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College Readiness and the Postsecondary Outcomes of Illinois High School Students

Eric J. Lichtenberger, Ph.D. and Cecile Dietrich, Ph.D.

Executive Summary

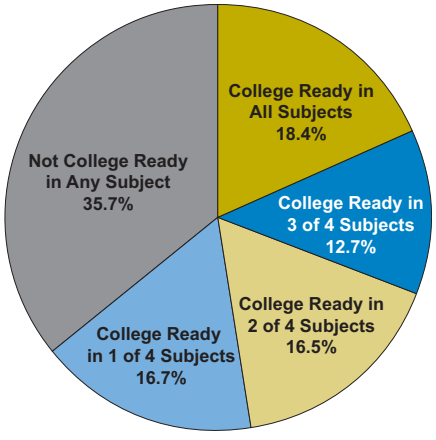
This study presents a longitudinal description of the association between college readiness—as measured by the college readiness benchmarks set by ACT—and a series of postsecondary outcomes of the Illinois High School Class of 2003. In addition to describing how college readiness is distributed among the cohort, this study establishes the college readiness of various groups based on select demographic characteristics such as gender, race, and family income. Finally, the relationships between college readiness, student characteristics, and postsecondary enrollment, persistence, and bachelor's degree completion measures are analyzed.

Defining college readiness and developing appropriate metrics have direct policy implications, particularly for states such as Illinois that are attempting to qualify for a No Child Left Behind (NCLB) waiver. The current study could inform the work of policymakers as they adapt measures of college readiness. According to the U.S. Department of Education, states must develop their own definition of and metrics for college and career readiness in order to apply for a NCLB waiver (U.S. Department of Education, 2011).

How is college readiness distributed among the Illinois High School Class of 2003?

Sixteen separate college readiness categories were developed using scores from the four subjects that comprise the ACT—Math, English, Reading, and Science—and determining whether students met ACT's college readiness benchmark in each. These categories ranged from meeting the college readiness benchmarks in all four subjects, to missing all of the benchmarks. Slightly less than one out of every five (18.4%) members of the Class of 2003 met all four of the college readiness benchmarks established by ACT. Nearly twice that proportion (35.7%) missed all of the benchmarks. On the positive side, an additional 12.7% met three of the benchmarks (usually meeting all except Science), and an additional 16.5% met two of the benchmarks (usually meeting English and Reading or English and Math); therefore slightly less than one-half of the class was adequately prepared to have a high probability of postsecondary success in at least two of the subject areas covered by the ACT (Figure I).

Figure I.
Illinois High School Class of 2003 and ACT's College Readiness Benchmarks: Overall Patterns



(N=115,677)

As previously stated, there were 16 categories based on the ACT college readiness benchmarks. As shown in Figure II, nearly all of the students (94%) fell into one of the following seven college readiness categories: missed all; met all; met all except Science; met Math and English; met English and Reading; met English only; met Reading only. The other nine categories only accounted for a combined 6% of the Illinois High School Class of 2003.

Figure II.
Illinois High School Class of 2003 and ACT's College Readiness Benchmarks: Specific Patterns

	ACT College Readiness					
	Math	English	Reading	Science	n	% of Total Enrolled
	≥22	≥18	≥21	≥24	115,677	100.0%
All Subjects	✓	✓	✓	✓	21,246	18.4%
3 of 4 Subjects	✓	✓	✓	⦸	10,743	9.3%
	✓	✓	⦸	✓	1,618	1.4%
	✓	⦸	✓	✓	146	0.1%
	⦸	✓	✓	✓	2,235	1.9%
2 of 4 Subjects	✓	✓	⦸	⦸	4,798	4.1%
	✓	⦸	✓	⦸	539	0.5%
	✓	⦸	⦸	✓	143	0.1%
	⦸	✓	✓	⦸	13,123	11.3%
	⦸	✓	⦸	✓	479	0.4%
	⦸	⦸	✓	✓	121	0.1%
1 of 4 Subjects	✓	⦸	⦸	⦸	1,706	1.5%
	⦸	✓	⦸	⦸	13,709	11.9%
	⦸	⦸	✓	⦸	3,633	3.1%
	⦸	⦸	⦸	✓	182	0.2%
None	⦸	⦸	⦸	⦸	41,256	35.7%

✓ = met the benchmark ⦸ = missed the benchmark

Interestingly, only one of the seven categories highlighted above included students meeting the Science benchmark. These were students who met all of the benchmarks. Among the four subjects covered by the ACT, Science has the highest benchmark at 24 and perhaps this is why college readiness in Science was a stumbling block for many students in the Class of 2003. Relatedly, the corresponding ACT score used to set the benchmark was negatively related to the proportion of students who were college ready in the specific subject area. For example, nearly 60% of the Class of 2003 was college ready in English, the subject with the lowest benchmark, while less than 23% was college ready in Science, the subject with the highest benchmark.

Major findings

College Enrollment

- Missing a single college readiness benchmark in either English or Math had a much more detrimental effect on the initial rate of enrollment at four-year institutions than missing a benchmark in Science or Reading.
- High income students had a relative advantage in terms of enrollment at four-year institutions when compared with similarly ready students in all other income categories.
- As income decreased, the rate of delayed enrollment typically increased.
- In terms of initial enrollment at four-year institutions, female students maintained a relative advantage over their male counterparts throughout all of the college readiness categories.
- Students from Chicago and the Northeast region had the highest rates of enrollment at four-year institutions, regardless of college readiness level.

Selectivity

- The greater the number of college readiness benchmarks met, the higher the rate of enrollment at more competitive institutions and the lower the rate of enrollment at less competitive institutions.
- Minority students meeting all four of the benchmarks had significantly higher rates of enrollment at the most competitive institutions relative to their white peers.
- Students from wealthier families who meet all of the benchmarks had the highest rate of enrollment at the most competitive four-year institutions.
- Across parallel readiness groups, students from the wealthiest families had the lowest rate of enrollment at non competitive institutions, while students in the mid-low and low income categories had the highest rates.
- Students from Chicago meeting all or most of the benchmarks had the highest rates of enrollment at highly competitive institutions.

Sector

- Students meeting all of the college readiness benchmarks had the highest out-of-state enrollment rates.
- The fewer the number of benchmarks met, the higher the rate of enrollment at for-profit institutions.

Persistence

- The greater the number of benchmarks met, the higher the rate of persisting into one's third year in college.
- Among the groups meeting three out of four benchmarks, missing the benchmark in Math appeared to have the most detrimental effect on persistence.
- In terms of the groups that only met one benchmark, meeting the benchmark in English or Math appeared to be related to higher rates of persistence.

Bachelor's Completion

- Among the students meeting three or fewer benchmarks, those ready in both Math and English had the highest rates of bachelor's completion.
- White and Asian students had higher rates of bachelor's completion relative to African-American and Hispanic students from parallel college readiness categories.
- Female students who met three benchmarks had a higher rate of bachelor's completion than male students who met all of the benchmarks.
- Among the students meeting all of the college readiness benchmarks, students from the Northeast region had the highest rate of bachelor's degree completion, followed by students from the East Central region.
- In general, students meeting fewer benchmarks who enrolled at institutions that were more competitive had higher rates of bachelor's completion than students meeting a greater number of benchmarks who enrolled at less competitive institutions.

Discussion

The unequal distribution of college readiness across demographic factors

In terms of college readiness and race, the gap between non-Asian minority (Hispanic and African-American) students and their Asian and white counterparts is quite alarming. Non-Asian minorities had the lowest proportions meeting all or most of the college readiness benchmarks and the highest proportions failing to meet any of the benchmarks. Around 60% of non-Asian minority students failed to meet any of the college readiness benchmarks, while only one-quarter of Asian and white students met that distinction. On the other end of the college readiness spectrum, only 3% of African-American students and 5% of Hispanic students were college ready in all subject areas; this was substantially lower than the proportions of Asian (29%) and white students (24%) college ready in all subjects.

There were also regional differences regarding college readiness, with the greatest disparity existing between Chicago and its suburbs (Northeast region). The proportion of students from the Northeast region meeting all of the college readiness benchmarks was nearly five times greater than that of the students from Chicago (24% to 5%). At the same time, the proportion of students from Chicago failing to meet any of the benchmarks was more than double that of the students from the Northeast region (62% to 29%). Of the remaining regions (Northwest, East Central, West Central, Southeast, Southwest), students from the East Central region tended to have slightly higher proportions meeting all or most of the college readiness benchmarks and a lower proportion failing to meet any of the benchmarks, while the opposite was true for students from the Southeast region.

The driving factor behind the racial and regional college readiness gaps may be associated with the unequal distribution of wealth (as proxied by family income) both geographically and across racial groups. For instance, roughly half of the Hispanic and African-American students fell into the low family income category (less than $30K), while only 30% of Asian students and roughly 18% of white students were within that same income group.

Also, while nearly a third of the students from the Northeast region were in the high income category, only 4.9% of students from Chicago and 10.7% of students from the Southeast region met that same distinction.

College readiness benchmarks and postsecondary success.

Meeting three or more—and in some cases two (Math and English)—of the benchmarks was related to increased rates of postsecondary success. This was particularly true for higher income students and those enrolling at more competitive institutions. However, differences in the importance of meeting the ACT benchmarks varied across demographic groups and the postsecondary outcome being measured. For example, in most cases, higher proportions of African-American and Hispanic students enrolled overall and at the most selective four-year colleges, relative to white students from parallel college readiness categories.

However, disparities were evident with respect to bachelor's degree completion. These differences are, in part, due to differences in college readiness that favor Asian-Americans, white students, and those from wealthier families. Still, readiness is only part of the story. For example, although a higher proportion of male students met all of the benchmarks, they lagged behind female students in terms of bachelor's degree completion. Perhaps females were more likely to meet the benchmarks that are most important to degree completion; this requires further study. Also, in some cases white students who were less ready for college completed bachelor's degrees at higher rates than better prepared African-American students. This also requires further investigation, namely examining how non-academic factors—such as first-generation status—could help explain the difference in bachelor's completion rates.

These findings suggest that access to four-year colleges is no longer the major issue for underrepresented minority students who are college ready. However, the completion of bachelor's degrees in a timely manner remains problematic. It should be noted that for the African-American students meeting all or most of the benchmarks, enrolling at a more competitive institution appeared to narrow the racial gap in terms of bachelor's degree completion, particularly for those enrolling in a highly competitive institution.

Assessing the relative impact of ACT subject tests

This study provided evidence that a student's likelihood of meeting all of the ACT college readiness benchmarks appeared to be driven by their performance on the Science test. Given the relatively high score required to meet the benchmark in Science, those who met this benchmark had a high probability of meeting all of the other benchmarks. In fact, for the students meeting the Science benchmark, the median ACT scores on the other three tests were well above the benchmarks set for each of those tests.

This study also revealed differences associated with the relative impact of each test with respect to postsecondary outcomes, thus substantiating earlier findings from Bettinger, Evans, and Pope (2011) as well as Lichtenberger (2011). For example, the study demonstrated the relative importance of meeting the English and Math benchmarks on the rates of initial enrollment, persistence, and bachelor's completion. Specifically, missing one of these benchmarks had a much more detrimental effect on postsecondary outcomes relative to missing either the Science or Reading benchmark.

Scientific/scholarly significance

Despite this study's limitations, it provides evidence to show that for college enrollment and bachelor's degree attainment, college readiness matters. The findings justify both the support of and creation of interventions implemented at the high school level that increase college readiness, particularly interventions targeted towards groups that are less ready for college.

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About the authors

Eric J. Lichtenberger, Ph.D., is the Associate Director for Research of the Illinois Education Research Council and an Assistant Research Professor at Southern Illinois University Edwardsville.

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Introduction

Despite recent gains in college enrollment, a relatively small proportion of students who initially enroll in college thrive in a college environment. Knapp, Kelly-Reid, and Whittmore (2006) and Conley (2007) noted that only 35 percent of students who entered four-year institutions in 1998 earned a bachelor's degree four years later. Although alarming, the aforementioned aggregate rate of bachelor's completion does not account for differences based on college readiness. A more recent study focusing on the Illinois High School Class of 2003 showed a wide variation in the rate of bachelor's degree completion based on college readiness (Smalley, Lichtenberger, & Brown, 2010). For example, according to Smalley et al. (2010), over 80% of the students deemed most ready for college had earned a bachelor's degree within six years of initially enrolling, while only 38% of the least ready students had earned such a degree.

For this reason, studies exploring the link between college readiness and postsecondary outcomes are crucial, particularly longitudinal studies focusing on the rates of postsecondary outcome attainment for students with varying degrees of college readiness.

This study presents a longitudinal description of the association between college readiness—as measured by the college readiness benchmarks set by ACT—and a series of postsecondary outcomes of the Illinois High School Class of 2003. In addition to describing how college readiness is distributed among the cohort, this study establishes the college readiness of various groups based on select demographic characteristics such as gender, race, and family income. Finally, the relationships between college readiness, student characteristics and postsecondary enrollment, persistence, and bachelor's degree completion measures are analyzed.

Defining college readiness and developing appropriate metrics have direct policy implications, particularly for states such as Illinois that are attempting to qualify for a No Child Left Behind (NCLB) waiver. The current study could inform the work of policymakers as they adapt measures of college readiness. According to the U.S. Department of Education, states must develop their own definition of and metrics for college and career readiness in order to apply for a NCLB waiver (U.S. Department of Education, 2011).

Defining college readiness

College readiness has been defined and measured in various ways in the literature. Conley's (2008) definition is very similar to a broader definition established a few years earlier by ACT (2005). According to ACT (2005), college readiness is the "level of preparation students need in order to be ready to enroll and succeed without remediation in credit-bearing entry-level coursework at a two or four-year institution, trade school, or technical school" (p. 1). Conley (2008) refers to college readiness as the amount of high school preparation needed to succeed in a postsecondary bachelor's degree granting institution without further remediation in college. One standardized test used as an indicator of readiness is the ACT. The ACT is strongly and positively correlated to college GPA and graduation (Koenig, Frey, & Detterman, 2008; Stumpf & Stanley, 2002) and is also a significant predictor of passing the following credit-bearing college courses: English, Biology, Social Science, and College Algebra (ACT, 2010a). The Illinois Education Research Council (IERC) has previously used the ACT composite score combined with high school GPA to create a two-dimensional college readiness index. IERC college readiness levels range from not/least ready on the low end (less than a 20 on the ACT and less than a 2.5 GPA) to most ready on the high end (generally 23 or higher on the ACT combined with a GPA of greater than 3.0).

One limitation of using composite ACT scores as indicators of college readiness is that the composite score often masks the effects of individual subject areas on postsecondary outcomes. For example, Bettinger, Evans and Pope (2011) discovered that the Math and English subtests of the ACT are salient predictors of postsecondary performance

whereas the Reading and Science subtests are not strong predictors. A recent study by Lichtenberger (2011) on reverse transfer students echoed these findings. These results suggest that using composite ACT scores potentially obfuscates the effects of high or low scores in English or Math. One way to circumvent this problem, and obtain more and better information with respect to predicting college readiness, is to take a multidimensional approach and investigate the effects of the ACT subject matter tests separately and in various combinations. ACT (2010a) provides a precedent for this and defines college readiness in terms of their four distinct subject matter tests. Specifically, ACT (2010a) defines college readiness benchmarks as the minimum ACT test score on each subject test required for a high probability of success in college courses: "Students who meet a Benchmark on the ACT…have approximately a 50 percent chance of earning a B or better and approximately a 75 percent chance of earning a C or better in the corresponding college course or courses" (p. 1). The ACT benchmarks are currently set at 22 in Math, 18 in English, 21 in Reading, and 24 in Science.

College readiness among high school graduates

Recent studies have shown that a relatively small proportion of high school graduates are college ready. Using public high school data from the U.S. Department of Education, Greene and Forster (2003) found that 32% of all students leaving high school are ready for college. Similar estimates of college readiness among high school graduates can be found in recent research reports. For example, Moore, Slate, Edmonson, Combs, Bustamante, and Onwuegbuzie (2010) reported that about one third of all Texas high school students were found to be college ready by graduation. ACT (2011) reported an even smaller proportion of college readiness using their college readiness benchmarks. Specifically, only 25% of high school graduates taking the ACT met all four of the college readiness benchmarks in English, Reading, Mathematics, and Science (ACT, 2011). Using the IERC college readiness index (Table 1), Gong and Presley (2006) established that only one-fifth of Illinois high school graduates were most ready for college, an additional third (34%) were either more or somewhat ready, 11% were minimally ready, and slightly more than a third were not/least ready (34%).

Table 1.
IERC College Readiness Index (Class of 2002)

	High School GPS (self-reported)				
ACT	≤2.4	2.5 - 2.9	3.0 - 3.4	3.5 - 4.0	Missing
<20	19.7%	8.0%	6.5%	1.9%	14.6%
20-22	3.1%	3.5%	5.2%	2.9%	4.0%
23-25	1.1%	1.7%	4.2%	4.8%	2.7%
26+	0.4%	0.8%	2.7%	9.5%	2.8%

Most Ready | More Ready | Somewhat Ready | Minimally Ready | Not/Least Ready

These findings are crucial since students who are more college ready are also more likely to enroll in college (ACT, 2008a; Smalley et al., 2010; Wyatt Kobrin, Wiley, Camara, & Proestler, 2011). Wyatt et al. (2011) showed that students who met college readiness benchmarks set by the College Board enrolled in college at a higher rate than students who did not meet these benchmarks- 78% versus 46%. In a longitudinal study of Illinois high school graduates from 2002, Smalley et al. (2010) established that nearly 85% of the students identified as being most ready for college immediately enrolled at post-secondary institutions. This was more than twice the rate of enrollment than students identified as least/not ready for college (40%). According to ACT (2010b), students who are not ready for college, as measured by the ACT benchmarks, are less likely to enroll in college and more likely to take remedial coursework if they do.

Methods

Data

In 2001, Illinois began administering the ACT test to all juniors in the state's public schools as part of the Prairie State Achievement Examination (PSAE); therefore the 2003 cohort is the second high school class for which scores and background information were universally available for college and workforce bound students alike. Prior to 2001, such information was generally only available for students who elected to take the test because they were expecting to enroll at a four-year college. Therefore information for students who anticipated enrolling at a community college was missing—as community colleges typically do not ask for ACT scores—as was the information for students who opted to immediately enter the workforce after high school graduation. The data were made available to IERC researchers under shared data agreements with the Illinois Board of Higher Education and ACT.

The information specific to the students' demographic characteristics (gender, race, parental income) was gleaned from the Student Interest Profiler of the ACT. Information related to each student's respective high school, namely the region in which the given high school is located, was obtained from the Illinois High School Report Card. It should be noted that this study does not include private high school graduates from Illinois, nor does it include out-of-state students who migrated to Illinois higher education institutions.

The selectivity of the four-year institutions was developed using *Barron's Profile of American Colleges* (2003) since these data were available to the Class of 2003. The top two competitiveness categories were combined (most/highly competitive), as were the bottom two categories (less/ noncompetitive) to create four categories for the analyses. The middle two categories were very competitive and competitive. College sector was based on the National Student Clearinghouse (NSC) designation of an institution as public or private and, for Illinois institutions, the Illinois Board of Higher Education designation as private not-for-profit or private for-profit. It should be noted that for out-of-state private institutions, the profit/not-for-profit distinction could not be made.

College enrollment and degree completion information was obtained from the National Student Clearinghouse (NSC), a national collaborative, in which nearly 3,300 postsecondary institutions participate, covering 92% of all postsecondary enrollments (National Student Clearinghouse, 2010).

Analyses

Descriptive statistics were calculated using cross tabulations and custom tables in an analytics software package called SPSS. Inferential statistics were not used since they are based on samples of a population and are not appropriate in this study, which investigates an entire population (Evans & Rosenthal, 2010; Wehrly, 2010).

It should be noted that at times the information presented in the tables and figures may not add up to 100% due to rounding.

Research questions

1. How is college readiness distributed among the Illinois High School Class of 2003?
2. How are gender, race, parental income, and high school region related to college readiness?
3. How do the college readiness benchmark patterns relate to the following postsecondary outcomes: enrollment, enrollment at four-year institutions by sector and selectivity, persistence, and bachelor's completion?

Findings

How is college readiness distributed among the Illinois High School Class of 2003?

Sixteen separate college readiness categories were developed using scores from the four subjects that comprise the ACT—Math, English, Reading, and Science—and determining whether students met ACT's college readiness benchmark in each. As illustrated in Figure 1, these categories ranged from meeting the college readiness benchmarks in all four subjects, to missing all of the benchmarks. Nearly 36% of students from the Illinois High School Class of 2003 missed all of the college readiness benchmarks. This means that more than a third of the Illinois High School Class of 2003 scored less than 22 on Math, less than 18 on English, less than 21 on Reading, and less than 24 on Science. The proportion of students missing all of the benchmarks was nearly twice the proportion of students who met all of the benchmarks (35.7% to 18.4%, respectively). These happened to be the two largest categories of students and comprised more than half of the Class of 2003.

There were four categories in which students met the college readiness benchmarks in three out of the four subject areas; slightly more than one-eighth (12.7%) of the Illinois High School Class of 2003 met this distinction. The bulk of these students (around 75%) met the benchmarks in every subject with the exception of Science, perhaps due to the relatively high Science benchmark (24). On the contrary, very few of the students meeting the college readiness benchmarks in three out of the four subjects missed the benchmark in English, perhaps due to the English benchmark being set relatively low (18).

There were six categories in which students met the college readiness benchmarks in two out of four subject areas and 16.5% of the Illinois High School Class of 2003 met this distinction. Nearly all of the students meeting the benchmarks in two out of four subject areas either met the benchmarks in English and Reading or (to a lesser extent) English and Math. Students from those two categories made up more than 90% of the students meeting the college readiness benchmarks in two out of four subjects.

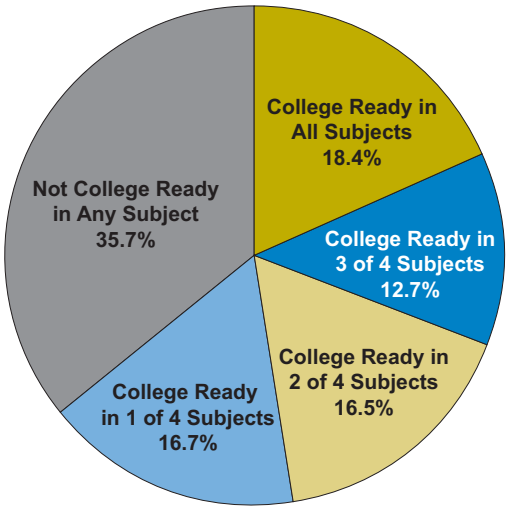
Finally, there were four categories in which students met the college readiness benchmark in one subject area only and 16.7% of the Illinois High School Class of 2003 met this distinction. Over 70% of the students who were college ready in only one subject met the benchmark in English and an additional 19% met the benchmark in Reading.

As previously stated, there were 16 categories based on the ACT college readiness benchmarks. Approximately 94% of the students fell into one of the following seven college readiness categories: missed all; met all; met all except Science; met Math and English; met English and Reading; met English only; met Reading only. The other nine categories only accounted for a combined 6% of the Illinois High School Class of 2003.

When the data are presented in a non-mutually exclusive manner—meeting a specific benchmark without considering the other ones—the corresponding ACT score used to set the benchmark was negatively related to the proportion of students who were college ready in the specific subject area (see the bottom part of Figure 1). For example, nearly 60% of the Class of 2003 was college ready in English, the subject with the lowest benchmark at 18, while less than one-quarter (22.6%) of the Class of 2003 was college ready in Science, which happened to have the highest ACT benchmark at 24.

The proportion of students missing all of the benchmarks was nearly twice the proportion of students who met all of the benchmarks (35.7% to 18.4%, respectively).

Figure 1.
Illinois High School Class of 2003 and ACT's College Readiness Benchmarks



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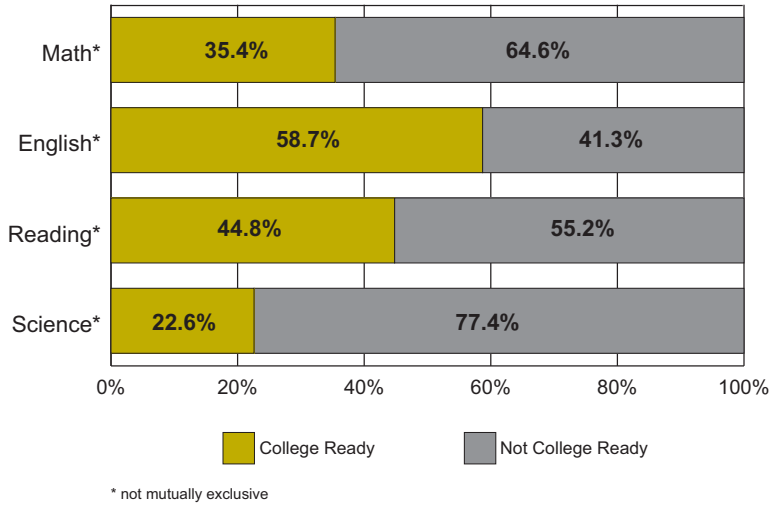
	⊘	✓	✓	⊘	13,123	11.3%
	⊘	✓	⊘	✓	479	0.4%
	⊘	⊘	✓	✓	121	0.1%
1 of 4 Subjects	✓	⊘	⊘	⊘	1,706	1.5%
	⊘	✓	⊘	⊘	13,709	11.9%
	⊘	⊘	✓	⊘	3,633	3.1%
	⊘	⊘	⊘	✓	182	0.2%
None	⊘	⊘	⊘	⊘	41,256	35.7%

✓ = met the benchmark ⊘ = missed the benchmark



* not mutually exclusive

The corresponding ACT score used to set the benchmark was negatively related to the proportion of students who were college ready in the specific subject area. For example, nearly 60% of the Class of 2003 was college ready in English, the subject with the lowest benchmark at 18.

How are the college readiness benchmarks associated with student and school characteristics?

Gender. As shown in Table 2, a higher proportion of male students were college ready in all subjects in comparison to their female counterparts (21% to 16%). This finding is consistent with recent research on ACT benchmarks (ACT, 2009). At the same time, a higher proportion of male students missed all of the benchmarks (38% to 34%). Higher proportions of female students met the benchmark in English only (14% to 10%), met the benchmarks in English and Reading (14% to 8%), and met the benchmarks in Math, English, and Reading (10% to 8%). The distribution of college readiness across gender was arguably associated with the findings of an earlier study (Smalley et al., 2010). Smalley et al. (2010) found a gender gap favoring female members of the Illinois High School Class of 2002 regarding nearly all of the postsecondary outcomes explored in their study. However, Smalley et al. (2010) also found male students had a relative advantage over their female counterparts in terms of the rate of enrollment at the most selective four-year institutions, which is perhaps associated with the higher proportion of male students meeting all of the benchmarks.

Parental income. In most cases, the higher the level of parental income, the greater the proportion meeting all or most of the college readiness benchmarks and the lower the proportion not meeting any of the benchmarks. In fact, the proportion of high-income students meeting all of the benchmarks was more than five times the proportion of low income students (37% to 7%). Furthermore, more than half of the low income students failed to meet any of the benchmarks, while only 14% of the high income students fell into this category. This parallels previous research that established a higher likelihood of college readiness among students from wealthier families (Presley & Gong, 2005).

Race. A study commissioned by ACT showed that college readiness varies by race: Asian-Americans are most college ready, followed by Caucasians, and African-Americans are least college ready (ACT, 2011). Similarly, Moore et al. (2010) and Greene and Winters (2005) found that higher percentages of white students were college ready when compared with both African-American and Latino students (non-Asian minorities). Presley and Gong (2005) had similar findings, as they reported that while only 11% of African-American and 17% of Hispanic high school graduates were either most or more ready for college, 55% of Asian and 48% of white students met that distinction.

In this study, stark differences between non-Asian minorities (Hispanic and African-American) and their white and Asian counterparts were also evident (Table 2). The gap between non-Asian minority students and their Asian and white counterparts in terms of college readiness is quite alarming. Around 60% of non-Asian minority students failed to meet any of the college readiness benchmarks, while only one-quarter of Asian and white students met that distinction. On the other end of the college readiness spectrum, only 3% of African-American students and 5% of Hispanic students were college ready in all subject areas; this was substantially lower than the proportions of Asian (29%) and white students (24%) meeting all of the benchmarks.

Regional differences and college readiness. There were also regional differences regarding college readiness, with the greatest disparity existing between Chicago and its suburbs (Northeast region). As shown in Table 2, the proportion of students from the Northeast region meeting all of the college readiness benchmarks was nearly five times greater than that of the students from Chicago (24% to 5%). At the same time, the proportion of students from Chicago failing to meet any of the benchmarks was more than double that of the students from the Northeast region (62% to 29%). Of the remaining regions (Northwest, East Central, West Central, Southeast, Southwest), students from the East Central region tended to have slightly higher proportions meeting all or more of the college readiness benchmarks and a lower proportion failing to meet any of the benchmarks, while the opposite was true for students from the Southeast region.

It should be noted that some of these variables, such as race and parental income (Figure 2) and region and parental income (Figure 3) are associated with one another. For example, the number of non-Asian minority students falling in the low parental income category was disproportionately high, while the opposite was true for their Asian and white peers. Furthermore, while close to a third of the students from the Northeast region were in the high income category, roughly ten percent of the students from the Southeast region and less than five percent of the students from Chicago had similar levels of family income.

Table 2.
Illinois High School Class of 2003: College Readiness & Student and School Characteristics

ACT College Readiness Category	M-E-R-S ✓-✓-✓-✓	M-E-R-S ✓-✓-✓-⦸	M-E-R-S ✓-✓-⦸-✓	M-E-R-S ✓-⦸-✓-✓	M-E-R-S ⦸-✓-✓-✓	M-E-R-S ✓-✓-⦸-⦸	M-E-R-S ✓-⦸-✓-⦸	M-E-R-S ✓-⦸-⦸-✓	M-E-R-S ⦸-✓-✓-⦸	M-E-R-S ⦸-✓-⦸-✓	M-E-R-S ⦸-⦸-✓-✓	M-E-R-S ✓-⦸-⦸-⦸	M-E-R-S ⦸-✓-⦸-⦸	M-E-R-S ⦸-⦸-✓-⦸	M-E-R-S ⦸-⦸-⦸-✓	M-E-R-S ⦸-⦸-⦸-⦸
Gender																
Male	21%	8%	2%	0%	2%	4%	1%	0%	8%	0%	0%	2%	10%	4%	0%	38%
Female	16%	10%	1%	0%	2%	4%	0%	0%	14%	0%	0%	1%	14%	3%	0%	34%
Parental Income																
High	37%	14%	2%	0%	2%	5%	0%	0%	10%	0%	0%	1%	10%	2%	0%	14%
Mid-High	24%	12%	2%	0%	2%	5%	1%	0%	13%	0%	0%	2%	12%	3%	0%	23%
Mid-Low	15%	9%	1%	0%	2%	4%	1%	0%	13%	0%	0%	2%	13%	4%	0%	36%
Low	7%	5%	1%	0%	1%	3%	0%	0%	10%	0%	0%	2%	12%	4%	0%	54%
Race																
African-American	3%	4%	0%	0%	1%	2%	0%	0%	10%	0%	0%	1%	15%	3%	0%	61%
Hispanic	5%	6%	0%	0%	1%	3%	0%	0%	10%	0%	0%	1%	12%	4%	0%	57%
Asian	29%	12%	3%	0%	1%	8%	0%	0%	8%	0%	0%	4%	8%	2%	0%	23%
White	24%	12%	2%	0%	2%	5%	1%	0%	13%	1%	0%	2%	12%	3%	0%	24%
Region																
Chicago	5%	4%	0%	0%	1%	2%	0%	0%	10%	0%	0%	1%	12%	3%	0%	62%
Northeast	24%	11%	2%	0%	2%	5%	0%	0%	11%	0%	0%	2%	11%	3%	0%	29%
Northwest	17%	9%	1%	0%	2%	4%	1%	0%	13%	0%	0%	2%	12%	4%	0%	35%
West Central	17%	9%	1%	0%	3%	4%	0%	0%	13%	1%	0%	1%	13%	3%	0%	35%
East Central	18%	10%	1%	0%	2%	5%	1%	0%	13%	0%	0%	2%	12%	3%	0%	32%
Southwest	15%	9%	1%	0%	2%	4%	1%	0%	12%	1%	0%	2%	13%	4%	0%	36%
Southeast	13%	7%	1%	0%	3%	3%	1%	0%	14%	0%	0%	2%	13%	3%	0%	40%

Figure 2.
Race and Parental Income

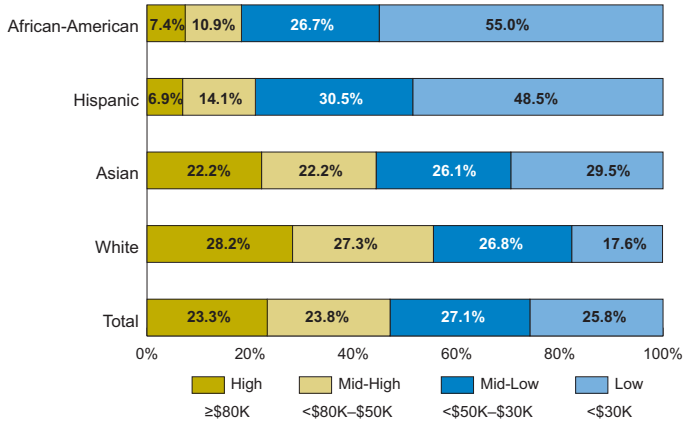
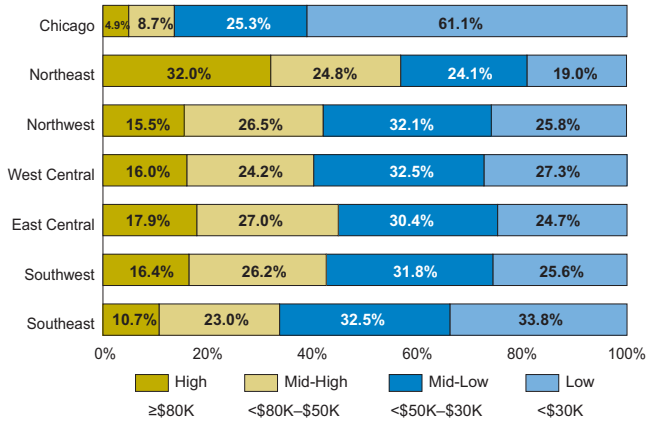


Figure 3.
Region and Parental Income



How are the college readiness benchmark patterns associated with college enrollment?

Meeting all four benchmarks. As illustrated in Figure 4, students meeting all four of the college readiness benchmarks had the highest rate of enrollment at four-year institutions during the fall semester following high school graduation, as well as the lowest proportion never enrolling at a postsecondary institution during the study period (fall semester of 2003 through the spring semester of 2010). Nearly two-thirds of the students who were college ready in all four subjects initially enrolled at a four-year institution immediately following high school graduation. On the other end of the college readiness spectrum, only 8.9% of the students who missed all of the benchmarks were four-year starters and nearly half (46.9%) had not enrolled during the study.

Meeting three out of four benchmarks. As displayed in Table 3, missing a single college readiness benchmark in either English (37.0%) or Math(40.6%) had a much more detrimental effect on initially enrolling at four-year institutions relative to missing a benchmark in Science (54.3%) or Reading (54.8%). Missing a benchmark in either English or Math had less of an impact on enrolling at community colleges, delaying enrollment, or never enrolling.

Meeting one or two of the benchmarks. Among students meeting the college readiness benchmarks in two out of four subjects, being college ready in both Math and English was related to an increased rate of initial four-year enrollment relative to others meeting only two benchmarks in other subjects. Interestingly, students who were college ready in both Math and English, had a higher rate of initial four-year enrollment (46.1%) than two of the groups meeting three of the four readiness benchmarks, particularly, those missing a single benchmark in either English or Math. Furthermore, for those meeting only one college readiness benchmark, students in the English only and, to a lesser extent, students in the Math only groups had the highest rates of four-year enrollment.

College readiness and community college enrollment. The patterns in the rates of initial community college enrollment were more nuanced, as community colleges serve a wide-range of students for a wide variety of reasons. Generally, students meeting only one benchmark had the highest rate of enrollment at community colleges (29.9%), followed by those missing all of the benchmarks (26.4%) and those meeting two of the benchmarks (25.9%). In terms of the specific benchmark patterns, students falling in the Math and Reading category had the highest rate of initial community college enrollment (32.1%), while at the same time having one of the lower overall rates of initial four-year enrollment, particularly among the students meeting benchmarks in two out of the four subjects.

College readiness and delayed enrollment. In most cases, the greater the number of college readiness benchmarks missed, the higher the rate of delayed postsecondary enrollment (Figure 4). More specifically, students in the Science-only category had the highest delayed enrollment rate; their delayed enrollment rate (19.8%) was higher than those missing all of the benchmarks (17.8%).

Missing a single college readiness benchmark in either English or Math had a much more detrimental effect on the initial four-year enrollment rate relative to missing a benchmark in Science or Reading.

Figure 4.
College Enrollment Patterns by the Number of ACT Benchmarks Met

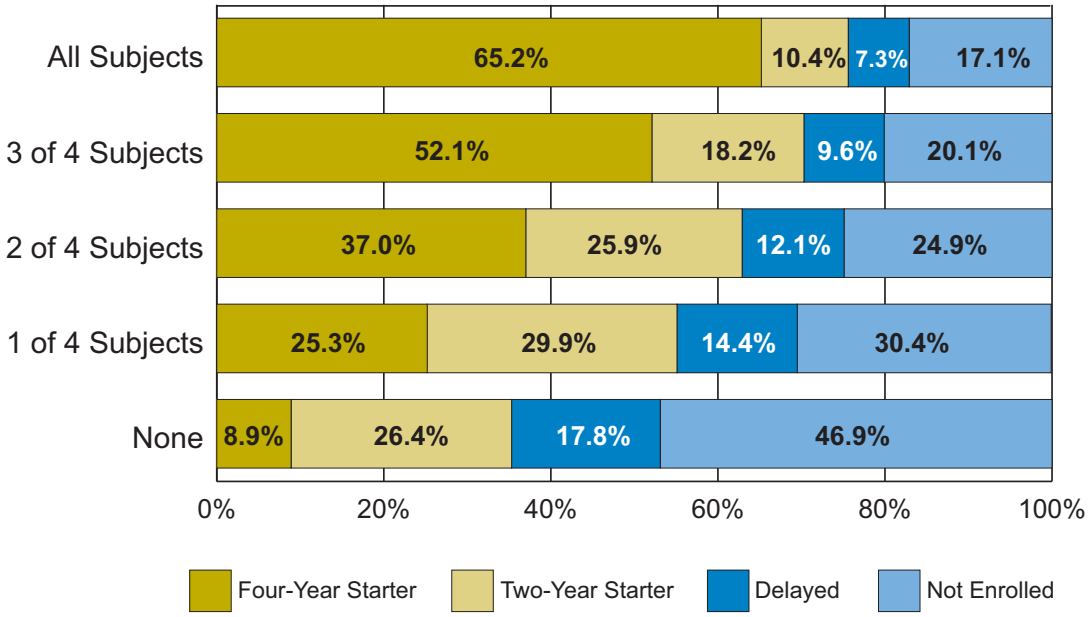


Table 3.
College Enrollment Patterns by ACT College Readiness Category

ACT College Readiness						College Enrollment Patterns			
Math	English	Reading	Science	n	% of Total Enrolled	Four-Year	Two-Year	Delayed	Not Enrolled
≥22	≥18	≥21	≥24	115,677	100.0%	32.1%	22.9%	13.3%	31.6%
✓	✓	✓	✓	21,246	18.4%	65.2%	10.4%	7.3%	17.1%
✓	✓	✓	⊘	10,743	9.3%	54.3%	17.0%	9.4%	19.3%
✓	✓	⊘	✓	1,618	1.4%	54.8%	18.0%	7.0%	20.1%
✓	⊘	✓	✓	146	0.1%	37.0%	26.0%	13.7%	23.3%
⊘	✓	✓	✓	2,235	1.9%	40.6%	23.4%	12.2%	23.8%
✓	✓	⊘	⊘	4,798	4.1%	46.1%	22.3%	9.7%	21.9%
✓	⊘	✓	⊘	539	0.5%	30.6%	32.1%	12.2%	25.0%
✓	⊘	⊘	✓	143	0.1%	37.1%	25.9%	11.2%	25.9%
⊘	✓	✓	⊘	13,123	11.3%	34.1%	27.0%	13.0%	25.9%
⊘	✓	⊘	✓	479	0.4%	35.3%	25.9%	13.2%	25.7%
⊘	⊘	✓	✓	121	0.1%	28.1%	24.8%	14.0%	33.1%
✓	⊘	⊘	⊘	1,706	1.5%	25.1%	29.1%	13.4%	32.3%
⊘	✓	⊘	⊘	13,709	11.9%	27.3%	30.2%	13.8%	28.7%
⊘	⊘	✓	⊘	3633	3.1%	17.6%	29.6%	17.1%	35.6%
⊘	⊘	⊘	✓	182	0.2%	22.0%	24.7%	19.8%	33.5%
⊘	⊘	⊘	⊘	41,256	35.7%	8.9%	26.4%	17.8%	46.9%
✓	—	—	—	40,939	35.4%	57.4%	15.0%	8.5%	19.1%
—	✓	—	—	67,951	58.7%	47.2%	20.2%	10.4%	22.2%
—	—	✓	—	51,786	44.8%	50.1%	18.2%	10.2%	21.5%
—	—	—	✓	26,170	22.6%	61.1%	12.6%	8.0%	18.3%

How are race and college readiness associated with postsecondary enrollment?

In exploring the interaction of race and college readiness on enrollment a few noteworthy patterns were evident, particularly the differences in the rates of initial four-year enrollment between African-American students and their white counterparts and the lack of difference between Hispanic students and their white counterparts. In comparing white and African-American students from the same ACT college readiness benchmark pattern, African-Americans had significantly higher rates of four-year enrollment (Figure 5). In fact, the African-American students who met three out of four benchmarks had nearly the same four-year enrollment rate as white students who met all four of the college readiness benchmarks (65.7% to 65.2%). The advantage for African-American students was even evident towards the bottom of the college readiness scale, as the four-year college going rate for African-American students missing all of the benchmarks was more than twice that of similarly ready white students (17.0% to 7.6%) and the four-year college going rate for African-American students meeting only one benchmark was nearly twice that of white students (42.9% to 23.7%). This parallels previous research with an earlier cohort (Smalley et al., 2010) that established that the odds of an African-American student enrolling at a four-year institution were more than twice that of a white student, holding all else constant. However, it should be noted that a significantly high proportion of African-American students clustered towards the bottom of the college readiness scale, as eight in every ten African-American students missed all or all but one of the college readiness benchmarks.

Race, college readiness and community college enrollment. As depicted in Figure 5, significantly higher proportions of white students who met all or most of the college readiness benchmarks elected to initially enroll at community colleges. At the upper end of the college readiness scale, white students had the highest proportion enrolling at community colleges by a wide margin. The initial two-year college going rate for such white students was 11.0% and this was more than double the rate of the next highest group, Hispanic students (5.2%). In fact, white students had the highest initial two-year college going rate across all of the college readiness categories with the exception of those missing all benchmarks, in which Asian students had the highest at nearly 40%.

Race, college readiness, and delayed enrollment. In terms of delayed enrollment for all race groups, the fewer the number of college readiness benchmarks met, the higher the proportion postponing college entry. In general, African-American students had the highest delayed enrollment rates, while Asian students had the lowest within each college readiness category.

How are gender and college readiness associated with postsecondary enrollment?

When looking at gender differences in terms of initial four-year enrollment, female students maintained a relative advantage over their male counterparts throughout all of the college readiness categories. For instance, while over two-thirds (68.1%) of the female students who met all of the benchmarks enrolled at four-year colleges, only 62.7% of similar male students met that distinction, for a difference of 5.4 percentage points (Figure 6).

Male students meeting two or more of the benchmarks had a higher rate of community college enrollment relative to their female peers. However, that advantage for male students disappears among students meeting one of the benchmarks or missing all of the benchmarks. Regarding initial community college enrollment, female students meeting one benchmark had a slight advantage (30.5% to 29.3%) and female students missing all of the benchmarks had a rather large advantage relative to similarly-ready male students (29.3% to 23.8%).

Among the students meeting at least one benchmark, a higher proportion of male students delayed their postsecondary enrollment. Among students missing all of the benchmarks, female students had a slightly higher delayed enrollment rate relative to male students (18.1% to 17.6%). Within each college readiness category, higher proportions of male students fell into the "not enrolled" category relative to similarly ready female students.

Figure 5.
The Interaction of Race & College Readiness and Basic Enrollment

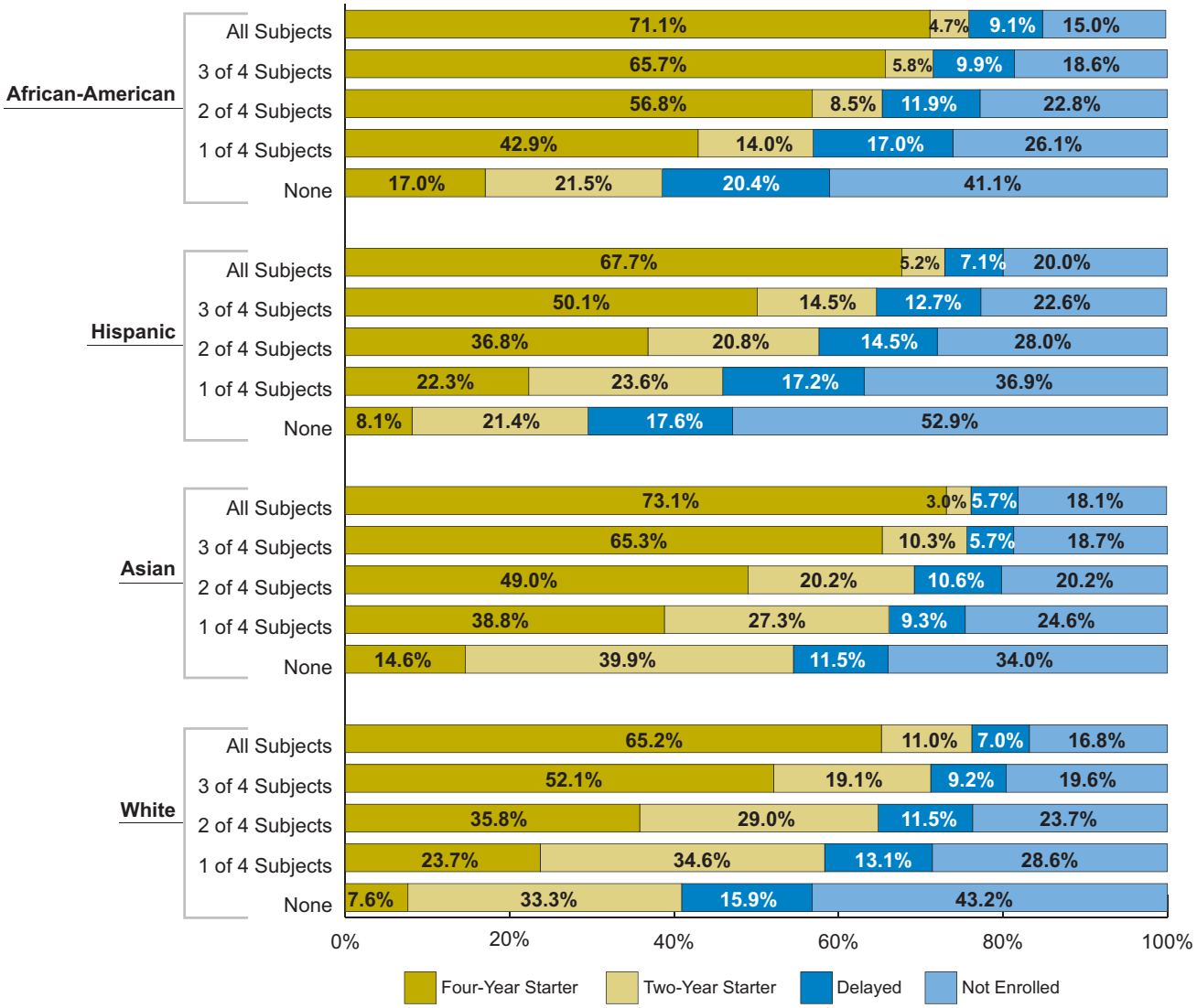
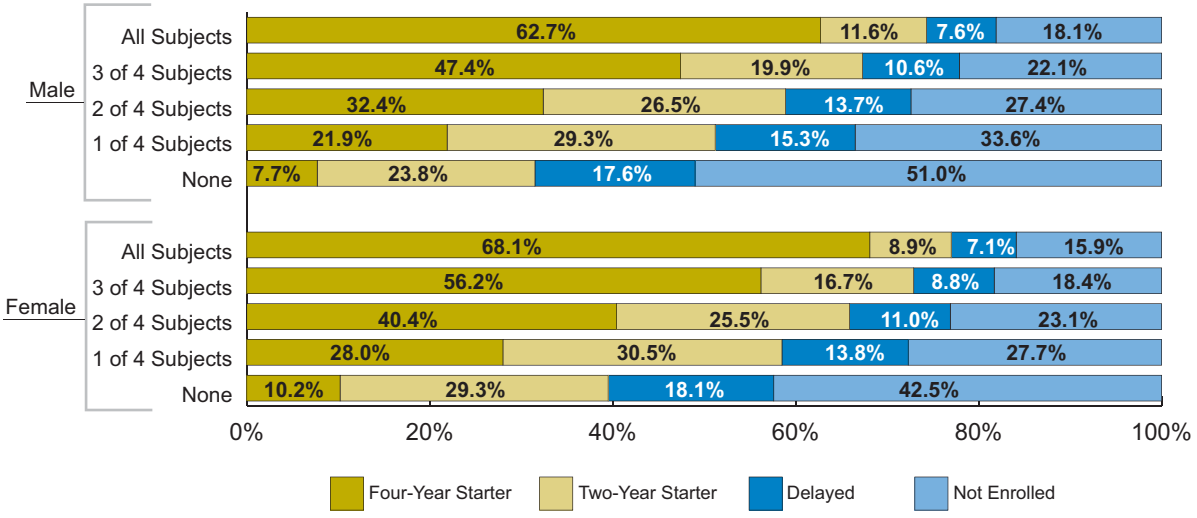


Figure 6.
The Interaction of Gender & College Readiness and Basic Enrollment



How are parental income and college readiness associated with postsecondary enrollment?

Enrollment at four-year colleges. As illustrated in Figure 7, parental income played a significant role in terms of the initial rate of enrollment at four-year institutions. This remained a salient finding when making comparisons of students from the same college readiness category. Throughout the college readiness benchmark scale, those in the high parental income category had a relative advantage when compared with similarly prepared students in the mid-high to low parental income categories. Also, missing all of the benchmarks had the least impact on the rate of initial four-year enrollment for students within the high parental income category, as their four-year college going rate of 12.7% was significantly higher than that of similarly prepared students from all other income categories.

Enrollment at community colleges. Students from wealthier families who met all of the benchmarks had the lowest rate of initial community college enrollment (5.9%). In fact, within all of the parental income categories, students meeting all of the benchmarks had the lowest rates of such enrollment. It should be noted that among those meeting three or more of the benchmarks, as income decreased the rate of community college enrollment increased. Students in the mid-high parental income category who met only one benchmark or missed all of the benchmarks had the highest rate of initial community college enrollment (35.6% and 35.9%, respectively), closely followed by students from the high parental income category missing all of the benchmarks (33.7%) and those in the mid-low category meeting only one benchmark (33.1%) or two benchmarks (32.0%). For students in the lower income categories who met fewer than three of the benchmarks, there appeared to be some within group clustering in terms of community college enrollment. In the mid-low income category, students meeting fewer than three benchmarks clustered within three percentage points (32.0%, 33.1%, and 30.1%) and in the low income category, similarly ready students clustered within 1.8 percentage points (24.1%, 25.9%, and 24.3%).

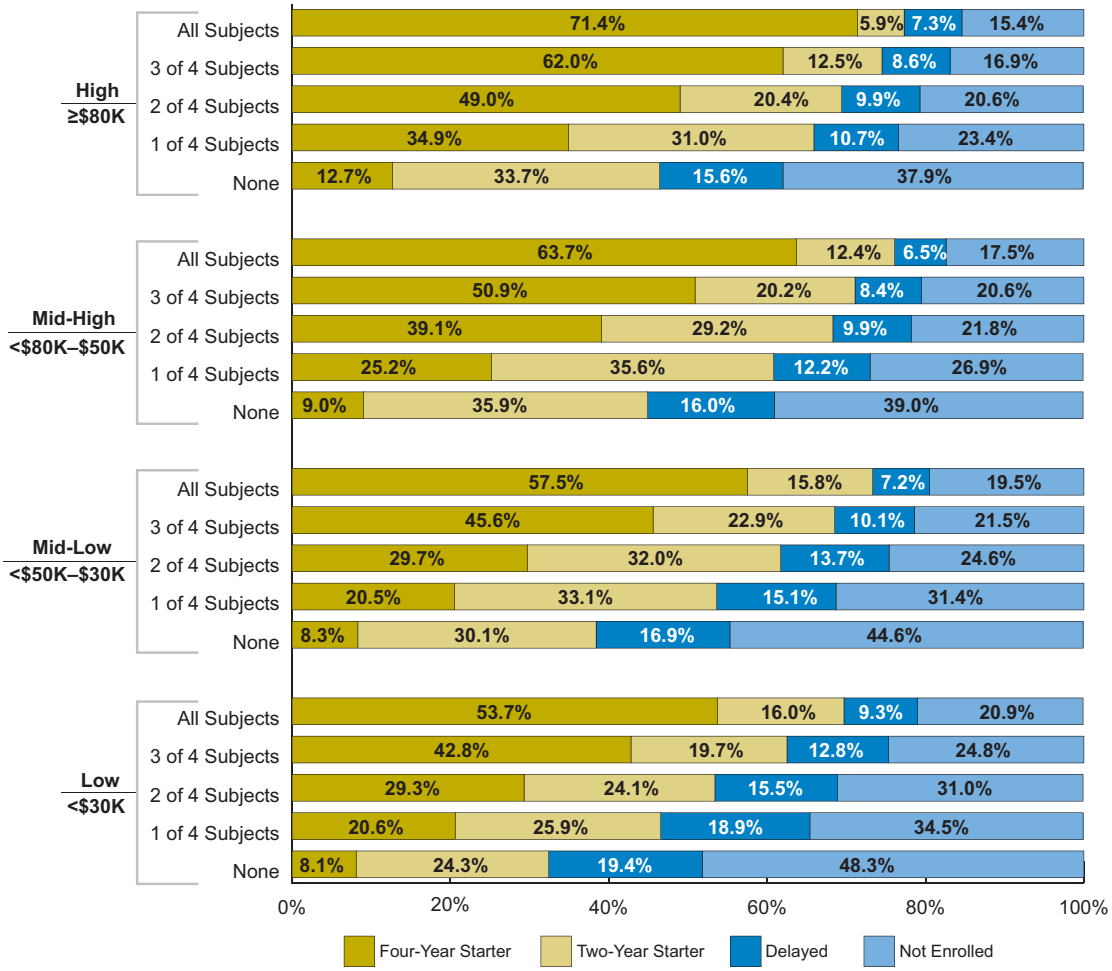
The good news is that when the initial rates of four-year and two-year enrollment are combined, the differences between the students in the top two income categories meeting all of the benchmarks were fairly minimal. For example the initial postsecondary enrollment rate of high income students meeting all benchmarks was 77.3%, while the parallel rate for mid-high income students was 76.1%. Unfortunately, this pattern did not hold true for the students meeting fewer benchmarks and those with less parental income.

Enrollment for low-income students. The enrollment patterns for students within the lower parental income categories were fairly similar. Among the students who met all or most of the college readiness benchmarks, those in the mid-low category had a marginal advantage over their counterparts in the low parental income category in terms of initial four-year enrollment (57.5% to 53.7%; 45.6% to 42.8%). However, for those meeting two or fewer benchmarks the rates of initial four- year enrollment were virtually the same across the low and mid-low parental income categories (29.7% to 29.3%; 20.5% to 20.6%).

Delayed postsecondary enrollment. Within each parental income category, delayed enrollment rates were higher for those meeting fewer college readiness benchmarks. Looking across all parental income categories at parallel readiness groups, as parental income decreased, the rates of delayed enrollment typically increased.

Missing all of the benchmarks had the least impact on the initial four-year enrollment rate for high income students.

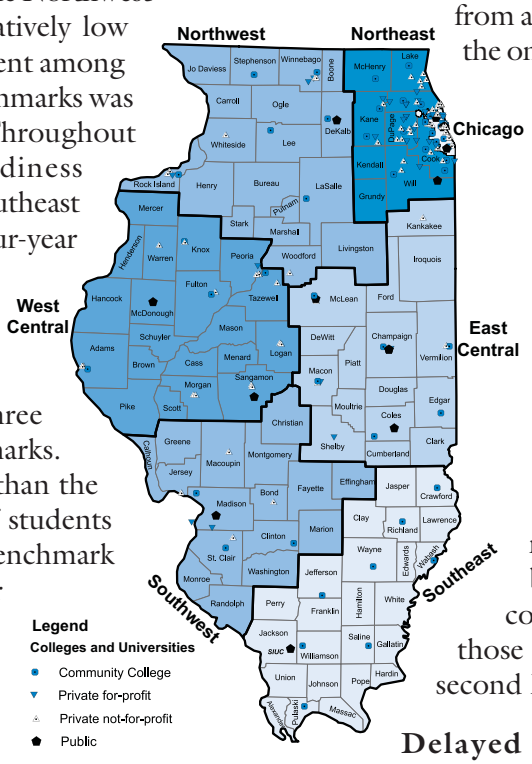
Figure 7.
The Interaction of Parental Income & College Readiness and Basic Enrollment



- *When the initial rates of four-year and two-year enrollment are combined, the differences between the students in the top two income categories meeting all of the benchmarks were fairly minimal.*
- *High income students had a relative advantage in terms of four-year enrollment when compared with similarly ready students in all other income categories.*
- *As income decreased, the rate of delayed enrollment typically increased.*

How are high school region and college readiness associated with enrollment?

Enrollment at four-year colleges. Throughout all of the college readiness categories, students from Chicago and the Northeast region had the highest rates of initial enrollment at four-year institutions, with students from Chicago generally having a slight advantage (Figure 8). For example, among the students meeting all four of the benchmarks, students from Chicago and the Northeast region had four-year enrollment rates of roughly 69%, while similarly prepared students from the Northwest and Southeast regions had the lowest rates (slightly above 50%). For students from the Northwest and Southeast regions, the relatively low rates of initial four-year enrollment among students meeting all of the benchmarks was where the similarities ended. Throughout all of the other college readiness categories, students from the Southeast region had the lowest rates of four-year enrollment by a wide margin. A dramatic example is the 30.0% rate of initial four-year enrollment for students from the Southeast region meeting three of the college readiness benchmarks. This rate was somewhat lower than the four-year college going rate of students from Chicago who met one benchmark (34.9%) and only slightly higher than the students from the Northeast region who met only one benchmark (28.9%).



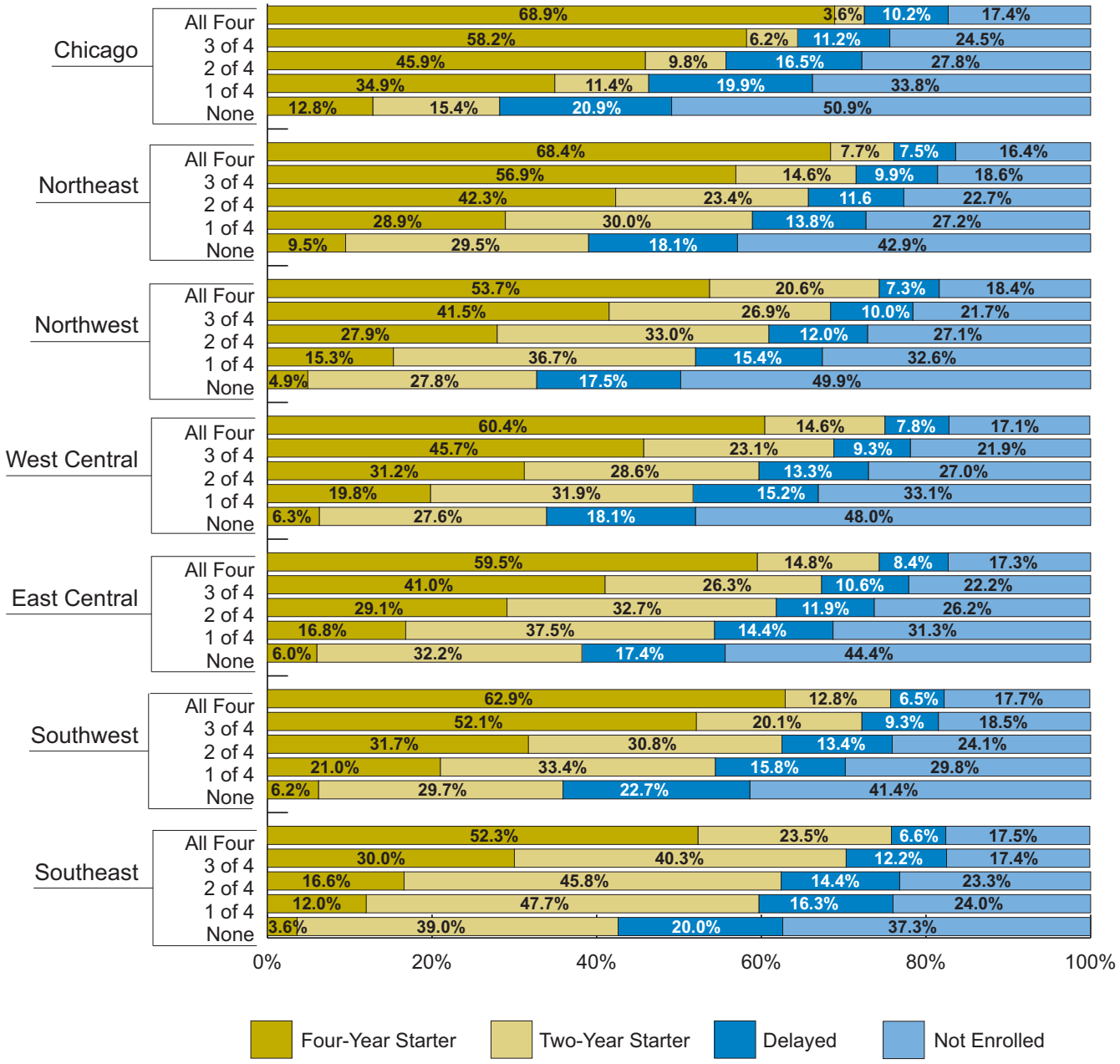
Enrollment at community colleges. Perhaps the initial under-utilization of four-year institutions by students from the Southeast region is related to their extremely high rates of enrollment at community colleges throughout each of the college readiness categories. As noted in Smalley et al. (2010), proximity to four-year institutions could be an issue, as there are no private institutions in the Southeast region and there is only one public four-year institution—Southern Illinois University Carbondale; and even it is somewhat geographically distant from most of the region (see map). Rouse (1995) concluded that most students who are diverted away from a four-year institution to a community college due to better access probably would not have completed a bachelor's degree anyway; however, when focusing on college readiness alone, for the students from the Southeast region this does not appear to be the case.

Among all of the college readiness categories, students from Chicago had significantly lower rates of community college enrollment relative to students from all other regions. Also, Chicago was the only region that had a purely negative relationship between college readiness and initial community college enrollment, where the rate continually decreased as the number of college readiness benchmarks met increased. It should be noted that the students from the Northeast region who missed all or all but one of the benchmarks had nearly the same rates of initial community college enrollment (around 30%). For students from all of the other regions, those meeting only one benchmark had the highest rate of community college enrollment and those meeting two benchmarks had the second highest rate.

Delayed postsecondary enrollment. Delayed postsecondary enrollment and not yet enrolling during the study period both had a negative relationship with the number of benchmarks met. Across all regions, as the number of benchmarks met increased, the rate of delayed enrollment and the proportion not enrolling during the study period decreased.

Throughout all of the college readiness categories, students from Chicago and the Northeast region had the highest rates of initial enrollment at four-year institutions.

Figure 8.
The Interaction of Region & College Readiness on Basic Enrollment



Comparatively, although students from Chicago meeting all of the benchmarks had the highest four-year enrollment rate, Chicago also had the lowest proportion meeting that number of benchmarks (Table 2, p. 13).

Students from Chicago had significantly lower rates of community college enrollment relative to similarly-ready students from all other regions.

How are the college readiness benchmark patterns associated with the probability of enrolling in selective four-year institutions?

In most cases, the greater the number of college readiness benchmarks met, the higher the rate of enrollment at more competitive institutions and the lower the rate of enrollment at less competitive institutions (Figure 10). By a wide margin, the students meeting all of the college readiness benchmarks had the highest proportion enrolling at most/highly competitive institutions (39.3%) and the lowest proportion enrolling at less/non competitive institutions (5.2%). In fact, the proportion of students meeting all of the benchmarks who enrolled at the most/highly competitive institutions was more than twice the proportion of those meeting three benchmarks (39.3% to 18.0%). Examples of Illinois institutions falling into the top selectivity category are: the University of Illinois at Urbana-Champaign and Northwestern University, while Northeastern Illinois University and Southern Illinois University Edwardsville fell into the lowest selectivity category (see Figure 9 for more examples).

As established in one of the earlier sections (Figure 4, p. 15), a lack of college readiness was not necessarily a barrier to four-year colleges, as nearly 10% of the students missing all four of the benchmarks initially enrolled at four-year institutions. However, missing all of the benchmarks appeared to be a barrier to enrollment at more competitive institutions, as less than 3% of the students missing all of the benchmarks enrolled at most/ highly competition institutions and roughly 10% enrolled at very competitive institutions.

Missing two and in some cases three benchmarks did not necessarily serve as a barrier to enrollment at very competitive institutions. In fact, over one-fifth of the four-year starters who missed the benchmarks in Math and Science and missed the benchmarks in English, Reading, and Science enrolled at very competitive institutions, such as DePaul University (Table 4). Also, over one-quarter (27.5%) of students meeting only the Math and English benchmarks enrolled at very competitive institutions, demonstrating the relative importance of meeting those benchmarks.

Figure 9.
Examples of Illinois Institutions and Selectivity

Most/Highly Competitive	Very Competitive	Competitive	Less/Non Competitive
• Illinois Wesleyan	• Bradley University	• Illinois State University	• Northeastern Illinois University
• Northwestern University	• DePaul University	• Northern Illinois University	• Roosevelt University
• University of Illinois at Urbana-Champaign	• Loyola University	• Southern Illinois University Carbondale	• Southern Illinois University Edwardsville
• University of Chicago	• University of Illinois at Chicago	• Western Illinois University	• Columbia College Chicago

According to Barron's Profile of American Colleges (2003)

- *The greater the number of college readiness benchmarks met, the higher the rate of enrollment at more competitive institutions and the lower the rate of enrollment at less competitive institutions.*
- *A lack of college readiness was not necessarily a barrier to four-year colleges. However, missing all of the benchmarks appeared to be a barrier to enrollment at more competitive institutions.*

Figure 10.
Selectivity by the Number of ACT Benchmarks Met

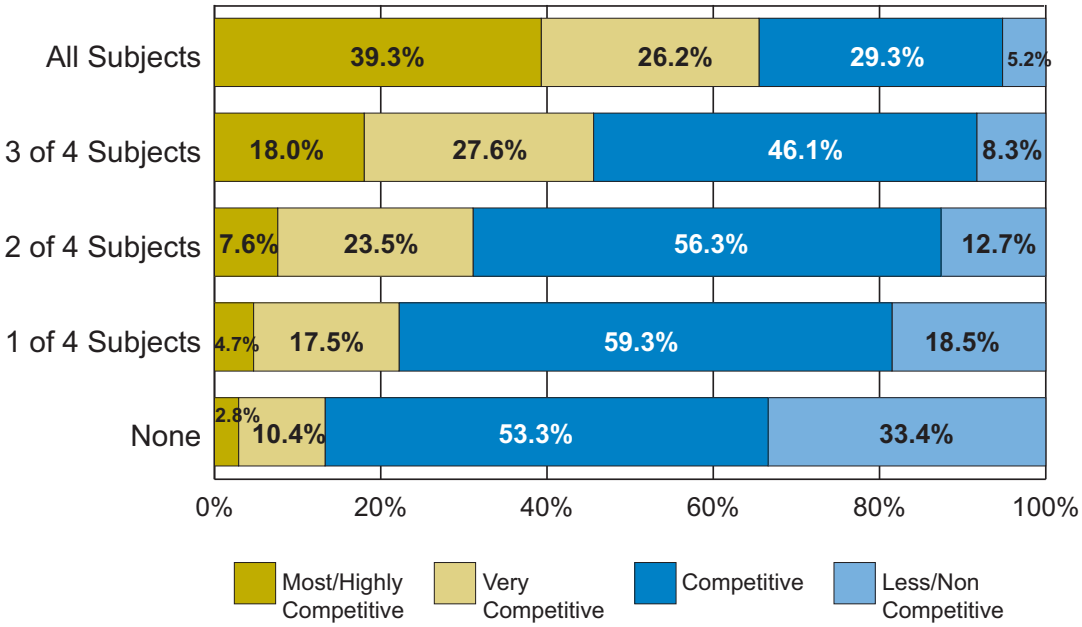


Table 4.
Selectivity by ACT College Readiness Category

ACT College Readiness				Selectivity			
Math	English	Reading	Science	Most/Highly Competitive	Very Competitive	Competitive	Less/Non Competitive
≥22	≥18	≥21	≥24	Row N %	Row N %	Row N %	Row N %
✓	✓	✓	✓	39.3%	26.2%	29.3%	5.2%
✓	✓	✓	⊘	19.6%	28.4%	44.0%	7.9%
✓	✓	⊘	✓	16.8%	28.8%	47.1%	7.3%
✓	⊘	✓	✓	~	~	~	~
⊘	✓	✓	✓	8.8%	21.1%	58.8%	11.2%
✓	✓	⊘	⊘	9.5%	27.5%	53.4%	9.5%
✓	⊘	✓	⊘	~	~	~	~
✓	⊘	⊘	✓	~	~	~	~
⊘	✓	✓	⊘	6.9%	21.6%	57.5%	14.0%
⊘	✓	⊘	✓	~	~	~	~
⊘	⊘	✓	✓	~	~	~	~
✓	⊘	⊘	⊘	3.8%	22.2%	57.7%	16.3%
⊘	✓	⊘	⊘	5.1%	17.8%	58.8%	18.3%
⊘	⊘	✓	⊘	2.9%	12.7%	63.0%	21.5%
⊘	⊘	⊘	✓	~	~	~	~
⊘	⊘	⊘	⊘	2.8%	10.4%	53.3%	33.4%
✓	—	—	—	29.7%	26.9%	36.7%	6.6%
—	✓	—	—	23.5%	25.0%	42.5%	9.0%
—	—	✓	—	27.0%	25.4%	39.6%	8.0%
—	—	—	✓	35.6%	26.0%	32.6%	5.8%

How does the interaction of race and college readiness relate to the selectivity of a student's first four-year institution?

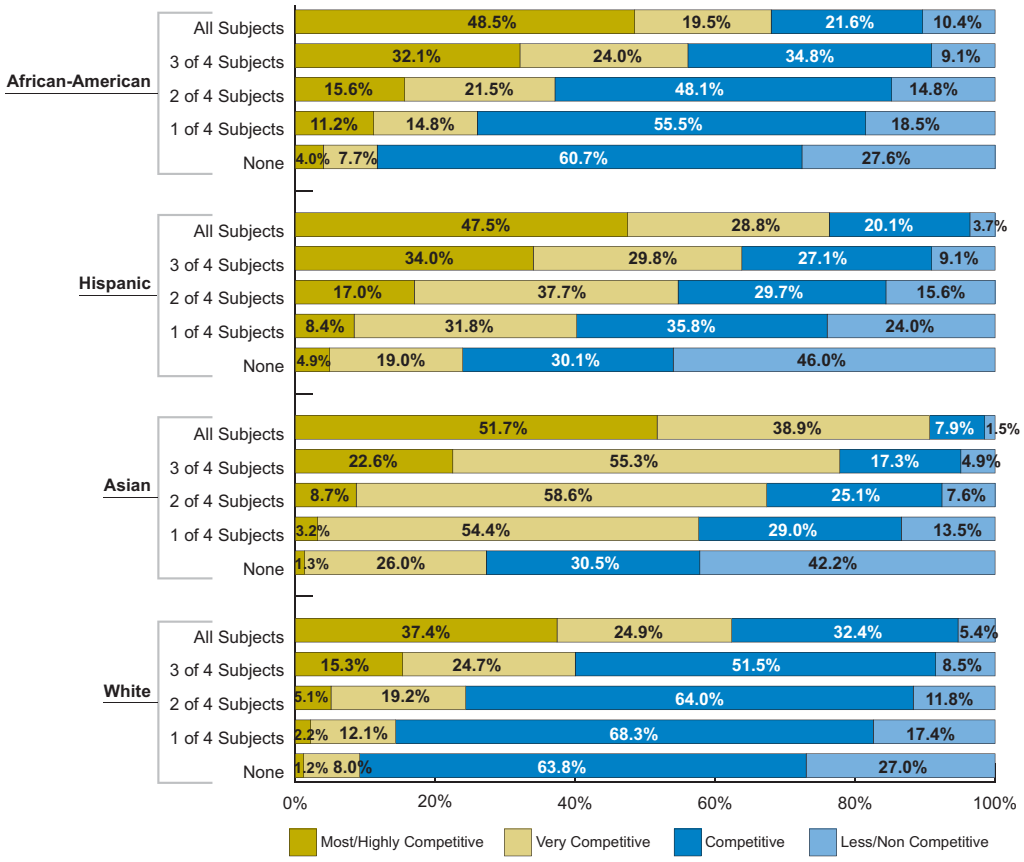
Race, College Readiness, and Enrollment in Selective Institutions. As shown in Figure 11, minority students meeting all four of the college readiness benchmarks had significantly higher rates of enrollment at the most competitive institutions relative to their white peers (48.5% to 37.4%). Among the students meeting three out of four benchmarks, non-Asian minority students had the highest rates of enrollment at highly competitive institutions (roughly 33%), followed by Asian students at 22.6%, and white students at 15.3%.

Among the students meeting all or most of the benchmarks, in terms of enrollment at institutions that are very competitive or better, Asian students had a relative advantage over all other groups. White students had the highest proportions enrolling at competitive institutions across all college readiness levels.

Among the least college ready students, or those missing all of the benchmarks, African-American and white students had similar patterns of enrollment, while Hispanic and Asian students had similar patterns. For both white and African-American students who missed all of the benchmarks, approximately 60% initially enrolled at competitive institutions and 27% enrolled at less/non competitive institutions. However, for similarly prepared Asian and Hispanic students, higher proportions enrolled at very competitive institutions and non competitive institutions; therefore, much lower proportions of Hispanic and Asian students were enrolled at competitive institutions.

Minority students meeting all four of the college readiness benchmarks had significantly higher rates of enrollment at the most competitive institutions relative to their white peers.

Figure 11.
The Interaction of Race & College Readiness and Selectivity

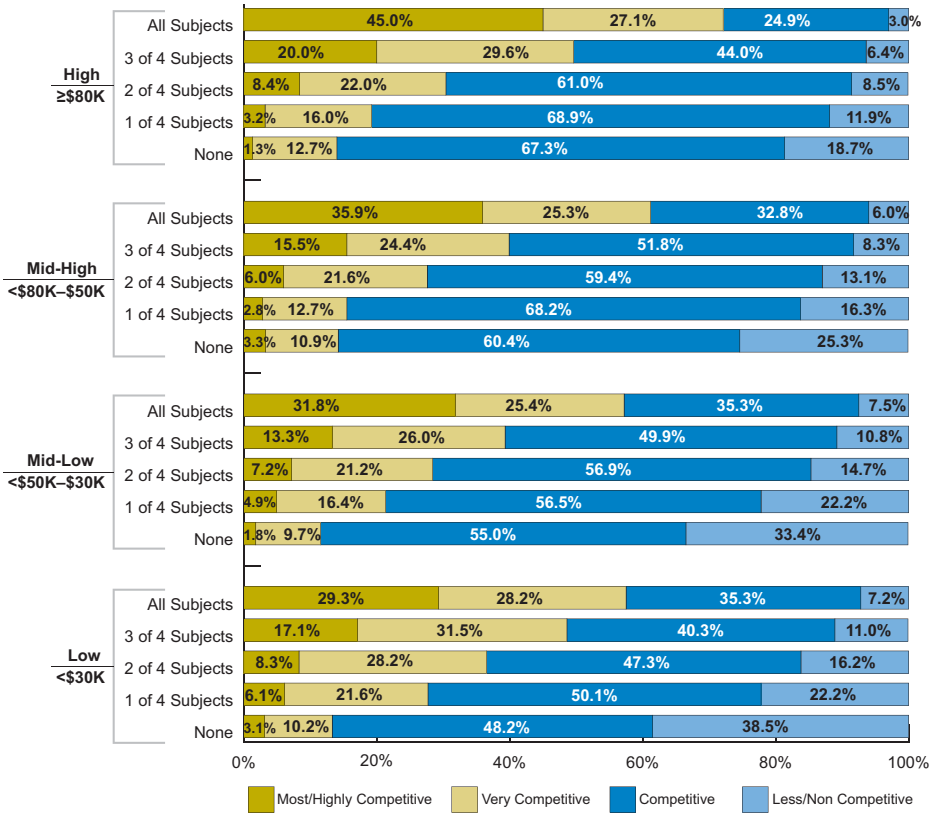


How does the interaction of parental income and college readiness relate to the selectivity of a student's first four-year institution?

Parental income, college readiness, and enrollment in selective institutions. It was not surprising that students from wealthier families who met all benchmarks had the highest rate of enrollment at the most competitive four-year institutions (45.0%). However, some interesting patterns in terms of enrollment at the most and very competitive institutions were evident among students outside the high family income category. For example, students in the low income category meeting three benchmarks had a relative advantage over similarly ready students from the middle income categories in terms of enrollment at the most or very competitive institutions (Figure 12). While close to half of low income students meeting three benchmarks enrolled at the most or very competitive institutions, only 40% of similarly ready students in middle income categories met that same distinction. In fact, significantly higher proportions of students in the low income category meeting one or two of the benchmarks enrolled at the most or very competitive institutions relative to similarly ready students from all other income groups. For instance, while 27.7% of low income students who met only one benchmark enrolled at the most or very competitive institutions, only 19.2% of similarly ready high income students enrolled at such institutions.

On the other end of the selectivity spectrum, throughout all of the readiness groups, students from the wealthiest families had the lowest rates of enrollment at non competitive institutions, while students in the mid-low and low income categories had the highest rates. In fact, the rate of enrollment at non competitive institutions was fairly similar across parallel college readiness groups for mid-low and low income students, with one exception: low income students who missed all of the benchmarks enrolled at non competitive institutions at a significantly higher rate than their peers in the mid-low income category (38.5% to 33.4%).

Figure 12.
The Interaction of Parental Income & College Readiness and Selectivity



Students from wealthier families who met all benchmarks had the highest rates of enrollment at the most competitive four-year institutions.

Across parallel readiness groups, students from the wealthiest families had the lowest rates of enrollment at non competitive institutions, while students in the mid-low and low income categories had the highest rates.

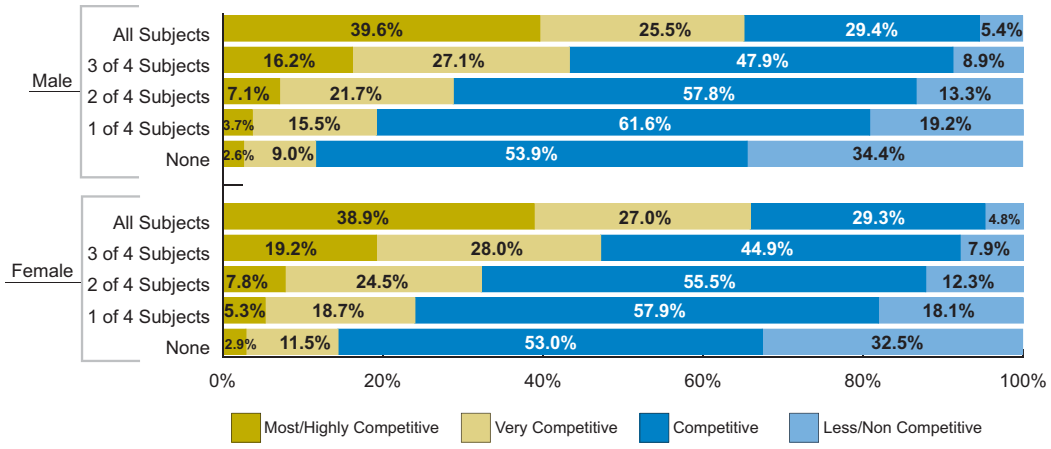
How does the interaction of gender and college readiness relate to the selectivity of a student's first four-year institution?

Gender, college readiness, and enrollment in selective institutions. In terms of gender differences, a slightly higher proportion of male students meeting all of the benchmarks enrolled at the most competitive institutions when compared with similarly ready female students (39.6% to 38.9%). However, as shown in Figure 13, among those meeting three or fewer benchmarks, female students had slightly higher rates of enrollment at the most competitive institutions. It should be noted that overall, students meeting two or fewer benchmarks had relatively low rates of enrollment at highly competitive institutions.

In terms of very competitive colleges, slightly higher proportions of female students enrolled at such institutions relative to male students from parallel college readiness categories. For all of the college readiness categories, slightly higher proportions of male students enrolled at both competitive and non competitive institutions relative to similarly ready female students.

Therefore, with the exception of a higher proportion of males who met all of the benchmarks enrolling at the most competitive institutions, higher proportions of female students enrolled at the most and very competitive institutions and lower proportions enrolled at competitive or non competitive institutions relative to male students from parallel college readiness categories.

Figure 13.
The Interaction of Gender & College Readiness and Selectivity



With the exception of a higher proportion of males who met all of the benchmarks enrolling at the most competitive institutions, higher proportions of female students enrolled at the most and very competitive institutions and lower proportions enrolled at competitive or non competitive institutions.

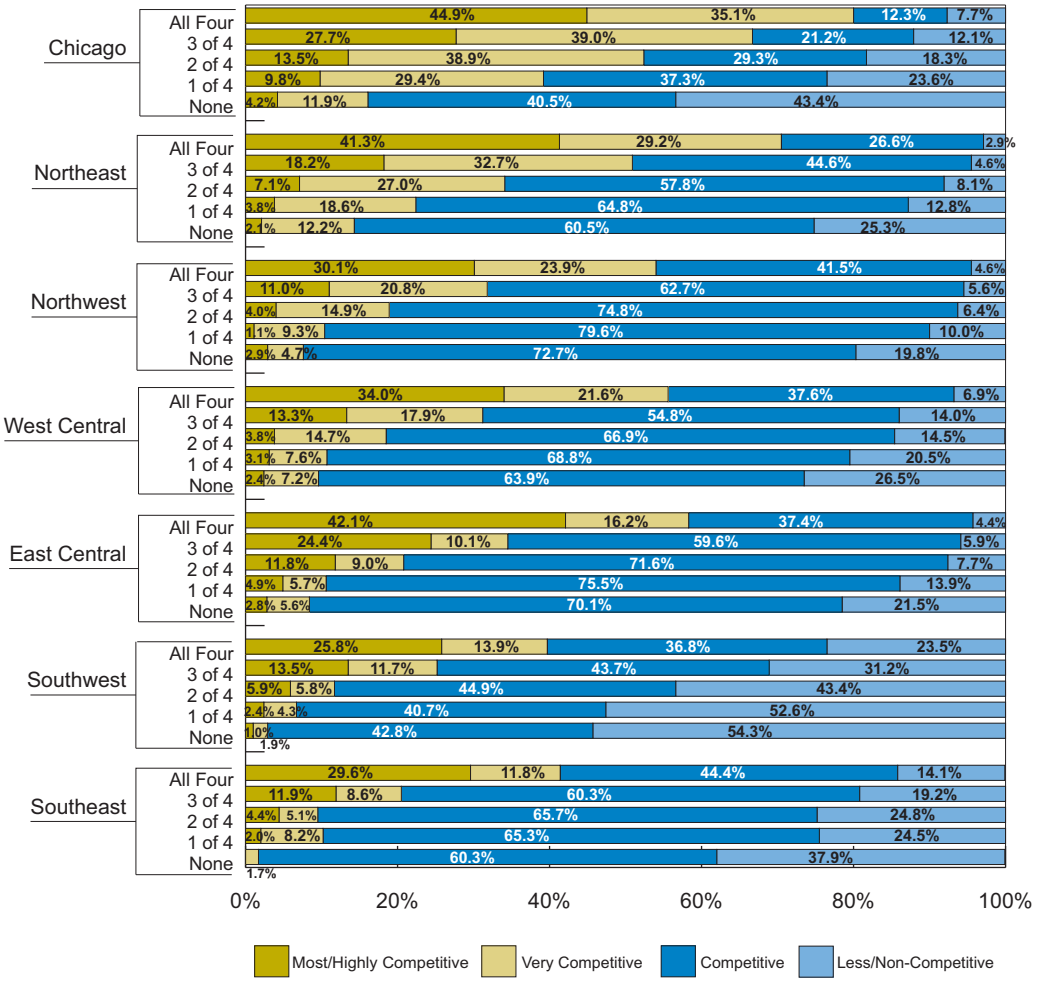
How does the interaction of region and college readiness relate to the selectivity of a student's first four-year institution?

Region, college readiness, and enrollment in selective institutions. As illustrated in Figure 14, students from Chicago meeting all or most of the benchmarks had the highest proportions initially enrolling at highly competitive institutions relative to students from all of the other regions. However, it should be noted that students meeting all of the benchmarks from the Northeast (41.3%) and East Central (42.1%) regions had proportions of initial enrollment that closely followed their similarly ready counterparts from Chicago (44.9%).

On the other end of the selectivity spectrum, students from the Southwest region, throughout all of the college readiness benchmark categories, had the highest rate of enrollment at less competitive institutions. Also, among the students meeting all of the benchmarks, students from the Southwest region had the lowest rate of enrollment at highly competitive institutions and one of the lower rates of enrollment at very competitive institutions.

The regional differences related to enrolling at highly competitive institutions could be associated with proximity to such institutions. For example, several highly competitive institutions are located in Chicago and one is located in the East Central region—University of Illinois at Urbana-Champaign. In general, the students from those regions meeting all or most of the benchmarks had the highest rates of enrollment at highly competitive institutions.

Figure 14.
The Interaction of Region & College Readiness and Selectivity



Students from Chicago meeting all or most of the benchmarks had the highest rates of enrollment at highly competitive institutions relative to students from all of the other regions.

The regional differences related to enrolling at highly competitive institutions could be associated with proximity to such institutions.

How are the college readiness patterns associated with college sector?

In-state versus out-of-state enrollment. As shown in Figure 15, students meeting all or all but one of the college readiness benchmarks had the highest out-of-state enrollment rates. This reinforces the issues Illinois has with the out-migration of its students and is supported by similar research on advanced placement tests which showed that students passing AP tests were less likely to enroll at in-state public institutions than students who failed (Dougherty, Mellor, & Jian, 2006). When Washington, DC and Puerto Rico are included, Illinois ranks 51st in out-migration and tends to lose significantly more high school graduates to colleges in other states than its higher education institutions are able to attract from outside its borders (Mortenson, 2010). Furthermore, as illustrated in Figure 15, a higher proportion of Illinois' best and brightest high school graduates are leaving the state. Students meeting all of the benchmarks had the highest proportion enrolling at out-of-state private institutions; however an equally high proportion of those students enrolled at out-of-state public institutions (18.5% to 18.8%, respectively).

Students who missed all of the benchmarks also had a relatively high rate of enrollment at out-of-state institutions. Their combined out-of-state enrollment rate (26.8%), was slightly higher than that of students meeting two benchmarks (25.7%) and significantly higher than students meeting only one benchmark (22.4%). Perhaps these students are forced to "shop around" and out-of-state public institutions are more than willing to accept less ready out-of-state students to the boost their enrollments, along with their out-of-state tuition revenue.

Profit versus not-for-profit private enrollment. Although only a small proportion of students enrolled at for-profit institutions, the number of college readiness benchmarks met was associated with such enrollment. Typically, the fewer the number of benchmarks met, the higher the rate of enrollment at for-profit institutions. Students missing all of the benchmarks had the highest proportion enrolling at for-profit private institutions at 5.1%, closely followed by students who only met the Math benchmark at 4.7% (Table 5). The latter finding may be explained by such institutions offering technical programs that might be attractive to these students.

There was not much of a difference in terms of the proportion of four-year starters enrolling at an in-state not-for-profit private institution based on the number of college readiness benchmarks met. Students meeting all four of the benchmarks had the lowest rate at 21.0%, while those meeting only one benchmark had the highest at 23.8% for a spread of only 2.8 percentage points. It would be interesting to explore how the interaction of sector and selectivity is associated with the college readiness benchmarks. For example, students meeting either two out of four or one out of four benchmarks had the highest proportions enrolling at in-state public institutions, perhaps because many of those institutions fall into the competitive category (Figure 9, p. 22).

- *Students meeting all of the college readiness benchmarks had the highest out-of-state enrollment rate.*
- *The fewer the number of benchmarks met, the higher the rate of enrollment at for-profit institutions.*

Figure 15.
Sector by the Number of ACT Benchmarks Met

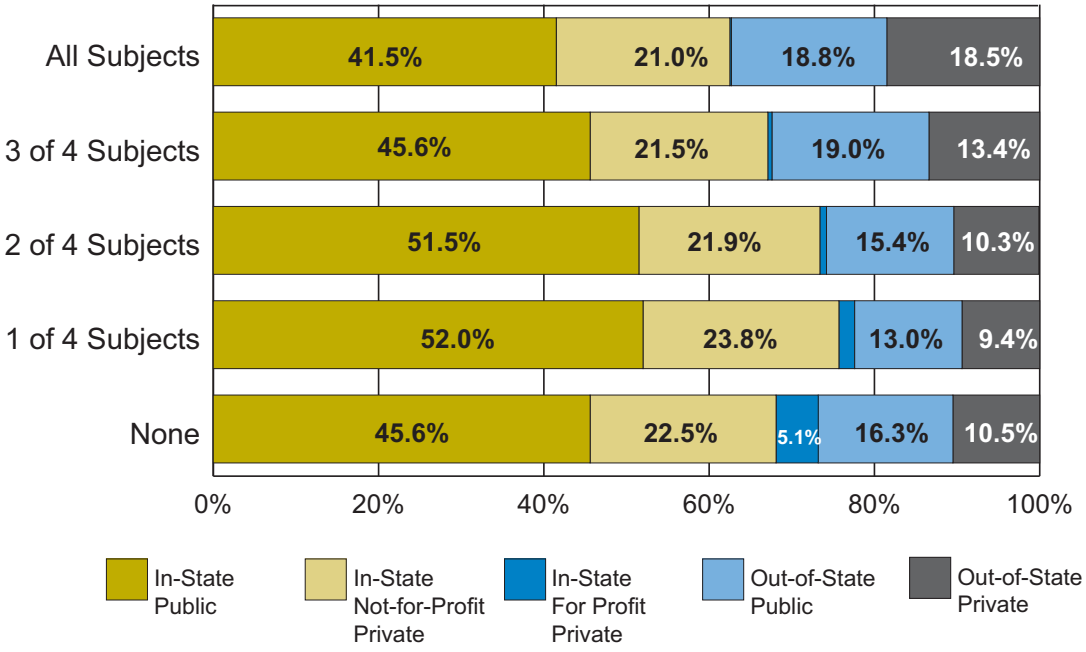


Table 5.
Sector by ACT College Readiness Category

ACT College Readiness				4-Year Starters by Sector				
Math	English	Reading	Science	In-State Public	In-state Not-for-Profit Private	In-state For Profit Private	Out-of-State Public	Out-of-State Private
≥22	≥18	≥21	≥24	Row N %	Row N %	Row N %	Row N %	Row N %
✓	✓	✓	✓	41.5%	21.0%	0.2%	18.8%	18.5%
✓	✓	✓	⦸	44.3%	21.8%	0.4%	19.5%	14.0%
✓	✓	⦸	✓	~	~	~	~	~
✓	⦸	✓	✓	~	~	~	~	~
⦸	✓	✓	✓	~	~	~	~	~
✓	✓	⦸	⦸	52.5%	20.4%	0.7%	16.7%	9.8%
✓	⦸	✓	⦸	~	~	~	~	~
✓	⦸	⦸	✓	~	~	~	~	~
⦸	✓	✓	⦸	50.7%	23.0%	0.9%	14.9%	10.6%
⦸	✓	⦸	✓	~	~	~	~	~
⦸	⦸	✓	✓	~	~	~	~	~
✓	⦸	⦸	⦸	54.1%	20.5%	4.7%	12.4%	8.4%
⦸	✓	⦸	⦸	51.3%	24.5%	1.5%	13.4%	9.3%
⦸	⦸	✓	⦸	54.8%	21.8%	2.0%	10.8%	10.6%
⦸	⦸	⦸	✓	~	~	~	~	~
⦸	⦸	⦸	⦸	45.6%	22.5%	5.1%	16.3%	10.5%

How are the college readiness benchmarks associated with third-year persistence?

The number of college readiness benchmarks met was positively related to the rate of third-year persistence. Third-year persistence was defined as maintaining enrollment at one or more four-year institutions from the fall semester of 2003 through the fall semester of 2005; therefore lateral transfers between four-year institutions were included but summer enrollment was not. As depicted in Figure 16, students meeting all four of the benchmarks had the highest rate of third year persistence (86%) while students missing all of the benchmarks had the lowest rate at 55%. Somewhere in between were students meeting three out of four benchmarks at 80%, students meeting two benchmarks (71%), and those meeting only one benchmark (66%). The differences between the groups in persistence rates increased during the study period.

As shown in Table 6, of the groups meeting three out of four benchmarks, missing the benchmark in Math appeared to have the most detrimental effect on persisting into one's third year in college. The other three groups meeting three out of four benchmarks clustered within 2.6 percentage points of each other (81.6% to 79.0%), while those missing Math had a third-year persistence rate of only 74.3%. Among the groups meeting only two of the benchmarks, students meeting both the English and Math benchmarks had a third-year persistence rate of 77.4% which was by far the highest and in fact, was higher than students meeting the benchmarks of English, Reading, and Science (74.3%), once again demonstrating the importance of meeting the benchmark in Math. In terms of the groups that only met one benchmark, meeting the benchmark in English or Math appeared to be related to higher rates of persistence. Students meeting the single benchmark in Math had a third-year persistence rate of 68.8% and students meeting the English benchmark had a rate of 67.3%. On the other hand, students meeting the benchmarks of Reading or Science only had persistence rates of 58.2% and 52.5%, respectively. Students meeting the benchmark in only Math had a higher persistence rate than most of the groups meeting two benchmarks, with the exception of the Math and English and Math and Reading combinations.

- *The number of college readiness benchmarks met was positively related to the rate of third-year persistence.*
- *Among the groups meeting three out of four benchmarks, missing the benchmark in Math appeared to have the most detrimental effect on persisting into one's third year in college.*
- *In terms of the groups that only met one benchmark, meeting the benchmark in English or Math appeared to be related to higher rates of persistence.*

Figure 16.
Persistence into Fall 2005 by the Number of ACT Benchmarks Met

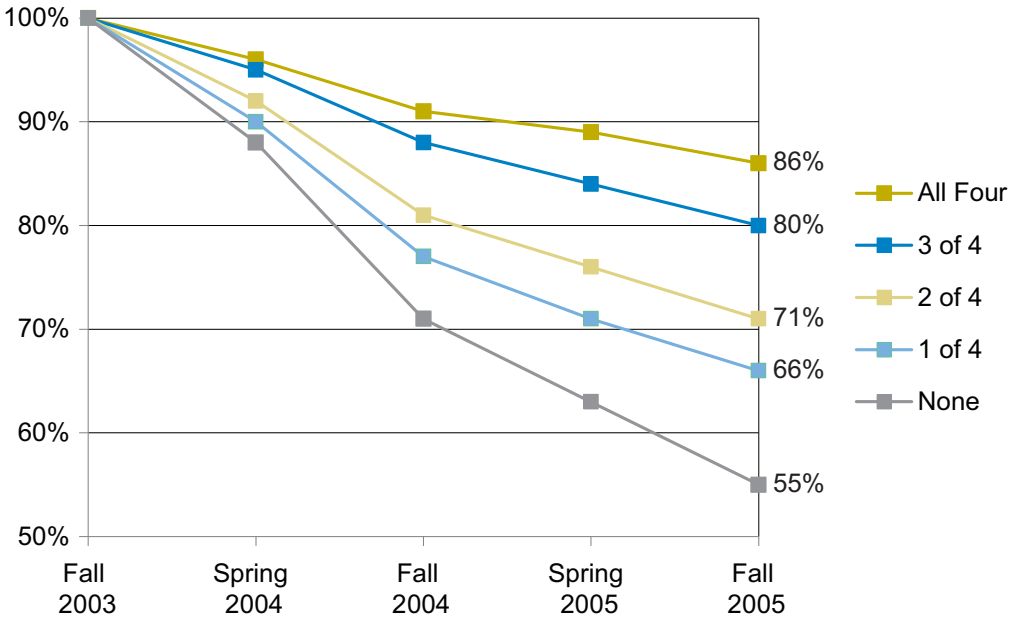


Table 6.
Persistence into Fall 2005 by ACT College Readiness Category

ACT College Readiness						Persistence Among 4-Year Starters			
Math	English	Reading	Science	Four-Year Starters (n)	% of Total Enrolled	Persisted Spring 2004	Persisted Fall 2004	Persisted Spring 2005	Persisted Fall 2005
≥22	≥18	≥21	≥24	37,165	100%	93.8%	84.6%	80.3%	76.1%
✓	✓	✓	✓	13,849	37.3%	96.5%	91.2%	88.6%	85.7%
✓	✓	✓	⊘	5,833	15.7%	95.4%	88.5%	85.1%	81.6%
✓	✓	⊘	✓	887	2.4%	94.9%	86.6%	82.6%	79.0%
✓	⊘	✓	✓	54	0.1%	94.4%	88.9%	87.0%	81.5%
⊘	✓	✓	✓	907	2.4%	94.4%	83.2%	78.4%	74.3%
✓	✓	⊘	⊘	2,214	6.0%	93.9%	85.5%	81.2%	77.4%
✓	⊘	✓	⊘	165	0.4%	95.2%	78.8%	73.9%	70.3%
✓	⊘	⊘	✓	53	0.1%	90.6%	73.6%	67.9%	62.3%
⊘	✓	✓	⊘	4,479	12.1%	91.5%	78.3%	73.1%	67.6%
⊘	✓	⊘	✓	169	0.5%	94.1%	85.3%	70.6%	64.7%
⊘	⊘	✓	✓	34	0.1%	94.1%	80.5%	72.2%	68.0%
✓	⊘	⊘	⊘	429	1.2%	91.6%	79.5%	73.9%	68.8%
⊘	✓	⊘	⊘	3,747	10.1%	91.0%	78.0%	72.4%	67.3%
⊘	⊘	✓	⊘	641	1.7%	87.8%	73.3%	63.8%	58.2%
⊘	⊘	⊘	✓	40	0.1%	75.0%	65.0%	55.0%	52.5%
⊘	⊘	⊘	⊘	3,664	9.9%	87.6%	71.2%	62.5%	54.6%

How are the college readiness benchmarks associated with bachelor's completion?

College readiness plays a clear role in bachelor's completion (Figure 17). In most cases, as the number of benchmarks met increased, so did the rate of bachelor's completion. The students who met all of the college readiness benchmarks had the highest bachelor's completion rate (83.7%), which was more than two times that of those who missed all of the college readiness benchmarks (41.6%).

One of the most interesting findings here is the relative importance of meeting the college readiness benchmarks in both Math and English. In fact, students meeting just those benchmarks had only a somewhat lower bachelor's completion rate (76.6%) when compared with those who met an additional benchmark in Reading (79.5%) or Science (77.8%). Based on these descriptive statistics, the additional benchmark of Science was related to a 1.2 percentage point increase and the additional benchmark of Reading was related to a 2.9 percentage point increase in the rate of bachelor's completion. It is worth noting that the Science benchmark predicts success in first-year biology only. Many students do not take this subject, but almost always take math, social science (reading), and English composition.

College readiness and delayed graduation. In terms of the pipeline outcomes that explored what students were doing at the end of the study if they had not earned a bachelor's degree, each additional college readiness benchmark that was missed increased the proportion of students still enrolled at four-year institutions. That is, students meeting only one of the benchmarks had a higher four-year pipeline rate than those meeting two out of four college readiness benchmarks and so on. This suggests that it is taking these students longer to graduate perhaps as they attempt to overcome deficits in one or more of the subjects in which they failed to meet a college readiness benchmark.

College readiness and dropping out. Roughly 44% of the students who missed all of the college readiness benchmarks and enrolled at four-year institutions had failed to earn a bachelor's degree and were no longer enrolled at the end of the study. It should be noted that movement across institutions was measured in this study, so the outcomes represent more than a student merely transferring out of their first four-year institution. Missing all of the college readiness benchmarks was not only related to lower rates of bachelor's completion, but also longer times to degree completion for those who complete (as suggested by the four-year pipeline rate). As shown in Table 7, among the students meeting the college readiness benchmarks in three out of four subjects, students missing the Math benchmark had the highest proportion falling in the no longer enrolled category (24.4%). This proportion was much higher than that of their counterparts who missed a benchmark in Science (15.7%) or Reading (16.9%). Their proportion failing to earn a bachelor's degree and not being enrolled was only slightly less than the students missing both the Math and Science benchmarks (27.5%). It should be noted that there were so few four-year starters meeting all of the benchmarks with the exception of English that their bachelor's completion rates could not be included on Table 7 due to cell-size restrictions.

- *College readiness plays a clear role in bachelor's completion.*
- *Among the students meeting three or fewer benchmarks, those ready in both Math and English had the highest rates of bachelor's completion.*

Figure 17.
Bachelor's Completion and End of Study Status by the Number of ACT Benchmarks Met

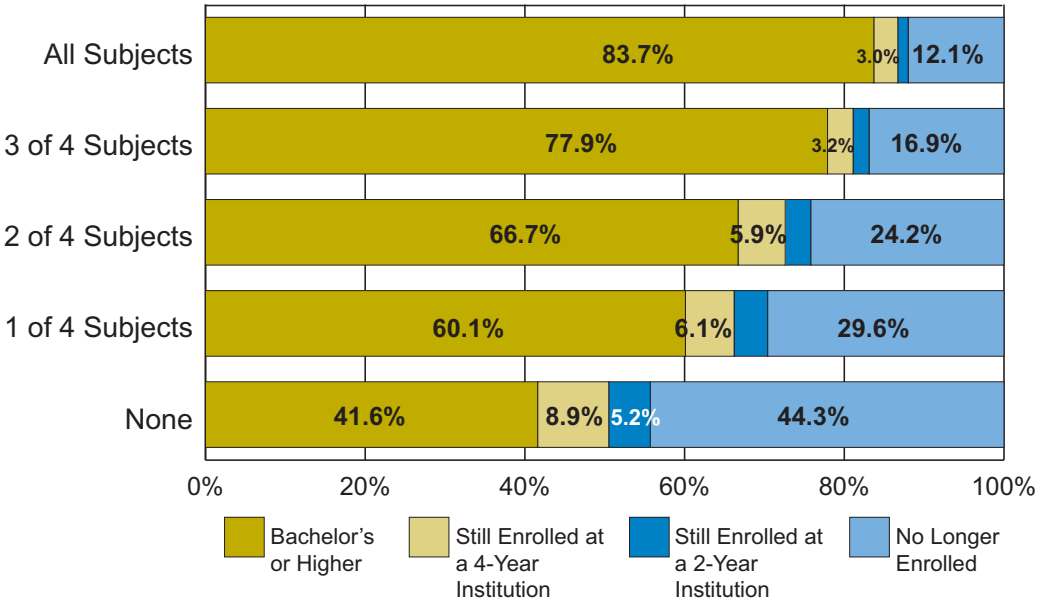


Table 7.
Bachelor's Completion and End of Study Status by ACT College Readiness Category

ACT College Readiness						Completion Among 4-Year Starters			
Math	English	Reading	Science	Four-Year Starters (n)	% of Total Enrolled	Bachelor's Completion Rate	Still Enrolled at 4-Year	Still Enrolled at 2-Year	No Longer Enrolled
≥22	≥18	≥21	≥24	37,165	100%	69.4%	6.4%	3.2%	20.9%
✓	✓	✓	✓	13,849	37.3%	83.7%	3.0%	1.3%	12.1%
✓	✓	✓	⊘	5,833	15.7%	79.5%	3.1%	1.7%	15.7%
✓	✓	⊘	✓	887	2.4%	77.8%	2.7%	2.6%	16.9%
✓	⊘	✓	✓	54	0.1%	~	~	~	~
⊘	✓	✓	✓	907	2.4%	68.0%	4.5%	3.1%	24.4%
✓	✓	⊘	⊘	2,214	6.0%	76.6%	4.8%	2.1%	16.4%
✓	⊘	✓	⊘	165	0.4%	~	~	~	~
✓	⊘	⊘	✓	53	0.1%	~	~	~	~
⊘	✓	✓	⊘	4,479	12.1%	62.4%	6.3%	3.8%	27.5%
⊘	✓	⊘	✓	169	0.5%	~	~	~	~
⊘	⊘	✓	✓	34	0.1%	~	~	~	~
✓	⊘	⊘	⊘	429	1.2%	60.4%	4.9%	4.0%	30.8%
⊘	✓	⊘	⊘	3,747	10.1%	61.4%	6.0%	4.3%	28.3%
⊘	⊘	✓	⊘	641	1.7%	52.9%	7.0%	3.7%	36.3%
⊘	⊘	⊘	✓	40	0.1%	~	~	~	~
⊘	⊘	⊘	⊘	3,664	9.9%	41.6%	8.9%	5.2%	44.3%

How are race and college readiness associated with bachelor's degree completion?

While African-American students had a relative advantage over white students in terms of initial enrollment at four-year institutions throughout all of the college readiness categories, the pattern in terms of bachelor's completion was just the opposite. Throughout all of the college readiness benchmark categories, white students had significantly higher bachelor's completion rates relative to their African-American peers (Figure 18). On the positive side, a higher proportion of African-American students meeting all of the benchmarks were still enrolled at four-year institutions at the end of the study, suggesting that the difference in the rates of bachelor's completion could be reduced in the future. However, the results suggest that the difference in bachelor's completion rates between white and African-American students meeting three or fewer of the benchmarks would be more difficult to overcome.

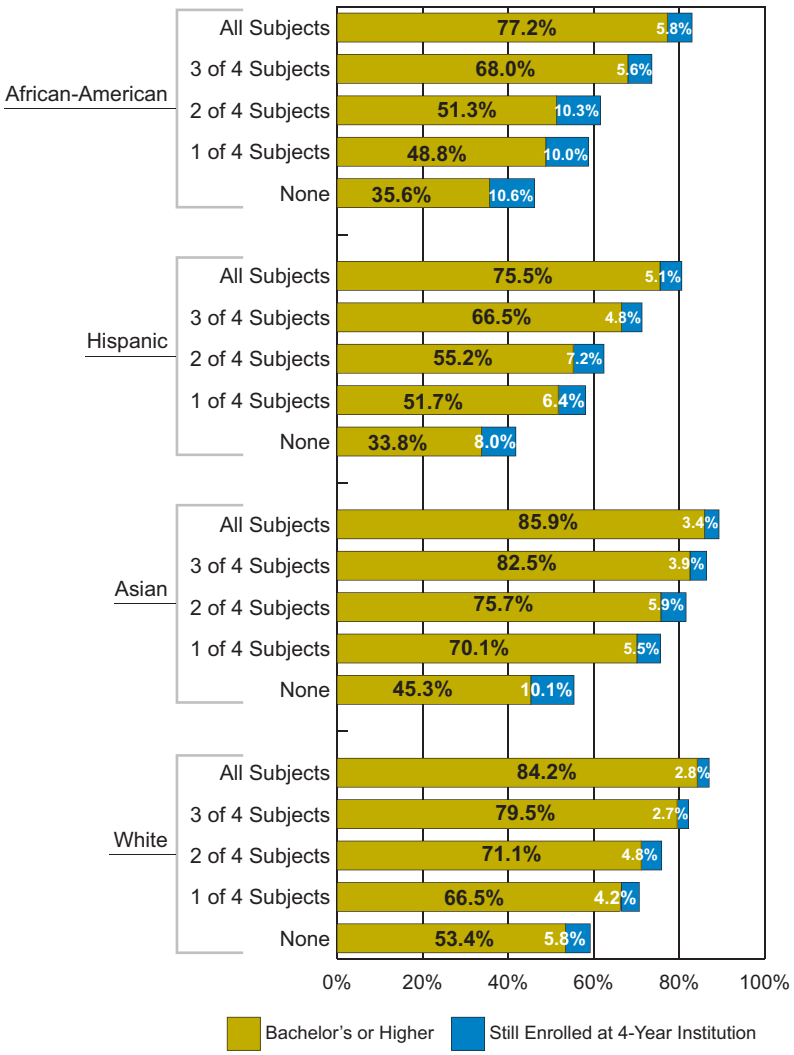
One explanation for this finding could be found in examining the variability of ACT subject scores by race. For example, the mean Math score for African-American students meeting all four of the benchmarks was 26.8 , while the mean Math scores for white and Asian students from that same college readiness category were 28.3 and 29.8, respectively (Table 8). While this does not explain the differences in the initial four-year enrollment rates between African-Americans and their white and Asian counterparts, it might partially explain some of the differences in terms of bachelor's completion.

Asian and white students had significantly higher bachelor's completion rates relative to African-American and Hispanic students from the same college readiness benchmark categories. This parallels recent research that established that Asian and white students are more likely than African-American or Hispanic students to complete four-year degrees (Alon, Domina, & Tienda, 2010; Kao & Thompson, 2003; Lundy, 2010; Oseguera, 2005; Vartanian, Karen, Buck, & Cadge, 2007). In comparing the bachelor's completion rates of Asian and white students from parallel college readiness categories, most of the differences were minimal and slightly in favor of Asian students, with one notable exception. Specific to those missing all of the benchmarks, white students had a huge relative advantage over their Asian counterparts regarding bachelor's completion (53.4% to 45.3%). What was also alarming was the fact that white students missing all of the benchmarks had a higher rate of bachelor's completion than African-American students who met two of the college readiness benchmarks and Hispanic students who met one of the benchmarks. It should be noted that a significantly higher proportion of African-American and Hispanic students were still enrolled at four-year institutions at the end of the study relative to white students missing all of the benchmarks, so perhaps this difference could be reduced in the future.

The bachelor's completion rates of Hispanic and African-American students were fairly similar throughout the college readiness benchmark categories. However, Hispanic students meeting one or two of the college readiness benchmarks had somewhat higher bachelor's completion rates relative to parallel African-American students. Asian students missing all of the benchmarks had a significantly higher proportion still in the pipeline relative to any other group with 10.1%. In most cases, a significantly higher proportion of non-white students were still enrolled at four-year institutions at the end of the study when compared with white students from similar college readiness benchmark categories.

Even after combining the bachelor's completion rates with the four-year pipeline rate, the non-Asian minority students were still significantly behind their Asian and white peers. However, the previously described small difference between the Asian and white students favoring Asian students becomes somewhat larger and the one area where white students had an advantage (for those missing all of the benchmarks) is nearly eliminated.

Figure 18.
The Interaction of Race & College Readiness and Bachelor's Completion



While African-American students had a relative advantage over white students in terms of initial enrollment at four-year institutions throughout all of the college readiness categories, the pattern in terms of bachelor's completion was just the opposite.

White students missing all of the benchmarks had a higher rate of bachelor's completion than African-American students who met two of the college readiness benchmarks and Hispanic students who met one of the benchmarks.

Table 8.
Mean ACT Scores for Four-Year Starters by Race and College Readiness

Race	ACT College Readiness Group	Composite	Math	English	Reading	Science
African-American	All Four Subjects	26.9	26.8	26.4	27.2	26.5
	3 of 4 Subjects	23.5	23.7	23.7	24.3	21.9
	2 of 4 Subjects	20.9	19.1	21.4	22.5	19.9
	1 of 4 Subjects	18.3	17.4	19.1	17.8	18.5
	None	15.6	15.7	14.2	15.3	16.4
Hispanic	All Four Subjects	27.1	27.3	26.3	27.5	26.6
	3 of 4 Subjects	23.9	24.2	23.8	24.8	22.2
	2 of 4 Subjects	21.1	19.8	21.5	22.5	20.2
	1 of 4 Subjects	18.6	18.0	18.9	18.2	18.8
	None	16.1	16.4	14.4	15.9	17.2
Asian	All Four Subjects	28.5	29.8	27.9	28.1	27.8
	3 of 4 Subjects	24.3	26.3	24.4	23.6	22.5
	2 of 4 Subjects	21.5	22.8	21.7	20.2	20.8
	1 of 4 Subjects	19.1	20.4	18.5	17.4	19.6
	None	16.2	17.1	14.0	15.3	17.8
White	All Four Subjects	28.1	28.3	27.6	28.3	27.6
	3 of 4 Subjects	24.1	24.6	24.3	24.4	22.6
	2 of 4 Subjects	21.5	20.9	22.0	21.9	20.8
	1 of 4 Subjects	19.1	18.8	19.4	18.2	19.6
	None	16.8	17.2	14.9	16.2	18.2

How are parental income and college readiness associated with bachelor's degree completion?

The relationship between parental income, college readiness, and bachelor's completion was very similar to the relationship between parental income, college readiness, and initial four-year enrollment. For each of the college readiness benchmark categories, students from the wealthiest families had the highest rate of bachelor's degree completion (Figure 19). Furthermore, the students meeting all or more of the benchmarks from the wealthiest families had the highest proportions earning a bachelor's degree.

Recent research has established that students from higher socioeconomic backgrounds complete bachelor's degrees at higher rates than students from lower socioeconomic backgrounds (Astin & Osegura, 2005; Titus, 2006; Wyner, Bridgeland, & Diiulio, 2007). One would hope that the advantage of students from wealthier families in terms of bachelor's completion would be mitigated to some extent by college readiness, but in looking at these descriptive results this was not necessarily the case. Higher family income was related to increased rates of bachelor's completion even among students with the same level of college readiness.

Looking at variability in ACT scores by income group in addition to benchmarks might provide some explanation for this trend (Table 9). For example, as shown on Table 9, the mean Math and English scores for high-income students who met all of the benchmarks were 28.9 and 28.0, while the mean Math and English scores for low-income students for the same college readiness category were 27.5 and 26.9. Also, a much higher proportion of the high income students who met all of the benchmarks enrolled at the most competitive institutions, which tend to have higher aggregate bachelor's completion rates. This too could help explain a portion of the roughly 12.6 percentage point difference between the students in the high (87.9%) and low (75.3%) parental income categories who met all of the college readiness benchmarks.

Higher family income was related to increased rates of bachelor's completion even among students with the same level of college readiness.

Figure 19.
The Interaction of Parental Income & College Readiness and Bachelor's Completion

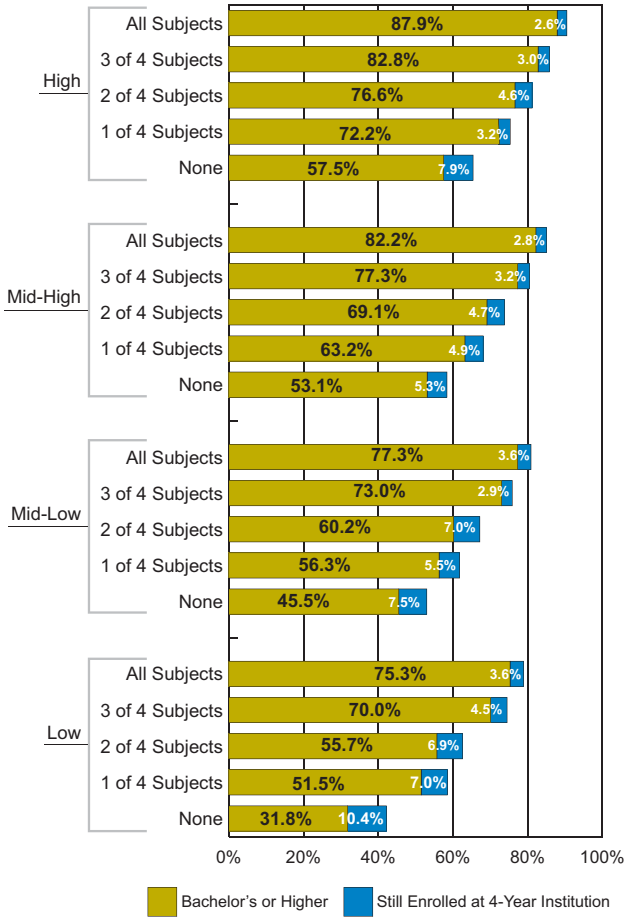


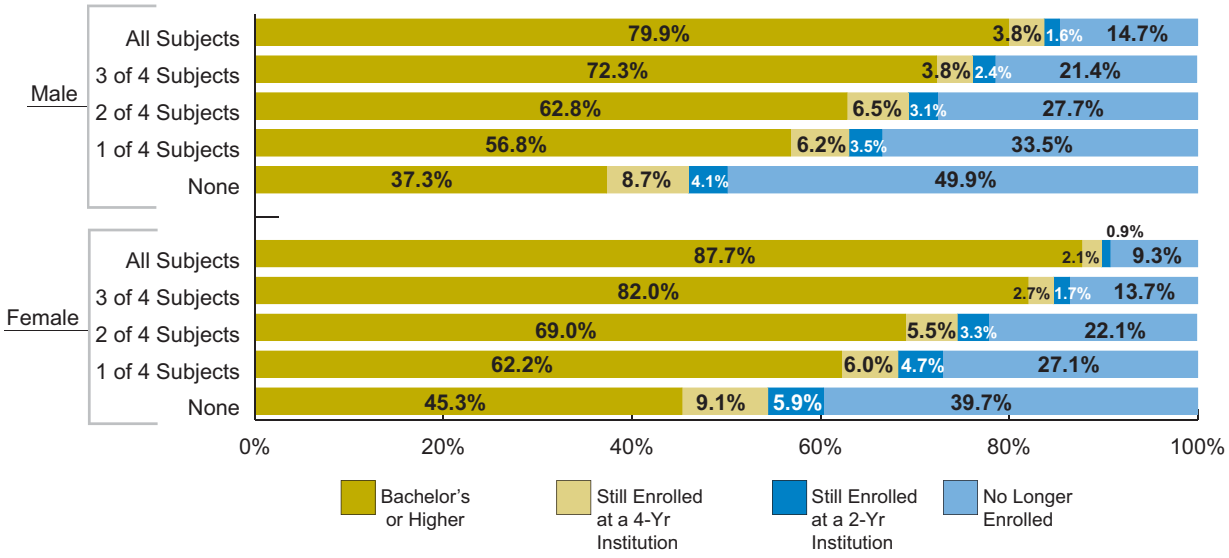
Table 9.
Mean ACT Scores for Four-Year Starters by Parental Income and College Readiness

Income	ACT College Readiness Group	Composite	Math	English	Reading	Science
High	All Four Subjects	28.5	28.9	28.0	28.6	27.8
	3 of 4 Subjects	24.3	25.0	24.5	24.5	22.6
	2 of 4 Subjects	21.6	21.1	22.2	21.8	20.8
	1 of 4 Subjects	19.2	19.0	19.5	18.0	19.6
	None	16.8	17.3	15.0	16.1	18.1
Mid-High	All Four Subjects	28.1	28.5	27.6	28.3	27.6
	3 of 4 Subjects	24.1	24.7	24.3	24.3	22.6
	2 of 4 Subjects	21.5	20.9	21.9	22.0	20.7
	1 of 4 Subjects	19.0	18.7	19.2	18.2	19.6
	None	16.6	17.0	15.0	16.0	18.1
Mid-Low	All Four Subjects	27.7	27.8	27.1	28.0	27.3
	3 of 4 Subjects	23.9	24.2	24.1	24.3	22.4
	2 of 4 Subjects	21.3	20.4	21.7	22.2	20.6
	1 of 4 Subjects	18.9	18.4	19.2	18.2	19.3
	None	16.2	16.6	14.6	15.9	17.4
Low	All Four Subjects	27.5	27.5	26.9	27.9	27.1
	3 of 4 Subjects	23.9	24.3	23.7	24.3	22.5
	2 of 4 Subjects	21.1	20.1	21.5	22.1	20.3
	1 of 4 Subjects	18.6	18.2	18.9	17.9	18.9
	None	15.7	16.1	14.1	15.4	16.7

How are gender and college readiness associated with bachelor's degree completion?

Recent literature shows that females now graduate with bachelor's degrees at higher rates than males, a reversal of the past trend favoring males (Buchmann & DiPrete, 2006; Buchmann, DiPrete, & McDaniel, 2008; Goldin, Katz, & Kuziemko, 2006; Smalley et al., 2010). The current study echoes these findings and establishes a gender gap favoring female students throughout all of the benchmark categories (Figure 20) . In fact, female students who met three benchmarks had a higher rate of bachelor's degree completion than male students who met all of the benchmarks (82.0% to 79.9%). Generally speaking, higher proportions of male students were still enrolled at four-year institutions at the end of the study when compared with female students from parallel readiness categories with the exception of those missing all of the benchmarks. Furthermore, significantly higher proportions of male students were no longer enrolled at the end of the study.

Figure 20.
The Interaction of Gender & College Readiness and Bachelor's Completion

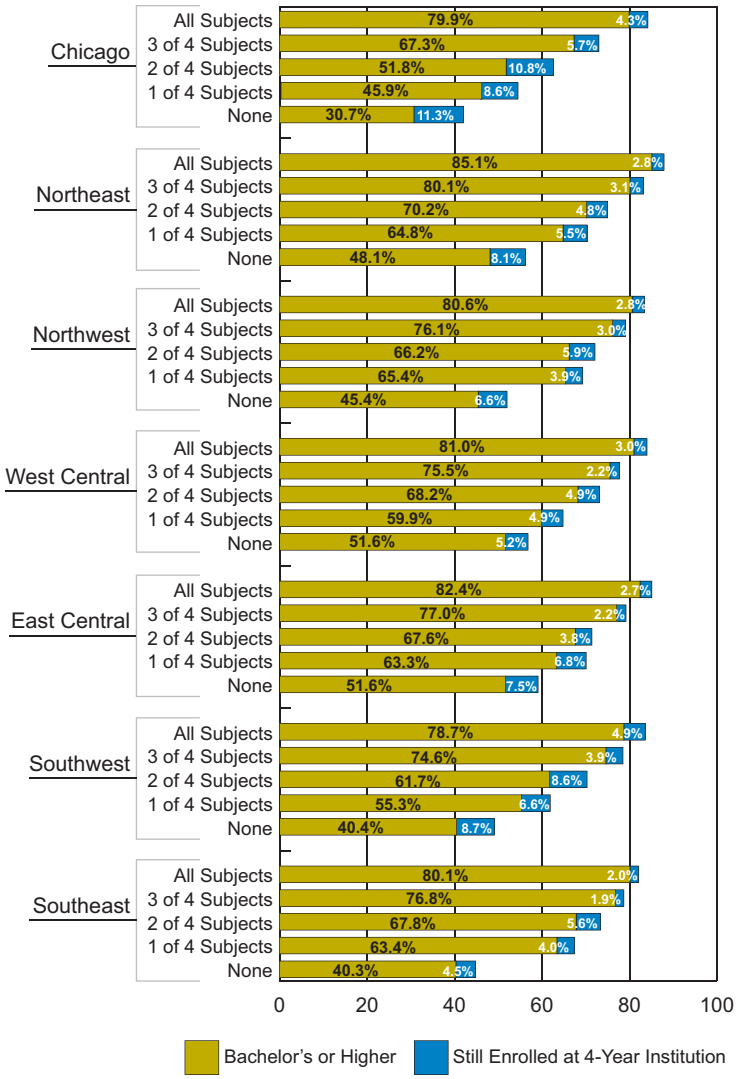


- *Female students who met three benchmarks had a higher rate of bachelor's degree completion than male students who met all of the benchmarks.*
- *Higher proportions of male students were still enrolled at four-year institutions at the end of the study when compared with female students from parallel readiness categories with the exception of those missing all of the benchmarks.*

How are region and college readiness associated with bachelor's completion?

As illustrated in Figure 21, among the students meeting all of the college readiness benchmarks, students from the Northeast region had the highest rate of bachelor's completion (85.1%), followed by similarly prepared students from the East Central region (82.4%). Students from all other regions clustered within 1.3 percentage points of 80%. For those meeting three out of four benchmarks, students from the Northeast also had a relative advantage over students from all other regions (80.1%); students from all other regions clustered within two percentage points of 75% with one notable exception—similarly prepared students from Chicago had a significantly lower rate of bachelor's completion at 67.3%. In fact, when looking at bachelor's completion rates of students from all other regions for students meeting three or fewer benchmarks, students from Chicago had the lowest rates by a wide margin. Among the students missing all of the benchmarks who enrolled at four-year institutions, students from the West Central and East Central regions had the highest bachelor's completion rates (51.6%), closely followed by students from the Northeast region (48.1%). For students from several of the regions who met at least one benchmark, the rates of bachelor degree completion were all near or above 60%, with the exception of students from Chicago and the Southwest region.

Figure 21.
The Interaction of Region & College Readiness on Bachelor's Completion



Among the students meeting all of the college readiness benchmarks, students from the Northeast region had the highest rate of bachelor's completion, followed by similarly prepared students from the East Central region.

How are institutional selectivity and college readiness associated with bachelor's degree completion?

The selectivity of a student's initial four-year institution impacted the rate of bachelor's degree completion, even when making the comparisons across parallel college readiness categories. As shown in Table 10, students enrolling at the most competitive four-year institutions had the highest rates of bachelor's degree completion. Also, among such students, those meeting more of the college readiness benchmarks had higher rates of degree completion relative to students meeting fewer benchmarks, and this was true among all of the selectivity categories. However, when looking for between group differences, there were several instances where students meeting a greater number of benchmarks who enrolled at less competitive institutions were being outperformed by students meeting fewer benchmarks who enrolled at more competitive institutions. For example, students meeting two of the benchmarks who enrolled at highly competitive institutions (82.5%) had a higher rate of bachelor's completion than students in nearly all other college readiness categories from all other institutions. Also, although relatively few students fell into this category, students missing all of the benchmarks who enrolled at highly competitive institutions (72.7%) had a higher rate of bachelor's degree completion relative to students meeting all four of the benchmarks who enrolled at less/non competitive institutions (63.6%).

Table 10.
The Interaction of Selectivity & College Readiness and Bachelor's Completion

	End of Study Status			
Selectivity	Bachelor's or Higher	Still Enrolled at Four-Year	Still Enrolled at Two-Year	No Longer Enrolled
Most/Highly Competitive				
All Four	92.2%	1.7%	0.6%	5.5%
3 of 4	89.2%	2.1%	1.0%	7.7%
2 of 4	82.5%	4.2%	1.1%	12.3%
1 of 4	74.3%	2.3%	3.6%	19.8%
None	72.7%	7.1%	2.0%	18.2%
Very Competitive				
All Four	83.2%	3.4%	1.3%	12.1%
3 of 4	82.4%	3.5%	1.6%	12.4%
2 of 4	72.0%	5.7%	3.1%	19.2%
1 of 4	68.4%	5.6%	4.0%	22.0%
None	55.9%	8.7%	4.9%	30.5%
Competitive				
All Four	76.6%	3.8%	2.0%	17.6%
3 of 4	74.2%	3.1%	2.3%	20.4%
2 of 4	66.4%	5.4%	3.4%	24.9%
1 of 4	62.2%	5.6%	4.4%	27.8%
None	46.7%	8.2%	4.7%	40.4%
Less/Non Competitive				
All Four	63.6%	4.7%	2.5%	29.2%
3 of 4	60.3%	4.5%	3.7%	31.5%
2 of 4	49.8%	9.3%	4.2%	36.8%
1 of 4	42.8%	9.3%	4.2%	43.7%
None	27.5%	10.9%	6.6%	55.0%

Students enrolling at the most competitive four-year institutions had the highest rates of bachelor's degree completion.

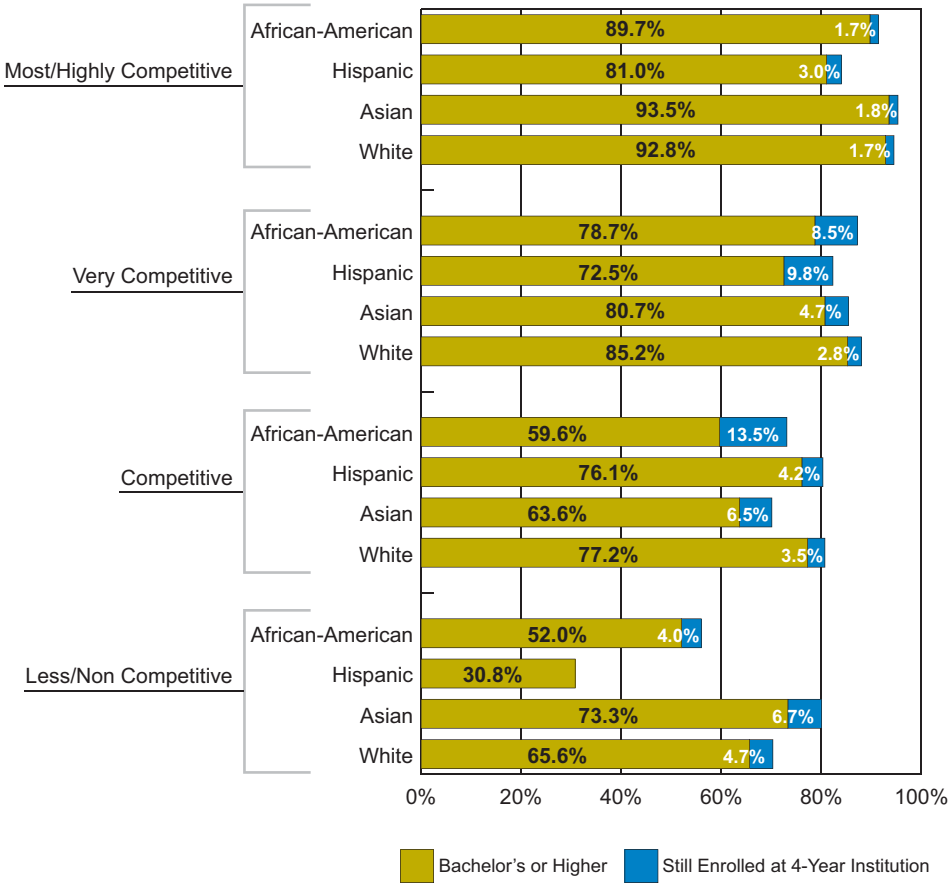
In general, students meeting fewer benchmarks who enrolled at institutions that were more competitive had higher rates of bachelor's completion than students meeting a greater number of benchmarks who enrolled at less competitive institutions.

How are race and selectivity associated with bachelor's completion for students meeting all of the benchmarks?

Students meeting all of the benchmarks performed best (i.e., highest bachelor's completion) when they enrolled at the most competitive institutions, regardless of race. As illustrated in Figure 22, among the students who met all of the benchmarks, enrolling at highly competitive institutions appeared to narrow the racial gap in terms of bachelor's completion, particularly for African-American students. For example, the difference in bachelor's completion rates between African-American students who enrolled at the most competitive institutions and their white counterparts was only 3.1 percentage points (89.7% to 92.8%). However, for similarly ready students who enrolled at competitive institutions, the difference was 17.6 percentage points (59.6% to 77.2%). Also, among the Hispanic students who met all of the benchmarks, the bachelor's completion rates clustered within 8.5 percentage points among those enrolling at highly competitive (81.0%), very competitive (72.5%), and competitive (76.1%) institutions. However, there was an extremely large difference between these students and similarly ready Hispanic students who enrolled at less competitive institutions, as their bachelor's completion rate was only 30.8%.

For African-American students who met all of the benchmarks, there was a rather large decline in the bachelor's completion rates in moving from very competitive to competitive institutions (78.7% down to 59.6%). There was a similar drop-off for Asian students; however, Asian students who enrolled at non competitive institutions actually had higher bachelor completion rates relative to those who enrolled at competitive institutions (73.3% to 63.6%).

Figure 22.
The Interaction of Institutional Selectivity & Race and Bachelor's Completion for Students Meeting all Benchmarks



Among the students who met all of the benchmarks, enrolling at highly competitive institutions appeared to narrow the racial gap in terms of bachelor's completion, particularly for African-American students.

Key Findings

College readiness and the Class of 2003. Slightly less than one out of every five (18.4%) members of the Class of 2003 met all four college benchmarks established by ACT. Nearly twice that proportion (35.7%) missed all of the benchmarks. On the positive side, an additional 12.7% met three of the benchmarks (usually meeting all except Science), and an additional 16.5% met two of the benchmarks (usually meeting English and Reading or English and Math); therefore slightly less than one-half of the class was adequately prepared to have a high probability of postsecondary success in at least two of the subject areas covered by the ACT.

Nearly all of the students (94%) fell into one of the following seven college readiness benchmark categories—missed all, met all, met all except Science, met Math and English, met English and Reading, met English only, and met Reading only. Interestingly, only one of the seven previously mentioned categories included those meeting the Science benchmark. These were students who met all of the benchmarks. Among the four subjects covered by the ACT, Science has the highest benchmark at 24 and perhaps this is why college readiness in Science was a stumbling block for many students in the Class of 2003.

The unequal distribution of college readiness across demographic factors. College readiness, as measured by the ACT benchmarks, was not evenly distributed across race, gender, parental income, nor region. The driving factor behind the racial and regional college readiness gaps may be associated with the unequal distribution of wealth (as proxied by family income) both geographically and across racial groups. For instance, roughly half of the Hispanic and African-American students fell into the low parental income category (less than $30K), while only 30% of Asian students and roughly 18% of white students fell into this income group. Also, while nearly a third of the students from the Northeast region were in the high income category, only 4.9% of students from Chicago and 10.7% of students from the Southeast region met that same distinction.

College readiness gender gap. Relative to female students, a higher proportion of male students met all four of the college readiness benchmarks, while at the same time, a higher proportion missed all four of the benchmarks. In fact, nearly 60% of all male students fell into one of those two college readiness categories, while only half of female students met that distinction. To make up for this difference, significantly higher proportions of female students meet the benchmarks in English and Reading only (14% to 8%) and English-Only (14% to 10%).

College readiness benchmarks and postsecondary success. Meeting three or more—and in some cases two (Math and English)—of the benchmarks was related to increased rates of postsecondary success. This was particularly true for higher income students and those enrolling at more competitive institutions. However, differences in the importance of meeting the ACT benchmarks varied across demographic groups. For example, throughout all of the ACT benchmark patterns, African Americans enrolled at four-year institutions at significantly higher rates than white students. In most cases, within the various college readiness categories, higher proportions of African-American and Hispanic students enrolled at the most competitive four-year colleges, relative to white students.

However, disparities were evident with respect to bachelor's degree completion. These differences are, in part, due to differences in college readiness that favor Asian-Americans, whites, and those from wealthier families. Still, readiness is only part of the story. For example, despite the fact that a higher proportion of male students met all of the college readiness benchmarks, they had significantly lower bachelor's completion rates relative to female students. Perhaps female students were more likely to meet the benchmarks that are most important to degree completion; this requires further study. Also, is some cases white students who were less ready for college completed bachelor's degrees at higher rates than better prepared African-American students. This also requires further investigation, namely examining how non-academic factors—such

as first-generation status—could help explain the difference in bachelor's completion rates.

These findings suggest that access to four-year colleges is no longer the major issue for underrepresented minority students who are college ready. However, the completion of bachelor's degrees in a timely manner remains problematic. It should be noted that for the African-American students meeting all or most of the benchmarks, enrolling at a more competitive institution appeared to narrow the racial gap in terms of bachelor's degree completion, particularly for those enrolling in a highly competitive institution.

Missing all of the benchmarks and postsecondary enrollment. Missing all of the college readiness benchmarks did not act as a definitive barrier to postsecondary enrollment, or even enrollment at four-year institutions. However, once institutional selectivity was explored, it was evident that missing all of the benchmarks was related to extremely low rates of enrollment at highly competitive institutions. Therefore, most of the students missing all of the benchmarks who enrolled at four-year colleges, did so at less/non competitive ones. This is problematic in that less competitive institutions typically have fairly low aggregate rates of bachelor's degree completion, even among students who met all of the college readiness benchmarks.

Discussion

College readiness as an index

The benchmarks used in this study are just that, benchmarks. In other words, the college readiness benchmarks established by ACT revealed important findings with respect to the demographic variables highlighted, but they do not adequately account for variation between the different demographic groups in parallel college readiness categories in terms of performance on each of the tests. For instance, the mean English score for high income students who met all four of the benchmarks was 28.0, whereas for low income students the mean was 26.9, more than a full point lower (Table 9). Viewed dichotomously, both groups of students met all four of the benchmarks and were well-prepared for first-year English composition, among other subject areas. However, if one accounts for the difference in scores, one can make the argument that high income students meeting all four of the benchmarks are slightly "more ready" for college than low income students meeting all four benchmarks. This could help explain some of the difference between these two groups in terms of bachelor's degree completion.

One method for addressing this problem is to adapt an approach developed by the IERC (Presley & Gong, 2005) and described by Conley (2011) that includes a range or index of college readiness rather than a set of benchmarks. Instead of setting benchmarks, one can establish, as Conley (2011) suggested, a three-point range for each subject (e.g., "not ready", partially ready", and "ready"). Another method would be to adapt the IERC College Readiness Index (Presley & Gong, 2005) which already includes three categories similar to Conley's (2011), make it more subject matter specific, but also add "more ready" and "most ready" for the students exceeding the benchmarks. Using a college readiness index could help to better pinpoint where interventions need to occur and the groups that need to be targeted. It should be noted that when ACT's benchmarks are used in conjunction with the scores from the two other components of ACT's college readiness system—EXPLORE and PLAN—educators can target students very early on and determine where curricular weakness should be addressed. ACT (2008b) found that in schools consistently using PLAN, average ACT Composite scores of students of all racial backgrounds increased relative to scores of students at schools not using PLAN.

Assessing the relative impact of ACT subject tests

This study provided evidence that a student's likelihood of meeting all of the ACT college readiness benchmarks appeared to be driven by their performance on the Science test. Given the relatively high score required to meet the benchmark in Science, those who met this benchmark had a high probability of meeting all of the other benchmarks. In fact, for the students meeting the Science benchmark, the median ACT scores on the other three tests were well above the benchmarks set for each of those tests. Furthermore, as shown in Table 11, those meeting the Science benchmark came closest to the median Math, English, and Reading scores for students meeting all of the benchmarks.

This study also revealed differences associated with the relative impact of each test with respect to postsecondary outcomes, thus substantiating earlier findings from Bettinger, Evans, and Pope (2011)

as well as Lichtenberger (2011). For example, the study demonstrated the relative importance of meeting the English and Math benchmarks on the rates of initial enrollment, persistence, and bachelor's completion. Specifically, missing one of these benchmarks had a much more detrimental effect on postsecondary outcomes relative to missing either the Science or Reading benchmark.

Table 11.
Median ACT Scores

ACT College Readiness				Median ACT Scores			
Math	English	Reading	Science	Math	English	Reading	Science
≥22	≥18	≥21	≥24	19	19	19	20
✓	✓	✓	✓	28	27	28	27
✓	—	—	—	26	25	25	24
—	✓	—	—	23	23	23	22
—	—	✓	—	24	24	25	23
—	—	—	✓	27	26	27	26

Scientific/scholarly significance

Despite this study's limitations, it provides evidence to show that for college enrollment and bachelor's degree attainment, college readiness matters. The findings justify both the support of and creation of interventions implemented at the high school level to increase college readiness, particularly interventions targeted towards groups that are less ready for college.

Future Work

Fine-tuning what it means to be college ready. While the current ACT method of benchmarking provides a multidimensional approach to studying college readiness that is easy to interpret, there is variation in test scores across demographic groups meeting the same benchmarks. This variation in ACT test scores partially explains some of the differences in bachelor's completion between demographic groups meeting the same benchmarks. Also, meeting all four of the ACT college readiness benchmarks appears to be driven by performance on the test with the highest benchmark (Science), while, English and Math appear to be the most crucial benchmarks to meet with respect to postsecondary success. Since the Science benchmark is set relatively high (24) and performance on the four tests is strongly correlated (more so for Science and Math, and English and Reading), meeting the Science benchmark is highly related to similar performance in the other subject areas. Therefore, in order to have a high likelihood of meeting all four of the ACT college readiness benchmarks, "college readiness plus" is required in English, Math, and Reading to approximate the 24 in Science. For these reasons, perhaps future measures of college readiness should be refined to include an index with a range of scores, remain multi-dimensional, and weight the various subject areas differently—for example, giving more weight to Math and English.

Exploring employment outcomes for all members of the class of 2003. Future work will involve exploring the association between college readiness, employment, and earnings for all members of the Illinois High School Class of 2003, not just the college-bound students. This could help determine the extent of the overlap between what it means to be college ready and what it means to be ready for a career. Furthermore, this could provide information specific to what is required for workforce success in different industries at various levels (e.g., entry-level).

Examining college readiness and postsecondary outcomes for the graduates of private high schools in Illinois. As previously stated, the current study was delimited to graduates of Illinois public high schools. After presenting the preliminary results at a state research conference, it was suggested that the IERC conduct similar analyses for the graduates of Illinois private high schools (N=12,441). One limitation of this line of research would be that it would only include private high school students who took the ACT. Although students enrolling at private high schools are not required to take the ACT as part of the Prairie State Achievement Exam, most take it anyway. Also, a high proportion of these students are enrolling at Illinois postsecondary institutions, both public and private, and therefore, this group is important in setting state-level public policy related to higher education.

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