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2019

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Honeycutt, Jane B., "Community College Honors Benefits: A Propensity Score Analysis" (2019). *Chapters from NCHC Monographs Series*. 53.

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## Community College Honors Benefits: A Propensity Score Analysis

JANE B. HONEYCUTT

NORTHEAST STATE COMMUNITY COLLEGE

According to Morgan and Badenhausen (2015), honors education began in the United States in 1921 when Frank Ayedelotte became president of Swarthmore College. At that time, Ayedelotte initiated an interdisciplinary curriculum that stressed critical thinking and active learning. Almost a century later, the National Collegiate Honors Council (2013) defines honors education in terms true to Ayedelotte's original vision:

Honors education is characterized by in-class and extra-curricular activities that are measurably broader, deeper, or more complex than comparable learning experiences . . . [and] honors experiences include a distinctive learner-directed environment and philosophy. (para. 2)

Similar to four-year university honors programming, community colleges have likewise established honors programs to meet the academic needs of high-achieving students. Floyd and Holloway (2006) recall that community colleges introduced honors programs

in the 1950s and 1960s in the form of “accelerated courses offered to academically talented students who had expressed interest in specific areas of study” (p. 43). In the 1980s, community colleges broadened their enrollment focus from open enrollment and social equality to increased attention to academic excellence. Carnicom (2011) reasons that increasing quality and academic rigor, especially with regard to transfer courses, led to an expansion of community college honors programming. The National Collegiate Honors Council (2017) lists 190 community college members, representing 20 percent of its membership.

Armstrong and Jones (2015), Bullock and Fennell (2015), Burrage and Coleman (2015), and many other honors program proponents contend that honors programs have the potential to make an important difference in postsecondary education. Although intriguing scholarship regarding community college honors education is developing, continued research, particularly with regard to community college honors programming, is a priority in order to answer the basic question of whether or not community college honors program participants emerge from the experience with outcomes superior to those of comparable non-honors students.

Keller and Lacy (2013) point to the significance of current quantitative research on college-level honors programs that has employed propensity score techniques because this method bolsters causal arguments by decreasing selection bias. Austin (2011) defines the propensity score as

a balancing score: conditional on the propensity score, the distribution of measured baseline covariates is similar between treated and untreated subjects. Thus, in a set of subjects all of whom have the same propensity score, the distribution of observed baseline covariates will be the same between the treated and untreated subject. (p. 402)

In the present study, the treatment cases are defined as honors program participants (honors students), those students who completed 12 or more honors credit hours. The untreated cases, on the other hand, are defined as honors-eligible nonparticipants (non-honors

students). The propensity score analysis we employ is based on a more extensive number of confounding variables than has been characteristic of previous research. This study adjusts for 13 variables, including ACT combined and sub-scores, high school GPA, socioeconomic status, first-generation college student status, and other characteristics also linked to academic success and honors participation. Following propensity score analysis, we conducted independent samples *t*-tests, which determine if a significant difference exists between the averages of two unrelated groups, and Pearson chi-square analyses, which determine whether a statistically significant difference exists between expected and observed rates between groups to estimate the unique effect of honors program participation.

### **RATIONALE FOR COMMUNITY COLLEGE HONORS**

Bullock and Fennell (2015) note that community colleges have become a focus of national attention as leaders acknowledge the outstanding progress that community college students are making: “Thanks to the efforts of hard-working, dedicated faculty and forward-thinking college leaders, test scores, grades, and completion rates are making slow but steady progress while achievement gaps are diminishing” (p. 27). Nevertheless, Trucker (2014) cautions that two-year colleges remain relatively low in terms of conventional measures of retention and graduation:

longitudinal studies that track student persistence each semester serve as the primary measurement of an institution’s success or, as the findings are often received at many of the country’s community colleges, an institution’s failure. These studies take place at the institutional and state-wide levels as well as nationally through grant-based organizations such as Complete College America. . . . [T]hese studies consistently reveal low college-wide retention and graduation rates. (p. 69)

According to the Century Foundation (2013), community colleges, which serve approximately 11 million students in the United States, are expected to educate the most at-risk students while expending minimal financial resources in institutions that are becoming more and more unconnected and dissimilar to four-year universities; thus, American higher education reflects the growing inequality in the larger society. To encourage racial and economic inclusiveness, the Century Foundation (2013) recommends that two-year colleges invest in innovative honors programming because honors programs attract high-achieving, economically disadvantaged students. Gee and Blemings (2015) further contend that community college honors programs attract high-achieving students who would not normally consider community college. Treat and Barnard (2012) also claim that honors programs facilitate regional efforts to “attract diversity in terms of underrepresented groups to their colleges and fulfill the promise of the traditional community college mission by making the transition from the community college to a selective four-year institution less onerous” (p. 695). Treat and Barnard (2012) add that community colleges serve more than half of all postsecondary students in the United States, many of whom are low income, minority, and/or first-generation college students who face barriers to entry into selective colleges and universities. Mellow and Koh (2015) concur, stating that, “counter-intuitive though it may be—open-access community colleges need programs like honors to fulfill their mission of serving students who have been under-served and are under-represented in higher education” (p. 66). The honors standard of offering small, learner-focused courses provides students the opportunity to establish a network of peer and faculty support, which substantially improves the prospects for successful completion (Mellow and Koh 2015).

## **HONORS AND THE COMMUNITY COLLEGE MISSION**

Community college honors programs are not without skeptics. Controversy abounds regarding whether two-year honors

programs contradict the egalitarian mission of the community college. In fact, some scholars have charged that honors programs promote an elitist agenda. In response to Moltz (2010), who described a boom in community college honors programming, Shor (2010) of the CUNY College of Staten Island asks challenging questions: "Why not make the whole community college curriculum an Honors program? . . . Democracy means a level playing field and equal protection for all, not tracking and privileging." After examining the pros and cons of community college honors programs, Floyd and Holloway (2006) concede the possibility that such programs potentially segregate high-achieving students from the regular student population, thereby creating an atmosphere of elitism; however, Floyd and Holloway (2006) ultimately conclude that offering honors classes actually allows community colleges to focus on social equality and level the playing field. Pruitt (2013) explains that honors contributes to social equality because institutions offering honors meet the educational needs of students at every academic level, from the underprepared to the highly able and motivated student.

Moreover, the presence of honors programs and honors students on campus can have other beneficial effects. Clauss (2011) points out that although honors students typically complete the majority of their general education requirements in honors, they take the majority of their courses outside of honors: "honors students typically take at least 75 percent of their coursework outside of honors. The influence of honors education beyond the perimeters of a particular program is thus substantial as these bright students interact with their peers and teachers outside of honors" (p. 96). Heckler and Kanelos (2015) agree, stating that honors education enhances the experience of students not participating in honors because the traditional students benefit by observing and frequently embracing the honors students' exceptional critical thinking and research skills. Honors students bring their appetite for engagement into non-honors classes across the curriculum, potentially revolutionizing classroom interactions by transforming class discussions into moments of uncertainty or surprise. Honors

students can conceivably inspire classmates to search for and find their own answers (Clauss 2011). From this perspective, the community college honors program is actually serving all students, from those in learning support programs to those capable of the most exacting challenges. In fact, both faculty and staff recognize honors students as an important resource to leverage in efforts to facilitate community college student success. At Northeast State, honors students serve non-honors students as ambassadors, tutors, and peer mentors. Each semester, the College's TRiO program, which is a Federal outreach program serving first-generation and low income students, and the College's Center for Students with Disabilities recruit honors students to serve as tutors for their students. Since 2015, Northeast State Honors Program students have also served as peer mentors to incoming Tennessee Promise students, who receive free tuition through Tennessee's last dollar scholarship program. In this role, honors student mentors ease Tennessee Promise students' transition from high school to college and promote student engagement in and outside the classroom. Clearly, honors programs can significantly contribute to the achievement of the community college mission and enhance the reputation of the institution.

## **DATA ANALYSIS**

The purpose of this observational study is to compare the academic achievement of community college students participating in honors programming (honors) to students who were academically eligible but did not participate in honors programming (non-honors). Specifically, we test the following hypotheses: (1) there is a significant difference in final course grades for a required first-year writing course between non-honors and honors students; (2) there is a significant difference in grade point average two semesters after honors eligibility attainment between non-honors and honors students; (3) there is a significant difference in grade point average upon graduation between non-honors and honors students; (4) there is a significant difference in retention from fall of eligibility to fall of the second year (second-year retention) between non-honors

and honors students; (5) there is a significant difference in community college graduation rate between non-honors and honors students; and (6) there is a significant difference in number of semesters to graduation between non-honors and honors students.

We asked for and received Internal Review Board approval to access and analyze archival data collected from Northeast State Community College, a medium-sized community college in Tennessee. In sum, we included five honors-eligible cohorts from academic years 2008 to 2013 in the design. For the five cohorts, we collected the following data: (1) first-year cumulative GPA at the end of the second semester after honors eligibility (a minimum of 24 credit hours); (2) cumulative GPA at the time of graduation; (3) retention from the fall of eligibility to the following fall (second-year retention); (4) graduation data, including number of semesters to completion; and (5) final course grade in English Composition II, a required first-year writing intensive course. The Office of Academic Technology provided final course grades from Desire to Learn (D2L), the learning management system used by the institution. For those students whose instructors did not utilize D2L, the Humanities Division staff provided grades collected from course records they routinely maintain.

To be eligible for honors, new students must have earned a composite ACT score of 25 or higher or an SAT of 1140 or higher. Returning students became eligible if they achieved a 3.25 GPA or higher regardless of ACT or SAT scores. Of those who were eligible for honors, 95 participated in the honors program while 357 did not. We present summary statistics describing the honors and non-honors comparison groups in Table 1. With a few exceptions, honors and non-honors groups were not substantively different. Among honors participants, 58 percent ( $n = 55$ ) were female and 42 percent (40) were males; of the non-honors students, 62 percent (223) were female, and 38 percent (134) were male. These results are somewhat different from those reported by Keller and Lacy (2013), who found that “women were more than twice as likely as men to participate in honors” (p. 78). Although the majority of honors-eligible students in the present study were female, a higher



percentage of females did not participate compared to the population of eligible males who did not participate. Eighty-seven percent of the honors students were white, whereas 95 percent of the non-honors students were white; there were not substantial numbers of other races represented within the data set to disaggregate specific racial categories. Thus, we combine nonwhite groupings for a dichotomous measure of white compared to nonwhite race-ethnicity. Eighty-one percent of the honors students in the data set were traditional students, which we define as 24 years of age or younger. Nineteen percent of honors students were non-traditional students,

**TABLE 1. DEMOGRAPHICS OF POPULATION**

Measure	Honors		Non-Honors		Total	
	N	%	N	%	N	%
Gender						
<i>Female</i>	55	58	223	62	278	62
<i>Male</i>	40	42	134	38	174	38
Race-Ethnicity						
<i>Non-White</i>	12	13	18	5	30	7
<i>White</i>	83	87	339	95	422	93
Age at Eligibility						
<i>Traditional</i>	77	81	273	76	350	77
<i>Non-Traditional</i>	18	19	84	24	102	23
Dual Enrolled	29	31	50	14	79	17
High School Type						
<i>Public</i>	93	98	355	99	448	99
<i>Private</i>	0	0	0	0	0	0
<i>Homeschool</i>	2	2	2	1	4	1
Low Income <sup>a</sup>	45	59	178	56	223	57
First Generation <sup>a</sup>	26	54	143	69	169	66
Total	95	100	357	100	452	100

<sup>a</sup>The measures of income had missing data for 19 honors students (20%) and 41 non-honors students (11%). The measure of first-generation status had missing data for 47 honors students (50%) and 150 non-honors students (42%).

defined as students 25 years of age or older. On the other hand, 76 percent of non-honors students were traditional, while 24 percent were non-traditional. The vast majority (98%) of honors students had attended public high schools; similarly, 99 percent of non-honors students had attended public schools. Although none of the students attended private high schools, 2 percent of honors students were homeschooled, and 1 percent of non-honors students were homeschooled. Fifty-nine percent of the honors students met the criterion of low income status based on whether they received the maximum Pell award; likewise, 56 percent of non-honors students met the criterion of low income status. Interestingly, in the present study, a higher percentage of honors students than non-honors students were low income. Fifty-four percent of honors students were first-generation college students while 69 percent of non-honors students were first-generation attendees. That 44 percent of the students in the data set left parental education information missing and did not indicate parental education levels should be noted. Nonetheless, the majority of the students who did answer were low income and first-generation college students, characteristics associated with students at risk of dropping out.

Only 14 percent of non-honors students had participated in dual enrollment while 31 percent of honors students had participated in dual enrollment. Although both populations were likely to succeed in community college honors courses, the dual enrollment experience may have facilitated the development of self-efficacy in those students who decided to accept the honors challenge. Additionally, dual enrollment students may have developed expectations of self that compelled them to take the honors challenge. Lile, Ottusch, Jones, and Richards (2017) found that dual enrollment students' "*sources of role expectations . . . included self-reflection and peer, family, teacher, and structural expectations*" (p. 95). A large percentage of honors participants were first-generation college students (54%); however, a noticeably larger number of non-honors students (69%) were first generation. Similarly, the vast majority of both honors and non-honors students were white; however, while only 5 percent of non-honors students were non-white, 13 percent of honors students were nonwhite.

## Honors Assessment Research Trends: Propensity Score Analysis

Austin (2011) notes that, in observational studies, an individual's decision to engage in a "treatment," such as an honors program, is shaped by that individual's attributes. Therefore, "baseline characteristics of treated subjects often differ systematically from those of untreated subjects" (p. 400). To address confounding variables, Austin recommends adjusting for fundamental variations when assessing the effect of a treatment on outcomes. Traditionally, researchers have utilized regression adjustment to explain differences in baseline attributes between treated and untreated subjects, but researchers are increasingly interested in techniques grounded in the propensity score to diminish or remove, as Austin (2011) explains, "the effects of confounding when using observational data" (p. 400). Furtwengler (2015), however, warns of important limitations associated with establishing propensity scores regarding honors program participation and the associated outcomes; he recommends the following: (1) including students' academic goals and declared majors as baseline characteristics, and (2) exploring the influence of honors and non-honors participation on individual course success, graduation, retention, and time to graduation. Therefore, we utilized propensity score matching (PSM) to generate two equally matched sample groups that served as the foundation of the analyses. PSM utilizes logistic regression to generate a propensity score for individual participants, which indicates the probability that each individual will participate in the treatment under examination: honors program participation in this case. In essence, the propensity score accounts for sample selection bias that contributes to differences in the probability of being in one group as opposed to the other (Grubb, Scott, and Good 2017). We utilized PSM as a method to better estimate the effect of honors programming, the treatment effect, on the student outcome criteria variables of grade in a first-year required English composition course; cumulative GPA two semesters after honors eligibility attainment; cumulative GPA upon graduation; second-year retention; graduation

rate; and number of semesters to completion between the groups (non-honors = 0, honors = 1). The propensity score was defined as the probability of honors participation based on the covariates listed in Table 1 because these characteristics impact academic success. Additionally, we included the baseline characteristics of ACT scores and high school GPA because this information provides “a measure of students’ motivation and perseverance” (Keller and Lacy 2013:76).

We used archival data collected from the following years: 2008, 2009, 2010, 2011, 2012, and 2013. For the five cohorts, the director of the college’s office of Research and External Reporting collected all covariate and outcome data, resulting in an initial data set that included 4,931 individuals. We then screened the data set to remove students with incomplete covariate information such as no high school GPA, no or incomplete ACT score, incomplete Compass test score information, or no English Composition II grade. After we eliminated all of the incomplete or missing records from the data set, a total of 452 unique student records remained with 95 (21%) meeting the study’s definition of honors participants (honors) and 357 (79%) meeting the study’s definition of honors-eligible non-participants (non-honors).

## **Matching on the Propensity Score**

We then imported the data into *R* statistical software and matched students using the “Match It” package version 2.4–21 (Ho, Imai, King, and Stuart 2013). The Match It package contains several methods for matching and provides other packages to assist with analytical choices. Each individual received a propensity score in the data reports and a weight so that the covariates were balanced as evenly as possible. The propensity score signified the probability that an honors eligible student will enroll in honors based on the above 13 observable covariates, which represented the predictors. After matching, 95 non-honors students were matched with the 95 honors students on the propensity score, leaving 190 students in the population for outcomes assessment. We then generated

a summary of the balance for the unmatched and matched data, which appears in the Appendix.

## Effect of Honors on Learning Outcomes

In the next phase of the analysis, we determined the effects of honors participation on the above selected student outcome variables. Furtwengler (2015) argued that researchers should ascertain the impact of the honors education experience so that “if a positive or negative effect [is] associated with participation . . . high-achieving college-going students are aware of the associations and their options” (p. 275). We selected English Composition II as an outcome appropriate for assessment because the course is a general education core course that requires literary criticism, research, and analysis. Additionally, like Furtwengler (2015), we studied the scale of the impact of taking part in honors as measured by overall GPA because GPA has been correlated with “personality and motivation, achievement striving, individual learning, academic performance, [and] team learning . . .” (p. 279). We also sought to confirm Keller and Lacy’s (2013) conclusion that honors program participation is correlated with significantly higher second-year retention as well as a larger percentage of students who graduate in a timely manner. Because the study examines students who first enrolled in one of the fall semesters from 2008 to 2013, all the students included in the study had at least three years to complete a two-year credential. The graduation rate signifies Northeast State Community College graduation.

## RESULTS

Concerning the hypothesis that a significant difference in final course grade for a required first-year writing course between non-honors and honors program participants exists, an independent samples *t*-test ( $t = 2.15$ ,  $df = 186$ ,  $p \leq .05$ ) indicated that honors program participants ( $M = 91.18$ ,  $SD = 6.41$ ) were likely to earn significantly higher final course grades in English Composition II than their similar matched non-honors counterparts ( $M = 88.77$ ,

$SD = 8.81$ ). Honors students were more likely to earn a final numerical course grade corresponding to the letter grade of A in English Composition II. Comparable non-honors students also performed well but were more likely to earn a final numerical course grade corresponding to the letter grade of B in the same course. The 95 percent confidence interval for difference in means was .19 to 4.63; however, the Cohen's effect size value ( $d = .31$ ) suggests a weak to moderate practical significance of the difference. This finding confirms Cosgrove's (2004) conclusion that honors program graduates, typically those students who are encouraged to ask intelligent and insightful questions, perform at the highest academic levels even when compared to students with equivalent ability. Table 2 illustrates these findings.

Table 3 presents the results of an independent-samples  $t$ -test to evaluate the hypothesis that a significant difference exists between honors and non-honors students in cumulative GPA two semesters after honors eligibility. The test was significant at the .001 level ( $t = 4.42$ ,  $df = 188$ ,  $p \leq .001$ ). Honors participants achieved a significantly higher cumulative GPA the second semester after honors eligibility ( $M = 3.71$ ,  $SD = .35$ ) than their comparable non-participant peers ( $M = 3.45$ ,  $SD = .40$ ). The 95 percent confidence interval for the difference in means was .13 to .35. Further, the Cohen's effect size value ( $d = .69$ ) suggests a moderate to strong practical significance. These results are consistent with Shushok's (2006) findings regarding university-level honors students who earned a higher GPA

**TABLE 2. COMPOSITION II FINAL GRADES**

Program	N	Mean	SD	CI
Honors <sup>a</sup>	93	91.18	6.41	[.19, 4.63]
Non-honors	95	88.77	8.81	

<sup>a</sup>Two honors students withdrew from Composition II.

**TABLE 3. CUMULATIVE GPA TWO SEMESTERS AFTER ELIGIBILITY**

Program	N	Mean	SD	CI
Honors	95	3.71	.35	[.13, .35]
Non-honors	95	3.45	.40	

than their non-honors counterparts by the end of the first year and suggest that community college honors participation has a positive effect on academic achievement. These outcomes indicate a positive effect of honors education that high-achieving community college students should be encouraged to consider when weighing the options available to maximize their educational experience. Providing this information to students, who typically assume that honors participation will have a negative impact on their GPA, is especially important.

Similarly, regarding the hypothesis that a significant difference exists between honors students and non-honors students in cumulative GPA upon graduation, an independent samples *t*-test did reveal, in fact, a significant difference ( $t = 3.76$ ,  $df = 142$ ,  $p \leq .001$ ). Results from this analysis are presented in Table 4. The average cumulative GPA among honors students ( $M = 3.66$ ,  $SD = .32$ ) exceeds the minimum GPA necessary to achieve the institutional honor of *cum laude* (GPA 3.5-3.7), whereas the average cumulative GPA among non-honors students does not meet the minimum required for institutional honors ( $M = 3.44$ ,  $SD = .38$ ), which suggests that the honors experience has a positive impact on individual success and academic accomplishment. The 95 percent confidence interval for difference in means was .11 to .34, and the Cohen's effect size value ( $d = .63$ ) suggests a moderate to strong practical significance.

Concerning the hypothesis that a significant difference exists in second-year retention between non-honors and honors program participants, we utilized the Pearson chi-square test. Honors students were 11 percent more likely to persist one year after honors eligibility; the proportion of honors students who persisted to the

**TABLE 4. CUMULATIVE GPA UPON GRADUATION**

Program	N	Mean	SD	CI
Honors	82	3.66	.32	[.11, .34]
Non-honors	62	3.44	.38	

*Note:* Thirteen honors students did not graduate from Northeast State. Thirty-three non-honors students did not graduate from Northeast State.

fall of their second year after attaining eligibility was .89. The proportion of non-honors students who persisted to the fall of their second year was .80; however, honors program participation and second-year retention were found not to be significantly related (Pearson  $X^2 = 3.30$ ,  $df = 1$ ,  $N = 190$ ,  $p = .07$ , Cramer's  $V = .25$ ).

Regarding the hypothesis that a significant difference exists in community college graduation rates between non-honors students and honors students, honors participation and graduation were found to be significantly related (Pearson  $X^2 = 11.47$ ,  $df = 1$ ,  $N = 190$ ,  $p \leq .001$ , Cramer's  $V = .13$ ). As illustrated in Figure 1, the proportion of honors students who graduated was .86 while the proportion of non-honors students who graduated was .65, suggesting that honors participation contributes significantly to community college degree completion. These outcomes indicate that honors students are 32 percent more likely to graduate than their non-honors peers.

**FIGURE 1. THREE-YEAR GRADUATION RATE FOR HONORS AND NON-HONORS PARTICIPANTS**

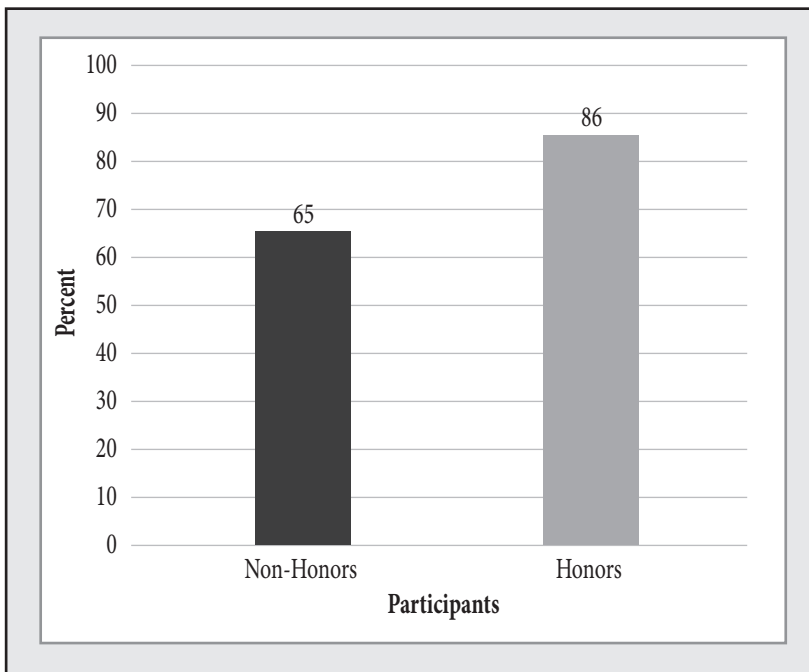




Table 5 indicates the results of an independent-samples *t*-test conducted to evaluate the hypothesis that a significant difference exists in number of semesters to completion between honors students and non-honors students. Although on first glance honors students ( $M = 6.35, SD = 1.82$ ) appear to complete somewhat faster than non-honors students ( $M = 6.98, SD = 2.4$ ), there was no significant difference in the number of semesters to completion ( $t = -1.73, df = 142, p = .08$ ). The 95 percent confidence interval for difference in means was  $-1.35$  to  $.09$ . The Cohen's effect size value ( $d = .30$ ) suggests a weak to moderate practical significance. In both cases, honors and non-honors students complete community college within the expected time frame at about the same pace.

## DISCUSSION

The major findings of this study are that honors program participants (1) earned significantly higher final course grades in Composition II; (2) earned significantly higher cumulative GPAs the second semester after starting in the honors program; (3) earned significantly higher cumulative GPAs upon degree completion; and (4) were significantly more likely to graduate. These findings substantiate prior research and support increased investment in community college honors education as a high-impact educational practice particularly relevant to at-risk high-achieving students.

Students often hesitate to take the honors challenge, perhaps because they do not possess accurate information about the benefits of honors. In an effort to increase community college honors participation, particularly among low income and first-generation students, honors directors might develop enhanced marketing strategies. Because these individuals are at-risk, they should be especially encouraged to pursue honors education. In particular,

**TABLE 5. NUMBER OF SEMESTERS TO GRADUATION**

Program	N	Mean	SD	CI
Honors	82	6.35	1.82	[-1.35, .09]
Non-honors	62	6.98	2.40	

high-achieving at-risk students should be carefully informed of the benefits: higher course grades, higher GPAs, and higher graduation rates, even when controlling for baseline differences between honors and eligible non-honors students. When honors program directors request a list of eligible students, that list could include more comprehensive data on eligible students, such as socioeconomic status, first-generation status, and veteran and disability status. With this additional information, honors directors can develop a more nuanced outreach. In general, invitations to join honors should include quantitative data illustrating the potentially positive impact on individual learning, motivation, and determination. Honors education often incorporates a number of what have come to be known as high-impact practices, such as writing intensive courses, undergraduate research, and vibrant learning communities. These results may well challenge existing myths and illustrate that honors participation has a positive impact on important measures of education outcomes.

## **RECOMMENDATIONS FOR FURTHER RESEARCH**

This study examined the relationship between honors participation and outcomes at a single community college using rigorous statistical methods to control for selection bias that influences who ends up in honors programs. To address this study's limitation to one community college in Tennessee, increasing the scale would be worthwhile, for instance, by conducting a similar study of all community colleges offering honors programs in a given state. A comparative analysis of community college honors programs state-wide, including the structure of honors degree programs, staffing, extracurricular requirements, and measurable outcomes, would contribute to the further development and refinement of honors best practices.

This study evaluated quantitative outcomes. In addition to evaluating quantitative outcomes, a survey of honors-eligible non-participants and honors participants regarding faculty interaction, extracurricular activity participation, and leadership development

activities would enrich future studies. Therefore, we recommend that future studies analyze information about the connection between community college engagement and academic success, particularly with regard to transfer scholarships.

Honors programs would benefit from future research studies designed to discover why the majority of students eligible for community college honors choose not to participate, particularly given the potential benefit to at-risk students. Specifically, a comparative analysis of honors participants and honors-eligible non-participants across income and parental education levels would improve our understanding of why some students choose to take the honors challenge and why others decline. This analysis would also provide us with information we need to improve outreach to at-risk honors-eligible students.

All students at Northeast State Community College are required to take an exit exam before graduation. Access to the exit exam results, particularly critical thinking scores, for all honors students and honors-eligible non-participants would provide a crucial outcome variable to include as a measure of critical thinking ability, which is a major objective of honors education. Honors programs would benefit from a close examination of those scores as part of improving the quality of annual honors program assessment and reporting.

Community colleges offering honors programs would clearly benefit from studying the impact of their programming, making improvements where indicated, and reporting the results to students and administrators alike in order to increase both investment and participation in honors programs.

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**APPENDIX**  
**Covariate Imbalance Check for**  
**1:1 Optimal Match with Replacement**

Variable	Before:		After:		Chi-square or <i>t</i> -test Association Between X and T		Percent Bias		Reduced %
	Proportion or M		Proportion or M		Before	After	Before	After	
	HNR	Non-HNR	HNR	Non-HNR					
ACT Composite	23.65	20.89	23.65	23.15	7.24 ( $p \leq .001$ )	1.47 ( $p = .14$ )	2.76	.51	.82
ACT English	24.44	21.19	24.44	23.72	6.26 ( $p \leq .001$ )	1.23 ( $p = .22$ )	3.25	.73	.78
ACT Math	20.73	19.03	20.73	20.29	3.45 ( $p = .001$ )	.54 ( $p = .59$ )	1.69	.43	.75
ACT Reading	26.25	22.58	26.25	25.85	6.88 ( $p \leq .001$ )	1.40 ( $p = .16$ )	3.67	.40	.89
High School GPA	3.39	3.16	3.39	3.30	3.45 ( $p = .001$ )	1.56 ( $p = .12$ )	.23	.09	.61
Gender					.43 ( $p = .480$ )	.09 ( $p = .77$ )			
Female	.58	.63	.58	.61			-.05	-.03	-.02
Male	.42	.37	.42	.39			.04	.03	.40
Race					22.22 ( $p = .001$ )	5.45 ( $p = .24$ )			
Non-White	.13	.06	.13	.06			.07	.07	.00
White	.87	.94	.87	.94			-.08	-.06	.25

Low Income					4.95 ( $p = .084$ )	2.77 ( $p = .25$ )		
True	.47	.50	.47	.52			-.03	-.04
False	.33	.39	.33	.30			-.06	.03
No Response	.20	.11	.20	.18			.09	.02
First-Generation College					10.37 ( $p = .040$ )	4.83 ( $p = .31$ )		
True	.30	.45	.30	.38			-.14	-.07
False	.50	.44	.50	.44			.06	.06
No Response	.20	.11	.20	.18			.09	.02
Dual Enrolled					14.30 ( $p \leq .001$ )	.14 ( $p = .14$ )		
True	.30	.14	.30	.26			.17	.05
False	.70	.86	.70	.74			-.16	-.04
Age	21.23	22.50	21.23	22.09	-1.63 ( $p = .100$ )	-1.07 ( $p = .28$ )	-1.26	-.86
GPA First-Term Eligibility	3.75	3.36	3.75	3.77	8.14 ( $p \leq .001$ )	1.38 ( $p = .17$ )	.40	-.02
Major <sup>a</sup>					28.08 ( $p = .040$ )	7.02 ( $p = .54$ )		

<sup>a</sup>Major was categorized into 27 different majors for this test. For the sake of brevity, only the chi-square test results are presented here, but detailed results are available from the author upon request.

