflective learning and critical thinking.

Factors Predicting Academic Goals

The final regression analysis was conducted to respond to research question 7, which looked at the background characteristics and college experiences that influence students' academic goals. Gender was a positive predictor of academic goals, with females being more likely than males to set high academic goals. However, as with the earlier discussion of the influence of race/ethnicity on critical thinking skills, caution is warranted with interpretation of this variable. The disproportionate number of females in the study may have influenced the finding. Future research needs to examine this issue in a sample with greater gender balance.

As would be expected, academic efficacy was a strong predictor of academic goals. Bandura (1977) explained the impact efficacy can have on people including on "how much effort they will expend" (p. 194). Students who feel more confident in their academic abilities will be more likely to set high goals for academic attainment and expend more energy toward achieving those goals. Breso et al. (2011) found that interventions can help students improve their perceived self-efficacy. Faculty and administrators should be aware

of opportunities to help students improve their academic self-confidence, which in turn may inspire them to strive for higher achievement.

Four additional college experience variables were significant with regard to academic goals: classification year, undecided major, reflective learning, and critical thinking skills. In the case of classification year it was found that, as years in college advance, the strength of students' academic goals decrease. Academic goals was conceptualized as an intrinsic value of learning and achievement, made up of items such as it's important to me that I improve my skills, one of my goals is to learn as much as I can, and it's important to me that I thoroughly understand my class work. Given this intrinsic goal orientation, the negative influence of classification year may indicate a shift from the general learning goals one establishes when new to college to a professional or career focus when closer to graduation. It may also stem from burnout or cynicism about working within the educational system. As time in college progresses, students may find themselves tempted to just "get the grade" rather than push themselves to fully engage in challenging work.

Being undecided about one's major also had a negative impact on academic goals, indicating that those still searching for an intellectual focus may be left without a clear sense of academic purpose. This finding is a concern, considering those undecided about a major are likely engaged in general education or core coursework. Do those engaged primarily in general education have lower levels of intrinsic drive to learn as much as possible or thoroughly understand course content? If so, they may be missing the connections general education seeks to provide across multiple fields of study and the application of that thought to the wider world. The institution should help undecided students recognize the intellectual

value of general education curriculum apart from one's major focus and encourage stronger intrinsic learning goals regardless of major.

Those who engaged in reflective learning and critical thinking developed stronger academic goals. This is similar to what was found in the examination of academic efficacy after academic goals was removed from the model. The two composite variables are similar, both representing an engagement in deep thinking and critical analysis. Higher order thinking skills leads students to have a stronger orientation toward learning goals. Analyzing concepts from multiple perspectives promotes an increased commitment to learning, understanding, and improving skills. Few educators would argue that the use of reflective learning and critical thinking skills results in better learning outcomes; it is also apparent that they influence students to set higher learning goals for themselves.

Open-Ended Responses

The final research question examined how high-ability students characterize their involvement in, or their decision not to participate in, a college honors program. This question provided the opportunity to analyze qualitative feedback provided for two open-ended survey questions. Responses were organized under two main subjects: (a) opting not to participate in the honors program and (b) impact of membership in the honors program.

Opting not to participate. Four meaningful themes emerged from the open-ended responses of those who indicated they did not accept the invitation to participate in the honors program upon their admission to the university: (a) perception of extra work with inadequate benefits, (b) concerns about time commitment and/or increased stress, (c) a lack of knowledge about the program or misunderstanding of requirements, and (d) lack of confidence in ability. Two of the themes, perception of extra work with inadequate benefits

and concerns about time commitment and/or increased stress, point to a misunderstanding of the value and intent of honors programming. Rather than recognizing opportunities for academic advancement, nonparticipants saw work, not reward. Honors courses were interpreted as extra requirements rather than special offerings, and the possibility of enhanced academic challenge was perceived to be a drawback. It is possible that additional conversations through recruitment or advising could have helped some nonhonors students more fully understand the intent and nature of the honors program. However, it is likely that some respondents are simply not motivated by the in- and out-of-class learning opportunities provided by the program. With limited resources, both monetary and human, program administrators may be well-served to focus on identifying students whose academic values and goals most closely align with the services an honors program provides.

Students also communicated a lack of knowledge about the program or misunderstanding of requirements. Students appeared more likely to ignore their honors invitation when they did not fully understand the nature of the program. Some mentioned they had not spoken directly to anyone who could provide additional information or clarification about honors membership. Additional recruitment time spent by honors staff in communication with prospective students could help alleviate this issue. This finding also emphasizes the importance of having a supportive campus community that understands the mission of the honors program and will communicate it to students with whom they come in contact. This theme may also be tied to the point above, as it represents the difficult task of communicating the meaning and value of an honors experience to students who are less motivated by the intrinsic nature of its rewards.

The final theme identified from feedback from students who did not accept their honors invitation was lack of confidence in ability. Given this study's finding that honors participants had parents with significantly higher levels of education than did honors-eligible nonparticipants as well as higher cumulative ACT scores and high school GPAs, this theme should be given careful consideration. There may be students with real promise who elect not to participate due to inaccurate perceptions of their abilities or assumptions about the level of difficulty presented by honors coursework. This could be alleviated through increased communication at the recruitment stage about the level of challenge one can expect in honors coursework as well as the resources and support the program provides. Honors-eligible students might also benefit from additional encouragement about their abilities and reassurance about their precollege preparation in order to bolster their levels of academic self-efficacy.

Impact of membership. Students who were current members of the institution's honors program provided feedback about the impact of that membership on their college experiences. Five meaningful themes emerged: (a) access to smaller, discussion-based courses, (b) academic/intellectual growth, (c) social connections/relationships, (d) no real impact, and (e) defining influence. Comments regarding academic influence abounded, resulting in the two major themes of access to smaller, discussion-based courses and academic/intellectual growth. Students communicated an appreciation for taking part in classes that place particular attention on discussion, interaction, and academic challenge. The ability to engage in discussion was repeated over and over again, exemplified by one student who said, "I have had so much fun in my honors classes, they are what I thought college classes would be more like, with discussions and emphasis on learning, not

repeating.” Study respondents appeared to recognize the pedagogical value of actively engaging with their classmates in an analysis of course material. This is supported by the study’s finding that honors participants reported greater awareness of diverse perspectives than their nonhonors counterparts. The diverse perspectives construct placed particular emphasis on conversing about human differences, an opportunity more readily available in honors classrooms than presented in some traditional ones. Participation in small, discussion-based classes appears to contribute directly to students’ perceptions that honors involvement supports their intellectual growth and enhances their love of learning.

As much as students commented about academic benefits of honors participation, their social connections/relationships were also important. Many participants described meaningful connections in the honors community, and friendship with similarly motivated students was often mentioned as a benefit. Associations with faculty also were mentioned, for example by the student who said, “I’ve also had a chance to develop good relationships with professors who challenge me in a way that would have been difficult in a regular class.” These qualitative findings are in keeping with the impact student relationships were found to have on academic efficacy and critical thinking skills. Good-quality relationships with members of the academic community appear not only to provide a social benefit, but also to support students’ educational achievement.

The final two themes that emerged from the open-ended comments of current honors program members were strangely disparate; some students indicated their involvement has had no real impact, whereas others spoke of their involvement as a defining influence on their college experience. Those who reported that participation had not made a meaningful impact often mentioned minimal involvement with honors courses or activities. One stated,

“I don't feel very involved with the honors program,” and another said, “I have done very little with the program thus far.” Such comments can be compared to those of students who spoke about honors involvement as a defining influence and recognized that their college experience would have been dramatically different without the academic, social, and leadership engagement their participation has provided. These contrasting student experiences speak to the presence of a quality of honors involvement or participation that this study did not capture. Membership in an honors program, alone, may not create a meaningful effect. The qualitative results of this study point to the likelihood that the intensity of one's honors experience plays a consequential role. Future research should attempt to define and measure the level of honors participation or the intensity of experience that is most advantageous for positive student outcomes.

Implications for Policy and Practice

This study was conducted to determine any significant differences between honors students and their honors-eligible, nonparticipating counterparts as well as to examine major influences on GPA, critical thinking skills, academic efficacy, and academic goals of high-ability college students. The study revealed some noteworthy findings that provide higher education administrators and practitioners with implications to consider for policy and practice.

Policy

Chapter 4 summarized a plethora of results stemming from the study's eight research questions. This section will focus on three primary areas in which the study's findings are particularly meaningful for higher education policy: fostering critical thinking, embracing diversity, and encouraging academic efficacy and goal setting.

Fostering critical thinking. Higher education literature presents a broad consensus about the importance of educating students to be critical thinkers. Bok's (2006) finding that 90% of faculty nationwide cited critical thinking as their most important educational aim underscores this idea. But despite agreement on the importance of critical thinking to an educated citizenry, there still are concerns about the level of influence higher education has on student learning and use of higher-order thinking skills (Arum & Roksa, 2011). Information from this study regarding experiences that affect use of critical thinking skills among high-ability students can help institutions increase critical thinking skills among all students. A renewed commitment to intentional curricular design and delivery is imperative to this end.

Diverse perspectives, student relationships, particular majors, advanced classification year, and academic goals were all found to be positive predictors of the use of critical thinking skills. However, one of the most telling findings of this study stemmed from a variable that was not found to be significant. Certain academic disciplines were found to positively influence the use of critical thinking skills, but having an education major did not. At a time when public policy is so focused on the improvement of the education system in the United States, it is incumbent upon teacher preparation programs to re-evaluate their curricula and pedagogical techniques to ensure future teachers are being adequately challenged.

Curricula designed to encourage critical thinking is only one step. Support must be provided for faculty development to share pedagogical techniques that encourage the use of critical thinking skills. As stakeholders demand ever-increasing attention on outcomes to demonstrate what students gain from higher education, administrators must make funding

and policy decisions to support quality teaching that encourages students to engage in critical inquiry, thereby leading to desired student outcomes.

Embracing diversity. This study clearly revealed that diversity of thought and experience are good vehicles for the application of critical thinking. Institutions of higher education must provide accessible opportunities for students to be exposed to diverse experiences, whether on home campuses, throughout the region or country, or around the world. The value of diversity must be demonstrated through the alignment of institutional resources. Examples include scholarship support for underrepresented populations, curricular innovations that examine human differences, clear institutional policies regarding recruitment and retention efforts for diverse populations, and evaluation and improvement of campus climates.

There should be little argument that increasing diversity in honors programs, or any academic setting, will result in a more enriching educational experience for all members of the campus community (Longo & Falconer, 2003). The survey items used in this study indicated that diversity of experience can be represented in any number of ways.

Administrators should approach diversity from multiple perspectives, including age, sexual orientation, gender, disability, race/ethnicity, socioeconomic status, country of origin, or other unique viewpoint. Institutions should articulate a definition of diversity that encompasses all types of human difference. Although race or ethnicity is often thought of first when diversity is mentioned, a multifaceted approach would be particularly helpful in settings with less racial or ethnic diversity. As emphasis is placed on the overarching value the institution places on diverse perspectives, a supportive culture will be developed. This articulation of value for diverse perspectives will result in a campus climate that provides

underlying support for an institution's ongoing efforts to recruit and retain underrepresented populations.

Encouraging academic efficacy and goal setting. The critical impact of academic efficacy and academic goals was evident throughout this study. Academic efficacy was a significant predictor of college GPA, and academic goals were a significant predictor of use of critical thinking skills. Additionally, academic efficacy predicted goals and vice versa. It is clear that students who feel more confident in their academic abilities will be more likely to set high goals for academic attainment and expend more energy toward achieving those goals. Institutional policies must recognize these important influences on student learning and support their development.

Student efficacy and goal setting can clearly be promoted through the individual attention provided by academic advising. Those who experience meaningful developmental advising often describe a mentoring relationship that goes beyond prescriptive instructions on which classes fulfill certain graduation requirements. Although professional advisors likely understand the influence they have on student development, faculty advisors need training to develop the knowledge and skills necessary to encourage academic self-confidence and inspire students to set higher goals. It can be challenging to convince faculty that developmental advising has a place among their other professional responsibilities. Therefore, institutions should modify their reward structures to recognize effective faculty advisors.

Practice

Several of the study's findings can contribute to innovations in the day-to-day practice of administrators, faculty, and student affairs professionals. Although some findings

are specific to administration of honors programs, other items are more widely applicable to higher education practices as a whole.

Honors recruitment practices. As honors program administrators seek to recruit the best and brightest students, they should be aware that improved communication could help prospective students more fully understand the intent and nature of honors programming. Recruitment materials must clearly articulate program purposes and goals. Qualitative findings indicated that some prospective students lacked clarity about program offerings, requirements, and benefits. Although staff time and program resources are likely at a premium, it may be beneficial for honors staff to dedicate more recruitment time to individual or group conversations. This proactive effort might help prospective students to more fully understand the level of challenge to expect from honors involvement as well as the intrinsic and extrinsic rewards one can expect from active participation.

Honors participants were more likely to experience diverse perspectives than were honors-eligible nonparticipants. Honors administrators should not interpret this finding as an opportunity to rest on their laurels; rather they should be inspired to redouble recruitment efforts to enhance the diversity of their programs. If honors programs can be successful in emphasizing diversity of thought and opinion in the classroom, they should work toward serving as leaders in the university's larger efforts to create an inclusive and welcoming campus community.

Active participation among honors students. The study revealed an apparent difference in the quality of experience between students who were actively engaged in honors coursework and activities and those who were less committed. Although future research is needed to more fully understand this difference in experience, honors faculty and

directors should communicate what is known about the value of active involvement to their members. Students should be guided through a deliberate process of identifying personal learning goals and then be encouraged to use program offerings to achieve their academic and personal goals. In this way, active engagement of honors students can be emphasized and encouraged.

First-generation students. Discussion of the study results often related to the interplay of parental educational attainment, the delivery of social capital, and influences on students' level of academic efficacy. Honors students had higher levels of parental educational attainment and higher levels of academic efficacy than did honors-eligible nonparticipants. It appears that social capital plays a serious role in bringing many high-ability students through the doors of honors programs. This leaves program administrators with an imperative to do more to identify students who may lack traditional forms of social capital and provide them with additional support and instruction during the college transition. Although this is important for high-ability students weighing the possibility of honors involvement, it is also true for all first-generation students whose parents or family support systems lack experience and familiarity with the college process.

Encourage active and engaged learners. Faculty and student affairs professionals must continue to encourage students to be active and engaged learners. This study demonstrated that the ability to engage in meaningful intellectual discussions contributes to diverse perspectives and use of critical thinking skills. Although it can be challenging for faculty to inspire students to speak up in traditional classroom settings, the opportunity for active learning, discussion, and debate need not be restricted to honors classes alone. Administrators should be held accountable for policy-level decisions that support active

learning environments, but faculty and staff also can work together to make meaningful changes to the way students learn. Faculty must encourage one another to use active pedagogies in the classroom, and student affairs professionals should be more intentional about including discussion and critical analysis of ideas in their extra- and cocurricular work with students.

Recommendations for Future Research

Numerous questions about honors program involvement and high-ability student learning remain, leaving much opportunity for future research. Additional exploration should be conducted with a larger, more diverse sample to correct the limitations in the current study regarding race/ethnicity and gender. A larger number of cases would also allow for the sample to be split between honors and nonhonors students at the regression stage to allow for a comparison of influences between groups.

The current study, in confirmation of prior empirical research, found honors participants to have higher collegiate GPAs than nonhonors students of similar ability levels. Does the difference stem from the emphasis placed on achievement or the additional support provided by the honors community? Could factors such as the higher levels of parental attainment, measures of prior ability, and higher levels of academic efficacy revealed in this study influence this finding? Future research should examine, in particular, what it is about honors participation that contributes to greater academic success as measured by GPA. The qualitative results of this study point to the likelihood that the intensity of one's honors experience plays a consequential role in the impact of that involvement. Future research should attempt to define and measure the intensity of experience or the level of honors participation necessary to maximize positive student outcomes.

Conclusion

This study was conducted in an effort to make a meaningful contribution to the body of honors-related scholarship. The quantitative design allowed for multiple comparisons between characteristics held by honors participants and nonparticipants, revealing important differences between those who elected to participate in the honors program and those who were eligible but declined to enroll. Previous studies in the field have not utilized a conceptual model in which background characteristics, college motivation, and in- and out-of-class engagement factors are used to predict academic achievement, use of critical thinking skills, academic efficacy, and academic goals. These analyses resulted in new insights regarding the factors that contribute to meaningful outcomes for high-ability students. Study findings can be used to further the collective understanding about important curricular and co-curricular behaviors, thereby maximizing the learning potential of high-ability students.

It is no secret that high-ability students have much to contribute to college campuses. Their engagement and motivation in the classroom often spill over into commitment to student organizations, research experiences, and community service work. Beyond these contributions to the life of the university, the selectivity of a student body can boost college rankings and, in doing so, improve institutional reputations. In addition, high-ability students are likely to become high-achieving alumni, providing longstanding benefits to their institutions by way of development and alumni relations. Honors programs can provide meaningful ways for institutions to harness student energy, encourage active learning and intellectual growth, and establish a sense of community that engenders a long-term commitment to the institution on the part of high-ability students.

This dissertation opened with a statement that higher education is an investment in one's future, for career attainment as well as for personal growth and self-improvement. It is also an investment in our collective futures, as the problems of our times are too challenging to overcome without an educated citizenry. At a time when society's commitment to higher education is often called into question, encouragement of and recognition for academic excellence has never been more important.

This study established a connection between honors involvement and student experiences with diverse perspectives, academic efficacy, and academic goal-setting. Such findings provide confirmation that participation in honors programs can enrich the academic experience of high-ability students. In an age of increasing competition among higher education providers, this information can help institutions attract the attention of students of exceptional potential who have much to contribute to the social and intellectual life of their campus communities. Moreover, as these talented students move from our campuses into new spheres of influence through leadership in schools, businesses, government, and community organizations, their academic achievements will provide a foundation for the meaningful roles they will play in society.

APPENDIX A. REGENTS ADMISSIONS INDEX

Admissions index = (2 x ACT composite score) + (1 x high school rank) + (20 x high school grade point average) + (5 x number of high school courses completed in the core subject areas)

APPENDIX B. SURVEY OF ACADEMIC ENGAGEMENT AND EFFICACY

Thank you for completing this survey about your college experience. Items in the survey are used with permission from the National Survey of Student Engagement (NSSE)¹ and the Patterns of Adaptive Learning Survey (PALS). Completing the survey should take approximately 15 minutes and is completely voluntary. Your responses will remain confidential. If you have any questions you can contact the principle investigator at jessica.moon@uni.edu.

Section One – Academic Engagement and Learning Activities

1. In your experience at your institution during the current school year, about how often have you done each of the following? (Very often, Often, Sometimes, Never)
 - a. Asked questions in class or contributed to class discussions
 - b. Made a class presentation
 - c. Prepared two or more drafts of a paper or assignment before turning it in
 - d. Worked on a paper or project that required integrating ideas or information from various sources
 - e. Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments
 - f. Come to class without completing readings or assignments
 - g. Worked with other students on projects **during class**
 - h. Worked with classmates **outside of class** to prepare class assignment
 - i. Put together ideas or concepts from different courses when completing assignments or during class discussions
 - j. Tutored or taught other students (paid or voluntary)
 - k. Participated in a community-based project (e.g., service learning) as part of a regular course
 - l. Used an electronic medium (listserv, chat group, Internet, instant messaging, etc.) to discuss or complete an assignment
 - m. Used e-mail to communicate with an instructor
 - n. Discussed grades or assignments with an instructor
 - o. Talked about career plans with a faculty member or advisor
 - p. Discussed ideas from your readings or classes with faculty members outside of class
 - q. Received prompt written or oral feedback from faculty on your academic performance
 - r. Worked harder than you thought you could to meet an instructor's standards or expectations
 - s. Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)

¹ Items 1-4 and 6-15 used with permission from The College Student Report, National Survey of Student Engagement, Copyright 2001-11 The Trustees of Indiana University

- t. Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)
- u. Had serious conversations with students of a different race or ethnicity than your own
- v. Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values
2. During the current school year, how much has your coursework emphasized the following mental activities? (Very much, Quite a bit, Some, Very little)
- a) **Memorizing** facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form
- b) **Analyzing** the basic elements of an idea, experience, or theory, such as examining a particular case or situation, in depth and considering its components
- c) **Synthesizing** and organizing ideas, information, or experiences into new, more complex interpretations and relationships
- d) **Making judgments** about the value of information, arguments, or methods, such as examining how others gathered and interpreted data and assessing the soundness of their conclusions
- e) **Applying** theories or concepts to practical problems or in new situations
3. During the current school year, about how much reading and writing have you done? (None, 1-4, 5-10, 11-20, More than 20)
- a) Number of assigned textbooks, books, or book-length packs of course readings
- b) Number of books read on your own (not assigned) for personal enjoyment or academic enrichment
- c) Number of written papers or reports of **20 pages or more**
- d) Number of written papers or reports **between 5 and 19 pages**
- e) Number of written papers or reports of **fewer than 5 pages**
4. Select the circle that best represents the extent to which your examinations during the current school year have challenged you to do your best work.
- (Very little/1 to Very much/7)

Section Two – Academic Efficacy and Goals

5. To what extent do you believe the following statements to be true?
- | | | | | |
|-----------------|---|---------------|---|-----------|
| 1 | 2 | 3 | 4 | 5 |
| Not at all true | | Somewhat True | | Very True |
- a) It's important to me that I learn a lot of new concepts this year.
- b) One of my goals in college is to learn as much as I can.
- c) I'm certain I can master the skills taught in my courses this year.

- d) I'm certain I can figure out how to do the most difficult course work.
- e) One of my goals is to master a lot of new skills this year.
- f) I can do even the hardest work in college if I try.
- g) It's important to me that I thoroughly understand my class work.
- h) It's important to me that I improve my skills this year.
- i) I can do almost all the work in college if I don't give up.
- j) Even if the work is hard, I can learn it.

Section Three – Enriched Learning and Quality of Relationships

6. During the current school year, about how often have you done each of the following?
(Very often, Often, Sometimes, Never)

- a) Attended an art exhibit, play, dance, music, theater, or other performance
- b) Examined the strengths and weaknesses of your own views on a topic or issue
- c) Tried to better understand someone else's views by imagining how an issue looks from his or her perspective
- d) Learned something that changed the way you understand an issue or concept

7. Which of the following have you done or do you plan to do before you graduate from your institution? (Done, Plan to do, Do not plan to do, Have not decided)

- a) Practicum, internship, field experience, co-op experience, or clinical assignment
- b) Community service or volunteer work
- c) Work on a research project with a faculty member outside of course or program requirements
- d) Foreign language coursework
- e) Study abroad
- f) Independent study or self-designed major
- g) Culminating senior experience (capstone course, senior project or thesis, comprehensive exam, etc.)

8. Select the circle that best represents the quality of your relationships with people at your institution. (Unfriendly, Unsupportive, Sense of alienation/1, Friendly, Supportive, Sense of belonging/7)

- a) Relationships with **other students**
- b) Relationships with **faculty members**
- c) Relationships with **administrative personnel and offices**

9. About how many hours do you spend in a typical 7-day week doing each of the following?
(0, 1-5, 6-10, 11-15, 16-20, 21-25, 26-30, More than 30)

- a) Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)
- b) Participating in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)

10. To what extent has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas? (Very much, Quite a bit, Some, Very little)

- a) Acquiring a broad general education
- b) Writing clearly and effectively
- c) Speaking clearly and effectively
- d) Thinking critically and analytically
- e) Analyzing quantitative problems
- f) Working effectively with others
- g) Learning effectively on your own
- h) Understanding people of other racial and ethnic backgrounds
- i) Solving complex real-world problems

Section Four – Satisfaction and Demographics

11. Overall, how would you evaluate the quality of academic advising you have received at your institution? (Excellent, Good, Fair, Poor)

12. How would you evaluate your entire educational experience at this institution? (Excellent, Good, Fair, Poor)

13. If you could start over again, would you go to the same institution you are now attending?
(Definitely yes, Probably yes, Probably no, Definitely no)

14. Did you begin college at your current institution or elsewhere? (Started here, Started elsewhere)

15. What is the highest level of education that your parent(s) completed? (Mark one box per column.)

Father Mother

- Did not finish high school
- Graduated from high school
- Attended college but did not complete degree
- Completed an associate's degree (A.A., A.S., etc.)
- Completed a bachelor's degree (B.A., B.S., etc.)
- Completed a master's degree (M.A., M.S., etc.)
- Completed a doctoral degree (Ph.D., J.D, M.D., etc.)

16. Were you invited to participate in your institution's honors program upon your admission to the university? (yes, no, I don't know)

If yes, did you accept to the invitation? (yes, no, I was placed on a waiting list)

If yes, was your membership required as part of a scholarship offer? (yes, no, I don't know)

If no, Why did you opt not to participate in the honors program?

17. Are you currently a member of your institution's honors program? (yes, no, I don't know)

If yes, how has your membership impacted your college experience?

18. Are there any comments you would like to add?

Thank you for your participation!

APPENDIX C. INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 8/22/2011

To: Jessica Moon
3920 Knoll Ridge Dr
Cedar Falls, IA 50613

CC: Dr. Frankie Santos Laanan
N225A Lagomarcino

From: Office for Responsible Research

Title: Honors Program Involvement at a Midwestern Comprehensive University: The Influence on Academic Engagement and Critical Thinking Skills

IRB Num: 11-365

Approval Date: 8/19/2011 **Continuing Review Date:** 8/18/2012

Submission Type: New **Review Type:** Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University. Please refer to the IRB ID number shown above in all correspondence regarding this study.

Your study has been approved according to the dates shown above. To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting the "Continuing Review and/or Modification" form.
- **Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems** involving risks to subjects or others.
- **Stop all research activity if IRB approval lapses**, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Research investigators are expected to comply with the principles of the Belmont Report, and state and federal regulations regarding the involvement of humans in research. These documents are located on the Office for Responsible Research website <http://www.compliance.iastate.edu/irb/forms/> or available by calling (515) 294-4566.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

APPENDIX D. CORRELATION MATRIX

	Total cumulative college GPA	ethnicity coded white/nonwhite	gender	father's education recoded with missing cases	mother's education recoded with missing cases	cumulative ACT	High school GPA	earned transfer hours	academic efficacy	academic goals	Honors participation	deciding majors	arts/humanities majors	bioscience majors
collGPA	1.000	.026	.083	.058	.177	.184	.486	.009	.312	.188	.255	-.004	.086	.009
ethnicity	.026	1.000	-.022	-.028	-.004	.080	-.035	.045	-.054	-.062	-.048	.036	-.027	.001
gender	.083	-.022	1.000	.010	.040	-.110	.063	-.007	-.018	.169	-.058	.009	.148	.025
fathed	.058	-.028	.010	1.000	.509	.116	-.038	-.055	-.060	-.036	.137	-.105	.089	-.078
mothed	.177	-.004	.040	.509	1.000	.161	.055	.033	-.056	-.079	.162	-.041	.096	-.015
ACT	.184	.080	-.110	.116	.161	1.000	.053	-.040	.172	.051	.340	-.055	.025	.009
HSGPA	.486	-.035	.063	-.038	.055	.053	1.000	.038	.127	.030	.136	-.036	-.040	.033
transhrs	.009	.045	-.007	-.055	.033	-.040	.038	1.000	-.051	.011	-.036	.027	-.084	.042
acadeff	.312	-.054	-.018	-.060	-.056	.172	.127	-.051	1.000	.491	.117	-.002	.115	.008
acadgoal	.188	-.062	.169	-.036	-.079	.051	.030	.011	.491	1.000	.098	-.085	.122	.062
honors	.255	-.048	-.058	.137	.162	.340	.136	-.036	.117	.098	1.000	-.024	.109	.040
deciding	-.004	.036	.009	-.105	-.041	-.055	-.036	.027	-.002	-.085	-.024	1.000	-.087	-.065
artshum	.086	-.027	.148	.089	.096	.025	-.040	-.084	.115	.122	.109	-.087	1.000	-.208
biosci	.009	.001	.025	-.078	-.015	.009	.033	.042	.008	.062	.040	-.065	-.208	1.000
business	-.084	.092	-.081	-.092	-.136	-.057	.052	.017	-.055	-.031	-.161	-.070	-.223	-.169
edmajors	.124	-.012	.119	.147	.082	-.045	.038	-.003	-.069	-.018	-.046	-.060	-.189	-.143
physci	-.047	-.088	-.229	.041	.023	.120	.025	-.054	-.034	-.118	.027	-.064	-.202	-.153
socsci	.003	-.047	-.030	-.076	-.047	-.013	-.107	.078	-.018	-.040	.039	-.063	-.200	-.151
othermaj	-.110	.071	.025	.015	.010	-.018	.025	.010	.032	.042	-.013	-.054	-.172	-.130
stufacint	.089	-.068	-.023	-.065	-.062	-.006	-.085	.068	.243	.233	.045	-.042	.063	.049

	reflective	.082	.023	-.010	.015	.046	.035	-.017	.057	.233	.306	.007	-.021	.215	-.110
	sturels	.124	-.068	.050	-.013	-.032	.013	.060	.043	.268	.183	.033	-.099	.118	.030
	div_exp	.103	-.116	-.002	.036	.079	.027	-.047	-.041	.254	.266	.106	-.047	.212	-.051
	actcollab	.064	-.032	.006	-.003	.004	-.008	.006	.002	.182	.181	.003	-.051	-.003	.051
	crit_think	.121	.044	.003	-.141	-.148	-.013	.064	-.082	.299	.303	.000	-.061	-.040	.045
	collGPA	.	.314	.064	.144	.001	.000	.000	.436	.000	.000	.000	.473	.056	.431
	ethnicity	.314	.	.340	.306	.471	.072	.259	.204	.161	.126	.189	.257	.311	.489
	gender	.064	.340	.	.430	.232	.022	.125	.452	.372	.001	.143	.437	.003	.321
	fathed	.144	.306	.430	.	.000	.017	.240	.157	.137	.253	.006	.027	.051	.076
	mothed	.001	.471	.232	.000	.	.001	.157	.273	.151	.073	.001	.224	.039	.390
	ACT	.000	.072	.022	.017	.001	.	.163	.230	.001	.173	.000	.157	.326	.435
	HSGPA	.000	.259	.125	.240	.157	.163	.	.243	.010	.292	.006	.253	.232	.274
	transhrs	.436	.204	.452	.157	.273	.230	.243	.	.174	.420	.256	.308	.061	.220
	acadeff	.000	.161	.372	.137	.151	.001	.010	.174	.	.000	.016	.485	.017	.441
	acadgoal	.000	.126	.001	.253	.073	.173	.292	.420	.000	.	.035	.060	.012	.128
	Honors	.000	.189	.143	.006	.001	.000	.006	.256	.016	.035	.	.331	.023	.233
	deciding	.473	.257	.437	.027	.224	.157	.253	.308	.485	.060	.331	.	.056	.115
	artshum	.056	.311	.003	.051	.039	.326	.232	.061	.017	.012	.023	.056	.	.000
	bioscie	.431	.489	.321	.076	.390	.435	.274	.220	.441	.128	.233	.115	.000	.
	business	.062	.046	.068	.045	.006	.147	.171	.379	.156	.285	.001	.098	.000	.001
	edmajors	.011	.411	.014	.003	.066	.207	.241	.476	.102	.368	.201	.137	.000	.004
	physci	.194	.054	.000	.223	.334	.014	.324	.160	.265	.015	.311	.121	.000	.002
	socsci	.479	.193	.289	.081	.194	.405	.024	.077	.369	.229	.239	.124	.000	.003
	othermaj	.021	.097	.323	.389	.424	.368	.320	.426	.278	.219	.405	.160	.001	.008
	stufacint	.052	.107	.336	.117	.127	.454	.058	.104	.000	.000	.203	.218	.124	.184
	reflective	.065	.337	.428	.389	.198	.261	.380	.147	.000	.000	.448	.347	.000	.022
	sturels	.011	.105	.180	.404	.280	.408	.136	.217	.000	.000	.275	.035	.015	.293
	div_exp	.029	.017	.489	.256	.073	.313	.195	.227	.000	.000	.025	.193	.000	.176
	actcollab	.121	.278	.453	.481	.473	.441	.456	.483	.000	.000	.476	.173	.478	.173
	crit_think	.013	.209	.476	.005	.003	.406	.120	.065	.000	.000	.499	.130	.233	.205
N	collGPA	339	339	339	339	339	339	339	339	339	339	339	339	339	339
	ethnicity	339	339	339	339	339	339	339	339	339	339	339	339	339	339
	gender	339	339	339	339	339	339	339	339	339	339	339	339	339	339
	fathed	339	339	339	339	339	339	339	339	339	339	339	339	339	339

Sig. (1-tailed)

		businessmajors	edmajors	physciencemajors	socsciencemajors	othermajors	student and faculty interaction	reflective learning	student relationships	diverse experiences	active and collaborative learning	critical thinking
Pearson	collGPA	-.084	.124	-.047	.003	-.110	.089	.082	.124	.103	.064	.121
Correlation	ethnicity	.092	-.012	-.088	-.047	.071	-.068	.023	-.068	-.116	-.032	.044
	gender	-.081	.119	-.229	-.030	.025	-.023	-.010	.050	-.002	.006	.003
	fathersed	-.092	.147	.041	-.076	.015	-.065	.015	-.013	.036	-.003	-.141
	mothersed	-.136	.082	.023	-.047	.010	-.062	.046	-.032	.079	.004	-.148
	ACT cumulative	-.057	-.045	.120	-.013	-.018	-.006	.035	.013	.027	-.008	-.013
	HSGPA	.052	.038	.025	-.107	.025	-.085	-.017	.060	-.047	.006	.064
	transferhours	.017	-.003	-.054	.078	.010	.068	.057	.043	-.041	.002	-.082
	academicdiff	-.055	-.069	-.034	-.018	.032	.243	.233	.268	.254	.182	.299
	academicgoals	-.031	-.018	-.118	-.040	.042	.233	.306	.183	.266	.181	.303
	honors	-.161	-.046	.027	.039	-.013	.045	.007	.033	.106	.003	.000
	decidingmajors	-.070	-.060	-.064	-.063	-.054	-.042	-.021	-.099	-.047	-.051	-.061
	artshumanities	-.223	-.189	-.202	-.200	-.172	.063	.215	.118	.212	-.003	-.040
	biosciencemaj	-.169	-.143	-.153	-.151	-.130	.049	-.110	.030	-.051	.051	.045
	businessmajors	1.000	-.153	-.164	-.162	-.140	-.060	-.099	-.005	-.101	.016	.083
	edmajors	-.153	1.000	-.139	-.137	-.118	-.054	-.016	-.019	-.009	.025	-.088
	physciencemaj	-.164	-.139	1.000	-.147	-.127	-.010	.005	-.032	-.088	-.023	.048
	socsciencemaj	-.162	-.137	-.147	1.000	-.125	-.041	.024	-.084	.065	-.057	-.013
	othermajors	-.140	-.118	-.127	-.125	1.000	.067	-.055	.014	-.051	.017	-.009
	studentfac_int	-.060	-.054	-.010	-.041	.067	1.000	.276	.380	.359	.434	.356
	reflective_learn	-.099	-.016	.005	.024	-.055	.276	1.000	.140	.436	.080	.180
	student_rel	-.005	-.019	-.032	-.084	.014	.380	.140	1.000	.251	.293	.400
	diverse_exp	-.101	-.009	-.088	.065	-.051	.359	.436	.251	1.000	.293	.334
	activecoll_learn	.016	.025	-.023	-.057	.017	.434	.080	.293	.293	1.000	.324
	criticalthinking	.083	-.088	.048	-.013	-.009	.356	.180	.400	.334	.324	1.000

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