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Do Honors Programs Make a Difference during the First Year of College? The Development of Critical Thinking Skills and Exposure to Good Practices in Undergraduate Education

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DO HONORS PROGRAMS MAKE A DIFFERENCE DURING THE FIRST YEAR OF COLLEGE? THE DEVELOPMENT OF CRITICAL THINKING SKILLS AND EXPOSURE TO GOOD PRACTICES IN UNDERGRADUATE EDUCATION

DO HONORS PROGRAMS MAKE A DIFFERENCE DURING THE FIRST YEAR OF
COLLEGE? THE DEVELOPMENT OF CRITICAL THINKING SKILLS AND EXPOSURE
TO GOOD PRACTICES IN UNDERGRADUATE EDUCATION

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Higher Education

by

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Bachelor of Science in Business Administration, 2004
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ABSTRACT

This longitudinal study analyzed pretest-posttest data to 1) examine the influence of honors programs on first-year college students' critical thinking skills, 2) to determine whether students in honors programs receive more exposure to good practices in undergraduate education than their non-honors peers, and 3) to assess the effect of good practices on critical thinking. The quasi-experimental study also investigated whether the influence of honors programs on critical thinking skills varied in direction and magnitude for male versus female students and White versus students of color. To replicate an earlier study conducted by Seifert et al. (2007), the current study utilized data from a recent national study, the Wabash National Study of Liberal Arts Education. In order to fulfill this purpose, five research questions were addressed using descriptive statistics analysis and Ordinary Least Squared multiple regression. The current study included 1,824 first-year college students from 21 institutions that offered an honors program during the first-year of college. The treatment group (honors students) consisted of 306 students, whereas the control group (non-honors students) consisted of 1,518 students. The findings indicate that honors programs did not have a statistically significant effect on honors students' critical thinking or their exposure to good practices in undergraduate education. Furthermore, the effect of honors program participation did not differ in direction or magnitude for male versus female students and White versus students of color.

This dissertation is approved for recommendation
to the Graduate Council

Dissertation Director:

Dr. James O. Hammons

Dissertation Committee:

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Dr. Suzanne McCray

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For three and a half years, I have dreamed about the moment when I would write my dissertation acknowledgments. It might seem odd that I did not dream of walking across the stage in my doctoral regalia. Instead, I dreamed about the moment that I could publicly acknowledge my loved ones, co-workers, and teachers who had a profound impact on my life. There were late nights working alone in my office that the thought of thanking each of you in such a public way was the fuel to keep me going.

As my college professor always said, “I am incredibly imperfect, and wonderfully loved” (D. Balla, personal correspondence, 2003). In the paragraphs that follow, I wish to thank people who have loved me despite my imperfections.

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DEDICATION

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CHAPTER ONE

INTRODUCTION

Speaking to University of Michigan students, President Obama (2012) stressed the importance of investing in a college education “because in this economy, there is no greater predictor of individual success than a good education” (para. 10). As his words illustrate—and in light of increasing unemployment rates and continuing economic and financial crises on national and international levels—the role of postsecondary education has become a topic of national concern. Increased *access* to higher education has become a national priority because an educated workforce is necessary to grow the economy (Arum, Roksa, & Cho, 2011). Moreover, the *quality* of American higher education and its impact on pertinent student learning outcomes has developed into a vital concern. As J. Willard Marriott, Chairman and CEO of Marriott International, Inc., remarked, “Our nation’s long-term ability to succeed in...the growing global marketplace hinges on the abilities of today’s students” (as cited by Casner-Lotto & Wright Benner, 2006, p. 11).

With this growing push to go to college, educators, business leaders, and researchers in the field of higher education have become increasingly concerned about the efficacy of education taking place at colleges and universities in promoting skills—such as problem solving, reading and writing, and critical thinking—that are critical to future employment and career success (Arum & Roksa, 2011). Commenting on these concerns, former Harvard University President Derek Bok (2006) deplored the failures of undergraduate programs in providing adequate education for their students:

Colleges and universities, for all the benefits they bring, accomplish far less for students than they should. Many seniors graduate without being able to write well enough to satisfy their employers. Many cannot reason clearly or perform competently in analyzing

complex, non-technical problems, even though faculties rank critical thinking as the primary goal of a college education. (p. 8)

Business and industry leaders also have concerns, according to recent reports that students are graduating from college without having developed the critical thinking skills needed in today's complex work environment (e.g., Association of American Colleges and Universities (AAC&U), 2007; Casner-Lotto & Silvert, 2008; Casner-Lotto & Wright Benner, 2006; Morris, 2010). Although critical thinking is regarded as the most essential skill for employment and career success (Halpern, 2000), research shows that only 22% of college graduates were "very well prepared" to think critically (Peter D. Hart Research Associates, Inc., 2008, p. 3).

The desire to reform undergraduate education in order to improve student learning is not new. Chickering and Gamson (1999) were among the early higher education researchers involved in national discussions about college-level learning and reforming undergraduate education. Supported by the Johnson Foundation and the American Association of Higher Education, Chickering and Gamson—seeking "to identify key principles which characterize the practices of educationally successful undergraduate institutions" harnessed the vast knowledge of a cadre of higher education research experts (Gamson, 1991, p. 7). Together, the group developed a list of seven "good practices" in undergraduate education (Chickering & Gamson, 1999). These practices focused on teacher behaviors, attitudes, and effective teaching and learning tools (e.g., high expectations, clear communication, consistent feedback on student performance, the use of active, experiential, and cooperative learning activities in the classroom that encourage diverse ways of understanding) (Chickering & Gamson, 1987, 1991). Chickering and Gamson (1991) asserted that good practices in undergraduate education "can help us respond to...social and economic imperatives for change and to the calls for improving undergraduate education" (p. 2).

With the cost of a college education outpacing inflation (Long, 2002), and with increased concerns about deficient levels of student learning (e.g., Arum & Roksa, 2011), it seems that what Chickering and Gamson (1991) identified as the “calls for improving undergraduate education” have not weakened since their beginning in the late 1980s (p. 2). In agreement with Chickering and Gamson (1991), many current researchers (e.g., Blaich & Wise, 2011; Cruce, Wolniak, Seifert, & Pascarella, 2006; Seifert, Pascarella, Colangelo, & Assouline, 2007) suggested that implementing the principles of good practice in undergraduate education can help improve student learning, especially in regard to critical thinking skills.

Although few deny the importance of improving the undergraduate education system, many doubt that college students are actually making large gains in critical thinking. Separate national studies have suggested that college students are, in fact, not greatly improving their critical thinking skills (see Arum et al., 2011; Arum & Roksa, 2011; Blaich, 2011; Pascarella, Blaich, Martin, & Hanson, 2011). The Wabash National Study of Liberal Arts Education (WNSLAE), a large-scale longitudinal study that used a pretest-posttest design, was particularly influential. In the current study, I analyzed data collected by the WNSLAE. With over 17,000 college students from 49 higher education institutions participating, the WNSLAE seeks to determine the academic, social, and institutional experiences that affect student learning throughout four years of college (Pascarella & Colleagues, 2007a). Blaich’s (2011) summary of the findings from the first cohort of the WNSLAE was not particularly positive. Blaich (2011) reported, “There are groups of students at every institution who have been positively transformed by their educational experience, as there are students who are intellectually worse off than when they started” (p. 3). Blaich (2011) found that 30% of the participants in the 2006 cohort showed a decline or no gain on a standardized measure of critical thinking. Furthermore, within

institutions, there was significant variation in student exposure to “good practices.” Across institutions, students who reported higher levels of exposure to good practices were more likely to experience growth on outcome measures, including critical thinking (Blaich & Wise, 2011). Findings from both the WNSLAE (Blaich & Wise, 2011) and the National Survey of Student Engagement (NSSE) (2008b) consistently indicated that the variability of outcome scores within institutions is far greater than it is between institutions.

Because of this variability, Pascarella (2006) recommended that higher education researchers examine the impact of “within-group” college factors, such as specific academic programs or interventions, and how they may impact the development of critical thinking skills across different groups (e.g., gender, race, school year) of college students. As a first step, Pascarella (2006) urged researchers to examine “rational myths” within higher education by investigating policies and programs that universities brag are “beneficial” but that lack empirical findings to confirm such claims (p. 513). For example, Pascarella (2006), noting the lack of longitudinal research examining the efficacy and impact of university honors programs in promoting students’ cognitive skills, presented such programs as an example of a rational myth in higher education that necessitates examination (p. 513).

In contrast to Pascarella (2006), the National Collegiate Honors Council (NCHC, 2012) defended honors programs’ effectiveness in exposing honors students to high-quality instructional practices aimed at enhancing students’ language (e.g., reading and writing) and critical thinking skills. The recruitment materials for honors programs, their bias in favor of the programs they represent notwithstanding, highlight the ways in which university honors programs are beneficial to students’ development of critical thinking skills (see NCHC, 2012; Sperber, 2000). Although honors programs do not label their strategies as such, most of the

practices they use are consistent with Chickering and Gamson's (1987, 1991) good practices. For example, university honors programs indicate that their programs are academically rigorous and simultaneously encourage frequent student-faculty contact, utilize effective teaching and learning approaches, and provide students opportunities to work with high-achieving peers (Digby, 2005; Sederberg, 2005).

In one of the only longitudinal studies that used a standardized measure of critical thinking, Seifert et al. (2007) found that university honors programs enhanced first-year honors students' critical thinking skills via the use of good practices. Seifert et al. (2007) analyzed longitudinal data from the early-1990's National Study of Student Learning. Although the data were dated, the study filled an important gap in the literature on collegiate honors programs. However, the researchers noted the need for a replication study with more recent longitudinal data. The investigators that helped design the National Study of Student Learning (NSSL) also designed the WNSLAE. Therefore, data from the WNSLAE provided an ideal dataset to use for a replication of the Seifert et al. (2007) study. Because of the existing gap in the literature, the current study seeks to replicate the work of the Seifert et al. (2007) study.

Such research is especially important in an age in which many college and university administrators, under mounting pressure to attract the best students, often rely on honors programs as a means to "increase the prestige" of the institution (Long, 2002, p. 6). When higher education institutions created honors programs in the 1920s, the focus was not on *recruiting* high-achieving students, but was rather on better *educating* them (Aydelotte, 1921). Frank Aydelotte, the father of honors education, believed that, as the masses went to college, the education of the nation's brightest students suffered (Aydelotte, 1921). He claimed that, "The greatest defect of...education is the regimentation of individuals at different levels of ability into

the same program” (Aydelotte, 1944, p. 9). Although institutions brag that honors programs facilitate a rich learning environment for academically gifted students, not much is known about their effectiveness in fostering an environment that exposes students to good practices, thus enhancing student learning (Pascarella, 2006; Rinn & Plucker, 2004, Seifert et al., 2007). For this reason, it is important to examine the influence honors programs have on college students’ exposure to good practices and the impact of honors programs on the development of students’ critical thinking skills.

Statement of the Problem

Currently, there is concern regarding the amount of learning that actually takes place in college (Arum & Roksa, 2011; Arum et al., 2011). Research has documented that college graduates have deficient levels of critical thinking skills, despite the fact that it is one of the essential learning outcomes of a college education (e.g., AAC&U, 2007; Casner-Lotto & Silvert, 2008; Casner-Lotto & Wright Benner, 2006; Morris, 2010). Recent national studies of student learning suggest that, in general, college students are making only modest gains in critical thinking (see Arum & Roksa, 2011; Arum et al., 2011; Blaich, 2011; Pascarella et al., 2011), and while some students within an institution experience growth in their critical thinking skills, other students decline (Blaich, 2011). A college education, it seems, does not guarantee an increase in a student’s critical reasoning capacity.

Although some researchers—including Haas (1992) and Edman (2002)—have suggested that university honors programs provide the ideal environment to teach students how to think critically, other researchers (Pascarella, 2006; Rinn & Plucker, 2004) disagree, arguing that there has not been enough empirical work on this topic to support such a claim. There is, indeed, a dearth of published research on university honors programs (Koch, Foote, Hinkle, Keup, &

Pistilli, 2007). Concern regarding the lack of such research is amplified by several articles in *The Journal of the National Collegiate Honors Council* (e.g., Digby, 2006; Driscoll, 2011; Frost, 2006; Lanier, 2008; Mariz, 2006; Snyder & Carnicom, 2011), all of which noted a lack of attention on the assessment and evaluation of university honors programs.

Specific economic and social factors on both institutional and national levels call attention to the need for more research on the effects of university honors programs. University administrators must balance the potential benefits of having an honors program against the costs of operating one (Seifert et al., 2007). According to Hebert and McBee (2007), the establishment of university honors programs over the past decade has substantially increased because of the perceived benefits of honors programs, i.e., that they would “enhance the entire university’s reputation and prestige” and attract high achieving students (p. 136). As such, there is an increasing institutional focus on the marketing of university honors programs (Long, 2002; Rinn & Plucker, 2004; Sederberg, 2005). However, operating an honors program—providing students with specialized academic seminars and courses, small class sizes, housing, and grants and scholarships—is expensive (Long, 2002; Sederberg, 2005; Speck, 2010). Moreover, as honors programs are often “invisible programs” on campus—generally lacking affiliation with one department or college—they are at an especially high risk for budget and programmatic cuts (England, 2010, p. 71). On a national level, the growing diversity within universities makes it increasingly difficult to judge the general effects of honors programs. Scholars have argued that, as the number of female students continues to rise and as college students become more culturally and ethnically diverse, more research on the potential differential impact of honors programs on student learning is needed (Pascarella, 2006; Rinn & Plucker, 2004). Pascarella (2006), for example, recommended studies be done that examine “program effect” variation in

magnitude or direction across student (cultural, gender, ethnic) groups. Colleges and universities have a stake in their honors programs, but, in order for colleges to be able to make well-informed decisions that balance the cost of the programs with the benefits they provide, further research on such programs' effectiveness is necessary.

And yet, given the potential financial and “public profile” costs and benefits of honors programs, there is a surprising paucity of research on university honors programs. If honors programs—via the use of good practices—do, in fact, enhance students' critical thinking skills, higher education institutions could implement the effective practices in other programs (Seifert et al., 2007). If honors programs are found not to improve the critical thinking of students, colleges and universities could devote their resources and funds to other programs or to reforming the honors program. The financial boons and expenses associated with honors programs, the claims that honors programs provide a more effective educational experience, and the increasing diversity of incoming students all warrant the need for research regarding the influence of honors programs on both students' experiences with good practices in undergraduate education and the development of their critical thinking skills.

Purpose of the Study

The purposes of this longitudinal study were 1) to examine the influence of honors programs on first-year college students' critical thinking skills, 2) to determine whether students in honors programs receive more exposure to good practices in undergraduate education than their non-honors peers, and 3) to assess the effect of good practices on critical thinking. This study also investigated whether the influence of honors programs on critical thinking skills varied in direction and magnitude for male versus female students and White versus students of color. To replicate an earlier study conducted by Seifert et al. (2007), the current study utilized

data from a recent national study, the Wabash National Study of Liberal Arts Education (WNSLAE).

Research Questions

The following five research questions guided the study:

1. What is the descriptive profile of non-honors and honors students who participated in the current study?
2. After controlling for a pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, are students in honors programs more likely to be exposed to “good practices in undergraduate education” during the first year of college, as compared to non-honors students?
3. After controlling for a parallel pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, do honors programs enhance honors students’ critical thinking by the end of their first year in college, as compared to non-honors students?
4. After controlling for a parallel pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, if honors programs enhance honors students’ critical thinking at a significant level, to what extent is the growth in honors students’ first-year critical thinking explained by their exposure to good practices in undergraduate education?
5. After controlling for a pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college

experiences, does the influence of honors programs on honors students' first-year critical thinking differ in magnitude and direction:

- a. For White students versus students of color?
- b. For male students versus female students?

Definition of Terms

Several terms are important for this study. Because the terms described below provide an important foundation, they are defined here as they were used for the study.

- *Honors programs* are defined by The National Collegiate Honors Council (NCHC) as "...special academic programs designed to help superior students-who are sometimes bored or unchallenged by conventional courses-make the most of their college experience" (2012, para. 2). According to the NCHC (2012), "A typical American honors program offers a series of small classes or seminars, taught by the best faculty at the college, limited to the students with superior academic abilities, and emphasizing class discussions rather than lectures" (para. 2). Consistent with other studies (e.g., Long, 2002; Rinn, 2007a; Sederberg, 2005), the current study used the term honors program to refer to both honors colleges and honors programs.
- *Honors students* are first-year college students who, on the Wabash Student Experiences Survey (Pascarella & Colleagues, 2007b), indicated that they participated in an honors program or honors college during their first year of college. Likewise, *non-honors students* are first-year college students who indicated that they did not participate in an honors program or honors college.
- ACT, Inc. (2008) defines *critical thinking* for the CAAP Critical Thinking Test as "the ability to analyze, evaluate, and extend arguments" (p. 13).

- “*Good practices in undergraduate education*” is a phrase used to refer to effective practices that promote student learning (Chickering & Gamson, 1987). This study utilized the operational definitions of “good practices” developed by Pascarella and Colleagues (2007a) as described below.
 - a. Good teaching and high quality interactions with faculty
 - i. Faculty interest in teaching and student development
 - ii. Prompt feedback
 - iii. Quality of non-classroom interactions with faculty
 - iv. Overall exposure to clear and organized instruction
 - b. Academic challenge and high expectations
 - i. Academic challenge and effort
 - ii. Frequency of higher-order exams and assignments
 - iii. Challenging classes and high faculty expectations
 - iv. Integration of ideas, information, and experiences
 - c. Diversity experiences
 - i. Diversity experiences
 - ii. Meaningful discussions with diverse peers
 - d. Influential interaction with peers
 - i. Co-curricular involvement
 - ii. Positive peer interactions
 - e. Frequency of interactions with faculty/professional staff
 - i. Frequency of interactions with faculty
 - ii. Frequency of interactions with student affairs staff

- f. Cooperative learning. (pp. 31-41)

Overview of Research Design

The current study is quasi-experimental and utilized a longitudinal, pretest-posttest design. The WNSLAE provided the data analyzed in this study. The unit of analysis for the current study consisted of first-year college students who attended a four-year institution that not only participated in the WNSLAE but also provided an honors program for first-year college students during the data collection period. The treatment group included students who identified that they participated in an honors program during their first year of college whereas the control group included students who indicated that they did not participate in an honors program during the first year of college. To answer the research questions and to replicate the Seifert et al. (2007) study, the present study used Ordinary Least Squares Regression to analyze data from the WNSLAE. Chapter Three describes the research design and analytic techniques in detail.

Delimitations of the Study

Several decisions were made to narrow the focus of this study. First, this study excluded institutions without an honors program. Second, a longitudinal study throughout all four years would add significantly to the body of research on honors programs. However, as all WNSLAE cohorts have not yet completed all four years of college, data analysis focused on their first-year of college. Finally, even though the number of honors programs in community colleges is increasing, community colleges were not included in this study. Only three community colleges participated in the Wabash National Study, and their response rate was low.

Significance of the Study

The current study is significant because 1) a standardized measure rather than a self-report measure of critical thinking was used, 2) the study was longitudinal and included a parallel pretest measure of critical thinking, 3) participants provided important student background and precollege characteristics which were statistically controlled for confounding influences in the regression model, 4) multiple institutions participated, 5) the measures of good practices in undergraduate education were empirically vetted, 6) the conditional effects of honors program participation were explored, 7) the clustered nature of the data was accounted for, and 8) the data were more recent than those used in past studies.

While most other studies identifying the effects of honors program participation on critical thinking used self-report measures to estimate gains in critical thinking (e.g., Ory & Braskamp, 1988; Shushok, 2003, 2006; Tsui, 1999), this study relied on a standardized measure of critical thinking. The use of self-reports to measure student gains limits the psychometric validity and internal design validity (Pascarella, 2001; Pascarella & Terenzini, 2005). Therefore, this study overcomes a significant limitation of several past studies that examined the effect of honors.

In addition to using a standardized measure of critical thinking, the current study was significant because of its longitudinal, quasi-experimental nature and statistical controls. Although experiments using random assignment are the preferred method of estimating the effect of a treatment or program, they are not always ethical or feasible when college students are involved (Padgett et al., 2010; Pascarella, 2006; Seifert, Pascarella, Erkel, & Goodman, 2010). If a randomized experiment cannot be conducted, longitudinal panel studies using a pretest-posttest design that statistically controls for student background characteristics and pretest performance

are the most internally valid and preferred type of research design (Pascarella, 2006; Pascarella & Terenzini, 1991, 2005; Seifert et al., 2010). As Seifert et al. (2010) explained, “For demonstrating the value that programs and services add to student learning, ...longitudinal pretest-posttest panel designs yield the most internally valid results and the most accurate estimate of college impact” (p. 14). Moreover, Rinn (2007a) argued that longitudinal studies are needed to examine the influence honors programs have on students. The current study is significant because it used a longitudinal pretest-posttest panel design.

Finally, the current study is the only study of its focus and scope to account for the clustered nature of the data using one of the techniques recommended by Thomas and Heck (2001). A review of the literature yielded only one other multi-institutional longitudinal study that used a standardized measure of critical thinking to estimate the influence that honors programs have on student experiences with good practices and gains in critical thinking skills (Seifert et al., 2007). However, although Seifert et al. (2007) used a longitudinal pretest-posttest design, they did not account for the nested or clustered nature of the data using one of the techniques described by Thomas and Heck (2001) (T. Seifert, personal communication, January 30, 2012). While the findings of Seifert et al. were statistically significant, failing to account for the clustered data could result in a false positive (Thomas & Heck, 2001). Furthermore, the data analyzed by Seifert et al. (2007) were collected in the early 1990s. Today’s college student is in a different generational and demographic cohort (Pascarella, 2006). Additionally, the number of honors programs has greatly increased since the 1990s (Sederberg, 2005; Seifert et al., 2007). This study replicated and built upon the study conducted by Seifert et al. (2007) using recent data and accounting for clustered data to examine the influence honors programs have on college students’ exposure to good practices in undergraduate education and critical thinking skills.

Theoretical Foundations

While this study was not designed to test theories, there are nevertheless several theories relevant to the study of university students in honors programs.

William Perry's Theory of Intellectual Development

Perry's theory of intellectual development delineates several stages through which students pass on their way to improved reasoning and critical thinking skills and, thus, is helpful in understanding how honors students progress in their intellectual development. Despite the fact that honors programs are far from homogenous (Seifert et al., 2007), a consistent goal of honors programs is to improve their students' critical thinking capacity (Edman, 2002). United by this common aim, many honors programs are guided by Perry's (1970, 1999) theory of intellectual development (Austin, 1986). Scholars have criticized Perry's (1970, 1999) theory because he based it on the results of a study that was limited to students at a highly selective university (Evans, Forney, Guido, Patton & Renn, 2010). However, as Rinn and Plucker (2004) claim, students at a highly selective university are probably similar to honors students at less selective institutions. Therefore, knowledge of Perry's (1970, 1999) theory is still a helpful tool in understanding how honors students progress in their intellectual development.

In light of prior theoretical work on cognitive development by Piaget (1970), Perry (1970, 1999) asserted that one of the key developmental areas for college students pertains to how they view learning and how they believe they acquire knowledge. According to Perry, college students pass through a predictable series of nine stages of intellectual development. However, for simplification and ease of use, Perry's (1970, 1999) theory most often appears in the literature as four stages—*duality*, *multiplicity*, *relativism*, and *commitment to relativism* (Evans et al., 2010; Rinn & Plucker, 2004).

In the first stage, *duality*, students believe that there is a right answer for every question, and they view their professors as the source of the right answers (Perry, 1999). Perry (1999) argued that most students enter college thinking this way. However, when students see that experts or people they respect disagree with one another on a topic, students begin to experience cognitive dissonance that can lead them into the next stage, *early multiplicity* (Perry, 1999).

In the *multiplicity* stage, students begin to view knowledge as opinion, and they often feel that each person's opinion is equal (Perry, 1999). Students in this stage tend to enjoy discussion; however, they often have difficulty seeing the strengths and weaknesses in ideas and arguments. Because students perceive all opinions as equal, students in this stage can view their opinions as equal to those of the professor (Evans et al., 2010). When professors challenge students to quantify or qualify their ideas or look for strengths and weaknesses in an argument, students can become frustrated (Evans et al., 2010). Unfortunately, most college students do not progress past the multiplicity stage (Evans et al., 2010).

As students begin to appreciate the need to substantiate their ideas or provide rationales for their arguments, they start to view knowledge as contextual and move into the *relativism* stage (Perry, 1999). It is typical for a student in this stage to challenge a professor's opinion. Thus, it becomes important for professors to model critical thinking and provide rationales for their own arguments (Evans et al., 2010). In the relativism stage, students begin to see the complexity in issues, ideas, and arguments (Perry, 1999). Although students grow in their ability to identify strengths and weaknesses on an issue, they may become frustrated when required to take a stance.

The fourth and final stage, *commitment in relativism*, is less of a cognitive stage and more akin to a theory of moral and ethical development (Perry, 1999). In this stage, students begin to

take stances on issues, internalize them, and incorporate them into their identity (Evans et al., 2010). Additionally, students are open to learning from other people's experiences (Gardner, 2009).

Perry's theory is helpful in gaining a better understanding of honors students' intellectual progress, especially in that it recognizes that students do not necessarily enter college with advanced reasoning skills. As Haas (1992), Thomas (1990), and Edman (2002) indicated, many professors who are new to teaching in honors programs mistakenly assume that honors students are more advanced in their critical thinking than non-honors students are. Thomas (1990) observed that although honors students might have accomplished more academically, "honors students are much the same as their less-gifted friends" (p. 4). Edman (2002) added that it is dangerous for honors faculty to assume that students are already gifted in thinking critically. However, both Haas (1992) and Edman (2002) agreed that honors programs can provide the ideal environment for students to improve critical thinking because classes are small and discussion oriented, the students are bright, and the best teachers and scholars often teach the courses.

The Impostor Phenomenon

Another theory pertinent to studies involving honors students is the *impostor phenomenon*. Clance and Imes (1978) discovered that many high achieving individuals do not believe they are intelligent and as such, attribute their past successes to luck. Students who view themselves in this way "fear that eventually some significant person will discover that they are indeed intellectual impostors" (Clance & Imes, 1978, p. 2). Before entering college, many honors students are accustomed to receiving praise for providing the "right" answers (Haas, 1992, p. 20). According to Haas (1992), when college professors challenge their honor students'

thinking or ask for further rationale from students, many students incorrectly assume that this indicates that their answers must be wrong. Suddenly, many of these students feel like impostors when challenged to think critically (Haas, 1992). It can be difficult for honors students to understand that having their ideas challenged and having to explain their rationale further is an essential part of developing critical thinking skills (Haas, 1992).

The literature describing the challenges of teaching honors students at the college level highlight the impact of the impostor phenomenon. Thomas (1990), for example, found that 80% of her honors students admitted to experiencing the impostor phenomenon while in college. When Thomas (1990) had the students read scholarly papers aloud, they expressed feelings of inadequacy. One student proclaimed, “I think I am too dumb to be in honors. I did not understand a word” (p. 5). Haas (1992) suggested that—because many students believe they are impostors, not cut out for honors work—honors faculty must recognize that many honors students lack reflective and critical thinking skills and must clearly communicate their support to high achieving students in the course of their intellectual development. Without this high level of support from faculty, honor students may have difficulty overcoming the impostor phenomenon (Haas, 1992). The presence of the impostor phenomenon could thus hinder honors students from developing critical thinking skills in the first year of college.

The Environmental Press Theory

The *environmental press* theory also aids understanding of research on university honors programs (Ogilvie & Reza, 2009). The environmental press theory suggests that grouping high achieving students together will facilitate higher levels of achievement (Thistlethwaite & Wheeler, 1966). Even Frank Aydelotte (1944), the pioneer of honors education, recognized the

importance of grouping students of high ability together when he asserted that the most significant flaw of college was grouping gifted and regular students together.

For college students, the peer group that surrounds them in college becomes their reference group in establishing norms (Astin, 1993; Feldman & Newcomb, 1969; Thistlethwaite & Wheeler, 1966). Several studies (e.g., Astin, 1993; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991, 2005) of college students have shown that the interaction students have with their peers influences their cognitive, emotional, and social development. The theory, therefore, predicts that motivated and high achieving students will be academically stronger when grouped with peers of a similar academic caliber than when grouped with lower achieving students (Rinn, 2007b). The peer environment pushes students to succeed academically (Rinn, 2007b). In a study of honors students, Rinn (2007b) found that the results matched the predictions of the environmental press theory: students participating in honors programs earned higher grades and reported higher levels of academic self-concept than did equally gifted students who did not participate in honors programs.

Summary of Chapter One

The quality of postsecondary education is a topic of national concern. Although enhanced critical thinking is one of the primary goals of a college education, employers report dissatisfaction with the critical thinking skills of college graduates (Peter D. Hart Research Associates, Inc., 2008). National studies (e.g., Arum & Roksa, 2011; Pascarella et al., 2011) have argued that some students make significant gains while others do not. Furthermore, the variability of critical thinking growth among college students *within* institutions is greater than the variability of growth *between* institutions (Blaich, 2011; NSSE, 2008b). However, students

exposed to higher levels of good practices in undergraduate education are more likely to experience gains on outcome measures (Blaich & Wise, 2011).

Honors programs promise an ideal environment for gifted students to improve critical thinking skills via the experiences of good practices in undergraduate education (Seifert et al., 2007). However, research on the influence of honors program participation is scant (Pascarella, 2006; Rinn & Plucker, 2004; Rinn, 2007a). Pascarella (2006) called the lack of research on honors programs in producing cognitive growth “scandalous” and suggested the belief that honors programs provide a more effective learning environment could be a “rational myth” in higher education (p. 513). For this reason, the current study sought to examine the influence of honors programs on first-year college students’ critical thinking skills, to determine if students in honors programs are more likely than their non-honors peers to be exposed to good practices in undergraduate education, and to assess the effect of good practices on critical thinking.

CHAPTER TWO

REVIEW OF THE LITERATURE

Chapter Two summarizes the relevant literature on university honors programs and their impact on critical thinking. Part one of this chapter summarizes the history—including the impetus and critiques—of university honors programs. The second part is a review of relevant studies on critical thinking. Part three provides an overview of the good practices in undergraduate education. Finally, the fourth part presents and discusses past research on the honors programs' influence in developing college students' critical thinking skills and exposing them to good practices in undergraduate education.

Part One: An Overview of Honors Programs in the United States

The literature review begins with an overview of honors programs including the history, purposes, and critiques. Given the rapid growth of university honors programs and the lack of research on the topic, a thorough overview of such programs is necessary (Rinn, 2006). For this reason, part one begins with a historical overview of honors programs, noting key institutions, leaders, and organizations that advanced the development of honors programs. Following the historical overview, the purposes, benefits, and characteristics of honors programs are discussed. The final section of part one presents the criticisms of honors programs.

A Historical Overview of Honors Programs

This section—a historical overview of honors programs—highlights important leaders and institutions that advanced honors education. A review of the history of honors programs is essential to understand why honors programs were created, to appreciate the continuing influence of the honors programs' pioneers, and to evaluate whether or not today's honors

programs are consistent with the historical vision (Rinn, 2006). The first subsection describes how Frank Aydelotte's experiences at Oxford University and Swarthmore College influenced the development of honors education in the United States. The subsequent section outlines Columbia College's impact on honors programs in general education. In the final sections, the legacy of Joseph Cohen at the University of Colorado, The Inter-University Committee on the Superior Student, and the National Collegiate Honors Council provide a historical foundation for understanding and appreciating the rich history of honors programs. Although the honors programs established at Swarthmore, Columbia, and the University of Colorado had, and continue to have, a significant impact on honors education in the United States, no academic institution had more impact than Oxford in England (Rinn, 2006).

Frank Aydelotte at Oxford University. The idea of developing honors programs in the United States began with Frank Aydelotte, an American Rhodes Scholar who studied at Oxford from 1905 to 1907 (Rinn, 2003). After his time there, Aydelotte felt that college students would learn more if American colleges and universities adopted the Oxford model of instruction, known as the tutorial system (Aydelotte, 1944, 1946). There was no greater impetus for the development of honors programs than Aydelotte's experience with the tutorial system at Oxford (Rinn, 2003).

The tutorial system at Oxford was quite different from the American model of instruction. Once enrolled at Oxford, students worked with a tutor in their field to develop a "program of study" that was comprised of recommended texts to read (Rinn, 2003, p. 29). Aydelotte (1946) reported, "Whereas the American undergraduate takes courses, the Oxford man studies a subject" (p. 66). Each week, a small group of students met with their tutor to read essays they had written in response to their reading list that was part of their program of study

(Bailey, 1932). The students, along with their tutor, provided feedback to the presenting classmate on how he or she could improve the essay (Rinn, 2003). The format created an environment in which every student needed to participate (Learned, 1927) and could receive individualized attention (Crosby, 1922). The goal of the discussion was primarily to improve students' critical thinking skills (Learned, 1927). Because the tutorial system demanded more student responsibility, Aydelotte believed that he and other students learned more (Aydelotte, 1944).

Aydelotte studied at Oxford at a time when students earned their degrees by taking two exams and fulfilling residency (Aydelotte, 1944). Aydelotte (1944) described how students in their first or second year completed an "intermediate exam" to make evident that they were qualified for more challenging academic work (p. 21). Approximately three years after passing the intermediate exam, Oxford students completed a final exam to earn the degree. However, a student did not attempt the exam until both the tutor and the student believed success was likely (Aydelotte, 1944). Students could choose between taking the pass version of the exam, an easier exam with fewer questions, or the more difficult honors exam with more questions and higher standards. The term for this option at Oxford was the "pass/honors approach" (Rinn, 2006, p. 30). Students earned an honors degree by successfully completing the honors exam or a pass degree by successfully completing the pass exam. It was easier to earn a pass degree than to earn an undergraduate degree from an institution in the United States, whereas an honors degree required mastery far greater than that required by schools in the United States (Aydelotte, 1944).

Completing the honors track was no easy task because of the amount of material on which students were tested, the rigor demanded, and the importance of the classification achieved (Aydelotte, 1944). Students who chose the honors examination completed

approximately twelve essay exams back to back over several days (Crosby, 1922). Furthermore, students attempting the honors examination competed for four different classifications (Aydelotte, 1944). First and second-class placement on the final examination gave a student a noteworthy honors distinction. However, a third or fourth-class designation would likely cause a student to enter a “less ambitious occupation” (Aydelotte, 1944, p. 22). Obtaining first class distinction was so important that students often elected to study for an additional year before attempting the honors examination. After his experience with Oxford’s pass/honors system, Aydelotte became convinced that an honors option would benefit gifted college students in the United States because of the extra rigor honors options demanded of their students (Rinn, 2003).

Frank Aydelotte at Swarthmore College. With his appointment as President of Swarthmore in 1921, Aydelotte found an opportunity to implement Oxford-inspired ideas on a large scale (Aydelotte, 1944). At the time, enrollment at colleges and universities surged, partly because many believed that one needed a college education to get a professional job (Swarthmore Faculty, 1941). This increase in enrollment also brought students with a broader range of abilities than in the past. Consequently, some faculty struggled to teach because the intellectual abilities of the students in their classrooms were vastly different (Rinn, 2006). This frustration amongst faculty members placed Aydelotte in a prime position to implement an honors program at Swarthmore (Aydelotte, 1944).

Aydelotte’s inaugural speech at Swarthmore College expressed his vision (Aydelotte, 1944). In contrast to other contemporary college and university presidents, Aydelotte argued that Swarthmore should keep its enrollment low and remain small because, “in such a college the individual means more and...has more of a chance” (as cited by Swarthmore Faculty, 1941, p. 5). Furthermore, Aydelotte believed that the education of the nation’s brightest college students

suffered disproportionately when less-able students went to college. In his inaugural address, Aydelotte argued,

Perhaps the most fundamentally wasteful feature of our educational institutions is the lack of a higher standard of intellectual attainment. We are educating more students up to a fair average than any country in the world, but we are wastefully allowing the capacity of the average to prevent us from bringing the best up to the standard they could reach. Our most important task at present is to check this waste. The method of doing it seems clear: To separate those students who are really interested in the intellectual life from those who are not. (Aydelotte, 1921, p. 23)

To rid Swarthmore of such waste, Aydelotte (1921) aspired to implement a version of the Oxford pass/honors approach and tutorial system at Swarthmore.

Led by Aydelotte's vision, a Swarthmore faculty committee began designing the honors program (Swarthmore Faculty, 1941). Subsequently, the faculty started an honors program in English Literature and Social Science in 1922 (Swarthmore Faculty, 1941). Aydelotte believed that honors education should include juniors and seniors (Cohen, 1966; Swarthmore Faculty, 1941) but exclude freshmen and sophomores, who, according to Aydelotte, needed to complete core curriculum courses to make up for an inadequate high school education (Cohen, 1966). Each spring, a selection committee chose sophomores for the honors programs based upon their dependability, involvement in curricular and extracurricular activities, and grades in the area they wished to study (Brewster, 1930). Additionally, honors students needed to demonstrate the ability to work independently (Aydelotte, 1944). Once in the program, students selected a major field and two minor fields for the focus of their studies (Brewster, 1930). For two years, honors students participated in two seminars per semester that were similar to the Oxford tutorial system that Aydelotte had experienced as a student. Guided by one to two faculty members, each seminar included five to six students who met in faculty homes or offices for at least two hours twice per week.

The honors program at Swarthmore required that students take responsibility for their own learning (Brewster, 1930; Cohen, 1966, Swarthmore Faculty, 1941). Aydelotte stressed that in order for students to learn, they needed to teach themselves and then actively engage in discussion with faculty and other honors peers (Swarthmore Faculty, 1941), and argued that the small seminar format best facilitated the rich learning environment that allowed gifted college students to thrive. Swarthmore's approach for awarding an honors degree was quite different because honors students did not attend lectures or complete coursework to earn a degree. Instead, students studied their major and minor field by "reading for honors" during the junior and senior year (Aydelotte, 1925). The culmination of the honors program was at the end of the senior year when students completed ten to twelve comprehensive essay exams and one oral exam that were evaluated by experts from other institutions (Aydelotte, 1925). Based on their exam performance, outside experts awarded students with Honors, High Honors, or Highest Honors (Brewster, 1930). Similar to Oxford, honors students at Swarthmore studied a subject instead of taking courses and earned degrees based on rigorous comprehensive exam performance.

Swarthmore's honors program was successful at the institution and influential across the nation. Within just a few years of implementing the honors program, Swarthmore not only became "*the pioneer*" in honors education that many private colleges and universities emulated (Clark, 1970, p. 206), but also transformed itself into an institution known for its high standards for all students (Horowitz, 1987; Thelin, 2004). In 1924, Aydelotte authored *Honors Courses in American Colleges and Universities*, a report that described honors courses and programs at postsecondary institutions. The subsequent year, Aydelotte published a second edition of this work because the number of honors programs doubled, especially at private universities (Rinn,

2003). However, Cohen (1966) found that large institutions did not embrace Aydelotte's vision for honors education because he restricted honors to juniors and seniors within their academic divisions or departments. Although Aydelotte believed honors programs were more effective for juniors and seniors, he admitted that different approaches might work better for other institutions based upon an institution's specific needs (Cohen, 1966). In spite of Cohen's criticism, the honors program at Swarthmore remains the "centerpiece of Swarthmore's curriculum," and, in many ways, the original model developed in the 1920s still prevails (West, 2003, p. 25). Frank Aydelotte succeeded in transforming education for gifted college students at Swarthmore and across the country.

Honors general education at Columbia College. Columbia College was another important pioneer in honors education. While Swarthmore served as a catalyst for the development of departmental honors programs within majors, Columbia College in New York pursued a different type of honors education: the development of honors programs within general education (Cohen, 1966). The implementation of honors at Columbia was not as smooth as it was at Swarthmore. For example, through many failed attempts, Columbia piloted both general honors and departmental honors. After these attempts, the most notable innovation at Columbia College came from John Erskine, a faculty member.

In 1917, John Erskine proposed the implementation of a two-year course that would require students to review a classic piece of literature each week (Trilling, 1954). Due to the instability caused by World War I, Columbia did not implement Erskine's plan for the new course until 1920 (Trilling, 1954). Although some faculty criticized Erskine's concept, many professors agreed that students would benefit from an understanding of the classics and that Erskine's program was the course to accomplish it. Against Erskine's wishes, Columbia titled

the course “General Honors” and limited enrollment to only the highest achieving students (Trilling, 1954). The General Honors course involved two key elements: extensive reading and spirited debate (Cohen, 1966). Each week, students read a piece of classic literature and participated in a two-hour discussion (Rinn, 2006). General Honors was co-facilitated by two faculty who were selected because of their tendency to debate with each other (Cohen, 1966). These lively debates fostered a classroom environment in which students could disagree with each other, as well as the faculty.

Coupled with the General Honors course, students were required to complete “Special Honors” (Trilling, 1954), in which students pursued independent research in their selected fields. By 1928, Columbia no longer offered General and Special Honors (Aydelotte, 1944) because the titles seemed to arouse resentment in students who were not allowed to participate (Trilling, 1954).

Because of this resentment and the resulting discontinuation of General and Special Honors, honors education at Columbia continued to evolve. In 1932, Columbia College reintroduced the General Honors course under a new title, the “Colloquium on Important Books” (Cohen, 1966). Columbia admitted select upperclassmen into the colloquium by invitation only based upon their academic performance, interests, and personal characteristics (Aydelotte, 1944). Students who enrolled in the Colloquium on Important Books read and discussed a wide range of important books for two years with a group of 15 students (Aydelotte, 1944). Eventually, Columbia also began offering departmental honors programs for advanced students (Aydelotte, 1944).

The honors programs at Columbia College have left a lasting impact on honors education. The historical roots of the many modern honors programs that utilize reading seminars with

small group discussion and a team-teaching approach lie in Columbia College's Colloquium on Important Books (Cummings, 1986; Shushok, 2002). Columbia was instrumental because it embedded the honors program within the general education curriculum (Cohen, 1966).

Furthermore, even today, many honors programs provide a great books course modeled off Erskine's Colloquium on Important Books (Rinn, 2006).

Joseph Cohen at the University of Colorado. Joseph Cohen of the University of Colorado played an equally important role to Frank Aydelotte in the advancement of collegiate honors programs (Austin, 1986; Cohen, 1966; Rinn, 2006). Cohen's work in honors education left two important legacies (Rinn, 2006): first, the University of Colorado's honors program and, later, the Inter-University Committee on the Superior Student (ICSS). In 1928, Cohen served on a committee that developed an honors program at the University of Colorado (Cohen, 1966; Rinn, 2006). The development of the honors program at the University of Colorado was especially important in that the university was one of the first large state institutions to offer such a program. Until the 1950s, honors education existed mostly at private institutions on the East coast (Cohen, 1966). The University of Colorado was, thus, a pioneer in honors education at large institutions (Cohen, 1966; Rinn, 2006). The University of Colorado, like Swarthmore and Columbia, recognized the need to develop a more rigorous educational experience for gifted students. By 1930, the committee formulated a plan that required participation in departmental and general honors programs (Cohen, 1966).

Although the University of Colorado influenced the development of honors programs at other large institutions, the program experienced challenges. When Cohen (1966) became the honors director at the beginning of World War II, the honors program was in jeopardy. According to Cohen (1966), the war harmed many honors programs in the United States. In an

attempt to save the program, the University of Colorado allowed students to select a course of study that included general honors, departmental honors, or both. Before World War II, honors students were required to complete general and departmental honors, and even after the rules were changed, many students elected to complete both. According to Cohen (1966), 50% of the honors students studied departmental and general honors simultaneously.

To deal with this challenge and many others, Cohen (1966), relying on the experience of more established honors programs, sought to implement successful practices at the University of Colorado that had been successful elsewhere. For example, Erskine's legacy at Columbia College greatly affected Cohen when he was invited to participate in the Colloquium on Important Books in 1947 (Cohen, 1966). That same year, Cohen developed a successful honors reading colloquium for seniors based upon Erskine's Colloquium (Rinn, 2006). The response from honors students at the University of Colorado was overwhelming, and Cohen looked for other ways to improve the honors program (Cohen, 1966). Through the years, Cohen recognized the value of collaborating with other honors programs to learn how to better deal with challenges and to implement effective practices at his own institution.

The need for honors programs to collaborate became more urgent in the late 1950s. At the time, public institutions were just beginning to experiment with honors programs (Cohen, 1966). Furthermore, with Frank Aydelotte's death in 1956, there was a need for a new leader of the honors movement because the prominent voice on honors programs was no longer living (Rinn, 2006). In the fall of 1957, when Sputnik launched, concern for the education of America's brightest college students became paramount (Austin, 1986). As a result, several colleges and universities developed honors programs to educate the nation's best students. These events, as well as Cohen's experience at the University of Colorado, gave him the authority to

become a leading national voice on honors education and to develop the first national organization for honors education.

Joseph Cohen and the Inter-University Committee on the Superior Student (ICSS).

Cohen's influence in the development of honors education in the United States extended beyond his work at the University of Colorado. In 1957, Cohen had a vision for collaboration and coordination between honors programs across the United States (Cohen, 1966). At the same time, the University of Colorado received a grant from the Rockefeller Foundation for honors programs. As a result, the University of Colorado hosted the first national conference on honors (Rinn, 2006). By 1958, Cohen and the conference committee created the Inter-University Committee on the Superior Student (ICSS) to act as a central agency for honors education. Housed at the University of Colorado, the ICSS received funding from the Carnegie Foundation.

The establishment of the ICSS was important in the history of honors programs for many reasons. The ICSS published important documents, arranged conferences, and visited institutions interested in honors education (Cohen, 1966). As part of the work of the ICSS, a committee developed *The Sixteen Major Features of a Full Honors Program* (Cohen, 1966). This document, as well as other efforts of the ICSS, led to changes in honors education across the country. For example, the ICSS believed that honors programs should encompass all four years of college and include general and departmental honors as well as liberal arts and professional programs. Before this, honors education was reserved for juniors and seniors (Cohen, 1966). The document served as a conversation piece for honors directors to reflect on and devise ways of improving honors education at their home institutions (Cohen, 1966).

Although the ICSS advanced the development of honors programs across the country, its tenure was short. In 1965, the ICSS did not receive the additional grant support needed to fund

the committee and terminated its work as a result (Cohen, 1966; Rinn, 2003). Cohen, however, remained confident that another organization would be created to act as a central agency for honors programs (Cohen, 1966).

The National Collegiate Honors Council. In April of 1966, the National Collegiate Honors Council (NCHC) was formed as a self-supporting association to continue advocating for collegiate honors programs in place of the ICSS (Owens, 2010). The NCHC was more successful in its endurance than its predecessor had been. The NCHC remains an important authority on honors education even today. The mission of the NCHC is to provide,

...support for institutions and individuals developing, implementing, and expanding honors education through curriculum development, program assessment, teaching innovation, national and international study opportunities, internships, service and leadership development and mentored research. More generally, NCHC carries out this mission by serving honors professionals and by advocating support for and excellence in higher education for all students. (NCHC, 2012, n.p.)

In an effort to support and advance honors education, the NCHC oversees an annual conference, collaborates with six regional honors associations, and publishes *The Journal of the National Collegiate Honors Council* and *Honors in Practice* (Rinn, 2006).

As the number of honors programs continues to rise, the NCHC has become an important voice in articulating what services honors programs should offer (Seifert et al., 2007). Recently, given the rapid growth of honors programs throughout the past twenty years (Long, 2002), the NCHC (2010) published *The Basic Characteristics of a Fully Developed Honors Program* and *The Basic Characteristics of a Fully Developed Honors College*, to provide a set of characteristics commonly found in successful programs. The *Basic Characteristics* publications were an important addition to the published literature on honors education.

The Purposes of Honors Education

Honors colleges and honors programs. The growth of honors education in the United States has resulted in the use of different terminology to define honors education at the postsecondary level (Seifert et al., 2007). The terms most frequently used throughout the literature are “honors programs” and “honors colleges” (Rinn, 2007a). Honors programs have a long legacy in American higher education, but the emergence of honors colleges is new (Sederberg, 2005).

Despite the fact that the terms are generally used interchangeably (Rinn, 2007a), there are differences between honors programs and honors colleges. Typically, honors colleges exist at large, comprehensive universities (Sederberg, 2005). A dean leads an honors college, while a director manages an honors program (Sullivan & Randolph, 1994). An honors program is integrated into the existing university educational system, whereas an honors college can be more separate. For example, the honors college at Florida Atlantic University exists on a separate campus altogether (Selingo, 2002). In contrast, students in an honors program complete most of their courses alongside non-honors students in non-honors sections. Some of the university’s courses, however, are reserved for honors students only (Austin, 1986). According to Sullivan and Randolph (1994), in the purest version of an honors college, honors students are completely separate from non-honors students. Conversely, Sederberg (2005) acknowledged that an honors college could be very similar to an honors program because there are no requirements to label an honors education program as an honors college. For the purpose of this study, the term honors programs is used to describe both honors programs and honors colleges.

Educational objectives of honors programs. Honors programs seek not only to educate but also to engage an institute’s brightest students. Honors programs are located at

nearly all types of postsecondary educational institutions including community colleges (Long, 2002; Shushok, 2002; Seifert et al., 2007). While honors programs vary just as widely as the institutions at which they operate, the programs share a common vision (Austin, 1986; Schuman, 1999; Shushok, 2002). Honors programs are defined by the National Collegiate Honors Council (NCHC) as “special academic programs designed to help superior students—who are sometimes bored or unchallenged by conventional courses—make the most of their college experience” (2012, para. 2). Austin (1986) emphasized that “Honors education consists of the total means by which a college or university seeks to meet the educational needs of its ablest and most highly motivated students” (p. 5). Defined in this way, it is clear that honors programs, although led by the same goal, can and do vary widely in structure and implementation.

Although honors programs vary from institution to institution, the educational objectives are similar (Austin, 1986; Schuman, 1999; Shushok, 2002). Written in 1973, Halverson’s *Report and Recommendations of the Ad Hoc Task Force on Honors* continues to shape the educational objectives of honors programs (as cited by Austin, 1986; Shushok, 2002). The report lists four primary educational objectives of honors programs. First, they exist to educate gifted college students more effectively than they would be through non-honors programs. As Frank Aydelotte (1944) believed, a college education without an honors program “holds [honors students] back, wastes their time, and blunts their interest by subjecting them to a slow moving routine which they do not need” (p. 14). Second, honors programs provide a more rigorous college experience to gifted students that will push them to their “highest level” of performance (as cited by Austin, 1986; Shushok, 2002, p. 336). Aydelotte (1944) explained that by separating honors students from non-honors students, colleges could “demand...a higher standard of attainment for the...degree distinctly required of them at present” (p. 31). A third objective of honors programs

is to provide an atmosphere that mentors honors students in a manner that shapes their character, dreams, and confidence. The fourth objective is to positively affect the rest of the campus through its focus on academic excellence (as cited by Austin, 1986; Shushok, 2002). The literature notes the influence of honors programs on the broader campus. For example, in an article by Selingo (2002), Judy Hample, Chancellor of Pennsylvania's state college system claimed that, "a lot of things that help make honors experience really great have a spillover effect on everything else" (para. 10). While honors programs can vary, the objectives of honors programs tend to be similar.

Characteristics of honors programs. Honors programs share several common characteristics from institution to institution. Honors students often complete interdisciplinary coursework where there are high levels of student-faculty interaction (Shushok, 2002). Additionally, most honors programs aim to create a community of honors students that engage in intellectual discourse (Shushok, 2002). Typically, honors programs consist of courses that are linked to the general education requirements and are known as general honors programs; however, some honors programs exist within specific academic departments and are known as departmental honors programs (Austin, 1986; Sullivan & Randolph, 1994). Most honors programs provide additional resources to honors students that are not available to non-honors students (Long, 2002). For example, some programs provide access to nicer facilities, advising, early registration, faculty, unique courses, and opportunities for undergraduate research (Friedman, 1986). In many honors programs, honors students must complete comprehensive exams or research projects in their senior year (Schuman, 1999). Most honors programs encompass all four years of college, however, some only admit upperclassmen (Digby, 2005).

Like honors programs in general, the type and structure of courses offered by honors programs tend to resemble one another, as well. Honors sections tend to limit course enrollment to between eight to twenty-five students, which is often considerably smaller than non-honors general education sections (Austin, 1986; Long, 2002; Sullivan & Randolph, 1994). Honors courses are supposed to be more rigorous (Austin, 1986), and the best full-time faculty often teach honors courses (Cummings, 1986). Finally, honors courses tend to encourage active participation and discussion among students, and as a result of this, honors sections are not frequently structured in a lecture format (Cummings, 1986). Many honors programs even allow their students to tailor courses or independent studies to their specific interests (Digby, 2005).

Although the aforementioned elements are commonly found in honors programs, the elements often vary based upon institutional type (Schuman, 1999). For example, honors programs at large research universities exist to provide students with experiences that are typical for all students at a small college: small class sizes, frequent student-faculty interaction, courses taught by full-time faculty instead of teaching assistants, interdisciplinary courses, faculty mentoring, and opportunities to explore academic interests with fellow students and faculty (Schuman, 1999). Because these conditions often exist already at small colleges, honors programs at such small institutions emphasize elements that are more typically found in graduate school at a research university: co-authoring publications with faculty, presenting research with faculty at conferences, and completing advanced study in their field (Schuman, 1999). Thus, an honors program's focus is often determined based upon the needs of the college or university where it exists (Schuman, 1999). No matter the institutional type, the purpose of honors programs is to provide the university's brightest students with a more rigorous collegiate experience (Austin, 1986).

Institutional benefits of honors programs. In addition to providing a rewarding experience for honors students, honors programs can positively affect the institutions where they operate. Halverson (1973), for example, identified four ways in which effective honors programs benefit institutions: attracting high achieving students, enhancing the institution's image, attracting and retaining talented faculty, and bringing in additional funding (as cited by Austin, 1986; Shushok, 2002).

Attracting high-achieving students. Honors programs often aid colleges in attracting high achieving students to their school. In fact, some colleges and universities even rely on honors programs as a recruiting tool (Austin, 1986; Long, 2002; Rinn & Plucker, 2004; Sederberg, 2005; Selingo, 2002), and it seems to be effective. For example, in 1996, Indiana University of Pennsylvania created an honors college because enrollment at the university was declining (Selingo, 2002). The honors college attracted high-achieving students and improved the university's reputation. Honors students in the honors program at Indiana University of Pennsylvania indicated they chose the University for a single reason: the honors program (Selingo, 2002). Considering such reasoning, several sources suggest honors programs appeal to high achieving students because they provide an education comparable to Ivy Leagues at a more affordable price (e.g., Long, 2002; Sederberg, 2005). Long (2002) identified the increasing cost of a college education as one reason why students are forgoing their admittance to Ivy Leagues and choosing instead to attend a less prestigious institution with an honors program. Additionally, as the level of competition between institutions continues to rise, institutions are increasingly attempting to attract outstanding students (Long, 2002).

Market conditions and concerns from state legislatures only add to the necessity of recruiting high-achieving students. Public universities feel pressure from the state where they

reside because legislatures are concerned about their brightest high school students moving to another state (Long, 2002; Selingo, 2002). Thus, the competition between institutions for high achieving students is fierce. As Hoxby (1997, 2000) explained, conditions in the market create a situation in which colleges are better off recruiting high ability students because of the theory of the “multiplier effect” (2000, p. 2). The multiplier effect suggests that if the cost of tuition remains constant while at the same time an institution increases the quality of the education then enrollment of gifted students should increase. Thus, the increase of gifted students at an institution further affects the quality, which then has a multiplicative effect on the enrollment of more high-ability students (Long, 2002).

Enhancing the institution’s image. Honors programs are often seen as a means to enhance the image of an institution. As Halverson (1973) indicated, the successful operation of an honors program can improve the reputation of a university and its commitment to academic excellence (as cited by Austin, 1986). In fact, more institutions created honors programs during the last decade than in the past to “enhance the entire university’s reputation and prestige...” (Herbert & McBee, 2007, p. 136). Long (2002) asserted that an increase in institutional prestige benefits all students, alumni, and faculty. Enhancing institutional prestige is of vital concern because colleges and universities no longer compete with their regional neighbors but rather with institutions across the country (Hoxby, 1997, 2000). Publications such as *The U.S. News & World Report’s College Rankings* and institutional emphasis on college rankings are indicative of the importance of improving an institution’s image (Long, 2002). Long (2002) reported that college rankings are based predominantly upon the quality of an institution’s students, and thus, the importance of recruiting gifted students cannot be overstated. Gifted students often become high achieving alumni who can successfully compete in the labor market, which then increases

public perception of the university and improves college rankings (Selingo, 2002; Long, 2002). Therefore, it is not surprising that institutions showcase honors programs in their marketing materials to portray the institution as academically excellent.

Attracting and retaining talented faculty. Halverson also claimed that honors programs not only attract the best students but also recruit and keep talented faculty (as cited by Austin, 1986). In view of this claim, it is surprising that the literature on honors programs has not examined this.

Bringing in additional funding. Halverson's (1973) last suggested objective of honors programs was that honors programs can bring in additional funding to the university (as cited by Austin, 1986). However, a more recent publication by Speck (2010) indicates that although his institution received a substantial gift to start an honors program 20 years ago, the endowment is no longer enough to fund the program. While much of the literature from around 25 to 40 years ago professes the belief that honors can bring additional funding from donors, it is not a common claim today. However, if recruiting high achieving students does in fact increase institutional prestige and rankings, a spillover effect might increase alumni donations and gifts.

The Criticisms of Honors Programs

Criticisms of honors programs exist alongside claims of educational and institutional benefits.

Honors programs are exclusive and elitist. The criticism of honors programs is often rooted in its exclusivity. The nature of honors programs limits the amount of students and faculty that can participate. Thus, those not included are inclined to resent honors (Friedman & Jenkins-Friedman, 1986; Pehlke, 2003). Cummings (1986) confirmed that elitism is the primary criticism raised whenever there is a meaningful conversation about honors programs. Even if the

aim of honors programs is positive, there is an inherent danger of abuse (Cummings, 1986; Knudson, 2011; Pehlke, 2003). According to Cummings (1986), some students wish to participate in honors to attract attention, and thus they brag about the elitism (Cummings, 1986).

Knudson (2011), an honors director, criticized the motivation of some students (and their parents) to participate in honors programs. Knudson was disappointed when one parent, whose primary focus was on making sure her son's room was in a prime location, made repeated inquiries about the dorm's layout. Because of situations such as this one, Knudson worries about students' motives in participating in collegiate honors program. One of Knudson's honors students confirmed his concerns when the student said the campus visit made the honors program seem as if "honors was like flying first class" (Knudson, 2011, para. 4). Because of this statement, Knudson fears that some students and their parents view admittance into an honors program as a reward and concierge service instead of an opportunity to participate in rigorous work. It seems that even those leading honors programs express criticism regarding the potential abuse.

The exclusivity of honors programs has led to concerns about access to such programs for minority students. Schuman (1999), for example, admitted that honors programs lack racial diversity. Pehlke (2003) suggested that honors programs' overreliance on high school grades and college entrance exams to determine who is eligible for membership has left students of color at a disadvantage. Schuman (1999) wrote, "it is...disappointing that one can still hear mutterings about the difficulty in finding minority students of 'Honors quality,' yet several of the most successful Honors Programs exist in historically black colleges and universities" (p. 10). The concern over who has access to honors education only adds to the allegations of elitism.

Non-honors students suffer. Although colleges and universities often showcase the accomplishments of students in honors programs in order to highlight the quality of academics at the university in general, in actuality, an honors program includes only a small portion of the student body. For example, large public universities often use honors programs to highlight their small class sizes, a luxury found at most smaller colleges (Selingo, 2002). However, most non-honors students will take classes with large enrollments. Selingo (2002) suggested this leaves non-honors students with a “bare-bones education” (para. 7). Cummings (1986) reported, “One of the best arguments against...honors programs holds that establishing a special program that challenges only the best students detracts from the need to adopt measures that challenge all students” (p. 19).

Most of the criticism of honors programs pertains to those at large universities. Few articles, however, distinguish between honors programs at smaller colleges versus larger universities. Sperber (2000) criticized several large universities because of the way the institutions market honors programs. For example, honors students at the University of Minnesota in Twin Cities participate in the honors program because class enrollment is smaller. According to Sperber (2000), the University of Minnesota illustrates the superiority of the honors classroom experience by bragging that non-honors students sit in lecture halls so enormous that they must watch television screens to be able to see the teacher. Sperber (2000) and Pehlke (2003) questioned why universities, who clearly recognize that such a learning environment is not conducive to education, limit an adequate educational experience to honors students only. Sperber (2000) suggests that large universities use honors programs to hide the reality that research and prestige take priority over student learning at the undergraduate level. Concerns

such as Sperber's (2000) are important during a time when the quality and cost of higher education is in question.

The problem of class size is not so profound in honors programs at smaller universities. In contrast to research universities, Schuman (1999) notes that smaller colleges often have classes taught by full-time faculty and that the average class size is considerably smaller in both honors and non-honors courses (Schuman, 1999). However, students in honors programs have access to scholarships and opportunities that are not as common or readily available for non-honors students (Cummings, 1986; Pehlke, 2003). If, however, limited access to scholarships or services disadvantage non-honors students, it is important to evaluate whether doing so aligns with the mission of higher education.

Concerns that non-honors students suffer not only apply to the educational experience but to financial aid as well. For instance, colleges use merit-based scholarships to recruit honors students, which has resulted in a shift in policy from need-based financial aid to more merit-based aid (Long, 2002). As institutions shift their financial resources to the highest achievers, the concerns about elitism and exclusion of students of color continue to increase.

Honors education is costly. Some critics of honors programs question whether the benefits of the program are worth the necessary expense to run it. Indeed, the creation and management of an effective honors program is costly (Austin, 1986; Long, 2002; Sullivan & Randolph, 1994; Selingo, 2002; Speck, 2010). As colleges and universities attempt to do more with fewer financial resources, honors programs are under increased scrutiny because of the expense (England, 2010; Selingo, 2002). Running an honors program—and providing to students specialized academic seminars and courses, small class sizes, housing, and grants and scholarships—is more expensive than traditional undergraduate education (Austin, 1986; Long,

2002; Sederberg, 2005; Speck, 2010). Seeking to examine the validity of such critiques, Indiana University of Pennsylvania compared the cost of remedial education to honors education and found that remedial education costs the state of Pennsylvania four times more than honors (Selingo, 2002). Although there is not much research comparing the costs of providing honors versus non-honors education, critics suggest honors education is too costly.

Summary of Part One

An understanding of the history, purposes, and the purported benefits and criticisms of honors programs provides an important foundation to the present study because it is the treatment of interest. Part one described how Frank Aydelotte's experience as a Rhodes Scholar at Oxford inspired the idea for honors programs. Once Aydelotte became President at Swarthmore College, he implemented his vision for honors education by creating departmental honors for upperclassmen (Aydelotte, 1944). Likewise, Columbia College piloted several iterations of honors programs (Rinn, 2006). The legacy of honors at Columbia College is the fact that it was embedded within general education (Cohen, 1966). Furthermore, its Colloquium on Important Books continues to serve as a model honors colloquium to this day. Even though private universities were among the first to implement honors programs, the University of Colorado, under Joseph Cohen's leadership, served as a pioneer for large universities (Rinn, 2006). Overtime, the work of these influential leaders led to the development of the National Collegiate Honors Council. As a result, the honors education movement was no longer dependent upon the voice of a few men; rather, it had a stabilizing organization to act as an advocate and resource for honors programs (Rinn, 2006).

Given the rapid growth of honors programs since the 1990s, communicating the purposes of honors programs has become vitally important. Although honors programs can provide

educational and institutional benefits, there is potential for abuse (Knudson, 2011).

Misunderstandings of the purposes of honors—as well as the overreliance upon them as a recruitment tool to attract bright students—is a source of much critique of university honors programs.

Despite differences in honors programs, a consistent goal of these programs is to improve honors students' critical thinking (Edman, 2002; Haas, 1992). Therefore, important information and findings from college impact studies on critical thinking are summarized below. Part four of the literature review will specifically address the influence of honors programs on critical thinking. However, part two begins more broadly with a review of relevant studies on critical thinking.

Part Two: Critical Thinking

Part two of the literature review synthesizes important studies on critical thinking. This section begins with a review of the terms that are frequently used to describe cognitive outcomes such as critical thinking and then describes why critical thinking is an important outcome of a college education. The section that follows highlights definitions of critical thinking. Part two concludes by highlighting important college impact studies on critical thinking.

Lack of Agreement on Terminology

The development of critical thinking, sometimes referred to as cognitive skills, is an important goal of higher education for honors and non-honors students (Astin, 1991; McMillan, 1987; Tsui, 2007). Parks Daloz, Keen, Keen, and Daloz Parks (1996) suggested,

At their best, colleges provide space and stimulus for a process of transformation through which students move from modes of understanding that are relatively dependent upon conventional assumptions to more critical, systematic thinking that can take many

perspectives into account, make discernments among them, and envision new possibilities. (p. 223)

Despite agreement that the development of cognitive skills is important, scholars do not agree on the term used to describe such skills (Pascarella & Terenzini, 2005; Tsui, 2007). For example, cognitive skills are described using a variety of terms such as reflective judgment, problem solving, intellectual development, epistemological development, intellectual flexibility, and critical thinking (Pascarella & Terenzini, 2005). In their synthesis of the literature, Pascarella and Terenzini (2005) reported that only a few studies examined how college affects changes in cognitive skills, and those that do tend to focus on either “critical thinking” or “postformal reasoning” (p. 156). The current study examined the influence university honors programs have on critical thinking. Therefore, critical thinking will be the focus of this section of the literature review.

Critical Thinking as an Important Outcome of College

Critical thinking is not a new goal of education. For example, in Ancient Greece, Socrates emphasized the teaching of critical thinking by requiring students to question ideas (Paul, 1990). Centuries later, John Dewey (1910) asserted that “reflective thinking” should be a primary goal of education in the United States. Although Dewey used the term “reflective thinking,” his description of it aligns with the definition of critical thinking used by cognitive psychologists (Halpern, 2000). Dewey (1916) believed that education could be a mechanism for advancing and reforming a democracy and society. Dewey was not only instrumental in elevating the importance of critical thinking, but he also indirectly affected the honors education movement. Dewey’s students, for example, are credited with bringing about the change at

Columbia College that led to the Important Books Colloquium that then led to honors in general education (Cohen, 1966).

Although some of Frank Aydelotte's (1944) educational philosophies differed from Dewey's, he also believed that critical thinking was of democratic importance. Aydelotte (1944) suggested that the only way to remedy challenges associated with war and peace would be through the education of "thinking being[s]" (p. 6). Furthermore, Aydelotte wrote, "The very foundation of our democracy is our conception of liberal education and the freedom of the mind which that implies" (p. 1). According to Moran (1992), Aydelotte's educational approach was to teach students how to think critically. The emphasis on critical thinking has a long history in American higher education that is especially evident in the words of influential leaders in the advancement of honors education.

Still today, many people agree that college students should improve their ability to think critically (Behar-Horenstein & Niu, 2011; Kuhn, 1999; McMillan, 1987). As the world shifts to a knowledge-based economy, the need to teach students how to think has become increasingly important (Halpern, 2000; Pascarella & Terenzini, 1991, 2005). Since the 1980s, teaching critical thinking has received increased consideration (Ennis, 1993). According to a report by the Higher Education Research Institute (2009), approximately 99.6% of faculty members at colleges and universities believe that critical thinking is a "very important" or "essential" aim of college. Political leaders, too, recognize critical thinking as an important outcome of postsecondary education. Those who worked on the Education 2000 agenda agreed that critical thinking skills should be a "primary goal" of education (Halpern, 2000, p. 2990). Furthermore, the ability to think critically is one of the most essential skills for an effective economy and citizenry (Halpern, 2000). Industry leaders and employers have expressed their appreciation of

the importance of students graduating from college with effective critical thinking skills as well (e.g., AAC&U, 2007; Casner-Lotto & Silvert, 2008). However, surveyed employers indicate only 22% of college graduates can think critically at satisfactory levels (Peter D. Hart Research Associates, Inc., 2008).

Definitions of Critical Thinking

Although the development of critical thinking skills is generally considered one of the main aims of a college education, there is nevertheless not one agreed upon definition of critical thinking (Halpern, 2001; McMillan, 1987; Tsui, 1999, 2007). Paul, Elder, & Bartell, (1997) reported that even faculty find it difficult to define critical thinking. Despite the trouble faculty have defining critical thinking, scholars define critical thinking similarly (Tsui, 1999).

Pascarella and Terenzini (2005) synthesized operational definitions of critical thinking,

Attempts to define and measure critical thinking operationally focus on an individual's capability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships and make correct references from the data, deduce conclusions from information or data provided, interpret whether conclusions are warranted based on given data, evaluate evidence or authority, make self-corrections, and solve problems. (p. 156)

Halpern (2001) has argued that there is “sufficient overlap in the various definitions to allow an evaluator to move beyond the definitional phase” (p. 272). This study used the definition of critical thinking that is consistent with the operational definition of the Collegiate Assessment of Academic Proficiency (CAAP) Critical Thinking Test. ACT, Inc. (2008) defines critical thinking as “the ability to analyze, evaluate, and extend arguments” (p. 13). Gellin (2003) and Owen (1998) indicated that the Collegiate Assessment of Academic Proficiency effectively measures critical thinking.

The Development of Critical Thinking in College

Past studies provide important information for researchers examining how college affects students' critical thinking ability. For example, studies have suggested that students' ability to think critically is improved during college (Dressel & Mayhew, 1954; Feldman & Newcomb, 1969; Lehmann, 1963; Pascarella & Terenzini, 2005). Generally, students at higher levels of postsecondary education have higher scores on critical thinking tests (McMillan, 1987; Pascarella & Terenzini, 2005; Tsui, 1998). In their synthesis of past studies, Pascarella and Terenzini (2005) reported that cross-sectional studies measuring critical thinking estimate that seniors have between .55 and .65 of a standard deviation advantage over freshmen.

It appears on the surface that students' critical thinking skills improve during college. However, several researchers indicate gains in critical thinking could be attributed to maturation that would happen despite college (McMillan, 1987; Pascarella, 1989; Tsui, 1998). To test this claim, Pascarella (1989) used the Watson-Glaser Critical Thinking Appraisal to compare students who attended college with those who did not. An important limitation in Pascarella's (1989) study was the small sample size, but his utilization of a control group is a component missing in many longitudinal studies measuring critical thinking gains in college (McMillan, 1987; Tsui, 1998). After their first year of college, the 47 college attendees had significantly higher levels of critical thinking compared to the 20 who did not attend college. Pascarella (1989) reported, however, that the gains made by first-year college attendees were modest, and yet the greatest magnitude of growth tends to take place in the first year of college (Lehmann, 1963; Pascarella & Terenzini, 1991, 2005). Tsui (1998) cautions that upperclassmen are less likely to participate in critical thinking studies than are college freshmen, which can, especially in cross-sectional studies, threaten the validity of the findings (Tsui, 1998).

Pascarella, Bohr, Nora, and Terenzini (1996) found further evidence that college attendance positively affects growth in critical thinking. Pascarella et al. (1996) compared full-time college students to part-time college students in the first year of college and determined that full-time college students who participated in the study had significantly higher gains in critical thinking than part-time students.

Although critical thinking ability improves during college, some suggest college graduates do not perform as well as they should (Keeley, 1992; Kuh, 1995; Norris, 1985). Because of these critiques, more studies have examined the effectiveness of different forms of instruction (McMillan, 1987). In his comprehensive review of 27 critical thinking studies, McMillan (1987) indicated that there is not sufficient evidence that instructional variables in a *single course* influence critical thinking. However, Pascarella and Terenzini (1991, 2005) suggest that because critical thinking takes a long time to develop, the impact of instructional variables is difficult to gauge in one semester or less.

Single courses do not appear to affect critical thinking; however, research suggests that aspects of courses can (McMillan, 1987). Students taking a series of courses that require integrative thinking appear to enhance critical thinking ability (Winter, McClelland, & Stewart, 1981). Astin (1993) identified that on self-report measures of critical thinking, students reported higher levels of critical thinking if they took integrative courses. Although Smith (1977, 1981) did not control for precollege characteristics, his research suggested that student-faculty interaction, encouragement from faculty, active student participation in class, as well as a high level of peer-to-peer interaction leads to gains in critical thinking. Additionally, courses with high levels of reading, writing, and interaction in class seem to affect the development of critical thinking (Gibson, 1985). These findings are important to this study because honors programs

tend to include curriculum that is more integrative, encourage high levels of interaction with faculty and students, and require more reading and writing.

Most of the research on critical thinking is cross-sectional rather than longitudinal (Pascarella & Terenzini, 1991, 2005). Dressel and Mayhew's (1954) longitudinal study of critical thinking is the study many consider the most comprehensive study to date (McMillan, 1987; Tsui, 1998; Pascarella & Terenzini, 1991). Eleven colleges and universities participated in the study. With a sample size of approximately 1,700 students, Dressel and Mayhew (1954) found that on a critical thinking test of the social sciences, every institution made statistically significant gains in the first year of college. The gain reported was approximately 0.5 of a standard deviation. Students who entered college with lower scores on the critical thinking test made the most gains in the first year. However, Pascarella and Terenzini (1991) caution that this finding could be because of the statistical phenomenon of regression to the mean.

In the same study, Dressel and Mayhew (1954) also examined critical thinking gains in the sciences and at institutions with a general education curriculum. They measured critical thinking in the sciences by administering a measure of critical thinking in science at seven institutions and to 470 students. All but one institution experienced statistically significant gains in critical thinking at 0.5 of a standard deviation. Furthermore, 1,000 students from seven institutions completed a general critical thinking test. Consistent with the other critical thinking tests, students experienced a 0.5 of a standard deviation gain in the first year of college. Dressel and Mayhew noted that institutions that required general education, especially within the first year, made the most gains. Although Dressel and Mayhew's (1954) study is considered the most comprehensive study, important precollege characteristics were not controlled for. Additionally, the same instrument was not used as the posttest. Creswell (2008) recommended that

longitudinal studies should use the same pretest-posttest measure. These are important methodological considerations to consider in assessing the Dressel and Mayhew study.

Despite the fact that most longitudinal studies examining the development of critical thinking focus only on the first year of college, a few noteworthy studies explore changes beyond the first year. Lehmann (1963) administered the American Council on Education's Test of Critical Thinking Ability to 1,051 (590 males and 461 females) entering freshmen at Michigan State University. Although the study consisted of a single institution, Lehmann followed his sample through their senior year of college. Participants completed the critical thinking measure at orientation and at the end of each academic year. Analyzing male and female participants separately, Lehmann used the *t*-test for correlated sample means to evaluate if changes in critical thinking scores were statistically significant. Gains in critical thinking scores from the freshman to senior year were 1.02 standard deviations for male participants and .93 for female participants. Two-thirds of the improvement took place in the first year. Lehmann did not have a control group for his study or control for important precollege characteristics. With only one institution, caution is necessary when generalizing the findings. However, it is still considered one of the most important studies on critical thinking (McMillan, 1987).

Like Lehman (1963), Mentkowski and Strait (1983) examined gains in critical thinking across four years of college. They conducted their study at Alverno College using the Watson-Glaser Critical Thinking Appraisal. The researchers reported gains for participants from freshman to senior year. They also found that the greatest magnitude of growth occurred in the first year of college. However, because Alverno College is a women's college the student body is not typical of other colleges and universities.

Although such past studies—some as much as 50 years old—of critical thinking gains in college were generally positive in their results, more recent research has been less hopeful. Most recently, a longitudinal study examined student progress on important educational outcomes such as critical thinking, complex reasoning, and writing as measured by the Collegiate Learning Assessment (CLA) (Arum & Roksa, 2011; Arum et al., 2011). This longitudinal study consisted of 24 institutions and 2,322 students. Arum and Roksa's (2011) book, *Academically Adrift*, has created a shockwave across the country (Pascarella et al., 2011). Their longitudinal study suggested that the intellectual growth of college students is low. From the beginning of the freshman year until the end of the sophomore year, students demonstrated gains of 0.18 of a standard deviation (Arum & Roksa, 2011) and 0.47 of a standard deviation in critical thinking by the end of the senior year (Arum et al., 2011). Approximately 45% of the students did not make significant gains during the first two years of college (Arum & Roksa, 2011). This finding is consistent with results from the first cohort of the WNSLAE (Blaich, 2011). Blaich (2011) indicated that 30% of the participants in the 2006 cohort showed a decline or no gain on a standardized measure of critical thinking. Pascarella et al. (2011) replicated Arum and Roksa's (2011) study with data collected for the WNSLAE and found consistent results. Arum and Roksa (2011), Arum et al. (2011), and Pascarella et al. (2011) report gains much lower than those reported in previous studies (Dressel & Mayhew, 1954; Lehmann, 1963; Pascarella & Terenzini, 1991). Given the importance of critical thinking, these findings are sobering.

The large-scale longitudinal study suggests that certain student experiences and background characteristics affect critical thinking gains. Students who majored in the liberal arts and sciences had greater gains (Arum & Roksa, 2011; Arum et al., 2011). Students majoring in business did not show as much improvement. Students experienced greater growth if they

studied alone, read and wrote a lot, and spent more time on task. Furthermore, Arum and Roksa's findings suggest that studying in groups negatively affects critical thinking scores. Additionally, although students from families with more education enter college with higher scores on the CLA, their growth overtime is consistent with students whose parents have lower levels of education. Furthermore, Arum and Roksa (2011) were quite concerned with how race affected critical thinking during the first two years of college. Arum and Roksa (2011) reported, "White students gained 41 points while African-American students gained 7 points" (p. 39). Arum and Roksa's (2011) study found that students in the top 25% of high school GPA and SAT/ACT scores achieved equal or higher gains than students that entered college with lower academic ability scores. This finding is different from Dressel and Mayhew's (1954) study and exactly opposite of what one would expect (Cohen et al., 2003).

Although the findings from *Academically Adrift* have raised concerns about the quality of higher education, caution is necessary when interpreting results about college impact on critical thinking (Pascarella et al., 2011). Many in higher education question the validity of the CLA, especially as a measure of critical thinking (see Arum & Roksa, 2011; Pascarella et al., 2011). A primary consideration when evaluating the validity of critical thinking studies is the measurement used. Pascarella et al. (2011) suggest that complex skills such as critical thinking take time to learn. In addition, Pascarella et al. (2011) add that there is no agreed upon standard that defines how much change students should make on standardized measures.

According to Pascarella et al. (2011), one cannot conclude that college does not add value without using a control group of non-college attendees. For example, Pascarella et al. (2011) point to Pascarella and Terenzini's (1991) work, which found that although the quantitative skills of college students did not improve much during college, non-college attendees experienced

significant declines. Just as many longitudinal studies exploring the impact of college on the development of critical thinking skills, Arum and Roksa (2011), Arum et al. (2011), and Pascarella et al. (2011) all lacked a control group of non-college attendees. However, because of the findings from *Academically Adrift*, cries for the reform of higher education have become increasingly urgent (Pascarella et al., 2011; Arum et al., 2011).

Part Three: Principles of Good Practice in Undergraduate Education

Concerns about student learning and cries for reform are not new. During the 1980s, stakeholders were worried that students were not learning as much as they should during college (Chickering & Gamson, 1987). At the same time many were expressing the need for reform, Arthur Chickering and Zelda Gamson were involved in national discussions about how to improve student learning and reform undergraduate education (Chickering & Gamson, 1999). Because of their participation in these conversations, they were invited by the Johnson Foundation to attend a conference about undergraduate education, where they realized that a statement of good practices in undergraduate education should be developed and disseminated to faculty across the country. Chickering and Gamson argued the best way to improve student learning and reform undergraduate education was to equip faculty with a list of good practices.

Part three describes the principles of good practice in undergraduate education. The section begins with a discussion about how and why these principles were developed. Next, the chapter describes the seven original good practices. This section then describes popular questionnaires that were designed and modified to measure good practices. The final part of this section briefly describes research on and recent adaptations to good practices.

The Development of Good Practices in Undergraduate Education

With the favor of the Johnson Foundation, the American Association of Higher Education (AAHE), and the Education Commission of the States, Chickering and Gamson pioneered the development of the seven principles of good practice in undergraduate education in 1986 (Chickering & Gamson, 1987, 1991). Prior to the development of the principles of good practices, Chickering and Gamson were involved in projects that made them recognize a need for a list of principles that synthesized college impact research into easily understood principles that could be used by faculty to improve student learning. Chickering and Gamson believed that the timing was right to develop principles of good practice because parents and legislators were concerned about higher education and demanded reform (Chickering & Gamson, 1991).

To develop the principles of good practice, Chickering and Gamson formed a task force of knowledgeable researchers—including Alexander Astin, K. Patricia Cross, Robert Pace, and others—in order, “to identify key principles which characterize the practices of educationally successful undergraduate institutions” (Gamson, 1991, p. 7). Chickering and Gamson instructed the group to ensure that the principles were “accessible, understandable, practical, and widely applicable” for college professors (Gamson, 1991, p. 7). Most of all, they wanted their work to inform and influence how faculty taught. The final product of the taskforce was a list of seven good practices in undergraduate education.

Research Based Good Practices in Undergraduate Education

The principles of good practice are based on the belief that education is “active, cooperative, and demanding” (Gamson, 1991, p. 5). In their original form, the seven principles were,

- Encourages student-faculty contact,

- Encourages cooperation among students,
- Encourages active learning,
- Gives prompt feedback,
- Emphasizes time on task,
- Communicates high expectations and
- Respects diverse talents and ways of learning (Gamson, 1991, p. 5).

The principles were based on findings from research on practices that were shown to enhance cognitive outcomes in college (Sorcinelli, 1991).

The seven principles of good practice were originally published in the *AAHE's Bulletin* in 1987 (Chickering & Gamson, 1987). The report summarized concerns about college level learning, articulated the urgent need for faculty to disseminate and utilize the seven principles of good practice in their work with students, and listed practical suggestions for faculty implementation of each of the seven good practices. The response from faculty and administrators was overwhelmingly positive (Chickering & Gamson, 1999; Gamson, 1991).

The Development of Questionnaires to Measure Good Practices

Due to the overwhelming response to the publication of the seven principles of good practice in undergraduate education, Chickering and Gamson's work had only begun. With the support of the Lily Foundation, Chickering and Gamson developed two self-assessment inventories to measure the extent to which faculty utilized good practices in their classes and the extent to which a campus had policies and actions that supported good practices (Gamson, 1991). Chickering and Gamson cautioned potential users that the inventories were for self-assessment purposes only. According to Gamson (1991), the inventory directions warned that the instruments were not psychometrically valid for research.

The increasing demand for measures of good practices led to the development of several inventories by the broader higher education community (Chickering & Gamson, 1999). For example, the College Student Experiences Questionnaire (CSEQ), which was developed by Robert Pace, was widely used in research to measure good practices in undergraduate education (Kuh, Pace, & Vesper, 1997; Kuh & Vesper, 1997). In later revisions of the CSEQ, items were added to the questionnaire to measure more of the principles of good practice (Chickering & Gamson, 1999). However, due to the length of the CSEQ and similar national surveys, the federal government expressed the need for shorter, but still reliable and valid, instruments that would inform teaching and learning at the institutional level (Kuh, 2009). Although the government's urgency in these conversations declined, the commitment of national organizations persisted (Kuh, 2009). At the request of Russ Edgerton of the Pew Charitable Trusts and with the assistance of Alexander Astin, Arthur Chickering, George Kuh and others, Peter Ewell from the National Center for Higher Education Management Systems constructed a questionnaire designed to measure student exposure to "empirically derived good educational practices" (Kuh, 2009, p. 7). This instrument became known as the National Survey of Student Engagement (NSSE). According to Kuh (2001, 2009), over 60% of the items on NSSE were identical or similar to the items on the CSEQ. In the late 1990s, Robert Pace, the developer of the CSEQ, had shifted responsibility of the CSEQ to the Indiana University Center for Postsecondary Research (IUCPR). Because of this, the IUCPR worked with Ewell to pilot NSSE in 2000.

The philosophy underpinning NSSE is that in absence of direct measures of student learning, the student questionnaire provides data on "process indicators" that lead to higher levels of student engagement and learning (Kuh, 2009, p. 9). Chickering and Gamson's (1987) principles of good practice are the process indicators used by NSSE (Kuh, 2000, 2009).

According to Kuh (2009), data on process indicators can help institutions know where they can improve practices that enhance student learning. Kuh (2000) stressed, “Emphasizing good educational practice helps focus faculty, staff, students, and others on the tasks and activities that are associated with higher yields in terms of desired students outcomes” (p. 1). Thus, one of the most widely used surveys in higher education was designed to measure student exposure to good practices.

Research on Good Practices in Undergraduate Education

Because Chickering and Gamson (1987, 1991) used fifty years of research as the foundation for the development of the seven good practices, it is not surprising that several studies support the predictive validity of the good practices in undergraduate education (Cruce et al., 2006). After controlling for confounding variables, numerous research studies suggest that good practices are linked to the cognitive and non-cognitive development of students (e.g., Astin, 1993; Cruce et al., 2006; Pascarella, Cruce, Wolniak, & Blaich, 2004; Pascarella, Wolniak, Seifert, Cruce, & Blaich, 2005; Pascarella et al., 2006; Pascarella & Terenzini, 1991, 2005; Sorcinelli, 1991).

Additional evidence highlights the importance of good practices. Blaich and Wise (2011) found that students who reported higher levels of exposure to good practices were more likely to experience growth on outcome measures, including critical thinking. Likewise, they report that there was significant variation in student exposure to good practices within institutions. Therefore, it seems that exposure to good practices matter, but a disparity of exposure exists within institutions.

Adaptations to the Good Practices

Since the initial publication of the good practices, Chickering and Gamson (1999) indicated that there have been various adaptations to the list of good practices. According to Seifert et al. (2007), several researchers suggest that there are two additional good practices in undergraduate education (e.g., Cruce et al., 2006; Pascarella et al., 2004, 2005, 2006). The first additional good practice pertains to quality and organization of teaching. The second good practice focuses on positive peer interaction. As mentioned previously, Chickering and Gamson (1999) specified that the good practices were intentionally broad, and it is, therefore, not surprising that others have suggested additional good practices.

Summary of Part Three

Chickering and Gamson, along with a team of higher education researchers, synthesized 50 years of research to highlight educational practices that improve student learning (Chickering & Gamson, 1987, 1991; Sorcinelli, 1991). Chickering and Gamson did this because they believed that providing faculty with research-based principles of good practice was the most effective way to improve student learning in college (Gamson, 1991). Because of the increasingly widespread dissemination of good practices, instruments measuring student exposure to good practices were needed (Chickering & Gamson, 1999). As a result, the CSEQ was modified and the NSSE instrument was designed to evaluate student exposure to good practices (Kuh, 2009). Recent findings from the first cohort of the WNSLAE indicate that exposure to good practices has an effect on student learning (Blair & Wise, 2011). Thus, it seems possible that the key to improving undergraduate education lies in exposing students to good practices in undergraduate education.

Part Four: The Influence of Honors Programs on Critical Thinking and Exposure to Good Practices

A consistent goal of honors programs is to improve honors students' critical thinking (Haas, 1992; Edman, 2002) by exposing students to good practices in undergraduate education (Digby, 2005; Sederberg, 2005). Although it seems like honors programs would provide the ideal environment to teach students to think critically, there is little research about the outcomes of honors programs. Because the research is scant, some speculate whether honors programs are actually effective in providing a better education to gifted students (Long, 2002; Pascarella, 2006; Rinn & Plucker, 2004). The absence of research on honors programs provides an opportunity for researchers to study the effectiveness of honors programs at facilitating student learning and exposing students to good practices in undergraduate education.

An extensive review of the literature identified four studies that examined the effectiveness of honors programs at exposing honors students to good practices in undergraduate education (Ory & Braskamp, 1988; Seifert et al., 2007; Shushok, 2003, 2006) and six studies that estimated the impact of honors at improving honors students' ability to think critically (Astin, 1993; Ory & Braskamp, 1988; Seifert et al., 2007; Shushok, 2003, 2006; Tsui, 1999). However, Seifert et al. (2007) was the only longitudinal study to use a standardized measure of critical thinking.

Ory and Braskamp (1988) conducted a single-institution study to compare educational gains and involvement of freshmen students in three college programs: honors, regular curriculum, and a transition program for at-risk students. A sample of 225 students completed the College Student Experiences Questionnaire (CSEQ) (Pace, 1979) to determine their exposure to good practices and the development of critical thinking. According to Ory and Braskamp,

honors students were more involved than regular and transition students. On the items that pertained to good practices, honors students reported more “experiences with faculty” and more influential discussions with peers (Ory & Braskamp, 1988, p. 121). However, regular students perceived that their institution put greater emphasis on “developing academic qualities” than honors students did. This is surprising since, by their very nature, honors programs are designed to develop the academic learning of member students. Students in all three programs did not report significant differences in the emphasis the institution placed on developing relationships with faculty, although honors students reported having more experiences with professors. For honors students, there was a strong positive relationship between academic effort and self-reported gains in the development of intellectual skills when compared to the participants in the other programs. However, when Ory and Braskamp conducted a one-way ANOVA to further evaluate the differences between students in the three programs, honors students did not report greater growth in critical and analytical thinking. The honors students did report higher gains in quantitative thinking. Ory and Braskamp did not control for precollege characteristics in their research design, and their results may therefore be somewhat misleading. For example, in the sample, 77% of the honors student group were White, whereas 79% of the students in the at-risk program group were non-White. Without controlling for race, Ory and Braskamp could have incorrectly attributed the effect to the honors program when it could have been an effect of race (Seifert et al., 2007).

Like Ory and Braskamp (1988), Shushok (2003, 2006) used a self-report measure of critical thinking to measure gains. In addition, Shushok controlled for potentially confounding variables. Shushok (2003) studied how non-honors and honors students at one university differed in the development of their intellectual skills as well as their exposure to different good

practices in the first year of college. Shushok (2003) used the CSEQ (Pace, 1990) to measure students' self-perceived gains. His sample included 172 students. In his 2003 study, honors and non-honors students did not report statistically different gains in critical thinking or exposure to good practices. Shushok (2003) added that honors program participation seemed to positively affect male honors students more than it affected female honors students, as male honors students reported more interaction and engagement with faculty than non-honors males. Furthermore, minority honors students had significantly more interaction with faculty than non-honors minority students did.

Although Shushok (2003) reported no statistical difference in the development of critical thinking skills between honors and non-honors students, it is important to note that many of the participants in the non-honors group were in an elite scholars program at the university. Shushok did not disclose how many participants were involved in the elite scholars program. However, students participating in a program such as this one may have similar experiences to students participating in the university honors program.

Shushok (2006) conducted a follow-up study to his dissertation to examine how, by their senior year, the same group of honors and non-honors students varied in their college experiences (good practices) and progress on student outcomes such as intellectual skills. One hundred and four students participated in the follow-up study. In his 2006 study, Shushok did not use the CSEQ as he did in the 2003 study. Collaborating with faculty who taught in the honors program, Shushok developed his own instrument. Once again, honors students did not report higher gains in critical thinking. However, honors students reported differences in their exposure to some good practices. Honors students were more likely to talk with faculty outside of class, discuss career plans, and participate in academic activities outside of class. Shushok's

study suggests that honors programs can affect students' self-concept because of the reference group. In a focus group session, for example, one honors student stated that he appreciated the honors program because it was the first time in his life where he felt that "it's okay to be smart and study" (Shushok, 2006, p. 94). Additionally, a non-honors student proclaimed to an honors student in the focus group, "I really haven't had the access you had with the faculty" (p. 94).

Although the honors students did not report higher gains in critical thinking skills, they did report more exposure to faculty. The sample in the 2006 study also included students in the elite scholars program in the non-honors group. Furthermore, the instrument used was a locally developed self-report measure that was not the same as the initial instrument. Creswell (2008) indicated that longitudinal studies should use the same instrument throughout the study because using a different one is a threat to internal validity.

Using a self-report measure of student gains also affects the validity of the study. On items where honors students reported larger gains, Shushok (2003) suggested that this could be explained by the "Pygmalion" effect, which hypothesizes that what students are told and what their teachers believe can affect student outcomes (Rosenthal & Jacobson, 1968). Thus, high achieving students who were in the honors program or in the elite scholars program may self-report high levels of gains on critical thinking measures because they think they should have gains (Shushok, 2003).

Tsui (1999) and Astin (1993) conducted a large-scale longitudinal study using the Cooperative Institute Research Program's (CIRP) 1989 Follow-up Survey. Approximately 25,000 fourth year students from over 200 four-year colleges and universities completed both the CIRP freshman survey as well as the follow-up measure that was developed by the Higher Education Research Institute (HERI). Astin (1993) found that participating in an honors

program had a positive effect on self-reported gains in problem-solving and analytical skills as well as on almost all other items. With the same sample, Tsui (1999) indicated that taking honors courses during college was significantly and positively related to self-reported gains in critical thinking. Both Astin (1993) and Tsui (1999) controlled for many potential confounding variables, but both studies used a self-report measure. Furthermore, the significant findings could be the result of such a large sample, leading to a Type I error. The studies did not examine exposure to good practices in undergraduate education for honors versus non-honors students.

Unlike all of the previously mentioned studies that used self-report measures, Seifert et al. (2007) used a standardized test to estimate the effects of honors program participation on critical thinking in the first year of college at 18 four-year institutions. The CAAP Critical Thinking Test was administered as a critical thinking pretest to 3,303 freshmen at orientation in the fall of 1992. Students also completed the National Study of Student Learning (NSSL) survey to provide researchers with information for the control variables. In the spring of 1993, students completed the CAAP Critical Thinking Test as a posttest. In addition, students completed the CSEQ (Pace, 1990) and a follow-up questionnaire about experiences they had in and out of class to measure good practices. The final sample consisted of 1,999 students, 13% of which participated in an honors program.

Honors program participation had a significant and positive effect on critical thinking scores even after controlling for precollege characteristics (Seifert et al., 2007). The gain achieved by honors program participants was 0.09 of a standard deviation higher than non-honors students. Seifert et al. (2007) reported that honors program participants were exposed to six of the twenty good practices—course related interactions with peers, academic effort/involvement, instructor use of higher-order questioning techniques, instructor feedback,

number of assigned readings, and instructional skill and clarity—at significantly higher rates than non-honors students were (p. 66). The six good practices honors students experienced at higher levels pertained to in-class experiences. Interestingly, students in honors reported fewer essay exams than non-honors students did. However, consistent with Shushok (2003), honors students' out of class experiences were similar to non-honors. After controlling for honors students exposure to good practices, honors programs were shown to have a significant and positive effect on critical thinking scores. Because honors participants entered college with higher pretest scores on the CAAP Critical Thinking Test, the researchers were surprised that even after adjusting for precollege characteristics, honors participants achieved significantly larger gains on critical thinking than their non-honors peers did. This finding is contrary to what one would expect (Cohen et al., 2003).

Seifert et al. (2007) examined whether the effect of honors program participation was similar for all honors students (general effect) or if the effect varied based on gender, race, college choice, and parental income (conditional effect) and concluded that the effect of honors program participation on critical thinking was general, not conditional. However, honors program participation had significantly stronger net effects on other measures of cognitive development for men, students from higher parental income levels, students of color, and for students attending a college that was their first choice.

To date, Seifert et al.'s (2007) study is the most psychometrically valid and comprehensive study on the effects of honors program participation on critical thinking. Because the researchers used a standardized measure of critical thinking and a longitudinal design, their study is considered more internally valid than past studies (Astin, 1993; Ory & Braskamp, 1988; Shushok, 2003, 2006; Tsui, 1999). The data, however, were collected from

college freshmen in the early 1990s. Since today's students are more diverse and represent a different generational cohort (Pascarella, 2006), Seifert et al. (2007) suggested a similar study is warranted with a more recent sample.

Summary of Chapter Two

When honors programs were first created, many were concerned about the education of gifted students. Of primary concern was the belief that as more Americans gained *access* to college, the *education* of gifted students suffered (Aydelotte, 1944). Frank Aydelotte, who believed that both the democracy and economy depended upon the education of the country's brightest college students, was especially concerned by the nature of post-secondary education in the United States. Aydelotte thought that by separating gifted students from those who were less able, gifted students would learn more (Aydelotte, 1921; Swarthmore Faculty, 1941), a philosophy that still underpins honors programs today. Although nearly 90 years have passed since Aydelotte expressed his concerns about education, concerns about quality, equity, and access persist. At the same time, administrators' increasing reliance on honors programs to recruit high-achieving students causes some to question whether honors programs really live up to their claims of better serving gifted students (Rinn & Plucker, 2004). Although honors programs are purportedly beneficial to students, Pascarella (2006) questions whether honors programs are a rational myth in higher education. In other words, do honors programs actually influence student learning? And, are students in honors programs more likely to experience "good practices" in undergraduate education?

Given recent economic concerns, there is a push to encourage postsecondary education because the nation needs an educated workforce. However, Arum and Roksa (2011) question whether college attendance makes a difference on important learning outcomes. While

employers suggest that critical thinking skills are vitally important, they complain that college graduates are lacking critical thinking skills (AAC&U, 2007; Casner-Lotto & Silvert, 2008; Casner-Lotto & Wright Benner, 2006; Morris, 2010; Peter D. Hart Research Associates, Inc., 2008). Findings from national studies (i.e., Arum et al., 2011; Arum & Roksa, 2011; Pascarella et al., 2011) support the claims of industry leaders and suggest that college students' critical thinking must be improved.

The same national reports that suggest overall, college students do not make significant progress also highlight the fact that some students are making substantial gains (Arum & Roksa, 2011). Furthermore, Blaich and Wise (2011) found that students who reported higher levels of experiences with good practices made the largest gains on learning outcomes. Additionally, there is more variation on good practices and growth in outcomes within institutions than across institutions (Blaich & Wise, 2011; NSSE, 2008b). Given the claims honors programs make about providing students with a more educationally rewarding learning environment, one must wonder what effect honors programs have on students' critical thinking skills and their experiences with good practices. A review of the literature located only one multi-institutional longitudinal study that used a standardized measure of critical thinking as the pretest and posttest (Seifert et al., 2007). However, given the dated nature of the dataset analyzed by Seifert et al. (2007), a replication study is warranted. For this reason, the current study examined the influence honors programs have on first-year college students' experiences with good practices in undergraduate education and critical thinking skills.

CHAPTER THREE

METHOD

Because the current study analyzed secondary data from the Wabash National Study for Liberal Arts Education (WNSLAE), Chapter Three begins with a description of the WNSLAE including its institutional sample, the data collection procedures used by the research team, and the student sample. The section that follows describes the college impact model that guided the conceptual model for the current study. The last sections of Chapter Three present the current study's design, institutional sample, data collection procedures, student sample, variables, and the data analysis process.

The Wabash National Study of Liberal Arts Education

The WNSLAE was a large-scale longitudinal study that used a pretest-posttest design (Wabash National Study Overview, n.d.). The study sample was comprised of over 17,000 students from 49 higher education institutions. The overarching goal of the WNSLAE was to identify the curricular and co-curricular college experiences that affect student outcomes, specifically critical thinking skills, sense of well-being, need for cognition, attitudes about and interest in diversity, level of moral reasoning, and others (Pascarella & Colleagues, 2007a). Because the WNSLAE was interested in measuring student growth throughout college, the study followed students across four years of college.

The Institutional Sample for the WNSLAE

The WNSLAE includes three (i.e., 2006, 2007, 2008) cohorts of higher education institutions, with representation from 17 four-year institutions and two community colleges for the 2006 cohort; eight four-year institutions for the 2007 cohort; and 25 four-year institutions and

one community college for the 2008 cohort. Data from a total of 49 different institutions were included in the WNSLAE (See Appendix A for a list of institutions that participated in the WNSLAE).

According to Pascarella and Colleagues (2007a), the institutions selected to participate in the WNSLAE represented the diversity of higher education institutions across the country differing by size, geographic location, admission standards, student enrollment, and costs of tuition. Liberal arts colleges were intentionally oversampled because the sponsoring organization, the Center of Inquiry in the Liberal Arts, focuses on the advancement of liberal arts education. However, community colleges, regional institutions, and research universities were also represented in the study. As such, the outcome measures of the WNSLAE are relevant to all types of institutions (Seifert et al., 2010).

The Data Collection Procedures for the WNSLAE

The study utilized a longitudinal pretest-posttest panel design. In an attempt to measure student growth throughout college, the WNSLAE hired ACT, Inc. to administer all tests and collect data at the beginning of students' first year in college, at the end of the first year of college, and at the end of the fourth year in college at each institution (Pascarella & Colleagues, 2007a).

Once the institutions were accepted to participate in the study, institutional administrators assisted in the recruitment of students and implementation of the study on their campus. The institutions invited incoming first time, full-time freshmen to participate in the four-year study (Wabash National Study Overview, n.d.). Most of the large research institutions used a random sample to invite newly admitted students (Pascarella & Colleagues, 2007a). However, the largest research university in the 2006 cohort randomly sampled entering first time, full-time

students from the College of Arts and Sciences only (K. Wise, personal communication, March 2, 2012). Other institutions used a convenience sample of full-time, first-time students, because the incoming class numbers at these colleges were smaller than the larger research institutions (Pascarella & Colleagues, 2007a).

The initial data collection occurred when students entered college (Pascarella & Colleagues, 2007a). At that time, students completed a battery of tests that collected information about their high school experiences, expectations of college, and demographic information. Students also completed pretests on outcome measures. In total, students spent 90 to 100 minutes completing surveys and pretests. Students in the 2006 cohort were paid \$50 each time they participated in the data collection, however, other cohorts did not receive compensation.

Because the WNSLAE included several outcome measures, the research team was concerned, that if participants completed all outcome measures, the time and cognitive demands would be taxing for participants (Pascarella & Colleagues, 2007a; Seifert et al., 2010). To address these concerns, the researchers used a random selection technique to assign students either the CAAP Critical Thinking Test (ACT, Inc., 2008) or the instrument measuring moral reasoning. Thus, only 50% of the students participating in the WNSLAE completed the CAAP Critical Thinking Test—the outcome measure of this study—at each data collection.

The second and third data collection occurred at the end of the students' first and fourth year of college and required approximately two hours each time (Wabash National Study Overview, n.d.). To relay information about students' experiences in college, including their exposure to empirically vetted principles of good practice in undergraduate education, students completed the National Survey of Student Engagement (NSSE) (2008a), the WNSLAE's Student Experiences Survey (WSES) (Pascarella & Colleagues, 2007b), and 21 items from the

Cooperative Institutional Research Program's (CIRP) survey (Wabash National Study Overview, n.d.). Students also completed posttest measures that were parallel to the measures completed at the initial data collection. The final data collection for the 2008 cohort occurred in the spring of 2012.

The Student Sample for the WNSLAE

As is typical of most longitudinal studies with a pretest-posttest panel design (Creswell, 2008), all three cohorts (2006, 2007, 2008) who participated in the WNSLAE experienced attrition (Goodman, 2011). Approximately 4,500 students from 17 four-year institutions and two community colleges participated in the 2006 cohort (Pascarella & Colleagues, 2007a). At the end of the first year, 68% of the students returned for the second data collection to complete the posttest measures. In the 2007 cohort, 3,375 first-year students from eight institutions joined the WNSLAE (Goodman, 2011). In the spring of 2008, 38% of the students returned for the second data collection to complete the posttest measures. The 2008 cohort included 9,628 students from 25 four-year institutions and one community college. In the spring of 2009, 43% of the students from the 2008 cohort completed the posttest measures.

Conceptual Framework Guiding the Current Study

College impact models are often used as a conceptual framework for studies assessing how college programs influence student learning. These models are helpful for assessing student change because they consider how the college environment, student characteristics, and sociological factors collectively influence student learning and development (Pascarella & Terenzini, 2005). For studies assessing the effectiveness of particular college programs such as honors programs, college impact models help identify confounding variables that need to be

statistically controlled in statistical analyses (Astin, 1991, 1993; Pascarella, 1985). Astin's (1991, 1993) Input-Environment-Outcome (I-E-O) Model guided the development of the conceptual model for the current study.

For non-experimental studies that cannot randomly assign students to a treatment or control group, Astin's (1991, 1993) I-E-O Model particularly provides an important framework. A common methodological challenge of studies such as this one is that random assignment is typically impossible and unpractical when working with college students (Astin, 1991; Creswell, 2008; Pascarella, 2006; Seifert et al., 2010). Although unpractical, random assignment is ideal because students with different precollege characteristics are more likely to participate in certain programs (Astin, 1991; Padgett et al., 2010; Seifert et al., 2010). To account for nonrandom assignment, studies must statistically control student background and precollege characteristics (inputs) to assess the impact of the program or treatment (environment) on student learning (outcomes) (Astin, 1991). Additionally, in multi-institutional studies, the I-E-O Model considers confounding variables such as institutional differences (Astin & Sax, 1998). For example, Astin and Sax's (1998) study on the effects of service participation among students from 42 institutions, controlled for environmental and institutional variables to "identify the 'pure' effects" of their treatment of interest (p. 252). Astin (1991, 1993) proposed that when analyzing the impact of a program, variable categories should be entered sequentially in regression analyses (Astin & Denson, 2009). Student variables and pretest measure scores should be entered first in the regression analysis, followed by variables on institutional characteristics and college experiences. By statistically controlling these variables, a researcher can have greater confidence in estimating the effect of the treatment or program. Furthermore, the I-E-O Model allows a researcher to examine environmental variables, such as experiences with good practices,

as an outcome variable of a program, and permits the analysis of interaction effects for “those in which the effect of the college environment is different for different types of students” (Astin, 1970, p. 225).

The Current Study’s Conceptual Framework

Based on Astin’s I-E-O Model (Astin, 1991, 1993), the figure in Appendix C illustrates the current study’s conceptual framework. As indicated in the model, student background and precollege characteristics (inputs) affect the institutions students attend, the programs in which students participate, and the experiences they have in college (environment) (Astin, 1970, 1991, 1993). Because student background and precollege characteristics (inputs) affect whether or not a student participates in an honors program (environment), it is important to statistically control pertinent student input variables. Furthermore, because honors program participation is the treatment of interest, it is important to statistically control college environmental variables to isolate the true effect honors programs have on honors students’ experiences with good practices during the first year of college and critical thinking skills.

The purposes of this longitudinal study were 1) to examine the influence of honors programs on first-year college students’ critical thinking skills, 2) to determine whether students in honors programs receive more exposure to good practices in undergraduate education than their non-honors peers, and 3) to assess the effect of good practices on critical thinking. This study also investigated whether the influence of honors programs on critical thinking skills varied in direction and magnitude for male versus female students and White versus students of color. To replicate an earlier study conducted by Seifert et al. (2007), the current study utilized data from a recent national study, the Wabash National Study of Liberal Arts Education (WNSLAE).

Research Questions

The following five research questions guided the study:

1. What is the descriptive profile of non-honors and honors students who participated in the current study?
2. After controlling for a pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, are students in honors programs more likely to be exposed to “good practices in undergraduate education” during the first year of college, as compared to non-honors students?
3. After controlling for a parallel pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, do honors programs enhance honors students’ critical thinking by the end of their first year in college, as compared to non-honors students?
4. After controlling for a parallel pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, if honors programs enhance honors students’ critical thinking at a significant level, to what extent is the growth in honors students’ first-year critical thinking explained by their exposure to good practices in undergraduate education?
5. After controlling for a pretest measure of critical thinking, student background characteristics and precollege traits, institutional characteristics, and other college experiences, does the influence of honors programs on honors students’ first-year critical thinking differ in magnitude and direction:
 - a. For White students versus students of color?

- b. For male students versus female students?

Research Design

The current study analyzed data from a longitudinal panel study that used a pretest-posttest design (Pascarella & Colleagues, 2007a). This research design was selected over cross-sectional survey design due to recommendations in the literature (e.g., Pascarella, 2006; Rinn, 2007a; Seifert et al., 2010). Because the current study used groups that were already intact, it is a quasi-experimental between-groups design (Creswell, 2008). The unit of analysis for the study consisted of first-year college students who attended a college or university with an honors program that was available for first-year students. The treatment group included students who self-identified that they participated in an honors program during their first year of college whereas the control group included students who self-identified that they did not participate in an honors program during their first year of college.

Institutional Sample

The current study analyzed first-year data from all three cohorts (2006, 2007, 2008) of the WNSLAE. As pointed out earlier, four-year institutions that offered an honors program or honors college to first-year students were included in the analyses.

To confirm whether the institution had an honors program available for first-year students at the time of data collection, the researcher contacted all 46 four-year institutions that took part in the WNSLAE. In the current study, 25 four-year institutions were eliminated because these institutions did not have an honors program or because the honors program admitted students after the first year of college. The remaining 21 four-year institutions offered honors programs

for first-year students at the time of data collection and had a sample of honors students that completed the CAAP Critical Thinking Test.

This study's institutional sample consisted of seven liberal arts colleges, nine regional universities that do not grant doctorates, and five research universities from 14 states and six regions in the United States. Appendix B summarizes characteristics of the institutional sample for the proposed study including geographical data, 2005 Carnegie classifications, level of institutional selectivity, reported full-time equivalents (FTE) for undergraduate enrollment, and the number of full-time, first time, degree-seeking students for the fall semester. All data were obtained from the Integrated Postsecondary Education Data System (IPEDS).

Student Sample

To identify honors program participation, students were asked on the WSES to indicate whether they were members of an honors program or college during their time at the current institution (Pascarella & Colleagues, 2007b, p. 1). First-year students who indicated that they participated in an honors program were considered the treatment group while those who indicated that they did not participate in an honors program were in the control group.

As described previously, in the WNSLAE, a random sample of students completed either the CAAP Critical Thinking Test or a moral reasoning questionnaire (Pascarella & Colleagues, 2007a). Approximately 8,870 students from 21-four year institutions with an honors program participated in the initial data collection with 4,119 completed the CAAP Critical Thinking Test. Fifty-one percent of the students completed the CAAP Critical Thinking Test at the second data collection at the end of their first year in college. However, 118 students did not complete the good practice measures, thus they were eliminated from the sample. In addition, 146 participants were missing data on control variables. The missing data appeared to be missing at random.

Before conducting outlier analyses, the sample included 1,832 first-year college students from 21 four-year institutions. Approximately 17% of the sample consisted of students in honors programs. The study conducted by Seifert et al. (2007)—which the current study intended to replicate—had a final sample of 2,000 first-year students from 18 four-year institutions, approximately 13% of whom identified themselves as honors program students.

Variables

The following section describes the dependent, independent, and control variables for the study. These are summarized in Tables 3.1 and 3.2.

Dependent Variables

First set: Good practices. To develop empirically vetted measures of good practices for the WNSLAE, Pascarella and Colleagues (2007a) were guided by previous studies (e.g., Astin, 1993; Chickering & Reisser, 1993; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005; Kuh, Schuh, Whitt, & Associates, 1991; Pascarella & Terenzini, 1991, 2005) that linked good practices in undergraduate education to student learning outcomes. Pascarella and Colleagues (2007a) selected items from the WSES (Pascarella & Colleagues, 2007b) and NSSE (2008a) that were consistent with empirically vetted scales of good practices used in previous studies (Cruce et al., 2006; Pascarella et al., 2004, 2005, 2006). The scales developed for the WNSLAE were constructed to assess a range of good practices (Pascarella & Colleagues, 2007a).

To assess the psychometric validity of the good practices scales, Pascarella and Colleagues (2007a) first conducted a principal components analysis. A six-factor model was shown to be the most psychometrically valid. These factors were: Good Teaching and High Quality Interactions with Faculty, Academic Challenge and High Expectations, Diversity

Experiences, Influential Interactions with Peers, Frequency of Interactions with Faculty and Staff Professionals, and Cooperative Learning (Pascarella & Colleagues, 2007a, pp. 16-17). To develop the scales, Pascarella and his colleagues standardized the factor items and computed a mean score for each factor or “subscale/scale.” Scale scores were calculated for each respondent who completed at least 60% of the items for each scale (Pascarella & Colleagues, 2007a). The six good practices’ scales and their subscales are described in the next several paragraphs.

Good Teaching and High Quality Interactions with Faculty. The first scale, Good Teaching and High Quality Interactions with Faculty, contained 23 items comprising of four subscales (Pascarella & Colleagues, 2007a, p. 2). The Cronbach’s alpha for the scale was .92 (Pascarella & Colleagues, 2007a, p. 31).

The first subscale, Faculty Interest in Teaching and Student Development, contained five items with statements such as “Most faculty with whom I have had contact are genuinely interested in teaching” (Pascarella & Colleagues, 2007b, p. 2). The subscale utilized a five-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). The Cronbach’s alpha for the Faculty Interest in Teaching and Student Development subscale was .85 (Pascarella & Colleagues, 2007a, p. 31).

The second subscale, Prompt Feedback, contained three items with statements such as, “In your experience at your institution during the current school year, about how often have you... received prompt written or oral feedback from faculty regarding your academic performance?” (NSSE, 2008a, p. 1). On two of the items, responses ranged from *never* (1) to *very often* (5) and on one item, responses ranged from *never* (1) to *very often* (4). The Cronbach’s alpha for the Prompt Feedback subscale was .68 (Pascarella & Colleagues, 2007a, p. 32).

The third subscale, Quality of Non-classroom Interactions with Faculty, contained five items with statements such as “I am satisfied with the opportunities to meet and interact informally with faculty members” (Pascarella & Colleagues, 2007b, p. 2). The subscale utilized a five-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). The Cronbach’s alpha for the Quality of Non-classroom Interactions with Faculty subscale was .85 (Pascarella & Colleagues, 2007a, p. 32).

The fourth subscale, Overall Exposure to Clear and Organized Instruction, consisted of 10 items with statements such as “Faculty gave clear explanations” (Pascarella & Colleagues, 2007b, p. 2). The subscale utilized a five-point Likert-type scale ranging from *never* (1) to *very often* (5). The Cronbach’s alpha for the Overall Exposure to Clear and Organized Instruction subscale was .89 (Pascarella & Colleagues, 2007a, p. 33).

Academic Challenge and High Expectations. The second good practices scale, Academic Challenge and High Expectations, contained 31 items, comprising four subscales (Pascarella & Colleagues, 2007a, p. 17). The Cronbach’s alpha for Academic Challenge and High Expectations scale was .88 (Pascarella & Colleagues, 2007a, p. 33).

The first subscale, Academic Challenge and Effort, contained 11 items with statements such as, “During the current school year, about how [many]... assigned textbooks, books, or book-length packs of course readings... have you [read]?” (NSSE, 2008a, p. 2). The response format on this subscale varied depending on the item. For the item described above, responses varied from *none* (1) to *more than 20* (5). On several of the items, responses ranged from *never* (1) to *very often* (4). The Cronbach’s alpha for the Academic Challenge and Effort subscale was .65 (Pascarella & Colleagues, 2007a, p. 34).

The second subscale, Frequency of Higher-order Exams and Assignments, consisted of five items with statements such as “Exams or assignments required me to argue for or against a particular point of view and defend an argument” (Pascarella & Colleagues, 2007b, p. 3). The response format was a five-point Likert-type scale ranging from *never* (1) to *very often* (5). The Cronbach’s alpha for the Frequency of Higher-order Exams and Assignments subscale was .76 (Pascarella & Colleagues, 2007a, p. 35).

The third subscale, Challenging Classes and High Faculty Expectations, included six items such as “Faculty asked challenging questions in class” (Pascarella & Colleagues, 2007b, p. 2). The response format was a five-point scale ranging from *never* (1) to *very often* (5). The Cronbach’s alpha for the Challenging Classes and High Faculty Expectations subscale was .82 (Pascarella & Colleagues, 2007a, p. 35).

The fourth subscale, Integrating Ideas, Information, and Experiences, contained nine items with statements such as “In your experience at your institution during the current school year, how often have you...worked on a paper or project that required integrating ideas or information from various sources?” (NSSE, 2008a, p. 1). The response format on this subscale varied depending on the item. Four of the items used a five-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). A four-point Likert-type scale with options ranging from *never* (1) to *very often* (4) was used on three of the items. The last two items on the subscale used a five-point Likert-type scale with options ranging from *never* (1) to *very often* (5). The Cronbach’s alpha for the Integrating Ideas, Information, and Experiences subscale was .76 (Pascarella & Colleagues, 2007a, p. 35).

Diversity Experiences. The third good practices scale, Diversity Experiences, consisted of nine items comprising two subscales (Pascarella & Colleagues, 2007a, p. 18). The

Cronbach's alpha for the Diversity Experiences scale was .80 (Pascarella & Colleagues, 2007a, p. 37). The first subscale, Diversity Experiences—which shares the same name as the overall scale—included six items with statements such as, “How often have you... attended a debate or lecture on a current political/social issue during this academic year?” (Pascarella & Colleagues, 2007b, p. 1). Three different Likert-type scales were used. The four-point Likert-type scales ranged from *never* (1) to *very often* (4) and *very little* (1) to *very much* (4). The five-point Likert-type scale included *never* (1) to *very often* (5). The Cronbach's alpha for the Diversity Experiences subscale was .65 (Pascarella & Colleagues, 2007a, p. 38).

The second subscale, Meaningful Discussions with Diverse Peers, included three items with items such as “How often have you... had meaningful and honest discussions about issues related to social justice with diverse students while attending this college” (Pascarella & Colleagues, 2007b, p. 3). Each item included a five-point Likert-type scale ranging from *never* (1) to *very often* (5). The Cronbach's alpha for the Meaningful Discussions with Diverse Peers subscale was .82 (Pascarella & Colleagues, 2007a, p. 38).

Influential Interactions with Peers. The fourth good practices scale, Influential Interactions with Peers, included two subscales consisting of a total of nine items (Pascarella & Colleagues, 2007a, p. 19). The Cronbach's alpha for the Influential Interactions with Peers scale was .85 (Pascarella & Colleagues, 2007a, p. 38).

The first subscale, Co-curricular Involvement, was a single-item scale that asked, “About how many hours do you spend in a typical 7-day week...participating in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)” (NSSE, 2008a, p. 3). Responses ranged from *0 hours* (1) to *more than 30 hours* (8) (Pascarella & Colleagues, 2007a, p. 38).

The second subscale, Positive Peer Interactions, included eight items with statements such as, “Since coming to this institution, I have developed close personal relationships with other students” (Pascarella & Colleagues, 2007b, p. 3). All but one of the items included a five-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). The Cronbach’s alpha for the Positive Peer Interactions subscale was .87 (Pascarella & Colleagues, 2007a, p. 39).

Frequency of Interactions with Faculty and Staff. The fifth good practices scale, Frequency of Interactions with Faculty and Staff, included nine items comprising two subscales (Pascarella & Colleagues, 2007a, p.19). The Cronbach’s alpha for the Frequency of Interactions with Faculty and Staff scale was .83 (Pascarella & Colleagues, 2007a, p. 39).

The first subscale, Frequency of Interactions with Faculty, included four items with statements such as “Discussed ideas from readings or classes with faculty members outside of class” (NSSE, 2008a, p. 1). The four-point Likert-type scale ranged from *never* (1) to *very often* (4). The Cronbach’s alpha for the Frequency of Interactions with Faculty subscale was .70 (Pascarella & Colleagues, 2007a, p. 40).

Frequency of Interactions with Student Affairs Staff was the second subscale and included five items. This scale included questions such as “How frequently have you...discussed a personal problem or concern with a student affairs professionals (e.g., residence hall staff, career counselor, student union or campus activities staff)” (Pascarella & Colleagues, 2007b, p. 3). The five-point Likert-type scale ranged from *never* (1) to *very often* (5). The Cronbach’s alpha for the Frequency of Interactions with Student Affairs Staff subscale was .84 (Pascarella & Colleagues, 2007a, p. 40).

Cooperative Learning. The sixth good practices scale, Cooperative Learning, included four items that asked respondents how often they participated in cooperative learning

experiences (Pascarella & Colleagues, 2007a, p. 19). For example, one item included on the scale asked, “During the current school year, how often have you worked with classmates outside of class to prepare class assignments” (NSSE, 2008a, p. 1). This item included a four-point Likert-type scale with response options ranging from *never* (1) to *very often* (4). The other three items used a five-point Likert-type scale with options ranging from *never* (1) to *very often* (5). The Cronbach’s alpha for the Cooperative Learning scale was .70 (Pascarella & Colleagues, 2007a, p. 40).

Second set: End-of-first-year critical thinking. The Collegiate Assessment Academic Profile (CAAP) Critical Thinking Test is a standardized measure of critical thinking that was developed by ACT, Inc. (2008). In *The CAAP Technical Handbook*, ACT, Inc. (2008) defines critical thinking as “the ability to analyze, evaluate, and extend arguments” (p. 13). The CAAP Critical Thinking Test includes 32 multiple-choice items and has a 40-minute time limit. According to the report, *Guide to Outcome Measures*, there are four passages on the test that address topics typically covered during college (Center of Inquiry in the Liberal Arts, 2006). The passages consist of different types of readings such as case studies, editorials, debates, and arguments using statistical evidence (ACT, Inc., 2008). Approximately 53% to 66% of the items ask respondents to analyze elements of an argument, 16% to 28% of the items require evaluation of an argument, and 19% ask students to extend an argument (ACT, Inc., 2008, p. 13). The range of possible scores on the CAAP Critical Thinking Test is 40 (lowest) to 80 (highest), thus, it is a continuous variable (Center of Inquiry in the Liberal Arts, 2006).

Reliability and validity are important factors when evaluating measures of critical thinking. The internal consistency reliability estimates reported for the CAAP Critical Thinking Test are .85 (Kuder-Richardson 20) and .81 (Spearman-Brown) (ACT, Inc., 2008). However, no

information on test-retest reliability is available in *The CAAP Technical Handbook*. According to Pascarella, Bohr, Nora, and Terenzini (1996), the correlation between the CAAP Critical Thinking Test and another highly used and widely regarded critical thinking measure; the Watson-Glaser Critical Thinking Appraisal is .75. Shulenburg and Keller (2009) indicated that the CAAP Critical Thinking Test has face validity, which measures “the extent to which items appear to measure a construct” (Crocker & Algina, 2008, p. 223). Furthermore, Klein, Liu, and Sconing (2009) reported that their analyses of the CAAP Critical Thinking Test supported confirmation of construct validity.

Table 3.1

Description of Dependent Variables

Variable	Description	No. of items	Cronbach's α WNSLAE	Cronbach's α current study
First set: Good Practices Scales				
Good Teaching and High Quality Interactions with Faculty	Overall scale included four subscales measuring Faculty Interest in Teaching and Student Development, Prompt Feedback, Quality of Non-classroom Interaction with Faculty, and Overall Exposure to Clear and Organized Instruction.	23	.92	.92
Academic Challenge and High Expectations	Overall scale that included four subscales measuring Academic Challenge and Effort, Frequency of Higher-order Exams and Assignments, Challenging Classes and High Faculty Expectations, and Integrating Ideas, Information, and Experiences.	31	.88	.87
Diversity Experiences	Overall scale that included two subscales measuring Diversity Experiences and Meaningful Discussions with Diverse Peers.	9	.80	.79
Influential Interactions with Peers	Overall scale that included two subscales measuring Co-curricular Involvement and Positive Peer Interactions.	9	.85	.84
Frequency of Interactions with Faculty/Professional Staff	Overall scale that included two subscales measuring Frequency of Interactions with Faculty and Frequency of Interactions with Student Affairs Staff.	9	.83	.84
Cooperative Learning	Scale that measured the extent to which the respondent worked studied and worked with other students for classes.	4	.70	.70

Table 3.1 continued

Description of Dependent Variables

Variable	Description	No. of items	Cronbach's α WNSLAE	Cronbach's α current study
Second set: Critical Thinking Posttest				
End-of-first-year critical thinking	Posttest score on the CAAP Critical Thinking Test at the end of the first-year of college.	32	.85 KR-20	

Note: KR-20 = Kuder-Richardson 20

Independent Variable of Interest

Honors program participation. The independent variable was a dichotomous dummy-coded variable that indicated participation versus nonparticipation in an honors program during the first year of college. The variable was obtained from a single self-report item on the WSES (Pascarella & Colleagues, 2007b) that asked respondents to indicate whether they had “been a member of an honors college or honors program” during their time at the current institution (Pascarella & Colleagues, 2007b, p. 1). Respondents were given the option of replying *no* (0) or *yes* (1). Students completed this item at the data collection period at the end of their first year in college.

Control Variables

One of the strengths of the WNSLAE's longitudinal design is that the extensive data collected allow for the statistical control of other confounding influences (Pascarella & Colleagues, 2007a). This leads to a more internally valid study (Pascarella, 2006; Seifert et al., 2010). To control for confounding influences, the following control variables were used in regression analyses.

First block: Student background and precollege characteristics. The first block of variables consisted of student demographics (e.g., gender, race, parent educational level), precollege critical thinking ability, academic motivation, and high school involvement.

Precollege critical thinking. The CAAP Critical Thinking Test (ACT, Inc., 2008) measured precollege critical thinking skills of students. The CAAP Critical Thinking score was a continuous variable with a scale ranging from 40 (lowest) to 80 (highest). The use of a parallel measure to the outcome variable helped account for selection bias (Pascarella, 2006; Padgett et al., 2010).

Gender. Participating institutions provided information regarding each participant's gender during the initial data collection period. Gender was a dichotomous variable coded as male (1) and female (0).

Race. During the initial data collection, institutions provided information regarding each respondent's race or ethnicity. For the purpose of the current study, race was recoded as a dichotomous, categorical variable (White = 1, students of color = 0).

Parents' education. Each respondent completed two items on the WNSLAE registration form at the time of the initial data collection. The respondent answered the question, "What is the highest level of education each parent has completed?" for each parent (Pascarella & Colleagues, 2007a, p. 42). The two items for each parent were averaged together to create a variable measuring the average of each respondent's parents' average years of education. Possible scores range from *did not finish high school* (11), *high school graduate or GED* (12), *some college but no degree* (13), *vocational certificate, associate's degree, or other two-year degree* (14), *bachelor's or other four-year degree* (16), *master's degree* (18), *law degree* (19), to *both parents have a doctorate* (20).

Precollege academic motivation. During the initial data collection, respondents completed an eight-item instrument measuring precollege academic motivation (Pascarella & Colleagues, 2007a). The WNSLAE defined *academic motivation* as:

A willingness to work hard to learn the material even if it doesn't lead to a higher grade, the importance of getting good grades, reading more for a class than required because the material was interesting, enjoyment of academic challenge, and the importance of academic experiences in college. (Pascarella & Colleagues, 2007a, p. 13)

The instrument used a five-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). A scale score was calculated for each respondent that ranged from *low motivation* (1) to *high motivation* (5). The Cronbach's alpha for the precollege academic motivation scale was .69 to .74 (Pascarella & Colleagues, 2007a, p. 14).

High school involvement. During the initial data collection, respondents completed a seven-item instrument to measure their high school involvement. The items addressed such things as socializing and studying with friends, talking to teachers outside of class, involvement in extracurricular activities and community service, computer use and exercise. The instrument used a five-point Likert-type scale ranging from *never* (1) to *very often* (5). Scale scores were created with high scores indicating high levels of involvement. The Cronbach's alpha for the high school involvement instrument was .58 (Pascarella & Colleagues, 2007a, p. 44)

Second block: Institutional characteristics and other college experiences. The control variables included in the second block consist of institutional characteristics (institutional type and cohort year) and other college experiences (courses taken in the liberal arts and honors program participation).

Institutional type. By statistically controlling for institutional characteristics, researchers account for the potential differences between different types of institutions (Pascarella, 1985; Pascarella & Terenzini, 2005). At the initial data collection, institutions provided their

institution classification (research university, liberal arts college, and regional institution). This categorical variable was recoded as a dummy variable with liberal arts colleges as the reference group.

Cohort year. Cohort year was controlled for in the analyses to account for potential differences associated with the cohorts (i.e., 2006, 2007, 2008). This categorical variable was recoded as a dummy variable, with the 2006 cohort as the reference group.

Courses taken in the liberal arts. At the end of their freshman year, respondents indicated how many courses they completed in arts and humanities, social sciences, natural sciences, and mathematics. The variable, courses taken in the liberal arts, was a continuous variable.

Table 3.2

Description of Independent and Control Variables

Variable	Description	No. of items	Cronbach's α WNSLAE	Cronbach's α Current Study's
Independent variable of interest				
Honors program participation	Self-report identified participation in an honors college or honors program during the current year. Coded, 0 = non-honors, 1 = honors.	1		
Control variables				
Precollege critical thinking	Pretest score on the CAAP Critical Thinking Test at the beginning of the first-year of college.	32	.85 KR-20	
Gender	Institutional data for each student's gender. Coded, 0 = female, 1 = male.			
Race	Each student's race or ethnicity. If institutional data were missing, self-report data were used. Recoded as a dichotomous, categorical variable, 0 = students of color, 1 = White.	1		
Parents' education	Self-report items were averaged to measure the average years of education parents had completed. Ranged from 11 = less than a high school diploma to 20 = doctorate.	2		
Precollege Academic Motivation	Scale measured the degree to which students felt motivated to work hard to learn, do more than required, earn good grades, and learn difficult material.	8	.69-.74	.69
High School Involvement	Scale measured the degree to which students were involved in high school based on how often they socialized and studied with friends, interacted with teachers outside of class, and were involved in co-curricular activities.	7	.58	.58

Note: KR-20 = Kuder-Richardson 20

Table 3.2 continued

Description of Independent and Control Variables

Variable	Description	No. of items	WNSLAE Cronbach's α	Current Study's Cronbach's α
Control variables				
Institutional type	Type of college or university attended (research university, regional institution, liberal arts college) recoded as a dummy variable. The reference group was liberal arts.			
Cohort year	The cohort year (i.e., 2006, 2007, 2008) that the institution began the WNSLAE was recoded as a dummy variable. The reference group was 2006.			
Courses taken in the liberal arts	Self-report items measured how many courses the student completed in arts and humanities, social sciences, natural sciences, and mathematics.	4		
Good practices	See Table 3.1			

Note: KR-20 = Kuder-Richardson 20

Third block: Good practices. The variables included in the third block of control variables consisted of the six good practices scales. As addressed below in the analyses section, the good practices scales were controlled for during one part of the hierarchical regression analyses to estimate the unique effect of honors program participation, or in other words, if honors students experiences with good practices mediated between honors and critical thinking scores. However, in stage one of the hierarchical regression analysis, good practices were an outcome variable.

Rationale for OLS Regression

Ordinary Least Squares Regression

This quasi-experimental study is a longitudinal panel study using a pretest-posttest design. Ordinary Least Squares (OLS) regression was the preferred method of analysis for the current study. Described below are the reasons the current study used OLS regression as well as some of the statistical procedures were executed before running the OLS regression.

Propensity score matching versus OLS regression. Because students chose the institution they attended and because institutions invited students to participate in an honors program and students accepted or declined participation, random assignment was not possible. Given the rarity of conducting studies with random assignment, some researchers have used analytic techniques such as propensity score matching to account for nonrandom assignment and selection bias (Padgett et al., 2010). Essentially, propensity score matching is a process that matches participants in the treatment group with participants in the control group based on their pretest performance (Padgett et al., 2010). Thus, the two groups are essentially equivalent based on pretest performance. According to Padgett et al. (2010), several researchers have analyzed data using propensity score matching versus OLS regression and have concluded that propensity score matching does not typically lead to different findings than OLS regression. Longitudinal panel studies with parallel pretest-posttest design, a large sample size, and sufficient precollege measures are just as effective at eliminating selection bias between the treatment and control groups as propensity score matching (Padgett et al., 2010). Therefore, this study did not use propensity score matching but instead used OLS regression.

Sample weight algorithms in large-scale data analysis. Studies using multi-institutional longitudinal data collected from complex sampling designs must deal with two

challenges (Thomas & Heck, 2001). First, the sample may not reflect the population. To properly account for sampling issues in the current study, all data were weighted based on a weighting algorithm developed by ACT, Inc. for the WNSLAE data. ACT, Inc. developed a weighting algorithm for each institution to weight data to match the sex, race, and ACT scores of the institution's first-year student population, thus making "the overall sample more similar to the population" of each institution (Pascarella & Colleagues, 2007a, p. 4). Thomas and Heck (2001) recommend using a weighting algorithm when analyzing secondary data from large-scale studies.

Hierarchical Linear Modeling versus OLS regression. Heck and Thomas (2001) suggest Hierarchical Linear Modeling (HLM) over OLS regression when data are clustered. However, because the current study examined the influence of honors programs at the student level, and was not interested in institutional-level effects, OLS regression was more appropriate. Moreover, Astin and Denson (2009) suggest OLS regression instead of HLM if researchers are interested in examining direct and indirect effects or if variables should be entered sequentially. Given this information and the techniques planned to account for clustering, OLS regression was the analytic technique for the current study. Prior to conducting regression analyses, data were cleaned, descriptive statistics conducted, and OLS assumptions checked.

The Steps in the Ordinary Least Squares Regression Analyses

Because the current study was a replication of Seifert et al.'s (2007) study on honors students, data were analyzed similarly using hierarchical OLS regression analysis, conducted in four stages using SPSS Premium 20.0. The primary independent variable was university honors program participation (measured dichotomously). The dependent variables for this study were students' exposure to good practices and end-of-first year critical thinking scores. Students'

exposure to good practices also acted as a mediating variable, and was used in analyses as a predictor of critical thinking scores. To control for possible confounding influences in the regression analyses, blocks of student, institutional variables, and other college experiences were entered hierarchically based on recommendations from Astin and Denson (2009). The block of student background and precollege variables were entered first in the regression analyses, and the block of institutional characteristics and college experiences second.

Stage one of the regression analysis estimated the direct effect (or unmediated effect) of honors program participation on exposure to each of the six good practices in undergraduate education. The independent variable of honors program participation was entered as a predictor of each of the six good practices, controlling for potential confounding variables (student background and precollege characteristics, institutional characteristics, and other college experiences).

Stage two of the analysis estimated the total effects of honors program participation on end-of-first year critical thinking. Honors program participation acted as a predictor of critical thinking scores, controlling for the effects of student background and precollege characteristics, institutional characteristics, and other college experiences.

Stage three of the analysis estimated the direct effect of honors program participation on end-of-first-year critical thinking using a path analytic technique recommended by Alwin and Hauser (1975) and Pascarella (2006) and used by Seifert et al. (2007). To accurately assess whether exposure to good practices explains the effect of honors, the analysis should indicate that participating in an honors program influenced critical thinking and exposure to good practices at statistically significant levels (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004). By adding the good practice measures as a block of control variables in this stage of the analysis,

the total effects from stage two of the analysis was assessed to estimate the direct effect of honors program participation on end-of-first-year critical thinking. More specifically, honors program participation acted as a predictor of end-of-first-year critical thinking scores while removing the effects of student background and precollege characteristics, institutional characteristics, other college experiences, and the six good practices measures. Net of a student's exposure to good practices, this stage of the analysis estimated "the unique effect of honors program participation" on end-of-first-year critical thinking (Seifert et al., 2007, p. 63).

Stage four of the analysis examined the conditional effects of honors program participation on end-of-first-year critical thinking. In other words, this stage estimated if the influence of honors programs on end-of-first-year critical thinking scores varied in direction and magnitude for male versus female students and White versus students of color. According to Pascarella (2006), "The same intervention or experience might not have the same impact for all students, but rather might differ in the magnitude or even the direction of its impact for students with different characteristics" (p. 512). To examine the potential conditional effects, honors program participation was used to create cross-product terms with race and gender. Each cross-product term was added sequentially to the total effects model. According to Pedhazur (1997), the effect is conditional if an increase in explained variance (R^2) is statistically significant.

Summary of Chapter Three

The purpose of this longitudinal panel study was to examine the influence honors programs have on first-year college students' exposure to good practices in undergraduate education and critical thinking skills. More specifically, the study examined the extent to which honors programs' influence on students' critical thinking skills was explained by cultivating an environment that exposed them to good practices in undergraduate education. This study also

investigated whether the influence of honors programs on critical thinking varied in direction and magnitude for male versus female students and White versus students of color. To replicate an earlier study conducted by Seifert et al. (2007), the current study analyzed data from a more recent national study, the Wabash National Study of Liberal Arts Education (WNSLAE).

Because the current study analyzed secondary data from the WNSLAE, chapter three began with a description of the WNSLAE. This section of the chapter described the college impact model that provided a strong theoretical framework for the current study. The remaining sections of the chapter were devoted to descriptions of the institutional sample, student sample, variables, and the data analysis process.

CHAPTER FOUR

RESULTS

Chapter Four reports the results of the study. The chapter begins with a summary of the study. This section briefly reviews the purposes, significance, and design of the study. This is followed by the results of the data collection, including the response rates, outlier analysis, and descriptive statistics. Next, the assumptions of OLS are presented. The chapter concludes with the results of the current study, which are organized by research question.

Summary of the Study

The purposes of this study were 1) to examine the influence of honors programs on first-year college students' critical thinking skills, 2) to determine whether students in honors programs are more likely to be exposed to good practices in undergraduate education, and 3) to assess the effect of good practices on critical thinking. This study also investigated whether the influence of honors programs on critical thinking skills varied in direction and magnitude for male versus female students and White versus students of color.

The current study adds significantly to the body of literature on collegiate honors programs because until now, Seifert et al.'s (2007) study was the most comprehensive study to estimate the effect of honors programs on critical thinking and exposure to good practices. Seifert et al.'s (2007) study was significant because it included multiple institutions, measured critical thinking with a standardized test, utilized a pretest-posttest design, and examined the conditional effects of honors. However, Seifert et al. (2007) recommended that replication was needed with data collected more recently because they analyzed data collected in the early 1990s. To replicate this earlier study conducted by Seifert et al. (2007), the current study utilized

data from a recent national study, the Wabash National Study of Liberal Arts Education (WNSLAE). Furthermore, the current study maintained the methodological and design strengths of Seifert et al.'s (2007) study, while also strengthening it by accounting for the clustered nature of the data.

Because the current study used groups that were already intact, it is a quasi-experimental between-groups design (Creswell, 2008). The treatment group included first-year college students in an honors program and the control group consisted of first-year college students not in an honors program. OLS regression was the primary statistical test used in the current study.

Data for the current study were collected for the WNSLAE at the beginning of each participating student's first semester in college. At the initial data collection, students completed pretest measures and multiple surveys to provide data on their precollege abilities and experiences. The students who were assigned the CAAP Critical Thinking Test completed it at the beginning of their first-year in college and at the end of their first year in college. Surveys that were administered at the end of their first year in college provided important information about participating students' college experiences.

Data Collection Results

As mentioned in the previous chapter, the WNSLAE included three cohorts of institutions (2006, 2007, 2008 cohorts) and the current study analyzed data from all three of these. The 21 four-year institutions that offered an honors college or honors program to first-year students during the data collection year were included in the study.

Response Rate

As illustrated in Table 4.1, 8,870 students from these 21 institutions participated in the initial data collection at the beginning of their first year in college. Forty-six percent of these students completed the CAAP Critical Thinking Test at the initial data collection. Students who did not complete CAAP Critical Thinking Test were eliminated from the sample, which left 4,119 students. At the end of their first year in college, 2,101 students returned to complete the CAAP Critical Thinking posttest measure (a response rate of 51%). However, 118 students did not complete the good practice scales, and 146 were missing data on control variables. The missing data did not appear to have consistent patterns therefore listwise deletion was used. This left a remaining 1,832 first-year students in the sample.

Table 4.1
Sample for the Current Study

	<i>N</i>	Honors	Non-honors
Participants at institutions with honors	8,870		
Completed CAAP pretest	4,119		
Completed CAAP posttest	2,101		
Completed good practice scales	1,982		
Cases without missing data	1,832		
Outliers	8		
Final sample	1,824	306	1,518

Outlier Analysis

To screen for outliers, several analytic approaches recommended by Osborne (2013) were used. First, histograms and scatterplots were created to visually screen for outliers. In addition, the casewise diagnostic feature in SPSS Premium 20.0 aided the screening process. As part of the casewise analysis, standardized residuals were examined to investigate whether these values exceeded ± 3.0 because according to Osborne (2013), cases outside this range might be outliers. Approximately 99.5% of the values were within the appropriate range. According to Osborne

(2013), in a perfect normal distribution, one would expect 99.74% of the values to be within this range. The nine cases with standardized residuals greater than ± 3.0 were further analyzed by examining the Mahalanobis distance, Cook's distance, and centered leverage values to determine whether the cases were outliers. As a result of the outlier analysis, the researcher deleted eight cases. The final analytic sample included 1,824 participants. The treatment group (honors) included 306 students or 16.8% and the control group (non-honors) included 1,518 or 83.2%.

Weighted Descriptive Statistics in Aggregate

Descriptive statistics were calculated in aggregate for the current study's overall sample ($N = 1,824$). Table 4.2 illustrates the means, standard deviations, minimum scores, and maximum scores on all continuous variables and the frequencies and percentages on all categorical variables. As shown, students in the current study were primarily female (56.8%), White (71.3%), and had parents who had completed an average of 15.06 years of education. The mean precollege critical thinking score on the CAAP Critical Thinking Test was 60.96. By the end of the first year of college, the mean score increased to 61.49. As highlighted in Table 4.2, 34.1% of the participants in the current study attended a regional university, 53.4% attended a research university, and 12.4% attended a liberal arts college.

Descriptive statistics were calculated to determine the level and types of experiences first-year students had in the first year of college. On average, students completed 6.29 liberal arts courses within the first year. As illustrated in Table 4.2, the mean scores on the six good practice scales were negative values. The researchers for the WNSLAE standardized the six scale scores so that the mean for the WNSLAE's overall sample ($N = 17,503$) was zero. Because the current study consisted of a subsample of students who participated in the WNSLAE, the mean for each good practice measure is different than it was for the WNSLAE. The negative

mean scores for the six good practice scales indicated that on average, students in the current study ($N = 1,824$) reported lower means on every good practice scale when compared to the mean average for the overall WNSLAE sample ($N = 17,503$).

Table 4.2
Weighted Descriptive Statistics, Overall Sample (N = 1,824)

Categorical Variables	<i>N</i>	<i>%</i>		
<i>Student background and precollege characteristics</i>				
Gender – male	789	43.2		
Gender – female (reference)	1,035	56.8		
Race – White	1,300	71.3		
Race – students of color (reference)	524	28.7		
<i>Institutional characteristics</i>				
Regional university	623	34.1		
Research university	975	53.4		
Liberal arts college (reference)	227	12.4		
2006 cohort (reference)	1,049	57.5		
2007 cohort	459	25.2		
2008 cohort	316	17.4		
Continuous Variables	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
<i>Critical thinking</i>				
Precollege critical thinking	60.96	5.58	46	73
End-of-first-year critical thinking	61.49	5.91	47	73
<i>Student background and precollege characteristics</i>				
Average years of parents' education	15.06	2.09	11	20
Precollege academic motivation	3.52	0.56	1.5	5
High school involvement	3.67	0.56	1.71	5
<i>Other college experiences</i>				
Courses taken in the liberal arts	6.29	2.32	0	20
<i>Good practices in undergraduate education</i>				
Good teaching and high quality interactions with faculty	-0.14	0.60	-2.29	1.42
Academic challenge and high expectations	-0.10	0.45	-1.72	1.29
Diversity experiences	-0.09	0.59	-1.47	1.78
Influential interactions with peers	-0.05	0.64	-2.78	1.34
Frequency of interactions with faculty and staff	-0.01	0.64	-1.31	2.19
Cooperative learning	-0.03	0.72	-1.95	1.63

Note. Min. = Minimum score. Max. = Maximum score.

OLS Regression Assumptions

After conducting the outlier analysis and calculating descriptive statistics for the overall sample, I used SPSS Premium 20.0 to properly check OLS regression assumptions for the final analytic sample. According to Cohen et al. (2003), studies that analyze data with OLS regression should meet the following assumptions:

- The relationship between the independent and dependent variables is linear,
- All relevant variables are included in the model,
- The measures are reliable,
- The residuals are not heteroscedastic,
- The residuals are independent,
- The residuals are normally distributed.

The first assumption of OLS regression states that the relationship between the independent variables and dependent variables is linear (Cohen et al., 2003). To check this assumption, Cohen et al. (2003) recommended creating scatterplots by “plot[ting] the residuals against each measured independent variable and against the predicted values” (p. 125). The nature of the relationship was further examined by adding the lowess fit line to each scatterplot. The lowess fit line followed the 0-line and it did not substantially deviate from zero, which indicates that the relationships between the continuous independent variables and the dependent variables were linear (Cohen et al., 2003).

The second assumption of OLS regression requires that all important independent variables are included in the regression equation (Cohen et al., 2003). This assumption was met by examining prior research. To determine which variables to include in the model, prior research was the guide.

To check the third assumption of OLS regression, the reliability of each scale was evaluated (Cohen et al., 2003). To ensure the reliability of the honors program self-report measure, each institution was contacted to verify that the institution offered an honors program to first-year students during the cohort year. The internal consistency reliability was calculated for each scale in the current study using Cronbach's alpha. Cohen et al. (2003) recommended that the Cronbach's alpha for each scale meet or exceed .70. As shown in Table 4.3, the Cronbach's alphas for the six good practices scales met the recommended internal consistency reliability level. According to ACT, Inc. (2008), the reliability for the CAAP Critical Thinking Test is .85 (Kuder-Richardson 20). The Cronbach's alpha for the high school involvement scale was .58 and .69 for the precollege academic motivation scale (Table 4.3). Although the internal consistency reliability was lower than what is recommended for the high school involvement scale, it was still included in the regression model to account for precollege behaviors. The academic motivation scale was only slightly below the acceptable level.

Table 4.3
Cronbach's Alphas of Scales

Variables	Current Study (<i>N</i> = 1,824)	WNSLAE (<i>N</i> = 17,504)
Precollege academic motivation	.69	.69-.74
High school involvement	.58	.58
Good teaching	.92	.92
Academic challenge	.87	.88
Diversity Experiences	.79	.80
Influential interactions with peers	.84	.85
Interactions with faculty & professional staff	.84	.83
Cooperative learning	.70	.70

To check the fourth assumption—homoscedasticity of the residuals—scatterplots were created and inspected (Cohen et al., 2003). According to Cohen et al. (2003), the assumption of

homoscedasticity is met when there is “constant variance of the residuals regardless of the value of X ” (p. 120). To inspect this assumption, the saved residuals were plotted against the independent continuous variables and the saved predicted values. Visual examination of the scatterplots confirmed homoscedasticity of the residuals. In other words, no bowtie or fan shapes were detected (Cohen et al., 2003).

The fifth assumption of OLS regression pertains to the independence of residuals. According to Cohen et al. (2003), data that are clustered violate the independence of residuals assumption. Thomas and Heck (2001) stated that clustering could occur because “students within colleges are more similar than students across colleges” (p. 520). Furthermore, statistical software assumes that data were collected via simple random sampling and assumes independence. According to Cohen et al. (2003), if clustering is not accounted for, standard errors will be “negatively biased” and the likelihood of a Type I error will increase (p. 537). To address the clustering effect adequately, an intraclass correlation (ICC) was calculated to estimate the clustering effect within the study using the VARCOMP procedure in SPSS Premium 20.0 (Cohen et al., 2003). If the ICC value for the current study was less than .05, then there was no need to account for clustering, and analyses could be conducted as planned (Thomas & Heck, 2001). Additionally, because the ICC value was greater than .05, the “more conservative critical alpha level” of .01 as recommended by Thomas and Heck, was used to determine statistical significance (p. 530). Because the data were clustered, the current study’s regression model could not exceed 20 variables ($N-1$, which is the number of institutions minus 1). As a result, the current study differed from the study it intended to replicate (Seifert et al., 2007) by setting a more stringent alpha level (.01 versus .05) and by reducing the number of variables included in the regression model. Because Seifert et al. (2007) did not account for clustering as suggested by

Thomas and Heck (2001), the likelihood of a Type I error was increased (T. Seifert, personal communication, January 30, 2012).

The sixth assumption of OLS regression assumes that the residuals are normally distributed (Cohen et al., 2003). To check this assumption, histograms were created with the residuals. The distribution of the residuals approximated the shape of a normal bell curve. In addition, normal probability plots were evaluated to further check the normality of the residuals. The residuals approximated the straight line. Taken together, inspection of the histograms and the normal probability plots indicated that the residuals were normally distributed. However, this was not surprising given the large sample size (Cohen et al., 2003).

Lastly, several steps were taken to examine whether there was multicollinearity in the current study. Multicollinearity occurs when independent variables (and control variables) are highly correlated with each other (Cohen et al., 2003). To screen for multicollinearity, I first inspected the correlation values between the independent variable (honors) and the control variables. The correlation matrix is presented in Table 4.4. The highest correlation between variables was between the CAAP Critical Thinking pretest and the CAAP Critical Thinking posttest ($r = .78, p < .001$). This is not surprising given that these are parallel measures. The highest correlation between control variables was between attending a research university and attending regional university ($r = -.77, p < .001$). Both of these correlations are below the value Field (2009) indicates could signal multicollinearity. I also inspected the Variance Inflation Factors (VIFs) and the tolerance statistics. According to Cohen et al. (2003), a VIF value above 10 or a tolerance statistic below .10 suggests the presence of multicollinearity. The VIFs ranged from 1.082 to 2.875 and the lowest tolerance statistic was .35. Thus, multicollinearity did not present a problem in the current study.

After checking the OLS regression assumptions, I proceeded with OLS regression. As discussed in chapter three, Thomas and Heck (2001) recommend using Hierarchical Linear Modeling over OLS regression when analyzing clustered data. However, Astin and Denson (2009) disagree. Following recommendations from Astin and Denson (2009) and Padgett et al. (2010), OLS regression was chosen as the primary analytic technique for the current study.

Table 4.4
Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
1. End-of-first-year critical thinking	1.00										
2. Precollege critical thinking	.78**	1.00									
3. Male	.06	.09**	1.00								
4. White	.22**	.24**	.24	1.00							
5. Average years of parents' education	.23**	.23**	.05	.21**	1.00						
6. Precollege academic motivation	.02	.03	-.12**	-.06*	-.01	1.00					
7. High school involvement	-.02	.01	-.19**	.04	.07*	.37**	1.00				
8. Liberal arts colleges	.02	.01	-.07*	.10**	-.01	.01	-.21	1.00			
9. Regional university	-.22**	-.18**	.01	-.32**	-.18	-.01	-.08**	-.27**	1.00		
10. Research university	.20**	.17**	.04	.24**	.17**	.01	.09**	-.41**	-.77**	1.00	
11. 2006 cohort	.33**	.35**	.05	.11**	.16**	.01	.09**	-.03	.06*	-.04	1.00

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

Table 4.4 Continued
Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
12. 2007 cohort	-.22**	-.23**	.01	-.22**	-.12**	-.01	-.06*	-.16**	.10**	.01	-.67**
13. 2008 cohort	-.18**	-.20**	-.07*	.11**	-.07*	-.01	-.04	.22**	-.2**	.04	-.53**
14. Courses taken in the liberal arts	.29**	.29**	.05	.22**	.18**	.06	.13**	-.07*	-.29**	.32**	.07*
15. Honors	.14**	.16**	-.05	.05	.08**	.13**	.09**	.05	-.09**	.05	-.08**
16. Good teaching	.15**	.15**	-.02	.05	.02	.23**	.19**	.15**	-.05	-.06	.12**
17. Academic challenge	-.08	.01	-.07*	-.01	-.01.	.34**	.28**	.12**	-.03	-.05	.01
18. Diversity Experiences	-.01	.01	.02	-.12**	.00	.2**	.15**	-.01	-.01	.01	.04
19. Influential interactions with peers	.07*	.09**	-.02	.16**	.07*	.05	.19**	.09**	-.07*	.01	.10**
20. Interactions with Faculty & Professional Staff	-.20**	-.16**	.01	-.05	-.05	.26**	.26**	.04	-.01	-.02	-.10**
21. Cooperative learning	-.04	-.01	.05	-.06*	-.04	.23**	.22**	.05	-.07*	.03	-.08**

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

Table 4.4 Continued
Correlation Matrix

Variables	12	13	14	15	16	17	18	19	20	21
12. 2007 cohort	1.00									
13. 2008 cohort	-.27**	1.00								
14. Courses taken in the liberal arts	-.09**	.02	1.00							
15. Honors	.02	.08**	.07*	1.00						
16. Good teaching	-.08**	-.04	.07*	.10**	1.00					
17. Academic challenge	.01	-.02	.1**	.07*	.54**	1.00				
18. Diversity experiences	-.01	-.04	.12**	.04	.27**	.50**	1.00			
19. Influential interactions with peers	-.07*	-.06	.05	.06	.34**	.29**	.20**	1.00		
20. Interactions with Faculty & Professional Staff	.09**	.04	.07*	.04	.30**	.51**	.56**	.19**	1.00	
21. Cooperative learning	.11**	-.02	.05	.05	.33**	.48**	.39**	.30**	.44**	1.00

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

Results from the Descriptive Statistics

Research question one – What is the descriptive profile of non-honors and honors students who participated in the current study?

Weighted descriptive statistics were calculated to determine the demographic and educational profile of first-year honors students ($N = 306$) and non-honors students ($N = 1,518$). Although the majority of students in honors and non-honors were White, the percentage of students of color in honors (24%) was less than the percentage of students of color who were not in honors (29.6%) (Table 4.5), thus, honors programs had a larger percentage of White students (76%) compared to non-honors (70.4%). Likewise, the majority of students in both groups were female although honors consisted of a greater percentage of female students (62.3%) compared to non-honors (55.6%). As Table 4.6 demonstrates, first-year honors students began college with higher precollege critical thinking scores on the CAAP Critical Thinking Test ($M = 62.95$) compared to non-honors students ($M = 60.56$). In addition, honors students reported higher levels of precollege academic motivation ($M = 3.68$) compared to non-honors students ($M = 3.49$). Furthermore, honors students reported higher levels of involvement in high school ($M = 3.77$ versus $M = 3.64$). Parents of honors students had completed more years of education ($M = 15.43$ years) compared to the parents of non-honors students ($M = 14.99$ years). Therefore, these descriptive profiles of honors and non-honors students suggest differences in precollege and student background characteristics.

Table 4.5

Weighted Descriptive Statistics for Categorical Variables, Honors Versus Non-Honors

Variables	Honors Students (<i>N</i> = 306)		Non-Honors Students (<i>N</i> = 1,518)	
	<i>N</i>	%	<i>N</i>	%
<i>Student background and precollege characteristics</i>				
Gender – male	115	37.7	673	44.4
Gender – female (reference)	191	62.3	845	55.6
Race – White	232	76.0	1,068	70.4
Race – students of color (reference)	73	24.0	450	29.6
<i>Institutional characteristics</i>				
Regional university	77	25.1	546	35.9
Research university	180	58.7	795	52.4
Liberal arts college	49	16.1	178	11.7
2006 cohort	150	49.2	898	59.2
2007 cohort	82	26.8	377	24.8
2008 cohort	73	24.0	243	16.0

Descriptive statistics were calculated to compare college experiences had by honors versus non-honors students. As Table 4.6 illustrates, honors students completed more liberal arts courses within the first year of college ($M = 6.66$ courses) compared to non-honors students ($M = 6.22$ courses). According to the descriptive statistics for the good practice scales, honors students reported higher levels of exposure on all six good practices in undergraduate education when compared to non-honors students. By examining the descriptive statistics, it appears that honors students entered college with higher levels of academic motivation, high school involvement, parental education, and critical thinking scores. Furthermore, once in college, honors students enrolled in more liberal arts courses and reported higher exposure to good practices in undergraduate education.

Table 4.6

Weighted Descriptive Statistics for Continuous Variables, Honors Versus Non-Honors

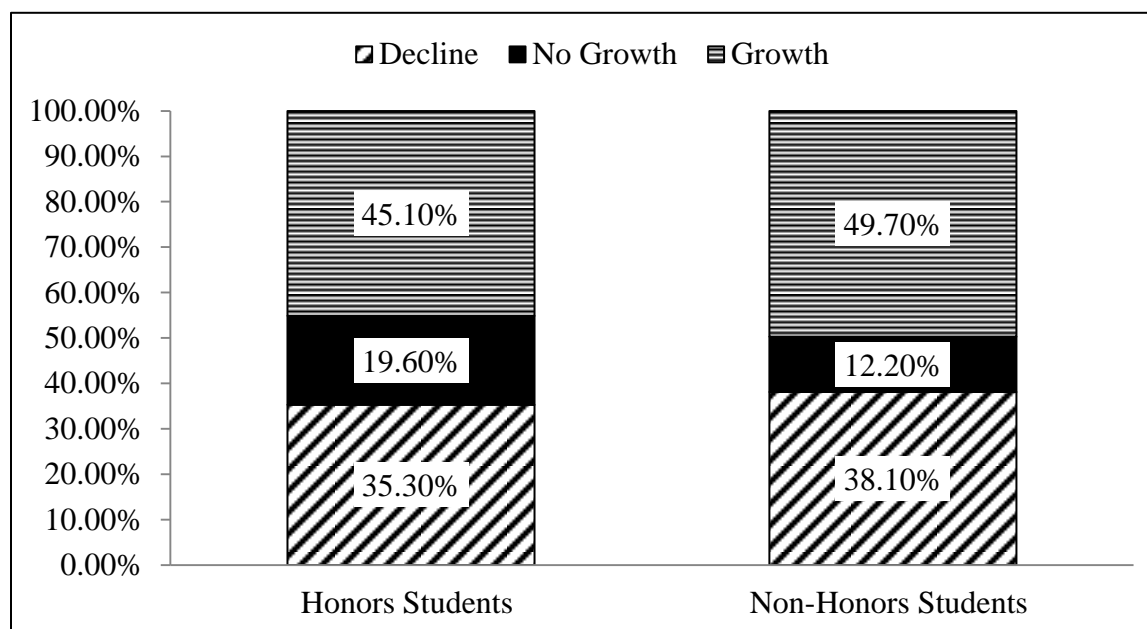
Variables	Honors (N = 306)				Non-honors (N = 1,518)			
	M	SD	Min.	Max.	M	SD	Min.	Max.
<i>Critical thinking</i>								
Precollege critical thinking	62.95	5.74	49	73	60.56	5.46	46	73
End-of-first-year critical thinking	63.39	6.42	48	73	61.11	5.72	47	73
<i>Student background and precollege characteristics</i>								
Average years of parents' education	15.43	2.18	11	20	14.99	2.07	11	20
Precollege academic motivation	3.68	0.56	1.88	5	3.49	0.55	1.50	5
High school involvement	3.77	0.49	2.29	5	3.64	0.58	1.71	5
<i>Other college experiences</i>								
Courses taken in the liberal arts	6.66	2.14	2	20	6.22	2.35	0	20
<i>Good practices in undergraduate education</i>								
Good Teaching	-0.01	0.60	-2.10	1.38	-0.17	0.59	-2.29	1.42
Academic Challenge	-0.02	0.45	-1.31	1.27	-0.11	0.44	-1.72	1.29
Diversity Experiences	-0.04	0.60	-1.38	1.63	-0.10	0.59	-1.47	1.78
Influential Interactions with Peers	0.03	0.64	-2.69	1.34	-0.06	0.64	-2.78	1.34
Frequency of Interactions with Faculty/Staff	0.04	0.70	-1.31	2.19	-0.02	0.63	-1.31	2.19
Cooperative Learning	0.04	0.70	1.75	1.63	-0.05	0.72	-1.95	1.63

Note. Min. = Minimum score. Max. = Maximum score.

To further analyze the descriptive profiles of honors and non-honors students, the precollege critical thinking scores and the end-of-first-year critical thinking scores were analyzed to determine the percentage of honors and non-honors students that experienced growth or decline in critical thinking during the first year of college. As displayed in Figure 4.1, a greater percentage of non-honors students (38.1%) had a decline in critical thinking during the first year of college than honors students (35.3%). However, a greater percentage of non-honors students improved their critical thinking scores (49.7%) than honors students did (45.1%). Furthermore,

19.6% of honors students experienced no change in critical thinking scores compared to 12.2% of non-honors students. The largest difference between honors and non-honors students was captured by the category of “no growth.”

Figure 4.1



Note: Figure 4.1 represents the change in the CAAP Critical Thinking scores between the pretest and posttest for Honors ($N = 306$) and Non-honors ($N = 1,518$). This was calculated by subtracting the posttest score minus the pretest score for each participant.

Results from the OLS Regression Analyses

The analysis was conducted in the same order as Seifert et al.’s (2007) analysis because this study is a replication. Consistent with Astin’s I-E-O Model, the first equation controlled for student background and precollege characteristics, and then college experiences and institutional characteristics.

The Effects of Honors on Exposure to Good Practices

Research question two – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, are students in honors programs more likely to be exposed to “good practices in undergraduate education” during the first year of college, as compared to non-honors students?

To estimate the effect of honors programs on exposing students to good practices, six OLS regression analyses were conducted. One at a time, the six good practice measures were regressed on honors program participation and two blocks of control variables (one block of student background and precollege characteristics and one block of college experiences and institutional characteristics). By using honors program participation as a dummy variable in the regression model, the unstandardized regression coefficient represented the difference in exposure to each good practice between honors and non-honors students while holding all other variables constant (Hardy, 1993). When the unstandardized regression coefficient was statistically significant, this denoted a statistically significant difference between honors and non-honors students (Field, 2009).

Table 4.7 summarizes the estimated effect of honors program participation on exposing students to each of the six good practices in undergraduate education. As illustrated in Table 4.7, honors program participation was not a significant predictor of exposure to any of the six good practices. Despite the fact that the coefficients for honors were positive, because the significance level for each exceeded the alpha level, the difference between honors and non-honors students could only be attributed to chance.

Table 4.7

Estimated Effects of Honors Programs on Exposure to Good Practices during the First-Year

(N = 1,824) Variables	Good Teaching		Academic Challenge		Diversity Experiences	
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.012**	.115**	-.001	-.019	-.002	-.019
Male	.033	.027	.002	.002	.062	.052
White	.022	.017	-.009	-.009	-.196**	-.151**
Average years of parents' education	-.007	-.024	-.005	-.023	-.001	-.003
Precollege academic motivation	.252**	.236**	.211**	.266**	.161**	.153**
High school involvement	.105**	.099**	.140**	.177**	.091*	.086*
Regional university	-.260**	-.207**	-.160**	-.171**	-.032	-.026
Research university	-.307**	-.257**	-.197**	-.221**	-.032	-.027
2007 cohort	-.054	-.039	.030	.029	-.046	-.034
2008 cohort	-.091	-.058	-.033	-.029	-.048	-.031
Courses taken in the liberal arts	.007	.027	.018**	.093**	.035**	.139**
Honors	.072	.045	.024	.020	.029	.019
<i>R</i> ²	.138**		.166**		.082**	

p* < .01. *p* < .001.Note: *b* = unstandardized regression coefficient. β = standardized regression coefficient.

Table 4.7 continued

Estimated Effects of Honors Programs on Exposure to Good Practices during the First-Year

Variables	Peer Interaction		Interactions with Faculty & Staff		Cooperative Learning	
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
(<i>N</i> = 1,824)						
Precollege critical thinking	.002	.017	-.020**	-.174**	.002	.018
Male	.020	.015	.113**	.087**	.162**	.112**
White	.200**	.141**	-.023	-.016	-.097	-.061
Average years of parents' education	.005	.017	-.008	-.026	-.018	-.052
Precollege academic motivation	-.010	-.009	.222**	.193**	.220**	.180**
High school involvement	.211**	.184**	.228**	.199**	.230**	-.155**
Regional university	-.170*	-.126*	-.120	-.089	-.234**	.171**
Research university	-.178**	-.138**	-.135*	-.105*	-.144*	-.101*
2007 cohort	-.043	-.029	.113*	.076*	.208**	.126**
2008 cohort	-.152*	-.090*	.041	.024	.013	.007
Courses taken in the liberal arts	-.002	-.008	.027**	.099**	.009	.029
Honors	.060	.035	.029	.017	.008	.004
<i>R</i> ²		.076**		.149**		.112**

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

Note: *b* = unstandardized regression coefficient. β = standardized regression coefficient.

The Total Effects of Honors on Critical Thinking

Research question three – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, do honors programs enhance honors students' critical thinking by the end of their first year in college compared to non-honors students?

OLS regression was used to estimate the total effect of honors program participation on critical thinking. End-of-first-year critical thinking scores were regressed on honors program participation and two blocks of control variables (one block of student background and precollege characteristics and one block for college experiences and institutional characteristics). By using honors program participation as a dummy variable in the regression model, the unstandardized regression coefficient represented the difference in end-of-first-year critical thinking scores between honors and non-honors students while holding all other variables constant (Hardy, 1993). When the unstandardized regression coefficient was statistically significant, this denoted a statistically significant difference between honors and non-honors students (Field, 2009).

After controlling for the block of student background and precollege characteristics (which included the critical thinking pretest) and the block of college experiences and institutional characteristics, honors programs did not have a statistically significant effect on honors students' critical thinking. Despite the fact that the coefficient was positive, the difference was no more than would be expected by chance ($b = .436, p = .064$) (Table 4.8). Simply put, holding all other variables constant, students in honors programs did not have significantly higher end-of-first-year critical thinking scores than students not in honors programs.

Even though participating in an honors program was not a significant predictor of critical thinking, the total effects model was significant and accounted for 63% of the variance in critical thinking at the end of the first year of college ($R^2 = .630, F(12, 1,811) = 256.44, p < .001$). As demonstrated in Table 4.8, six control variables were statistically significant. Precollege critical thinking was a positive predictor of end-of-first-year critical thinking ($b = .757, p < .001$). In

addition, holding other variables constant, the number of liberal arts courses taken during the first year of college had a significant effect on critical thinking posttest scores ($b = .121, p < .01$). The four variables that had a significant negative effect on critical thinking at the end of the first year of college were high school involvement ($b = -.564, p < .01$), attending a regional university versus a liberal arts college ($b = -.968, p < .01$), and being in the 2007 cohort ($b = -.903, p < .001$) and the 2008 cohort ($b = -1.198, p < .001$) versus the 2006 cohort.

Table 4.8

Total Effects and Direct Effects of Honors on Critical Thinking

Variables	Total Effects		Direct Effects	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.757**	.715**	.734**	.692
Male	-.267	-.022	-.172	-.014
White	-.035	-.003	-.057	-.004
Average years of parents' education	.083	.029	.077	.027
Precollege academic motivation	.034	.003	.069	.007
High school involvement	-.564*	-.054*	-.414	-.039
Regional university	-.968*	-.078*	-.938*	-.075
Research university	.082	.007	.148	.013
2007 cohort	-.903**	-.066**	-.730*	-.054
2008 cohort	-1.198**	-.077**	-1.097**	-.070
Courses taken in the liberal arts	.121*	.048*	.136*	.053
Honors	.436	.028	.411	.026
Good teaching and high quality interactions with faculty			.647**	.065
Academic challenge and high expectations			.017	.001
Diversity experiences			.138	.014
Influential interactions with peers			-.008	-.001
Frequency of interactions with faculty & staff			-.824**	-.090
Cooperative learning			-.191	-.023
R^2	.630**		.638**	

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

Note: *b* = unstandardized regression coefficient. β = standardized regression coefficient.

The Direct Effects of Honors on Critical Thinking

Research question four – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, if honors programs enhance honors students' critical thinking at a significant level, to what extent is the growth in honors students' first-year critical thinking explained by their exposure to good practices in undergraduate education?

To estimate the direct effect of honors on first-year critical thinking, the six good practice measures were added as a block of variables to the total effects equation. This analytic technique was recommended by Alwin and Hauser (1975) and Pascarella (2006) and was used by Seifert et al. (2007). In this equation, honors program participation acted as a predictor of end-of-first year critical thinking while controlling for student background and precollege characteristics, institutional characteristics, college experiences, and the six good practice measures. This stage of the analysis estimated “the unique net effect of honors program participation” on end-of-first-year critical thinking (Seifert et al., 2007, p. 63). If honors program participation was a significant predictor of critical thinking in the total effects model and if good practices mediated that effect, the significance of honors would become nonsignificant after controlling for exposure to good practices in the direct effects model (Seifert et al., 2007). However, because honors program participation did not influence critical thinking or exposure to good practices in undergraduate education at statistically significant levels, the steps to test for mediation were not met (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004).

However, by adding the good practice measures as control variables, the direct effects model explained an additional 0.8% of the variance in end-of-first year critical thinking ($R^2 = .638$, $F(18, 1,805) = 176.40$, $p < .001$, $\Delta R^2 = .008$, $F_{\text{change}}(6, 1,804) = 6.673$, $p < .001$). Despite

the fact that the coefficient was positive, the difference was no more than we could expect by chance ($b = .411, p = .078$) (Table 4.8). Given the results of the previous regression analyses, one cannot conclude that exposure to good practices mediated the relationship between honors and critical thinking (Baron & Kenny, 1986). Despite this, seven variables were significant predictors of critical thinking (see Table 4.8). Even when holding other variables constant, two good practices were significant predictors of critical thinking: Frequency of Interactions with Faculty and Staff and Exposure to Good Teaching and High Quality Interactions with Faculty. The Frequency of Interactions with Faculty and Staff had a significant negative effect on critical thinking ($b = -.824, p < .001$). However, exposure to Good Teaching and High Quality Interactions with Faculty had a significant positive effect on critical thinking ($b = .647, p < .001$). Taken together, it appears that honors students and non-honors students did not differ in critical thinking growth or in their exposure to good practices when all other variables were held constant.

The Conditional Effects of Honors on Critical Thinking

Research question five – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, does the influence of honors programs on honors students' first-year critical thinking differ in magnitude and direction for White versus students of color and for male versus female students?

Stage four of the analysis examined the conditional effects of honors program participation on end-of-first-year critical thinking. Because this study did not find an overall effect of honors on critical thinking, it was important to examine conditional effects (Pascarella, 2006). To examine potential conditional effects, honors program participation was used to create cross-product terms with race and gender. Each cross-product term was added sequentially to

the total effects model. If the effect was conditional, an increased R^2 would be significant (Pedhazur, 1997).

In both cases, the interaction terms did not increase the R^2 (see Table 4.9). When the cross-product term for gender and honors was added to the model, the ΔR^2 was nonsignificant ($\Delta R^2 = .000$, $F_{\text{change}}(1, 1,809) = 1.985$, $p = .159$). Therefore, it does not appear that the effect of honors program participation differs in magnitude or direction for male versus female students. In the same way, when the cross-product term for race and honors was added to the model, the ΔR^2 was nonsignificant ($\Delta R^2 = .000$, $F_{\text{change}}(1, 1,809) = 2.134$, $p = .144$). Therefore, it does not appear that the effect of honors program participation differs in magnitude or direction for White versus students of color.

Table 4.9

Conditional Effects of Honors on Critical Thinking by Gender and Race

Variables	Honors x gender		Honors x race	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.757**	.714**	.757**	.714**
Male	-.160	-.013	-.269	-.023
White	-.039	-.003	.086	.007
Average years of parents' education	.082	.029	.079	.028
Precollege academic motivation	.029	.003	.026	.002
High school involvement	-.557*	-.053*	-.561*	-.053*
Regional university	-.956*	-.077*	-.970*	-.078*
Research university	.100	.008	.079	.007
2007 cohort	-.914**	-.067**	-.911**	-.067**
2008 cohort	-1.208**	-.077**	-1.212**	-.078**
Courses taken in the liberal arts	.121*	.048*	.119*	.047*
Honors	.693	.044	1.018	.064
Honors x gender	-.656	-.027	-.768	-.043
R^2	.630		.630	
ΔR^2	.000		.000	

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

Note: *b* = unstandardized regression coefficient. β = standardized regression coefficient.

Summary of Chapter Four

Although the purpose of the current study was not to determine which blocks of variables explained most of the variance in critical thinking during the first-year of college, this information is provided in Appendix D. For those interested in examining each step of the analyses, please see Appendix D.

Chapter Four reported the current study's results. The chapter began with a summary of the study. This section briefly reviewed the purposes, significance, and design of the study. This was followed by the results of the data collection, including the response rates, outlier analysis,

and descriptive statistics. Next, the assumptions of OLS were presented. The chapter concluded with the results of the current study, which were organized by research question.

CHAPTER FIVE

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Chapter Five discusses the findings and highlights the implications of the study. The chapter begins with a brief overview of the study. The next section discusses the findings of the study. Next, recommendations for practice and future research are presented. The chapter concludes with limitations of the current study.

Overview of the Study

The purposes of this longitudinal panel study were 1) to examine the influence of honors programs on first-year college students' critical thinking skills, 2) to determine whether students in honors programs receive more exposure to good practices in undergraduate education than their non-honors peers, and 3) to assess the effect of good practices on critical thinking. This study also investigated whether the influence of honors programs on critical thinking skills varied in direction and magnitude for male versus female students and White versus students of color. To replicate an earlier study conducted by Seifert et al. (2007), the current study utilized data from a recent national study, the Wabash National Study of Liberal Arts Education (WNSLAE). In order to fulfill this purpose, five research questions were addressed using descriptive statistics analysis and OLS multiple regression. The current study included 1,824 first-year college students from 21 institutions that offered an honors program during the first-year of college. The treatment group (honors students) consisted of 306 students, whereas the control group (non-honors students) consisted of 1,518 students. The results of the current study are presented in detail in Chapter Four.

Conclusions and Discussion

This section highlights several important conclusions based on the findings of the current study and discusses how they compare to previous research. In this section, the conclusions and discussion are organized by research question. When it is appropriate, this section provides possible explanations for the results.

Descriptive Profile of Honors and Non-Honors Students

Research question one – What is the descriptive profile of non-honors and honors students who participated in the current study?

Several conclusions that emerged from the descriptive analysis point to the differences between non-honors and honors students. Although female and White students made up the majority of students in non-honors and honors, honors programs in the study consisted of fewer males and students of color. Upon entering college, students in honors earned higher scores on the CAAP Critical Thinking pretest and reported higher levels of academic motivation and high school involvement than non-honors students. Furthermore, the parents of honors students had completed more years of education. Similarly, Seifert et al. (2007) reported that honors students earned higher CAAP Critical Thinking pretest scores and reported greater levels of academic motivation, high school involvement, and parental education than non-honors students. However, compared to Seifert et al.'s (2007) study, the percentage of students of color in honors was substantially less.

Once in college, students in honors reported different experiences than non-honors students. Consistent with Seifert et al. (2007), students in honors completed more liberal arts courses than non-honors students. The descriptive statistics suggest that honors students reported greater exposure to each of the good practices in undergraduate education (good

teaching and high quality interactions with faculty, academic challenge and high expectations, diversity experiences, influential interactions with peers, frequency of interactions with faculty and professional staff, and cooperative learning). Furthermore, students in honors earned higher CAAP Critical Thinking posttest scores. However, a larger percentage of honors students experienced no growth in critical thinking during the first year of college. Upon reviewing the CAAP Critical Thinking scores from Seifert et al.'s (2007) study, it was surprising to see that honors and non-honors students in their study entered college with higher CAAP pretest scores than the students in the current study earned even after one year in college.

The racial diversity of honors students was particularly concerning in light of prior research. For example, Schuman (1999) admitted that honors programs lack racial diversity. According to Pehlke (2003), honors programs' over-reliance on high school GPAs and college entrance exams to award membership has been shown to disadvantage access for minority students. Schuman (1999) lamented, "It is...disappointing that one can still hear mutterings about the difficulty in finding minority students of 'Honors quality'" (p. 10). It is concerning that the percentage of students of color in honors is less than the percentage of students of color not in honors.

The Effects of Honors on Exposure to Good Practices

Research question two – After controlling for a pretest measure of critical thinking, student background characteristics, and other college experiences, are students in honors programs more likely to be exposed to “good practices in undergraduate education” during the first year of college, as compared to non-honors students?

After holding other variables constant, honors students did not report greater exposure to good practices at statistically significant levels. In fact, the differences between honors and non-

honors students' exposure to good teaching and high quality interactions with faculty, academic challenge and high expectations, diversity experiences, influential interactions with peers, frequency of interactions with faculty and professional staff, and cooperative learning could only be attributed to chance.

These findings contradicted the findings of three studies. In the first of these, Ory and Braskamp's (1988) study of first-year honors students completed more assigned readings, spent more time studying, and had more interactions with faculty. In the second study conducted by Seifert et al. (2007), first-year students in honors reported that their professors used higher-order questioning techniques, gave prompt feedback, and taught with greater skill and clarity than non-honors students reported. Furthermore, honors students indicated that they were assigned more textbooks to read, had greater levels of academic challenge and involvement, and had more course related interactions with their peers (Seifert et al., 2007). It should be noted that in contrast to the current study, the researchers regressed each of the 20 good practice subscales on honors program participation instead of regressing the mega scales. In the third study, Shushok's (2003) examination of the effects of honors on first-year students, he found that honors and non-honors students reported similar experiences. By their fourth year in college, honors students were more likely to talk with faculty, discuss career plans, and participate in activities outside of class (Shushok, 2006).

There are several reasons why findings from the present study might contradict previous research. First, Ory and Braskamp (1988) and Shushok (2006) conducted their studies at one institution. Second, Ory and Braskamp (1988) did not control for student background or precollege characteristics. Third, both Ory and Braskamp's (1988) and Seifert et al.'s (2007) studies analyzed data from the 1980s and early 1990s who represent an entirely different

generational cohort than students today. Fourth, in the current study, only the six mega good practice scales were regressed instead of the 20 subscales as Seifert et al. (2007) did. Because of this, the regression artifacts of the mega scales could mask the effect of honors on the individual subscales. However, by doing it this way, I prevented each of the subscales in the regression model from causing multicollinearity. Fifth, although it is unknown, it is quite possible that some of the findings of the Seifert et al. (2007) study may have been the result of a Type I error. According to Song and Herman (2010), by testing as many hypotheses as Seifert et al. (2007) did, the probability of a Type I error was substantially increased because of the additive effect of running several comparisons. In much the same way, just analyzing clustered data can increase the probability of a Type I error (Cohen et al., 2003).

The Effects of Honors on Critical Thinking

Research question three – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, do honors programs enhance honors students' critical thinking by the end of their first year in college, as compared to non-honors students?

In this study, first-year honors students had slightly higher critical thinking gains than non-honors students, but differences could only be attributed to chance because they were not statistically significant. Similarly, Shushok (2003), using the CSEQ (Pace, 1990), found that first-year honors and non-honors students did not self-report statistically different gains in critical thinking. Seifert et al. (2007) used the same standardized measure as the current study did—the CAAP Critical Thinking Test—to assess first-year honors and non-honors students' critical thinking. According to Seifert et al. (2007), honors students had significantly higher CAAP Critical Thinking gains at the end of the first year as compared to non-honors students.

There are several possible reasons why the findings from the current study do not support previous findings.

Three studies examined the effect of honors after four years in college. Shushok (2006)—following the same first-year students from his 2003 study until their fourth year in college—found that fourth-year honors and non-honors students did not self-report statistically different gains in critical thinking. Tsui (1999), however, found that taking honors courses in college had a significant effect on self-reported gains in critical thinking. Consistent with Tsui's (1999) findings, Astin (1993) reported that participating in honors had a significant positive effect on self-reported problem-solving and analytical skills by the fourth year in college.

As described above, the findings from the current study were different than the results of other studies. One possible explanation for this may be because Pascarella et al. (2011) points out that critical thinking is a complex skill to develop, thus, it might take more than one year of participating in an honors program to measure an effect. Tsui's (1999) and Astin's (1993) research examined gains over four years of college. Support for this comes from Perry's (1970, 1999) influential work on college student intellectual development in which he suggested that most college students do not progress beyond the second stage of intellectual development by their fourth year of college (Evans et al., 2010). In addition, from a programmatic perspective, many of the high-impact practices (e.g., undergraduate research) that are typical of honors programs do not take place until after the first year of college. Therefore, the effect of honors could be more significant after the first year in college. The problem with this line of reasoning is that the Seifert et al. (2007) study showed a significant difference between non-honors and honors students' critical thinking after the first year of college.

Additionally, there are methodological and design elements in Tsui (1999) and Astin's (1993) studies that could also explain the different findings. For example, the sample size in Tsui and Astin's studies included over 20,000 students. It is possible that honors courses were a statistically significant predictor of critical thinking because of the enormous sample size (Maxwell & Delaney, 2004). Furthermore, because Tsui (1999) and Astin (1993) used self-report measures to assess gains in critical thinking, the internal validity was compromised. As Shushok (2003) suggested, honors students could overestimate their gains in critical thinking on self-report measures because they perceive that they should have gains, not because they actually do. Equally important, honors students may not be able to accurately self-assess their critical thinking development because, as Clance and Imes (1978) discovered and described (the "impostor" phenomenon), many high-achieving individuals do not believe they are intelligent. Therefore, honors students could underestimate their critical thinking skills. The current study used a standardized measure of critical thinking to ensure internal validity (Pascarella, 2006).

The results of the current study can also be differentiated from past research because of a ceiling effect which can actually mask the effect of the independent variable (see Cohen et al., 2003). In the present study, a ceiling effect could have occurred because the group with higher scores on the pretest (honors) had less to gain on the posttest (Cohen et al., 2003). However, because honors students in Seifert et al.'s (2007) study had much higher CAAP Critical Thinking pretest scores than the honors students in the current study and still estimated significant gains, this is not certain.

There are additional reasons this study's findings could contradict Seifert et al.'s (2007) results. First, it is possible that the data analyzed by Seifert et al. (2007) were clustered. In their study, they attempted to account for clustering by creating a dummy variable for each institution

that participated in the study. However, Thomas and Heck (2001) recommend alternative approaches. When data are clustered, the chances of a Type I error, or false positive increase (Cohen et al., 2003). Although the Seifert et al. (2007) study is the most comprehensive and methodologically sound study until now, the current study attempted to further strengthen the design and methodological strengths employed by Seifert et al. (2007) by accounting for the clustered data as suggested by Thomas and Heck (2001). While it is possible that some of the findings from the previous study were the result of a Type I error, it is also possible that the decisions made to account for clustered data in the current study masked the true effect of participating in a collegiate honors program.

The second reason the current findings might differ from the Seifert et al. (2007) study is because they analyzed data that were collected in the early 1990s. In fact, they identified the dated nature of the data as a limitation and recommended replication. Today's college students are of a different generational cohort. Given recent findings that suggest the amount of time college students allocate to preparing and studying for classes has declined (Arum & Roksa, 2011), it may not be surprising that the current study found no significant differences in critical thinking for honors and non-honors students at the end of the first-year of college.

The difference in the current study's findings might be because of the mindset of today's college students who, when selecting a college, view admittance into an honors program as a reward for previous academic achievements instead of an opportunity to participate in rigorous work (Knudson, 2011). In an effort to recruit high-achieving students, it is possible that institutions over-emphasize the non-educational rewards of honors (e.g., free laundry, an honors lounge, special housing, early registration, etc.) instead of the educational opportunities. As an illustration, Knudson (2011) in describing one of his honors students' impressions of collegiate

honors programs after his campus visit, reported the student said that the campus visit made the program seem as if “honors was like flying first class” (Knudson, 2011, para. 4). If honors students simply view their participation in honors programs as a reward for past academic achievement, it is possible that they might not make the most of the educational experience, which could then explain a lack of a significant difference between honors and non-honors students.

Another reason that students in honors programs might not differ in significant ways from non-honors students is that honors faculty may not be equipped to educate this special population of students. Several sources in the literature note the challenges faculty encounter when they teach collegiate honors courses (Edman, 2002; Haas, 1992; Thomas, 1990). For example, many professors incorrectly assume that honors students are more advanced critical thinkers than their non-honors classmates (Edman, 2002; Thomas, 1990). If professors assume that honors students are further along in their critical thinking skills than they are, faculty may not challenge honors students at appropriate levels.

The Effects of Honors and Good Practices on Critical Thinking

Research question four – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, if honors programs enhance honors students’ critical thinking at a significant level, to what extent is the growth in honors students’ first-year critical thinking explained by their exposure to good practices in undergraduate education?

The findings from the current study suggested that participating in an honors program did not influence critical thinking or exposure to good practices at statistically significant levels, and as a result, it could not be concluded that good practices explained growth in critical thinking

(see Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004). Although Seifert et al. (2007) found that honors programs significantly influenced critical thinking, and that good practices explained this effect, the findings of the current study do not support these prior findings.

Despite this, this stage of the analysis indicated that exposure to Good Teaching and High-quality Interactions with Faculty was the strong positive predictor of critical thinking after precollege critical thinking.

The Conditional Effects of Honors

Research question five – After controlling for a parallel pretest measure of critical thinking, student background characteristics, and other college experiences, does the influence of honors programs on honors students' first-year critical thinking differ in magnitude and direction for White versus students of color and for male versus female students?

The influence of honors programs on critical thinking did not significantly differ in direction or magnitude for White students versus students of color or for male versus female students. These findings are consistent with Seifert et al. (2007). Just as the Seifert et al. (2007) study did, the current study grouped all students of color together. It is possible that this could have masked the differences between different races and ethnicities (i.e., Asian students, Black students, American Indian students, etc.) (Stage, 2007).

Recommendations for Practice

The results of the current study have several implications for the education of college students in honors programs. Collectively, the results of this study indicated that honors students' development of critical thinking and their exposure to good practices in undergraduate education were not significantly different from non-honors students during their first year of

college. This section highlights recommendations for administrators, honors directors, honors faculty, students, and prospective honors program students and their parents to improve practice. Most of the recommendations to improve practice are directed to honors directors, deans, and administrators.

Increase Minority Student Access

Honors directors and university administrators must be vigilant in their efforts to improve minority access to honors programs. Ideally, the diversity of an institution should be reflected in the diversity of the students in honors. Consistent with Seifert et al. (2007), the current study found that the percentage of students of color in honors was less than the percentage of students of color not in collegiate honors programs. This was concerning given findings in the literature that suggest there is a lack of racial diversity in honors programs (Pehlke, 2003; Schuman, 1999). Although it is not possible to determine whether the percentage of students of color has truly decreased since the 1990s, Seifert et al.'s multi-institutional study of first-year honors students included a larger percentage of honors minority students than the current study. Pehlke (2003) suggested that to live up to the "honor" label, honors programs must examine minority access to honors programs. Honors directors and institutional leaders should ensure that the percentage of students of color in honors equal or exceed the percentage of minority students not in honors.

Alternative admission measures. To increase the racial diversity of honors students, institutional leaders may need to look for additional measures—other than high school GPA and ACT or SAT scores—to increase minority student access. As Pehlke (2003) indicated, honors programs tend to use high school GPAs and college entrance exam scores to select students for honors despite the fact that research suggests these disadvantage access for minority students. Giazzoni and Hilberg (2009) argued that honors programs "reinforce class hierarchy" when they

base their selection solely on high school GPA and college entrance exam scores because such standards “favor certain demographics” (pp. 57-58). The argument for including additional measures for admission is strengthened by the fact that the University of Pittsburgh found that high school GPA and college entrance exam scores were not effective criteria to select gifted students for their institution’s honors college (Giazsoni & Hilberg, 2009). It seems that high school GPA and scores on college entrance exams are used as honors admission criteria, not because these are the best, but because these are the most time efficient. It is not recommended that honors directors lower admission requirements, rather, they should look for additional measures to identify gifted students.

Although it is time consuming, many recommend using interviews to select students. In her article, Pehlke (2003) quoted an interview that she conducted with Dr. Ada Long, the honors program administrator and editor of both journals produced by the NCHC. Dr. Long laments,

The ONLY way to accomplish genuine diversity in honors is by not using minimum SAT or ACT scores. Our program is, by design, small, and we interview every applicant. I know of no other honors program in the country that follows such a pattern. Having done so for 20 years, I now KNOW that ACT and SAT have no value as predictors of individual success...the majority of honors faculty I know claim they want diversity while at the same time using admissions standards that make diversity impossible. I find that the subject of diversity in honors has become an invitation to egregious hypocrisy. (Pehlke, 2003, p. 30)

Braid (2009) echoes Long’s recommendation to interview prospective students who apply for the honors program because by doing so, students can demonstrate their intellectual curiosity more than they can on a college entrance exam. Because admissions counselors interact with prospective students, honors directors should collaborate with them to identify students to interview who do not meet typical standards for the honors program, but demonstrate intellectual curiosity.

Alternative entry points. To increase the diversity students in honors, institutional leaders may need to look for alternative entry points to admit students. Andrews (2007), for example, recommended inviting students to participate in honors after the first year of college so that students have the opportunity to show their abilities. At the University of Pittsburgh, students with a GPA of 3.25 or above can take an honors course (Giazconi & Hilberg, 2009). If students do not meet the minimum requirements, the professor or an honors advisor can waive the requirement. In addition, the institution involves faculty to actively identify students who are gifted, but not in the honors program (Giazconi & Hilberg, 2009). They believe that these alternative methods of selection and alternative entry points into the honors college increase minority student access.

Identify potential collegiate honors students earlier. To increase the diversity of students in collegiate honors programs, junior high and high school teachers and guidance counselors should seek to identify gifted minority students years before they enter college. If these students are not in honors classes already, guidance counselors and teachers should recommend enrollment in honors courses. Furthermore, teachers and guidance counselors should educate students and their parents about the importance of studying for college entrance exams. As teachers and guidance counselors assist students with their college applications, they should talk with students about collegiate honors programs. In order for them to do this properly, honors directors should meet junior high and high school faculty from schools in the area.

Assess Student Learning in Honors

Another recommendation for improved practice is that directors of honors programs should actively assess student learning, especially critical thinking. Several articles in *The*

Journal of the National Collegiate Honors Council noted a lack of attention on the assessment and evaluation of university honors programs (e.g. Digby, 2006; Driscoll, 2011; Frost, 2006; Lanier, 2008; Mariz, 2006; Snyder & Carnicom, 2011). Without proper assessment, it should not be assumed that students in honors are improving their critical thinking skills or learning more. By challenging their own assumptions of honors programs, honors directors and faculty demonstrate the very skill they seek to develop in students: critical thinking. In order to improve critical thinking, honors programs must lead the way in assessing student learning and taking steps to improve undergraduate education. To do this properly, honors directors should work with institutional leaders and faculty to clarify and articulate the purpose of honors and the desired student learning outcomes of honors for their institution. Because critical thinking is an important learning outcome of college and honors is an ideal environment to enhance critical thinking, developing an assessment plan to measure and improve critical thinking seems like an appropriate first step. Given the wealth of assessment data collected by institutions, honors directors may not need to collect additional data. It is important, however, that assessment plans account for precollege characteristics (Astin, 1993). For honors directors who are new to assessment, the National Collegiate Honors Council hosts a Summer Institute on Honors Assessment and Evaluation. Furthermore, meetings with honors faculty should include time to make sense of assessment results so that it informs their classroom teaching. Feedback from assessment can inform curricular changes, faculty development, and recruiting efforts.

Selection and Training of Honors Faculty

Honors directors should select honors faculty who are effective teachers and who are known for interacting with students in meaningful ways. The current study found that after precollege critical thinking, the most significant predictor of growth in critical thinking was

exposure to Good Teaching and High-quality Interactions with Faculty. Although advocates of honors indicate that the best fulltime professors teach in honors (Cummings, 1986), the current study found that first-year students in honors programs were not exposed to more Good Teaching and High-quality Interactions with Faculty, than non-honors students were. Because of this, it is important that honors directors select faculty who care about engaging in meaningful interactions with students inside and outside of class and who are known for effective teaching. It is critical that honors directors communicate the expectation for student-faculty interaction and good teaching when recruiting faculty to teach in honors because, by doing this, an honors director can take steps to make sure faculty are a good fit to teach in honors.

In addition to ensuring proper selection of honors faculty, institutions should provide specialized faculty development opportunities for honors faculty to improve the quality of their teaching to improve student learning in honors. Just because some assume the best professors teach in honors, it does not mean they are properly equipped to educate honors students, especially in critical thinking. As noted by Edman (2002), Haas (1992), and Thomas (1990), teaching honors courses present unique challenges. Educating honors faculty on the needs of honors students, the purposes of honors, pedagogical strategies to improve critical thinking, and classroom assessment techniques could improve student learning and critical thinking in honors. In fact, college professors have difficulty defining critical thinking (Paul, Elder, & Bartell, 1997). Because the current study found that honors students' critical thinking scores did not differ significantly from those of non-honors students, training should also focus on defining, teaching, and assessing critical thinking.

Provide Good Instruction and Create Opportunities for Student Interaction

Because Good Teaching and High-quality Interactions with Faculty was a strong predictor of critical thinking, and due to the fact that students in honors programs did not report statistically different exposure to this, faculty in honors programs should make intentional efforts to improve their teaching and create opportunities for meaningful interactions with students. The Good Teaching and High-quality Interactions with Faculty scale was composed of four subscales: Faculty Interest in Teaching and Student Development, Prompt Feedback, Quality of Non-Classroom Interactions with Faculty, and Overall Exposure to Clear and Organized Instruction. Therefore, faculty should take interest in their teaching, provide prompt and frequent feedback to students, create opportunities to meet with students outside of class, and ensure that their organization is clear and organized. As Haas (1992) argued, honors students need a high level of support from faculty.

Ensure Honors Program is more than a Recruiting Tool

The final recommendation for practice is directed towards prospective honors students and their parents. The findings from the current study might only add to concerns that honors programs are only a marketing tactic to recruit high-achieving students. Because of this, parents of prospective students should diligently ask honors program directors to provide assessment evidence that the program is measuring student learning and making improvements based on assessment feedback. Parents and prospective students should not settle for anecdotal examples from institutional leaders. By doing this, parents and students could make informed decisions about whether to participate in an honors program or attend an institution.

Recommendations for Future Research

Due to the fact that there is a dearth of research on collegiate honors programs (Koch et al., 2007), many opportunities for future research exist. In light of findings in the literature and the present study, several recommendations are noted:

1. Despite the limited amount of research that exists on collegiate honors programs, I located extensive research on K-12 gifted education. Collaboration with scholars who research K-12 gifted education is needed because the quantity of research on postsecondary gifted education is behind.
2. A study should examine whether the effect of honors on critical thinking and exposure to good practices differs in direction and magnitude based on the type of institution attended. This is an important topic for future research because as the literature review discussed, the offerings of an honors program can depend on the type of institution. Therefore, a study should compare the effect of participating in an honors program at different types of institutions.
3. Because critical thinking is a complex skill that takes time to develop (Pascarella et al., 2011), a large scale longitudinal study examining the effect of honors is needed. Although Tsui (1999) and Astin (1993) reported that honors had a significant effect on critical thinking gains by the fourth year of college, they used self-report measures, which compromise the internal validity (Pascarella, 2006). Thus, such a study should use a standardized measure of critical thinking.
4. Institutions that are members of the National Collegiate Honors Council should conduct a descriptive study examining the demographics of students in honors programs and colleges versus those who are not.

5. Shushok (2003) indicated that honors students could overestimate their critical thinking skills on self-report measures because they assume that they should improve their critical thinking. In contrast to Shushok, students experiencing the impostor phenomenon could underestimate their critical thinking on self-report measures. To examine whether honors students can accurately assess their critical thinking, a study should be conducted by comparing a group of honors students' self-report results to their standardized measures of critical thinking.
6. Studies assessing the effect of honors programs on other important learning outcomes are needed. Although honors program participation did not affect critical thinking skills during the first year of college, participation could influence other learning outcomes.

Limitations of the Study

Even though the current study attempted to fill gaps in the research on honors students by employing a quasi-experimental design with a parallel pretest-posttest measure, the study has its limitations. The section below describes these limitations.

First, just as any study using secondary data, this study was restricted to using the operational definitions, variables, design, instruments, and data used for the Wabash National Study of Liberal Arts Education. At the same time, the strength of the WNSLAE's longitudinal design was the ability to control for multiple confounding variables that included a parallel pretest of critical thinking and student background characteristics (Pascarella & Colleagues, 2007a).

Second, one should exercise caution when generalizing the results of the current study to all honors programs at American colleges and universities because the sample was not nationally

representative. The WNSLAE researchers used a purposive sampling technique to select institutions.

Third, a limitation of all quasi-experimental research is selection bias because students in the treatment group were not randomly selected to participate (Padgett, Salisbury, An, & Pascarella, 2010). Random assignment is typically impossible and unpractical when working with college students (Astin, 1991; Creswell, 2008; Pascarella, 2006; Seifert et al., 2010). Random assignment is ideal because students with different precollege characteristics are more likely to participate in certain programs. To account for nonrandom assignment, the current longitudinal study used a parallel, precollege measure as an effective way to account for selection effect bias (Padgett et al., 2010; Pascarella, 2006). Furthermore, other precollege characteristics were statistically controlled for to properly minimize this limitation as recommended by Astin (1991, 1993).

Fourth, due to the amount of time required from participants and the time lapse between data collection, attrition of participants in any longitudinal study is a potential limitation (Creswell, 2008). To properly deal with this, the WNSLAE paid participants in the 2006 cohort \$50 at each data collection. Furthermore, each institution reminded students of the importance of their participation in the study.

Fifth, similar to Seifert et al.'s (2007) study, information about the types of honors programs and the level/frequency of student participation in honors programs were unknown. As an illustration, some programs might require several honors classes during the first year, while others could only require one. Thus, the results of this study cannot account for differences in honors programs or in the level of student participation. It should be noted that while honors programs vary in design and offerings, a typical goal of honors programs is to enhance critical

thinking (Edman, 2002; Haas, 1992). Furthermore, student participation was measured as a dichotomous variable: respondents indicated “yes” or “no” for honors program participation. Because the student ID was not available, I could not verify that the student actually participated in an honors program during the first year of college. To address this limitation, each institution was contacted to verify that they had an honors program for first-year students during the cohort year. Furthermore, I made sure that each honors program required involvement within the first year.

Lastly, because this study was limited to examining the influence of honors programs during the first year of college, honors students may have experienced limited changes in critical thinking because they did not have adequate time or exposure to honors programs to experience growth in critical thinking (Pascarella & Terenzini, 2005).

Closing

Although collegiate honors programs are not a new educational innovation, the number of honors programs has drastically increased since the 1990s (Long, 2002). While critics worry that honors programs are simply a marketing tactic to recruit high achieving students (see Long, 2002; Sperber, 2000) to increase the institution’s prestige and college rankings, others defend that honors programs provide an educationally rewarding experience (NCHC, 2012; Sederberg, 2005). However, there is little research examining the effectiveness of honors programs, which only fuels concerns (Long, 2002; Pascarella, 2006; Rinn & Plucker, 2004). The results of the current study could increase the concerns expressed by those who are already skeptical of honors programs. It is possible that the emphasis in honors programs is focused more on recruiting high achieving students, rather than providing a different educational experience. As long as honors programs provide an effective educational experience, colleges and universities should use the

honors program to recruit gifted students. However, it is also possible that the educational benefits of honors are not realized until after the first year of college.

Because the current study is the most comprehensive study examining the influence of honors on critical thinking and exposing honors students to good practices since the Seifert et al. (2007) study, the findings are of great importance to the future of higher education. When Frank Aydelotte and others worked diligently to create and advance honors education, the focus was on educating the country's brightest students rather than recruiting them because they believed these students were the future leaders in our country (Aydelotte, 1944). Given the fact that 54.9% of honors students in the current study experienced a decline or no growth in their critical thinking skills, and 50.3% of non-honors students experienced no growth or a decline, there is a clear signal that improvement is needed. In a time of great economic uncertainty and increasing costs to attend college, we must respond swiftly because students, industry leaders, and the country depend on it.

REFERENCES

- Alwin, D., & Hauser, R. (1975). The decomposition effects in path analysis. *American Sociological Review*, 40(1), 37-47.
- American College Testing, Inc. (ACT, Inc.). (2008). *Collegiate Assessment of Academic Proficiency: Technical handbook 2007-2008*. Iowa City, IA: Author.
- Andrews, L. (2007). Grades, scores, and honors: A numbers game. *Journal of the National Collegiate Honors Council*, 8(1), 23-30.
- Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago, IL: University of Chicago Press.
- Arum, R., Roksa, J., & Cho, E. (2011). *Improving undergraduate learning: Findings and policy recommendations from the SSRC-CLA longitudinal project*. Brooklyn, NY: Social Science Research Council.
- Association of American Colleges and Universities. (2007). *College learning for the new global century: A report from the National Leadership Council for Liberal Education & America's Promise*. Washington, DC: Author.
- Astin, A. (1970). The methodology of research on college impact: Part one. *Sociology of Education*, 43(3), 223-254.
- Astin, A. (1991). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education*. Washington, DC: American Council on Education/Oryx Press Series on Higher Education.
- Astin, A. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.
- Astin, A., & Denson, N. (2009). Multi-campus studies of college impact: Which statistical method is appropriate. *Research in Higher Education*, 50(4), 354-367.
- Astin, A., & Sax, L. J. (1998). How undergraduates are affected by service participation. *Journal of College Student Development*, 39(3), 251-263.
- Austin, C. (1986). Orientation to honors education. In P. Friedman & R. Jenkins-Friedman (Eds.), *Fostering academic excellence through honors programs* (pp. 5-16). San Francisco, CA: Jossey-Bass.
- Aydelotte, F. (1921). Inaugural address: Better training for our best minds. *Swarthmore College Bulletin*, 29(2), 19-25.

- Aydelotte, F. (1924). *Honors courses in American colleges and universities*. Washington, DC: The National Research Council of the National Academy of Sciences.
- Aydelotte, F. (1925). *Honors courses in American colleges and universities* (2nd ed.). Washington, DC: The National Research Council of the National Academy of Sciences.
- Aydelotte, F. (1944). *Breaking the academic lock step: The development of honors work in American colleges and universities*. New York, NY: Harper & Brothers.
- Aydelotte, F. (1946). *The American Rhodes Scholarships: A review of the first forty years*. Princeton, NJ: Princeton University Press.
- Bailey, C. (1932). The tutorial system. In *Handbook to the University of Oxford* (pp. 249-256). Oxford, England: Clarendon Press.
- Barron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Behar-Horenstein, L.S., & Niu, L. (2011). Teaching critical thinking skills in higher education: A review of the literature. *Journal of Teaching & Learning*, 8(2), 25-41.
- Blaich, C. F. (2011). *Summary of four-year change*. Crawfordsville, IN: The Center of Inquiry in the Liberal Arts at Wabash College & The Wabash National Study for Liberal Arts Education. Retrieved from <http://www.liberalarts.wabash.edu/storage/4-year-change-summary-website.pdf>
- Blaich, C. F., & Wise, K. S. (2011, January). From gathering to using assessment results: Lessons from the Wabash National Study. (NILOA Occasional Paper No. 8). Urbana, IL: University of Illinois and Indiana University, National Institute of Learning Outcomes Assessment.
- Bok, D. C. (2006). *Our underachieving colleges: A candid look at how much students learn and why they should be learning more*. Princeton, NJ: Princeton University Press.
- Braid, B. (2009). Honors and class. *Journal of the National Collegiate Honors Council*, 10(1), 69-73.
- Brewster, E. H. (1930). Reading for honors. *Journal of Higher Education*, 1, 507-513.
- Casner-Lotto, J., & Silvert, H. (2008). *New graduates' workforce readiness: The midmarket perspective*. New York, NY: The Conference Board.

- Casner-Lotto, J., & Wright Benner, M. (2006). *Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce*. New York, NY: The Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, & The Society for Human Resource Management.
- Center of Inquiry in the Liberal Arts. (2006). *Guide to outcome measures*. Retrieved from http://www.liberalarts.wabash.edu/storage/assessmentinstruments/Guide_to_outcomes.pdf
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3-7.
- Chickering, A. W., & Gamson, Z. F. (1991). *Applying the seven principles for good practice in undergraduate education*. San Francisco, CA: Jossey-Bass.
- Chickering, A. W., & Gamson, Z. F. (1999). Development and adaptations of the seven principles for good practice in undergraduate education. *New Directions for Teaching and Learning*, 80, 75-81.
- Chickering, A. W., & Reisser, L. (1993). *Education and identity*. San Francisco, CA: Jossey-Bass.
- Clance, P. R., & Imes, S. (1978). The imposter phenomenon in high achieving women: dynamics and therapeutic intervention. *Psychotherapy Theory, Research and Practice*, 15(3), 1-8.
- Clark, B. R. (1970). *The distinctive college: Antioch, Reed & Swarthmore*. Chicago, IL: Aldine Publishing Company.
- Cohen, J. W. (Ed.). (1966). *The superior student in American higher education*. New York, NY: McGraw-Hill.
- Cohen, J., Cohen, P., West, S., & Aiken, L. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson.
- Crocker, L., & Algina, J. (2008). *Introduction to classical & modern test theory*. Mason, OH: Cengage Learning.
- Crosby, L. A. (1922). The Oxford system of education. In L. A. Crosby and F. Aydelotte (Eds.), *Oxford of today: Manual for prospective Rhodes Scholars* (pp. 48-52). New York, NY: Oxford University Press.

- Cruce, T., Wolniak, G., Seifert, T., & Pascarella, E. (2006). Impacts of good practices on cognitive development, learning orientations, and graduate degree plans during the first year of college. *Journal of College Student Development, 47*, 365-383.
- Cummings, R. J. (1986). Exploring values, issues, and controversies. In P. Friedman & R. Jenkins-Friedman (Eds.), *Fostering academic excellence through honors programs* (pp. 17-28). San Francisco, CA: Jossey-Bass.
- Dewey, J. D. (1910). *How we think*. Boston, MA: D.C. Heath.
- Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York, NY: The Macmillan company.
- Digby, J. (2005). *Honors programs & colleges: The official guide of the National Collegiate Honors Council* (4th ed.). Princeton, NJ: Peterson's.
- Digby, J. (2006). They graduated. *Journal of the National Collegiate Honors Council, 7*(1), 57-60.
- Dressel, P. L. & Mayhew, L. B. (1954). *General education: Explorations in evaluation: The final report*. Washington, DC: American Council on Education.
- Driscoll, M. B. (2011). National survey of college and university honors programs assessment protocols. *Journal of the National Collegiate Honors Council, 12*(1), 89-100.
- Edman, L. O. (2002). Teaching critical thinking in the honors classroom. In C. L. Fuiks & L. Clark (Eds.), *Teaching and learning in honors* (pp. 45-64). Lincoln, NE: The National Collegiate Honors Council.
- England, R. (2010). Honors programs in four-year institutions in the northeast: A preliminary survey toward a national inventory of honors. *Journal of the National Collegiate Honors Council, 11*(2), 70-82.
- Ennis, R. H. (1993). Critical thinking assessment. *Theory into Practice, 32*(3), 179-186.
- Evans, N. J., Forney, D. S., Guido, F., Patton, L., & Renn, K. A. (2010). *Student development in college: Theory, research, and practice* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Field, A. P. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage.
- Feldman, K. A., & Newcomb, T. M. (1969). *The impact of college on students (Vol. 1)*. San Francisco, CA: Jossey-Bass.
- Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51*(1), 115-134.

- Friedman, P. G. (1986). Independent study, fieldwork, and peer teaching. In P. Friedman & R. Jenkins-Friedman (Eds.), *Fostering academic excellence through honors programs* (pp. 87-98). San Francisco, CA: Jossey-Bass.
- Friedman, P. G., & Jenkins-Friedman, R. C. (1986). *Fostering academic excellence through honors programs*. San Francisco, CA: Jossey-Bass.
- Frost, L. (2006). Saving honors in the age of standardization. *Journal of the National Collegiate Honors Council*, 7(1), 21-26.
- Gamson, Z. F. (1991). A brief history of the seven principles for good practice in undergraduate education. In A.W. Chickering & Z.F. Gamson (Eds.) *Applying the seven principles for good practice in undergraduate education* (pp. 5-12). *New Directions for Teaching and Learning*, No. 47. San Francisco, CA: Jossey-Bass.
- Gardner, S. K. (2009). Student development theory: A primer. *ASHE Higher Education Report*, 34(6), 15-28.
- Gellin, A. (2003). The effect of undergraduate student involvement on critical thinking: A meta-analysis of the literature 1991-2000. *Journal of College Student Development*, 44(6), 746-762.
- Giazconi, M., & Hilberg, N. (2009). Dealing with subjective and objective issues in honors education. *Journal of the National Collegiate Honors Council*, 10(1), 57-59.
- Gibson, H. W. (1985). *Critical thinking: A communication model*. Ph.D. dissertation, Washington State University, United States -- Washington. Retrieved January 1, 2012, from Dissertations & Theses: Full Text. (Publication No. AAT 8601471).
- Goodman, K. (2011). *The influence of the campus climate for diversity on college students' need for cognition*. Ph.D. dissertation, The University of Iowa, United States -- Iowa. Retrieved March 1, 2012, from Dissertations & Theses: Full Text. (Publication No. AAT 3461142).
- Haas, P. F. (1992). Honors programs. *Liberal Education*, 78(1), 20.
- Halpern, D. F. (2000). Critical thinking, the cognitive psychology of. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopedia of the social and behavioral sciences*. Amsterdam: Pergamon.
- Halpern, D. F. (2001). Assessing the effectiveness of critical thinking instruction. *The Journal of General Education*, 50(4), 270-286.
- Halverson, W.H. (1973). *Report and recommendations of the ad hoc task force on honors*. Columbus: The Ohio State University.

- Hardy, M. A. (1993). *Regression with dummy variables*. Newbury Park, CA: Sage Publications.
- Herbert, T. P., & McBee, M. T. (2007). The impact of an undergraduate honors program on gifted university students. *Gifted Child Quarterly*, 51(2), 136-151.
- Higher Education Research Institute. (2009). *The American college teacher: National norms for 2007-2008*. Los Angeles, CA: Higher Education Research Institute, University of California Los Angeles.
- Horowitz, H. L. (1987). *Campus life: Undergraduate cultures from the end of the eighteenth century to the present*. New York, NY: A.A. Knopf.
- Hoxby, C. (1997). *How the changing structure of U.S. higher education explains college tuition*. Boston, MA: Harvard University.
- Hoxby, C. (2000). *Peer effects in the classroom: learning from gender and race variation*. Cambridge MA: National Bureau of Economic Research.
- Keeley, S. M. (1992). Are college students learning the critical thinking skill of finding assumptions. *College Student Journal*, 26(3), 316-322.
- Klein, S., Liu, O. L., & Sconing, J. (2009). *Test validity study (TVS) report*. Voluntary System of Accountability. Washington, DC: Fund for the Improvement of Postsecondary Education.
- Knudson, K. (2011, July). 'Honors' should mean a challenge, not an upgrade to first class. *The Chronicle of Higher Education*, 57(41). Retrieved from <http://chronicle.com/article/Honors-Should-Mean-a/128229/>
- Koch, A. K., & Foote, S. M., Hinkle, S. E., Keup, J. R., Pistilli, M. (2007). *The first-year experience in American higher education: An annotated bibliography* (4th ed.). Charleston: National Resource Center for the First-Year Experience & Students in Transition, University of South Carolina.
- Kuh, G. (1995). Cultivating "high stakes" student culture research. *Research in Higher Education*, 36(5), 563-576.
- Kuh, G. D. (2000). *The National Survey of Student Engagement: Conceptual framework and overview of psychometric properties*. Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.
- Kuh, G. D. (2001). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change*, 33(3), 10-17, 66.
- Kuh, G. D. (2009). The national survey of student engagement: Conceptual and empirical foundations. *New Directions For Institutional Research*, 2009(141), 5-20.

- Kuh, G. D., Kinzie, J., Schuh, J., Whitt, E., & Associates. (2005). *Student success in college: Creating conditions that matter*. San Francisco, CA: Jossey-Bass.
- Kuh, G. D., Pace, C., & Vesper, N. (1997). The development of process indicators to estimate student gains associated with good practices in undergraduate education. *Research in Higher Education*, 38(4), 435-454.
- Kuh, G. D., Schuh, J., Whitt, E., & Associates. (1991). *Involving colleges: Successful approaches to fostering student learning and development outside the classroom*. San Francisco, CA: Jossey-Bass.
- Kuh, G., & Vesper, N. (1997). A comparison of student experiences with good practices in undergraduate education between 1990 and 1994. *The Review of Higher Education*, 21(1), 43-61.
- Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher*, 28(2), 16-26, 46.
- Lanier, G. (2008). Towards reliable honors assessment. *Journal of the National Collegiate Honors Council*, 9(1), 81-116.
- Learned, W. S. (1927). *The quality of the educational process in the United States and Europe*. New York, NY: Carnegie Foundation for the Advancement of Teaching.
- Lehmann, I. J. (1963). Changes in critical thinking, attitudes, and values from freshman to senior years. *Journal of Educational Psychology*, 54(6), 305-315.
- Long, B. (2002). *Attracting the best: The use of honors programs to compete for students*. Chicago, IL: The Spencer Foundation.
- Mariz, G. (2006). Accountable to whom? Assessment for what? *Journal of the National Collegiate Honors Council*, 7(1), 43-46.
- Maxwell, S. E., & Delaney, H. D. (2004). *Designing experiments and analyzing data: A comparison perspective* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates
- McMillan, J. H. (1987). Enhancing college students' critical thinking: A review of the studies. *Research in Higher Education*, 26(1), 3-29.
- Mentkowski, M., & Strait, M. J. (1983). *A longitudinal study of student change in cognitive development, learning styles, and generic abilities in an outcome-centered liberal arts curriculum*. Final Report to the National Institute of Education.
- Moran, M. G. (1992). *Frank Aydelotte, Oxford University, and the thought movement in America*. Paper presented at the Annual Meeting of the Conference on Composition and Communication in Cincinnati, OH. Retrieved from ERIC.

- Morris, C. (2010). Degreed & unemployable. *Commonweal*, 137(11), 6. Retrieved from Academic Search Premier database.
- National Center for Educational Statistics (n.d.). *Integrated postsecondary education data system*. Retrieved February 8, 2012, from <http://nces.ed.gov/IPEDS>
- National Collegiate Honors Council. (2010). Basic characteristics of a fully developed honors college. In *Faculty & Directors*. Retrieved January 2, 2012, from <http://nchchonors.org/faculty-directors/basic-characteristics-of-a-fully-developed-honors-college/>
- National Collegiate Honors Council. (2010). Basic Characteristics of a Fully Developed Honors Program. In *Faculty & Directors*. Retrieved January 2, 2012, from <http://nchchonors.org/faculty-directors/basic-characteristics-of-a-fully-developed-honors-program/>
- National Collegiate Honors Council. (2012). Frequently Asked Questions about Honors. In *High School Students, Counselors & Parents*. Retrieved January 1, 2012, from <http://www.nchchonors.org/faqs.shtml>
- National Survey of Student Engagement. (2008a). *NSSE: National survey of student engagement*. Retrieved from http://www.liberalarts.wabash.edu/storage/assessment-instruments/NSSE2008_Sample.pdf
- National Survey of Student Engagement (2008b). *Promoting engagement for all students: The imperative to look within*. Retrieved from http://nsse.iub.edu/NSSE_2008_Results/docs/withhold/NSSE2008_Results_revised_11-14-2008.pdf
- Norris, S.P. (1985). Synthesis of research on critical thinking. *Educational Leadership*, 42(8), 40-45.
- Obama, B. (2012, January). *Remarks by the President on college affordability*. Speech presented at the University of Michigan, Ann Arbor, MI. Retrieved from <http://www.whitehouse.gov/the-press-office/2012/01/27/remarks-president-college-affordability-ann-arbor-michigan>
- Ogilvie, K., & Reza, E. (2009). Business student performance in traditional vs. honors course settings. *Business Education Innovation Journal*, 1(2), 12-29.
- Ory, J. C., & Braskamp, L. A. (1988). Involvement and growth of students in three academic programs. *Research in Higher Education*, 28(2), 116-129.
- Osborne, J. W. (2013). *Best practices in data cleaning: A complete guide to everything you need to do before and after collecting data*. Thousand Oaks, CA: Sage.

- Owen, S. V. (1998). Review of the Collegiate Assessment of Academic Proficiency. In J. C. Impara & B. S. Plake (Eds.), *Thirteenth mental measurements yearbook* (pp. 283-285). Lincoln, NE: University of Nebraska Press.
- Owens, D. (2010). *Honors programs at colleges and universities in the southern region of the United States*. Ed.D. dissertation, Texas A&M University - Commerce, United States – Texas. Retrieved January 6, 2012, from Dissertations & Theses: Full Text. (Publication No. AAT 3405815).
- Pace, C. (1979). *College Student Experiences Questionnaire*. Los Angeles, CA: University of California, Center for the Study of Evaluation, Graduate School of Education.
- Pace, C. (1990). *College Student Experiences Questionnaire* (3rd ed.). Los Angeles, CA: University of California, Center for the Study of Evaluation, Graduate School of Education.
- Padgett, R. D., Salisbury, M. H., An, B. P., & Pascarella, E. T. (2010). Required, practical, or unnecessary? An examination and demonstration of propensity score matching using longitudinal secondary data. *New Directions in Institutional Research: Longitudinal Assessment for Institutional Improvement, 2010(s2)*, 29-42.
- Parks Daloz, L., Keen, C. H., Keen, J. P., & Daloz Parks, S. (1996). *Common fire: Lives of commitment in a complex world*. Boston, MA: Beacon Press.
- Pascarella, E. T. (1985). College environmental influences on learning and cognitive development: A critical review and synthesis. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 1, pp. 1-64). New York, NY: Agathon.
- Pascarella, E. T. (1989). The development of critical thinking: Does college make a difference. *Journal of College Student Development, 30*(5), 19-26.
- Pascarella, E.T. (2001). Using student self-reported gains to estimate college impact: A cautionary tale. *Journal of College Student Development, 42*(5), 488-492.
- Pascarella, E.T. (2006). How college affects students: Ten directions for future research. *Journal of College Student Development, 47*(5), 508-520.
- Pascarella, E. T., Blaich, C. F., Martin, G. L., & Hanson, J. M. (2011, May/June). How robust are the finding of Academically Adrift? *Change: The Magazine of Higher Learning, 43*(3).
- Pascarella, E. T., Bohr, L., Nora, A., & Terenzini, P. T. (1996). Is differential exposure to college linked to the development of critical thinking?. *Research in Higher Education, 37*(2), 159-174.

- Pascarella, E. T., & Colleagues (2007a). *Methodological report for the Wabash National Study of Liberal Arts Education*. Retrieved from <http://www.liberalarts.wabash.edu/study-research/>
- Pascarella & Colleagues (2007b). *Wabash Student Experiences Survey*. Iowa City, IA: Center for Research on Undergraduate Education & The Center of Inquiry in the Liberal Arts.
- Pascarella, E. T., Cruce, T., Umbach, P., Wolniak, G., Kuh, G., Hayek, J., Gonyea, R., & Zhao, C. (2006). Institutional selectivity and good practices in undergraduate education: How strong is the link?. *Journal of Higher Education*, 77(2), 251-285.
- Pascarella, E. T., Cruce, T., Wolniak, G., & Blaich, C. (2004). Do liberal arts colleges really foster good practice in undergraduate education? *Journal of College Student Development*, 45(1), 57-74.
- Pascarella, E.T., & Terenzini, P. (1991). *How college affects students*. San Francisco, CA: Jossey-Bass.
- Pascarella, E. T., & Terenzini, P. (2005). *How college affects students: A third decade of research*. San Francisco, CA: Jossey-Bass.
- Pascarella, E. T., Wolniak, G., Seifert, T., Cruce, T., & Blaich, C. (2005). *Liberal arts colleges and liberal arts education: New evidence on impacts*. San Francisco, CA: Jossey-Bass/ASHE.
- Paul, R. (1990). *Critical thinking*. Rohnert Park, CA: Center for Critical Thinking and Moral Critique.
- Paul, R., Elder, L. & Bartell, T. (1997). *California teacher preparation for instruction in critical thinking: Research findings and policy recommendations*. Sacramento, CA: California Commission on Teacher Credentialing & The Foundation for Critical Thinking.
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction*. Fort Worth, TX: Harcourt Brace College Publishers.
- Pehlke, J. (2003). The myth of honors education. *Journal of the National Collegiate Honors Council*. 4(2), 27-34.
- Peter D. Hart Research Associates, Inc. (2008). *How should colleges assess and improve student learning: Employers' views on the accountability challenge*. Washington, DC: Association of American Colleges & Universities.
- Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years: A scheme*. New York, NY: Holt, Rinehart and Winston.

- Perry, W. G. (1999). *Forms of intellectual and ethical development in the college years: A scheme*. San Francisco, CA: Jossey-Bass.
- Piaget, J. (1970). *Science of education and the psychology of the child*. New York, NY: Orion Press.
- Rinn, A. N. (2003). Rhodes Scholarships, Frank Aydelotte, and collegiate honors education. *Journal of the National Collegiate Honors Council*, 4(1), 27-39.
- Rinn, A. N. (2006). Major forerunners to honors education at the collegiate level. *Journal of the National Collegiate Honors Council*, 7(2), 63-81.
- Rinn, A. N. (2007a). College programming. In J. A. Plucker & C. M. Callahan (Eds.), *Critical issues and practices in gifted education: What the research says* (pp. 97-106). Waco, TX: Prufrock Press.
- Rinn, A. N. (2007b). Effects of programmatic selectivity on the academic achievement, academic self-concepts, and aspirations of gifted college students. *Gifted Child Quarterly*, 51(3), 232-245.
- Rinn, A. N., & Plucker, J. A. (2004). We recruit them, but then what? The educational and psychological experiences of academically talented undergraduates. *Gifted Child Quarterly*, 48(1), 54-67.
- Rosenthal, R., & Jacobson, L. (1968). Pygmalion in the classroom. *The Urban Review*, 3(1), 16-20.
- Schuman, S. (1999). *Honors programs at smaller colleges*. Radford, VA: National Collegiate Honors Council.
- Sederberg, P. (2005). Characteristics of the contemporary honors college. A descriptive analysis of a survey of NCHC member colleges. *Journal of the National Collegiate Honors Council*, 6(2), 121-136.
- Seifert, T., Pascarella, E.T., Colangelo, N., & Assouline, S.G. (2007). The effects of honors program participation on experiences of good practices and learning outcomes. *Journal of College Student Development*, 48(1), 57-74.
- Seifert, T. A., Pascarella, E. T., Erkel, S. I., & Goodman, K. M. (2010, Winter). The importance of longitudinal pretest-posttest designs in estimating college impact. *New Directions in Institutional Research: Longitudinal Assessment for Institutional Improvement*, 2010(s2), 67-78.
- Selingo, J. (2002, May 31). Mission creep? *Chronicle of Higher Education*, 48(38), A19-21.

- Shulenburg, D., & Keller, C. (2009). *Interpretation of findings of the test validity study conducted for the Voluntary System of Accountability*. Washington, DC: Fund for the Improvement of Postsecondary Education.
- Shushok, F. (2002). Honors programs. In J. F. Forest & K. Kinser (Eds.), *Higher education in the United States: An encyclopedia*, (pp. 335-336). Santa Barbara, CA: ABC-CLIO, Inc.
- Shushok, F. (2003). Educating the best and brightest: Collegiate honors programs and the intellectual, social, and psychological development of students. *Dissertation Abstracts International*, 63(11-A).
- Shushok, F. (2006). Student outcomes and honors programs: a longitudinal study of 172 honors students 2000-2004. *Journal of the National Collegiate Honors Council*, 7(2), 85-96.
- Smith, D. G. (1977). College classroom interactions and critical thinking. *Journal of Educational Psychology*, 69(2), 180-190.
- Smith, D. G. (1981). Instruction and outcomes in an undergraduate setting. Paper presented at the meeting of the American Educational Research Association, Los Angeles, CA.
- Snyder, C., & Carnicom, S. (2011). Assessment, accountability, and honors education. *Journal of the National Collegiate Honors Council*, 12(1), 111-128.
- Song, M., & Herman, R. (2010). Critical issues and common pitfalls in designing and conducting impact studies in education: Lessons learned from the What Works Clearinghouse (phase I). *Educational Evaluation and Policy Analysis*, 32(3), 351-371.
- Sorcinielli, M. D. (1991). Research findings on the seven principles. In A.W. Chickering & Z.F. Gamson (Eds.) *Applying the seven principles for good practice in undergraduate education* (pp. 13-25). *New Directions for Teaching and Learning*, No. 47. San Francisco, CA: Jossey-Bass.
- Speck, B. W. (2010). The growing role of private giving in financing the modern university. *New Directions for Higher Education*, 149, 7-16.
- Sperber, M. (2000). *Beer and circus: How big-time college sports is crippling undergraduate education*. New York, NY: Henry Holt & Company.
- Stage, F.K. (2007). Using quantitative data to answer critical questions. *New Directions for Institutional Research*, 2007(133), 5-16.
- Sullivan, R.R., & Randolph, K. R. (1994). *Ivy League programs at state school prices: The best honors at state universities nationwide*. New York, NY: Prentice Hall.
- Swarthmore Faculty. (1941). *An adventure in education: Swarthmore College under Frank Aydelotte*. New York, NY: Macmillan.

- Thelin, J. R. (2004). *A history of American higher education*. Baltimore, MD: Johns Hopkins University Press.
- Thistlethwaite, D., & Wheeler, N. (1966). Effects of teacher and peer subcultures upon student aspirations. *Journal of Educational Psychology*, 57(1), 35-47.
- Thomas, S.F. (1990). Common problems encountered by beginning honors teachers. *The National Honors Report*, 11(1), 4-5.
- Thomas, S.L., & Heck, R.H. (2001). Analysis of large-scale secondary data in higher education research: Potential perils associated with complex sampling designs. *Research in Higher Education*, 42(5), 517-540.
- Trilling, L. (1954). The Van Amringe and Keppel eras. In D.C. Miner (Ed.), *A history of Columbia College on Morningside* (pp. 14-47). New York, NY: Columbia University Press.
- Tsui, L. (1998). *A review of research on critical thinking*. Paper presented at the annual meeting of the Association for the Study of Higher Education, Miami, FL.
- Tsui, L. (1999). Courses and instruction affecting critical thinking. *Research in Higher Education*, 40(2), 185-200.
- Tsui, L. (2007). Cultivating critical thinking: Insight from an elite liberal arts college. *The Journal of General Education*, 56(3-4), 220-227.
- Wabash National Study Overview. (n.d.) Retrieved from <http://www.liberalarts.wabash.edu/study-overview/>
- West, D. (2003). Frank Aydelotte architect of distinction: A look at Swarthmore's defining president. *The Swarthmore College Bulletin*, C(4), 20-25.
- Winter, D. G., McClelland, D. C., & Stewart, A. J. (1981). *A new case for the liberal arts*. San Francisco, CA: Jossey-Bass.

APPENDICES

Appendix A – Institutions Participating in the WNSLAE

- Allegheny College
- Alma College
- Alverno College
- Augustana College
- Bard College
- Bard College at Simon’s Rock
- Bennington College
- Blackburn College
- Butler University
- Carleton College
- Coe College
- College of the Holy Cross
- Columbia College (SC)
- Community College of Rhode Island
- Connecticut College
- Delaware State University
- Fairfield University
- Franklin College
- Gustavus Adolphus College
- Hamilton College
- Hampshire College
- Hampshire College
- Hobart and William Smith College
- Hope College
- Ivy Tech Community College
- Kirkwood Community College
- Lassell College
- Marlboro College
- New College of Florida
- North Carolina Agricultural and Technical State University
- Oxford College of Emory University
- Prescott College
- Ripon College
- San Jose State University
- University of Kentucky
- University of Michigan
- University of North Carolina Wilmington
- University of Notre Dame
- University of Rhode Island
- Vassar College
- Wabash College
- Wabash College
- Wabash College
- Warren Wilson College
- Wheelock College
- Whittier College

Appendix B – Institutional Characteristics of the Current Study’s Sample

Table B1

Institutional Characteristics, Liberal Arts Colleges

Cohort	2005 Carnegie classification	Selectivity	Geographic region in the U.S.	Reported FTE undergrad enrollment	Fulltime, first time, degree seeking
2006	Baccalaureate Colleges– Arts & Sciences	Selective	Great Lakes	1,236	316
2006	Baccalaureate Colleges– Arts & Sciences	More Selective	Plains	1,347	276
2006	Baccalaureate Colleges– Arts & Sciences	More Selective	Great Lakes	3,342	778
2007	Baccalaureate Colleges– Diverse Fields	Selective	Great Lakes	1,043	383
2008	Baccalaureate Colleges– Arts & Sciences	More Selective	Great Lakes	1,724	639
2008	Baccalaureate Colleges– Diverse Fields	Inclusive	New England	1,381	483
2008	Baccalaureate Colleges– Arts & Sciences	More Selective	Southeast	901	222

Note: Data from Integrated Postsecondary Education Data System for the institution’s cohort year.

Table B2

Institutional Characteristics, Research Universities

Cohort	2005 Carnegie classification	Selectivity	Geographic region in the U.S.	Reported FTE undergrad enrollment	Fulltime, first time, degree seeking
2006	Research Universities (very high research)	Selective	Southeast	18,037	4,118
2006	Research Universities (very high research)	More Selective	Great Lakes	25,386	5,356
2006	Research Universities (very high research)	More Selective	Great Lakes	8,411	2,037
2007	Research Universities (high research)	Inclusive	Southeast	9,164	1,569
2007	Research Universities (high research)	More Selective	New England	12,184	3,005
2008	Research Universities (high research)	More Selective	New England	12,563	3,033

Note: Data from Integrated Postsecondary Education Data System for the institution's cohort year.

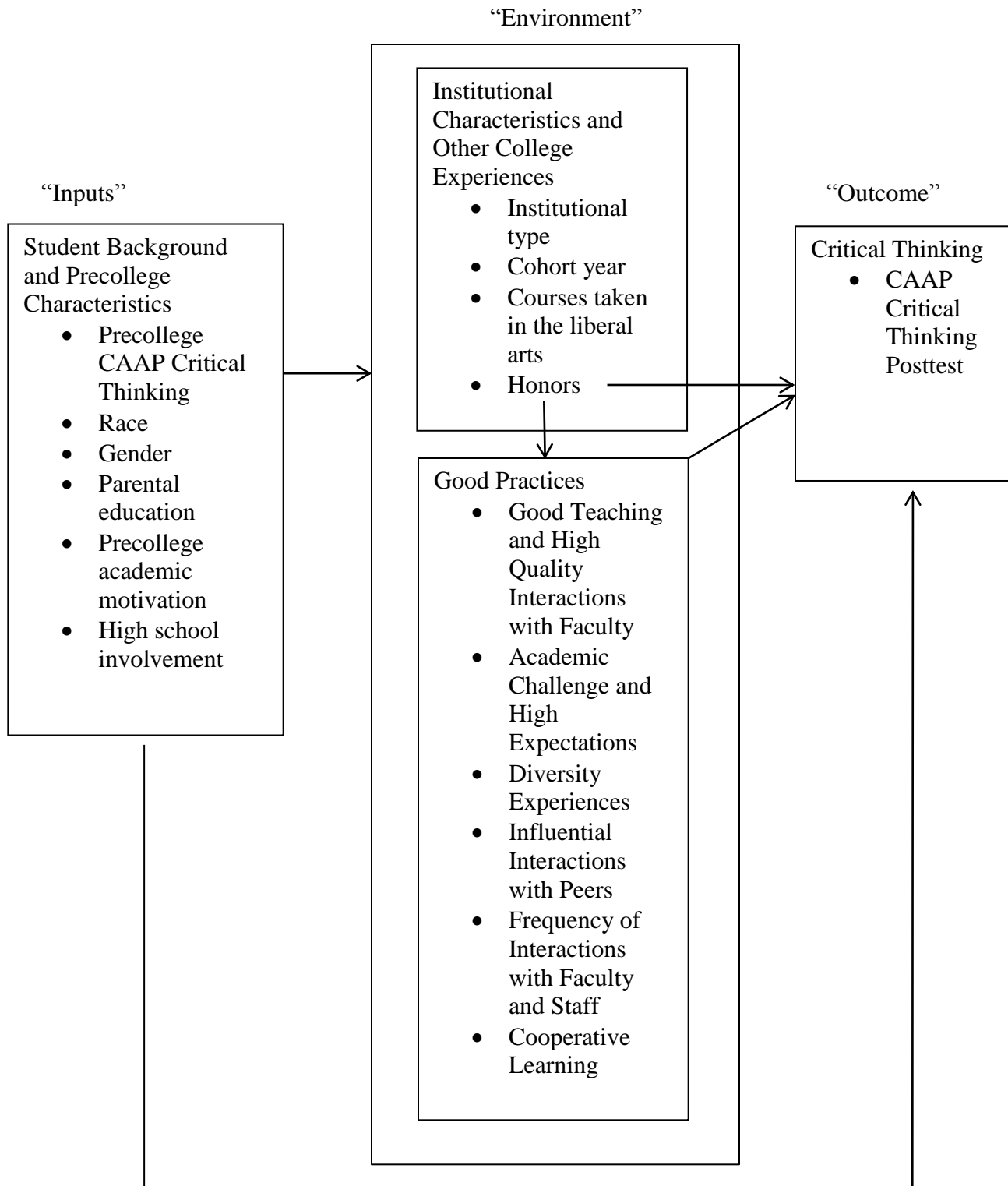
Table B3

Institutional Characteristics, Regional Colleges and Universities

Cohort	2005 Carnegie classification	Selectivity	Geographic region in the U.S.	Reported FTE undergrad enrollment	Fulltime, First time, degree seeking
2006	Master's Colleges and Universities (larger programs)	Selective	Southeast	1,082	257
2006	Master's Colleges and Universities (medium programs)	More Selective	Great Lakes	4,180	965
2006	Master's Colleges and Universities (larger programs)	Selective	Far West	20,591	2,594
2006	Master's Colleges and Universities (larger programs)	More Selective	Southeast	10,032	1,984
2007	Master's Colleges and Universities (smaller programs)	Inclusive	Mid East	2,466	799
2007	Master's Colleges and Universities (larger programs)	More Selective	New England	4,140	842
2008	Master's Colleges and Universities (larger programs)	Selective	New England	890	238
2008	Master's Colleges and Universities (larger programs)	Selective	Mid East	6,974	1,311
2008	Master's Colleges and Universities (larger programs)	Inclusive	New England	6,797	1,134

Note: Data from Integrated Postsecondary Education Data System for the institution's cohort year.

Appendix C – Conceptual Model



Note: The development of the conceptual model was guided by Astin’s (1991, 1993) I-E-O Model.

Appendix D – Hierarchical Regression Tables

Table D1

Effects of Honors on Critical Thinking

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1		Regression equation 2 (Total effects)	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.813**	.767**	.757**	.715**
Male	-.235	-.020	-.267	-.022
White	.312	.024	-.035	-.003
Average years of parents' education	.139*	.049*	.083	.029
Precollege academic motivation	.054	.005	.034	.003
High school involvement	-.355	-.034	-.564*	-.054*
Regional university			-.968*	-.078*
Research university			.082	.007
2007 cohort			-.903**	-.066**
2008 cohort			-1.198**	-.077**
Courses taken in the liberal arts			.121*	.048*
Honors			.436	.028
Good teaching and high quality interactions with faculty				
Academic challenge and high expectations				
Diversity experiences				
Influential interactions with peers				
Frequency of interactions with faculty & staff				
Cooperative learning				
R^2	.616**		.630**	
ΔR^2			.013**	
F	486.076**		256.440**	

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

Note: b = unstandardized regression coefficient. β = standardized regression coefficient.

Table D1 Continued

Effects of Honors on Critical Thinking

Variables	Good practices	
	Regression equation 3 (Direct effects)	
	<i>b</i>	β
Precollege critical thinking	.734**	.692**
Male	-.172	-.014
White	-.057	-.004
Average years of parents' education	.077	.027
Precollege academic motivation	.069	.007
High school involvement	-.414	-.039
Regional university	-.938*	-.075*
Research university	.148	.013
2007 cohort	-.730*	-.054*
2008 cohort	-1.097**	-.070**
Courses taken in the liberal arts	.136*	.053*
Honors	.411	.026
Good teaching and high quality interactions with faculty	.647**	.065**
Academic challenge and high expectations	.017	.001
Diversity experiences	.138	.014
Influential interactions with peers	-.008	-.001
Frequency of interactions with faculty & staff	-.824**	.065**
Cooperative learning	-.191	-.023
R^2		.638**
ΔR^2		.008**
F		176.397**

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

Note: b = unstandardized regression coefficient. β = standardized regression coefficient.

Table D2

Estimated Effects of Honors Programs on Exposure to Good Teaching and High-quality Interactions with Faculty

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1		Regression equation 2	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.015**	.143**	.012**	.115**
Male	.019	.016	.033	.027
White	.034	.025	.022	.017
Average years of parents' education	-.006	.022	-.007	-.024
Precollege academic motivation	.259**	.242**	.252**	.236**
High school involvement	.105**	.099**	.105**	.099**
Regional university			-.260**	-.207**
Research university			-.307**	-.257**
2007 cohort			-.054	-.039
2008 cohort			-.091	-.058
Courses taken in the liberal arts			.007	.027
Honors			.072	.045
R^2	.108**		.138**	
ΔR^2			.030**	
F	36.788**		24.150**	

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

Note: b = unstandardized regression coefficient. β = standardized regression coefficient.

Table D3

Estimated Effects of Honors Programs on Exposure to Academic Challenge and High Expectations

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1 <i>b</i>	Regression equation 1 β	Regression equation 2 <i>b</i>	Regression equation 2 β
Precollege critical thinking	.000	.002	-.001	-.019
Male	-.003	-.003	.002	.002
White	.000	.000	-.009	-.009
Average years of parents' education	-.004	-.020	-.005	-.023
Precollege academic motivation	.216**	.272**	.211**	.266**
High school involvement	.142**	.179**	.140**	.177**
Regional university			-.160**	-.171**
Research university			-.197**	-.221**
2007 cohort			.030	.029
2008 cohort			-.033	-.029
Courses taken in the liberal arts Honors			.018**	.093**
			.024	.020
R^2	.142**		.166**	
ΔR^2			.023**	
F	50.263**		30.005**	

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

Note: b = unstandardized regression coefficient. β = standardized regression coefficient.

Table D4

Estimated Effects of Honors Programs on Exposure to Diversity Experiences

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1		Regression equation 2	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.003	.029	-.002	-.019
Male	.069	.058	.062	.052
White	-.168**	-.129**	-.196**	-.151**
Average years of parents' education	.003	.012	-.001	-.003
Precollege academic motivation	.166**	.157**	.161**	.153**
High school involvement	.111**	.106**	.091*	.086*
Regional university			-.032	-.026
Research university			-.032	-.027
2007 cohort			-.046	-.034
2008 cohort			-.048	-.031
Courses taken in the liberal arts			.035**	.139**
Honors			.029	.019
R^2	.064**		.082**	
ΔR^2			.018**	
F	20.723**		13.401**	

* $p < .01$. ** $p < .001$.Note: b = unstandardized regression coefficient. β = standardized regression coefficient.

Table D5

Estimated Effects of Honors Programs on Exposure to Influential Interactions with Peers

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1		Regression equation 2	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	.005	.044	.002	.017
Male	.013	.010	.020	.015
White	.195**	.137**	.200**	.141**
Average years of parents' education	.007	.021	.005	.017
Precollege academic motivation	-.007	-.006	-.010	-.009
High school involvement	.215**	.187**	.211**	.184**
Regional university			-.170*	-.126*
Research university			-.178**	-.138**
2007 cohort			-.043	-.029
2008 cohort			-.152*	-.090*
Courses taken in the liberal arts			-.002	-.008
Honors			.060	.035
R^2	.062**		.076**	
ΔR^2			.013**	
<i>F</i>	20.119**		12.362**	

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

Note: *b* = unstandardized regression coefficient. β = standardized regression coefficient.

Table D6

Estimated Effects of Honors Programs on Exposure to Interaction with Faculty and Staff

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1		Regression equation 2	
	<i>b</i>	β	<i>b</i>	β
Precollege critical thinking	-.020**	-.170**	-.020**	-.174**
Male	.111**	.085**	.113**	.087**
White	-.007	-.005	-.023	-.016
Average years of parents' education	-.007	-.024	-.008	-.026
Precollege academic motivation	.230**	.200**	.222**	.193**
High school involvement	.230**	.201**	.228**	.199**
Regional university			-.120	-.089
Research university			-.135*	-.105*
2007 cohort			.113*	.076*
2008 cohort			.041	.024
Courses taken in the liberal arts Honors			.027**	.099**
			.029	.017
R^2	.133**		.149**	
ΔR^2			.016**	
<i>F</i>	46.331**		26.462**	

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

Note: *b* = unstandardized regression coefficient. β = standardized regression coefficient.

Table D7

Estimated Effects of Honors Programs on Exposure to Cooperative Learning

Variables	Student background and precollege characteristics		Institutional characteristics and other college experiences	
	Regression equation 1 <i>b</i>	Regression equation 1 β	Regression equation 2 <i>b</i>	Regression equation 2 β
Precollege critical thinking	.001	.005	.002	.018
Male	.157**	.109**	.162**	.112**
White	-.083	-.052	-.097	-.061
Average years of parents' education	-.017	-.050	-.018	-.052
Precollege academic motivation	.225**	.176**	.220**	.171**
High school involvement	.226**	.177**	.230**	.180**
Regional university			-.234**	-.155**
Research university			-.144*	-.101*
2007 cohort			.208**	.126**
2008 cohort			.013	.007
Courses taken in the liberal arts			.009	.029
Honors			.008	.004
R^2	.090**		.112**	
ΔR^2			.023**	
F	29.829**		19.076**	

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

Note: b = unstandardized regression coefficient. β = standardized regression coefficient.

Appendix E – Approval to Use Data

Center of **Inquiry**

WABASH COLLEGE

February 28, 2012

To the members of the University of Arkansas IRB:

We have granted Amanda Moore both access and permission to use data collected for the Wabash National Study. Prior to receiving this data from ACT, Inc., all identifying information about individuals is removed and replaced with a unique study ID. The data collection procedure for the Wabash Study was designed so that the Center of Inquiry would only have access to the study ID and not to any personal information about study participants. Therefore, Wabash Study data is secondary data for the Center of Inquiry and would also be secondary data for Amanda Moore.

Thank you,



Charles Blaich
Director, Center of Inquiry at Wabash College

Appendix F – IRB Approval



Office of Research Compliance
Institutional Review Board

May 16, 2012

MEMORANDUM

TO: Amanda Mocre
Jim Hammors

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 12-05-692

Protocol Title: *The Development of Critical Thinking Skills and Exposure to Good Practices in Undergraduate Education: Do Honors Programs Make a Difference?*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 05/16/2012 Expiration Date: 05/15/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 17,700 participants. If you wish to make any modifications in the approved protocol including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.