Initial Evidence Supporting Interpretations of Scores from the Enhanced ACT Test

Jeff Allen and Ty Cruce

Introduction

The ACT® test has evolved to better meet the needs of students. The changes to the test are designed to help students do the following:

- perform their best on test day
- have the flexibility and choice to determine how they will test
- demonstrate their true capabilities and potential
- tailor their testing experience to fit their future goals and highlight their strengths

Supporting this evolution, two versions of the ACT test were administered during the June 2024 national test date: the legacy ACT test and a new, enhanced ACT test. At all test centers that administered the test online, students who tested during that national test date were randomly assigned to take one of the two versions of the test, and scores from either version were eligible for college reporting.

Like the legacy test, the enhanced test includes multiple-choice tests in English, math, reading, and science. The enhanced test is shorter than the legacy test and allows more time per test question (item). The enhanced test also includes embedded field test items, which are not counted in students' scores. A comparison of the legacy and enhanced test specifications is provided in Table 1.

In addition to the changes to the number of items and time allowed, there are additional differences in the test design for the enhanced test. For more details on test design, please see the Design Framework for the ACT Enhancements (ACT, 2025).

Table 1. Enhanced and Legacy ACT Test Specifications

Test	Section	Scored items	Field test items	Total items	Number of minutes allowed
Enhanced ACT	English	40	10	50	35
	Math	41	4	45	50
	Reading	27	9	36	40
	Science	34	6	40	40*
	Total	**142**	**29**	**171**	**170**
Legacy ACT	English	75	0	75	45
	Math	60	0	60	60
	Reading	40	0	40	35
	Science	40	0	40	35
	Total	**215**	**0**	**215**	**175**

Note. *For the June 2024 administration of the enhanced ACT, 45 minutes was allotted for the science test.

In this report, we summarize some of the evidence supporting interpretations of scores from the enhanced ACT. We focus on reliability, concurrent validity, predictive validity, and score comparability. Other important evidence for supporting interpretations of scores from the enhanced ACT that are not covered in this report include alignment to state content standards, alignment to expectations for college and career readiness, student perceptions after testing, and other psychometric evidence (e.g., linking study design, standard error of measurement, evaluation of population invariance of equating results, and timing/speededness). For more details on these and other topics, please see the Design Framework for the ACT Enhancements (ACT, 2025) and the Enhanced ACT Linking Study Report (Li, Kapoor, Arthur, Huang, Cho, Qiu, & Wang, 2025). Also, note that some of the results documented in this report are also summarized in Chapter 4 of the Design Framework for the ACT Enhancements (ACT, 2025).

We argue that the evidence presented in this report supports the interpretation of scores from the enhanced ACT as measures of high school academic achievement and college readiness. In turn, those interpretations support the use of scores from the enhanced ACT for informing college admissions decisions, awarding college scholarships, placing students into programs and courses, identifying students in need of academic support, and measuring academic achievement at the school and district level for accountability systems. Because section test scores from the enhanced ACT are linked to section test scores from the legacy ACT using equipercentile equating methods, the enhanced ACT supports continued interpretations of ACT section scores that were established from the legacy ACT, including interpretations of the ACT College Readiness Benchmarks.

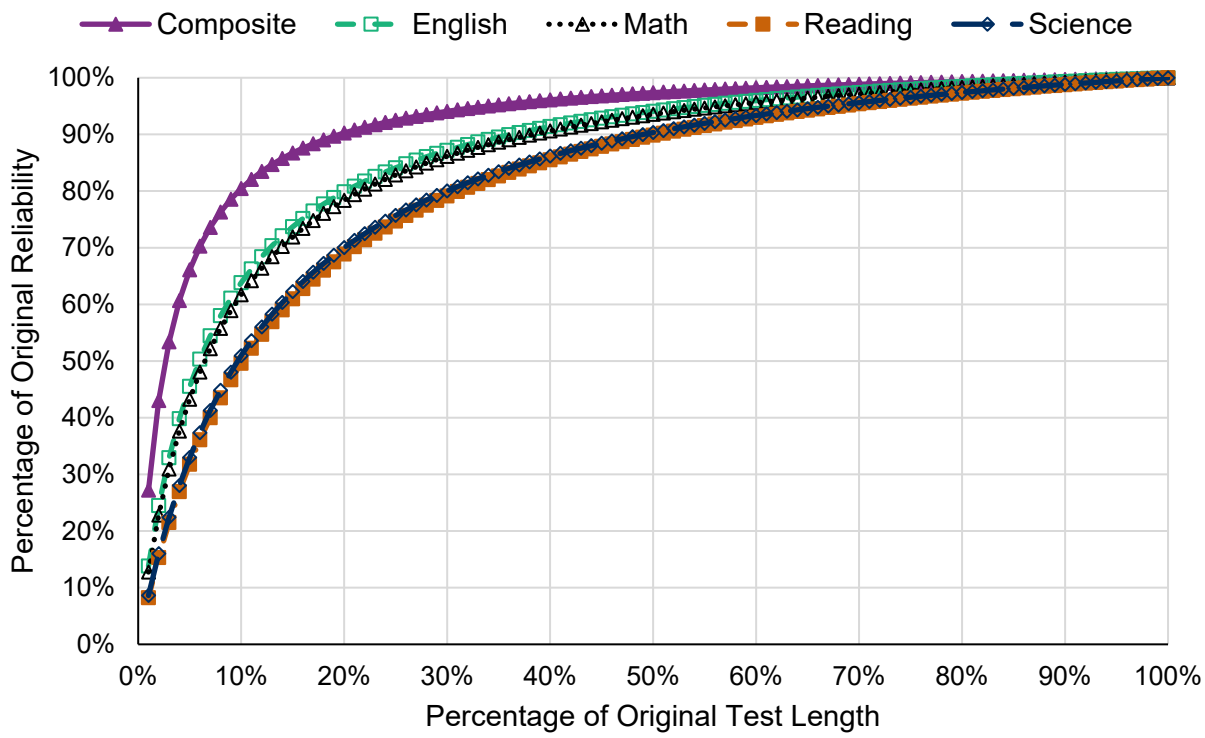
Methods

Reliability

Reliability or precision refers to the consistency of scores across replications of a testing procedure (American Educational Research Association [AERA] et al., 2014). Examining how the reliability coefficients of ACT test scores vary for the enhanced and legacy ACT is important for supporting score interpretations. We compare reliability coefficients for the enhanced and legacy ACT administered online for students who participated in the June 2024 Linking Study. Because two enhanced ACT test forms were administered, we present the mean reliability coefficients across the two forms. Reliability estimates for each enhanced ACT test form are provided in the Enhanced ACT Linking Study Report (Li et al., 2025).

We anticipate a decrease in the reliability of the section test scores and Composite score for the enhanced ACT when compared to the legacy ACT given the decrease in the number of items appearing on the enhanced ACT. Using the Spearman-Brown Prophecy Formula (Spearman, 1910; Brown, 1910), Figure 1 illustrates the relationship of test length and reliability, assuming that the reliabilities of the legacy ACT are .94, .93, .89, .89, and .97 for the English, math, reading, science, and Composite scores, respectively.[1]

Figure 1. Relationship of Changes in Test Length and Expected Changes in Reliability



[1] These are the estimated reliability estimates for the legacy ACT from June 2024 online testing.

Given the number of scored items for the enhanced ACT (Table 1), the reliabilities of the enhanced ACT English, math, reading, science, and Composite scores are expected to be approximately 95%, 97%, 95%, 98%, and 99% of the reliabilities of the respective scores from the legacy ACT. This prediction is crude because it assumes that the tests are the same except for the test length, whereas there are other differences between the enhanced and legacy ACT that could impact reliability.

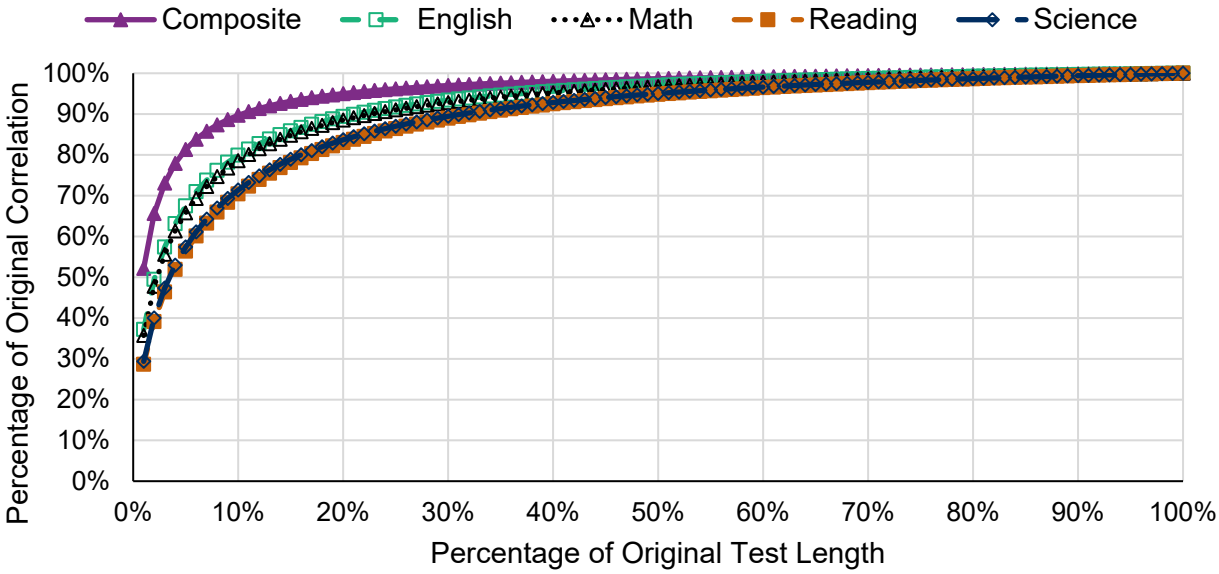
Given an anticipated decrease in the reliability of the section test scores and Composite score for the enhanced ACT compared to the legacy ACT, we would expect a small decrease in the correlations among the test scores themselves and between the test scores and other contemporaneous and subsequent measures of academic achievement. The correlation between a test score (*X*) and other measure of academic achievement (*Y*) is a function of the reliability of the test score. Equation 1 shows the expected correlation between *X* and *Y* (ρ_*) given the reliability ($r_{xx,*}$), the original correlation (ρ_0), and the original reliability ($r_{xx,0}$):

Equation 1: Expected Change in Correlation With Change in Reliability

$$\rho_* = \rho_0 \sqrt{\frac{r_{xx,*}}{r_{xx,0}}}$$

Applying both the Spearman-Brown Prophecy Formula and Equation 1, Figure 2 shows the relationship of test length and correlation with another variable. As the length of the tests decrease, the expected correlation decreases very slowly. In fact, even with a 50% reduction in test length, the expected correlations are still at least 90% of the original correlation.

Figure 2. Relationship of Changes in Test Length and Changes in Correlations With Other Variables



Given the number of scored items for the enhanced ACT (Table 1), the correlations of enhanced ACT English, math, reading, science, and Composite scores with other variables are expected to be approximately 97%, 98%, 98%, 99%, and 99% of the correlations that are observed for the legacy ACT.

Interrelationships Among ACT Section Test Scores

The intercorrelations of ACT section test scores provides evidence of convergent or divergent relationships among the constructs being measured. For example, higher English and reading correlations are evidence of convergent relationships, while lower English and math correlations are evidence of divergent relationships. Using the scores of all students who took the ACT online during the June 2024 Linking Study, we compared the intercorrelations of ACT section test scores for the enhanced ACT to those of the legacy ACT. Despite the new enhancements, we would anticipate that the overall pattern of relationships among the section test scores would be comparable between the enhanced ACT and the legacy ACT, although we expected somewhat lower correlations for the enhanced ACT because of the anticipated lower reliability of these test scores.

Concurrent Validity

The validity of interpretations of ACT test scores are supported by evidence of relationships of ACT scores with other measures of current academic performance. Arguments of concurrent validity for the enhanced ACT are supported by relationships of ACT scores from the enhanced ACT test with high school grades and prior test scores from the legacy ACT test. We compared correlations for two groups of students: those who were randomly assigned to the enhanced ACT and those who were randomly assigned to the legacy ACT.

First, we compared the correlations between ACT Composite scores and high school grades. Through ACT's registration system (MyACT®), students have the option of reporting the courses they have taken in high school and the grades they have earned. High school GPA (HSGPA) was calculated by averaging the students' self-reported grades earned in up to 23 core high school courses taken in English, math, social studies, and the natural sciences. In addition to HSGPA, we compared the correlations between ACT Composite scores and the ACT Rigor Index. The ACT Rigor Index is like HSGPA, but it awards more points for taking more difficult courses. The ACT Rigor Index is based on student-reported grades in up to 30 different high school courses (including foreign languages and arts, in addition to the core subject areas) and incorporates indicators for advanced coursework and students' plans for taking upper-level STEM courses (chemistry, physics, advanced math, and calculus). See Allen & Mattern (2019) for more information about the ACT Rigor Index.

Second, we compared the correlations between students' ACT section scores and their respective high school grades in the four core subject areas (i.e., English, math, social studies, and natural science). Subject-area GPA was calculated for students who used MyACT to report their course grades in at least three English, math, social studies, and natural science courses, respectively.

Finally, we compared the correlations between the students' test scores from the June 2024 Linking Study and their test scores from a prior ACT administration. Overall, 54% of the students who participated in the June 2024 Linking Study had taken the ACT previously, and this share did not differ for students who were randomly assigned to the enhanced ACT or the legacy ACT.

As stated earlier, correlations between two measures are a function of the reliability of the two measures. If the reliability of one or both measures decreases, then the correlation is also expected to decrease. Therefore, we expect to find that the correlations of enhanced ACT scores with high school course grades and prior ACT test scores are comparable, but slightly lower when compared to the correlations of legacy ACT scores. In addition to comparing the correlations for the enhanced and legacy ACT, we test whether the differences in correlations are statistically significant. Correlations were considered significantly different if the z-score from the correlation difference test was greater than 3.0.

Analysis of Differences in Differential Validity for Enhanced and Legacy ACT

It is possible that the relationship of ACT test scores with other variables varies for different groups of students. These differences are evidence of *differential validity*. Further, it is possible that differential validity could be different for the enhanced ACT and legacy ACT. Detecting differences in differential validity for the enhanced ACT and legacy ACT is important for understanding if the evidence supporting interpretations of ACT scores for different groups of students is different for the enhanced ACT. Therefore, we tested for *differences* in differential validity between the enhanced and legacy ACT. A difference in differential validity could emerge, for example, if Composite scores from the legacy ACT have stronger relationships with high school GPA for students who are female compared to students who are male, but Composite scores from the enhanced ACT have similar relationships with high school GPA regardless of student gender. The tests of differences in differential validity were conducted using multiple linear regression with interaction terms. Results were considered statistically significant if the z-score associated with the difference in difference was greater than 3.0. The student subgroups included gender groups (female, male, and another gender), racial/ethnic groups (Asian, Black, Hispanic, Native American, Native Hawaiian or other Pacific Islander, two or more races, and White), and grade level (6–10 or 11/12).

In addition to testing for differences in differential validity by student demographic characteristics, we also tested for differences in differential validity by students' preparation for the June 2024 test date. Because students did not know whether they would take the enhanced or legacy ACT and did not know the enhanced ACT test specifications prior to the June 2024 test, students were not able to prepare specifically for the enhanced ACT. Students could have used the test preparation resources that have been developed for the legacy ACT, and those resources may have benefitted them on the enhanced ACT as well. However, it is also possible that ACT score validity coefficients vary for students who prepared for the test versus those who did not, and that there are differences in test prep-related differential validity between the enhanced and legacy ACT. Therefore, we tested for differences in differential validity by test preparation indicators, including 1) whether the student previously took the ACT test, 2) whether

the student previously took the PreACT test, 3) whether the student took one or more timed ACT practice tests, and 4) whether the student prepared for the test using any test prep materials. The ACT and PreACT prior testing indicators were obtained using historical ACT and PreACT testing data and the other two test prep indicators were obtained through the special survey administered after the June 2024 ACT test.

All analyses of differences in differential validity were conducted for correlations of ACT scores with high school GPA, the ACT Rigor Index, and prior ACT test scores.

Predictive Validity

The validity of interpretations of ACT test scores are also supported by evidence of relationships of ACT scores with subsequent measures of academic performance, such as first-year cumulative college GPA (FYGPA), individual first-year college course grades, and college degree attainment. As such, predictive validity evidence for ACT scores requires time for the students who have taken the ACT to enter college. Because most students who took the enhanced ACT as part of the June 2024 Linking Study just completed 11th grade, predictive validity evidence specific to the enhanced ACT is not yet available.

However, historical data for students who took the legacy ACT and enrolled in college can be used to examine how the predictive validity of ACT section and Composite scores might change when those scores are based on a shorter test that matches the number of items scored for the enhanced ACT. To achieve this, we used ACT test data and college outcomes data that had been collected for students who took the legacy ACT test. For each test form, we randomly selected the items from each section test to simulate shortened tests that match the enhanced ACT's number of scored items.[2] (Hereafter, we will refer to these shortened tests as a "simulated enhanced" test.) For example, for each English test form, we randomly selected 40 of the 75 test items from the full English test. For each test section, we then calculated the number correct, and converted the number correct to a scale score so that the mean and standard deviation of the scale score matched the mean and standard deviation of the scale score from the legacy (full) test. Using the scale scores generated from the simulated enhanced test, we then calculated the Composite score for the simulated enhanced test.

To compare the correlations of ACT Composite scores with FYGPA between the simulated enhanced ACT and legacy ACT, we used a data set of 1,111,776 students who completed high school between 2006 and 2017 and enrolled at one of 527 2- and 4-year colleges that provided ACT with students' first-year college GPA. To compare the correlations of ACT subject scores with individual first-year course grades between the simulated enhanced ACT and legacy ACT, we used a data set of 327,512 students who completed high school between 2006 and 2017 and enrolled at one of 375 two- and four-year colleges that provided ACT with course-specific grade data. To compare the correlations of ACT Composite scores with degree attainment

[2] We also explored other methods for selecting a subset of p items from the full set of n items including (a) select the first p items from each section test, (b) select the p items with the highest correlations with first-year college GPA, and (c) select the p items with the lowest correlations with first-year GPA. Results were similar across item selection methods.

between the simulated enhanced ACT and legacy ACT, we used a dataset composed of a random sample of 116,918 ACT-tested students who completed high school in 2017 and entered the subsequent fall into one of 2,578 2- and 4-year colleges for which degree attainment status was tracked over 6 years by the National Student Clearinghouse. Note that these three datasets are partially overlapping, with some students and institutions appearing in more than one analysis.

We hypothesized that the correlations between the scores of the simulated enhanced ACT with college outcomes such as FYGPA, first-year course grades, and degree attainment would be comparable, albeit smaller, than the correlations that result from the scores of the legacy ACT. We caution, however, that scoring a shortened version of the legacy ACT for students who took the legacy ACT does not fully capture the differences between the enhanced ACT test and the legacy ACT test for several reasons. First, the creation of the simulated enhanced ACT test forms and their scale scores does not follow the method of form construction and equating that is typically followed in creating the reporting scale. Second, the enhanced ACT has other design changes in addition to having fewer scored items than the legacy ACT. Additionally, the experience of taking the enhanced ACT test, with fewer test questions and more time per test question, cannot be fully simulated by simply scoring fewer items for students who took the legacy ACT. Therefore, the predictive validity evidence presented in this report is provisional and will require additional analyses based on actual postsecondary outcomes data for students who take the enhanced ACT.

Leveraging Current and Historical Data

As described above, analyses of reliability, ACT score interrelationships, and concurrent validity are based on the June 2024 Linking Study, while the analyses of predictive validity are based on historical data for students who took the legacy ACT and enrolled in college. The June 2024 Linking Study allows us to compare results for the enhanced and legacy ACT, while the historical data allows us to compare predictive validity results for a simulated enhanced ACT and legacy ACT.

Given that the data required for the analyses of ACT score interrelationships and concurrent validity are also available for the historical student samples, we also conducted those analyses for the historical student samples (see appendix). These additional analyses of the historic data allow us to compare the differences in the results for enhanced ACT versus legacy ACT (using the June 2024 Linking Study data) with the results for the simulated enhanced ACT versus legacy ACT (using the historical data). If the ACT score interrelationships and concurrent validity results are similar across the two datasets, then we have greater confidence that the predictive validity results produced by the historical data are also likely to be similar to the results we will expect from the enhanced ACT data when those become available to ACT.

June 2024 and Historical Validity Sample Summaries

For the June 2024 Linking Study, students were randomly assigned to take either the enhanced or legacy ACT, with a 1-in-3 (33.3%) chance of taking the legacy ACT and a 2-in-3 (66.7%) chance of taking the enhanced ACT. Table 2 summarizes the demographics and ACT scores of

the students who were assigned to the enhanced ACT (*n* = 4,584) and those who were assigned to the legacy ACT (*n* = 2,298). Because students were randomly assigned to the enhanced or legacy ACT, the two groups are evenly balanced on gender, race/ethnicity, grade level, and having previously taken the ACT test. The randomization of students to each test version was utilized to link test scores from the enhanced to the legacy ACT (Li et al., 2025). Therefore, by design, the means and standard deviations of the ACT test scores are nearly identical for students who took the enhanced and legacy ACT.

Table 2. Sample Summaries for Validity Analyses

Variable		June 2024 Linking Study		Historical validity samples		
		Enhanced ACT	Legacy ACT	GPA	Course grades	Degree attainment
Number of students		4,584	2,298	1,111,776	327,512	116,918
Gender (%)	Another gender	0.2	0.1	—	—	—
	Female	54.1	54.7	54.4	54.1	56.0
	Male	44.8	44.6	44.7	44.8	43.1
	Missing	0.9	0.6	0.9	1.1	0.9
Race/ethnicity (%)	Asian	4.9	4.6	2.6	2.3	5.8
	Black	14.4	14.8	9.2	11.4	11.3
	Hispanic	13.6	12.9	4.3	5.1	16.1
	Native American	0.7	0.7	0.6	2.6	0.6
	Native Hawaiian/ OPI	0.1	0.1	0.1	0.1	0.3
	Two or more races	4.8	5.4	2.3	2.4	4.2
	White	57.9	58.3	76.0	71.2	56.6
	Missing	3.7	3.3	5.0	5.0	5.2
Grade level (%)	10	12.0	13.2	0.3	0.4	0.1
	11	68.8	69.6	32.4	26.6	44.3
	12	12.1	10.5	66.7	72.4	55.4
	Other	7.2	6.6	0.6	0.6	0.2
ACT score mean (*SD*)	Composite	21.6 (5.5)	21.6 (5.5)	23.1 (4.5)	21.5 (4.2)	22.5 (5.3)
	English	20.8 (6.4)	20.7 (6.3)	23.0 (5.5)	21.3 (5.1)	22.1 (6.5)
	Math	20.9 (5.6)	20.9 (5.4)	22.7 (4.9)	21.0 (4.6)	22.0 (5.4)
	Reading	22.4 (6.7)	22.4 (6.6)	23.5 (5.6)	21.9 (5.4)	23.0 (6.3)
	Science	21.8 (5.8)	21.8 (5.7)	22.7 (4.5)	21.4 (4.3)	22.3 (5.2)
Took post-test survey (%)		91.6	92.9	NA	NA	NA
Took prior ACT test (%)		53.6	54.2	62.5	59.4	52.6
Reported high school grades (%)		89.2	90.0	87.9	86.2	87.4

Note. OPI = Other Pacific Islander; *SD* = standard deviation; NA = not applicable.

Table 2 also summarizes the demographics and ACT scores of the students included in the historical validity samples examining predictors of first-year college GPA, grades in common

first-year courses, and degree attainment. Compared to the June 2024 Linking Study, the historical validity datasets have relatively more students who are White and fewer who are Black, Hispanic, or two or more races. While 69% of the students in the June Linking Study were in 11th grade, most students in the historical validity datasets were in 12th grade when they last took the ACT. Average Composite scores were highest for the first-year GPA sample (23.1), followed by the degree attainment sample (22.5), course grades sample (21.5), and June 2024 Linking Study samples (21.6).

Comparability of Composite Scores With and Without Science

Beginning in April 2025 for national online testing and September 2025 for all other test administrations, students' Composite scores will be based only on the English, math, and reading tests. We examine the implications of this change for interpreting ACT Composite scores for individual students, as well as for K–12 educational organizations and postsecondary institutions. We use the abbreviations EMRS (English, math, reading, science) to refer to Composite scores with science and EMR (English, math, reading) to refer to Composite scores without science.

First, to examine the extent to which normative interpretations of Composite scores might change when the science score is removed from the Composite score, we produced equipercentile concordances of EMRS and EMR. Next, we examined the extent to which EMRS and EMR scores might differ for individual students, and whether those differences might vary by gender and racial/ethnic subgroups. Finally, we examined the extent to which individual student differences between EMRS and EMR scores could result in different distributions for those scores, and the implications of any differences for college applicant pools and student cohorts entering college.

Study Samples for Composite Score Comparability Analyses

We examined the impact of removing science from the Composite score for six different ACT-tested groups:

- students who took the enhanced ACT as part of the June 2024 Linking Study.
- school-day testers who took the ACT as part of state or district testing programs in spring 2024. This group of students is most representative of the general population of 11th grade high school students.
- students who took the ACT and completed high school in 2024. This is the ACT-tested graduating cohort and is a mix of students who took the ACT as part of a school-day testing program and students who only tested on a national (Saturday) test date. This group represents all U.S. students who take the ACT.
- students who took the ACT and were included in applicant pools for a select set of colleges. The data cover 6 public and 8 private 4-year colleges and universities from across the United States. Applicant pool data for the entering student cohorts of 2021, 2022, and 2023 were used for the analysis.
- students who took the ACT, completed high school in 2022, and enrolled in any college during the 2022–2023 college academic year. This group represents U.S. students who take the ACT and go on to college immediately after high school.

- students who took the ACT, completed high school in 2022, and enrolled in a **four-year** college during the 2022-2023 college academic year. This group represents U.S. students who take the ACT and go on to a four-year college immediately after high school.

By examining the differences for these six groups, the research addresses score comparability for different ACT user groups, including state contract testing populations, prospective college students, and enrolled college students. Table 2 summarizes the demographics and ACT scores of the June 2024 Linking Study sample; Table 3 summarizes the demographics and ACT scores of the other five groups.

Table 3. Sample Summaries for Composite Score Comparability Analysis

Variable		ACT-tested group				
		School day examinees	High school graduates	Select college applicants	College enrollees	Four-year college enrollees
Number of students		1,134,015	1,374,791	158,350	836,339	639,203
Gender (%)	Another gender	0.5	0.6	0.2	0.3	0.3
	Female	44.1	47.2	59.2	54.5	55.8
	Male	44.4	45.5	39.7	43.1	42.2
	Missing	11.0	5.6	0.9	2.0	1.7
Race/ ethnicity (%)	Asian	2.7	4.1	8.0	5.0	5.8
	Black	13.6	12.0	9.4	10.7	10.2
	Hispanic	17.4	17.9	17.1	13.9	12.9
	Native American	1.1	1.0	1.1	0.6	0.6
	Native Hawaiian/ OPI	0.3	0.3	0.2	0.2	0.2
	Two or more races	5.3	5.0	6.1	4.7	4.7
	White	47.5	49.9	53.7	57.3	58.9
	Missing	12.0	9.8	4.4	7.6	6.8
Grade level (%)	10	5.5	1.2	1.3	0.6	0.6
	11	91.4	70.3	55.0	60.8	59.1
	12	2.6	28.2	42.6	38.2	39.9
	Other	0.5	0.3	1.1	0.4	0.4
ACT score mean (*SD*)	Composite	18.3 (5.3)	19.4 (5.9)	24.6 (5.9)	21.4 (5.8)	22.6 (5.7)
	English	17.2 (6.3)	18.6 (7.0)	24.6 (6.9)	20.9 (6.9)	22.2 (6.8)
	Math	18.0 (5.1)	19.0 (5.6)	23.6 (6.1)	20.7 (5.6)	21.7 (5.7)
	Reading	18.8 (6.4)	20.1 (7.1)	25.5 (6.7)	22.2 (6.9)	23.4 (6.8)
	Science	18.7 (5.3)	19.6 (5.8)	24.2 (5.9)	21.4 (5.7)	22.4 (5.6)

Note. OPI = Other Pacific Islander; *SD* = standard deviation.

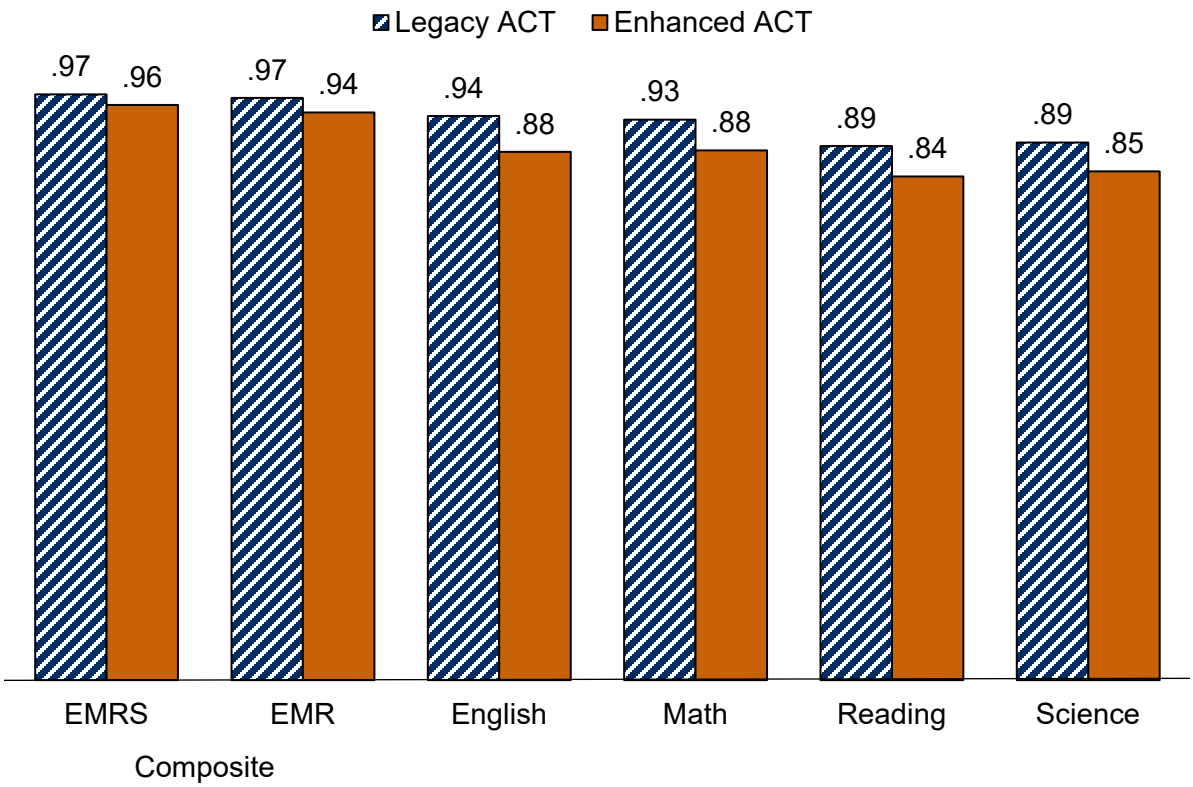
Results

Next, we present the results of the analyses. Results are presented in the following order: reliability, relationships among ACT section test scores, relationships with high school course grades and rigor, relationships with prior ACT scores, prediction of college outcomes, and comparability of normative interpretations of ACT Composite scores with and without science.

As Anticipated, the Enhanced ACT Has Lower Reliability Than the Legacy ACT

Using the June 2024 Linking Study data, reliability coefficients were estimated for the enhanced ACT and legacy ACT (Figure 3). For the four section tests, the reliability coefficients were lower for the enhanced ACT, which is consistent with what we'd expect from the Spearman-Brown Prophecy Formula (Figure 1). The difference in reliability coefficients was very small for EMRS scores (.96 compared to .97) and small for EMR scores (.94 compared to .97). It's important to note that reliability coefficients vary somewhat across ACT test forms. While some of the differences observed in Figure 3 are likely because of the enhanced ACT being shorter than the legacy ACT, it's also possible that some of the differences are because of test form differences. Therefore, the change in reliability observed in Figure 3 does not generalize to all future ACT test administrations.

Figure 3. Reliability Estimates from June 2024 Linking Study



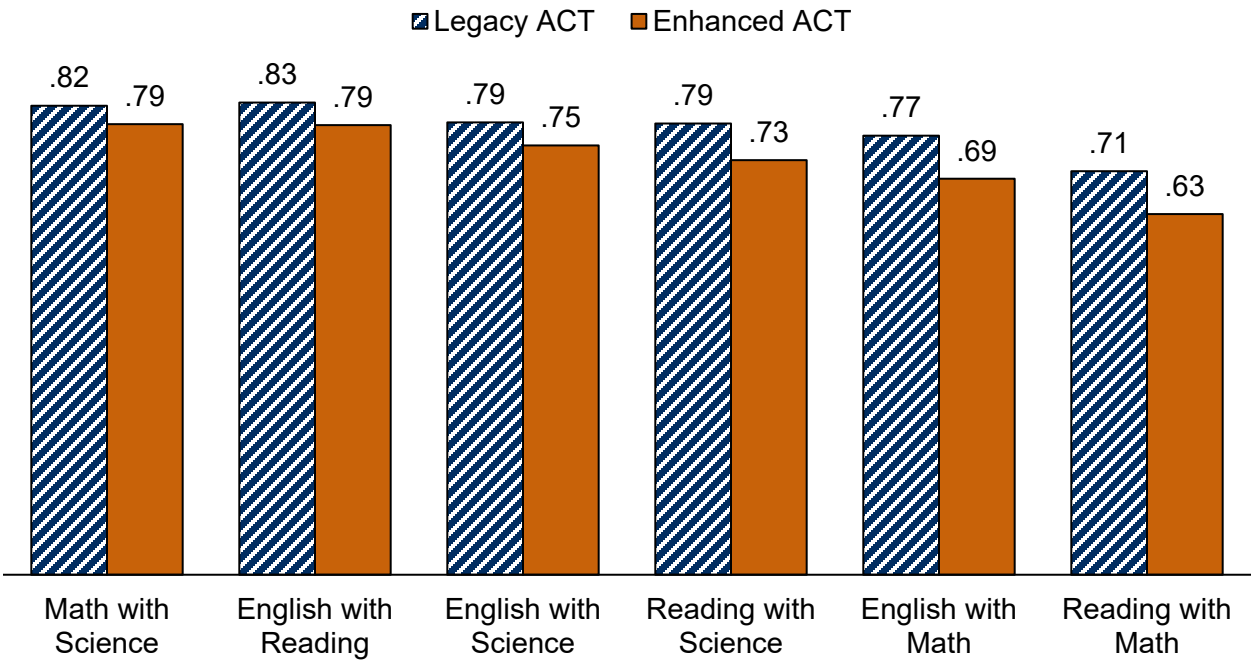
Given the differences in reliability coefficients observed in Figure 3, we can anticipate slightly lower correlations between enhanced ACT scores and other variables, relative to what is observed for the legacy ACT. Applying Equation 1, the correlations of enhanced ACT English, math, reading, and science scores with other variables are expected to be approximately 3% lower than the correlations that are observed for the legacy ACT. The correlations of enhanced EMRS and EMR scores are expected to be approximately 99% of the correlations that are observed for the legacy ACT.

The Relationships Among ACT Section Test Scores Are Comparable Between the Enhanced and Legacy ACT Tests

Figure 4 provides the correlations among the ACT section test scores for students who were randomly assigned to the enhanced version of the ACT and for students who were randomly assigned to the legacy version of the ACT. As the figure shows, the correlations among the ACT section scores are somewhat lower for the enhanced ACT but exhibit similar patterns as the legacy ACT correlations. The lower correlations for the enhanced ACT are expected because of the lower reliability observed for the enhanced ACT test scores.

For both the enhanced and legacy ACT tests, the highest correlations (convergent relationships) were observed for English with reading and for math with science. For both versions of the ACT, the lowest correlations (divergent relationships) were observed for reading with math and for English with math. This suggests that the relationships among the measured constructs are comparable irrespective of the enhancements made to the ACT.

Figure 4. Correlations Among Section Test Scores: Enhanced and Legacy ACT

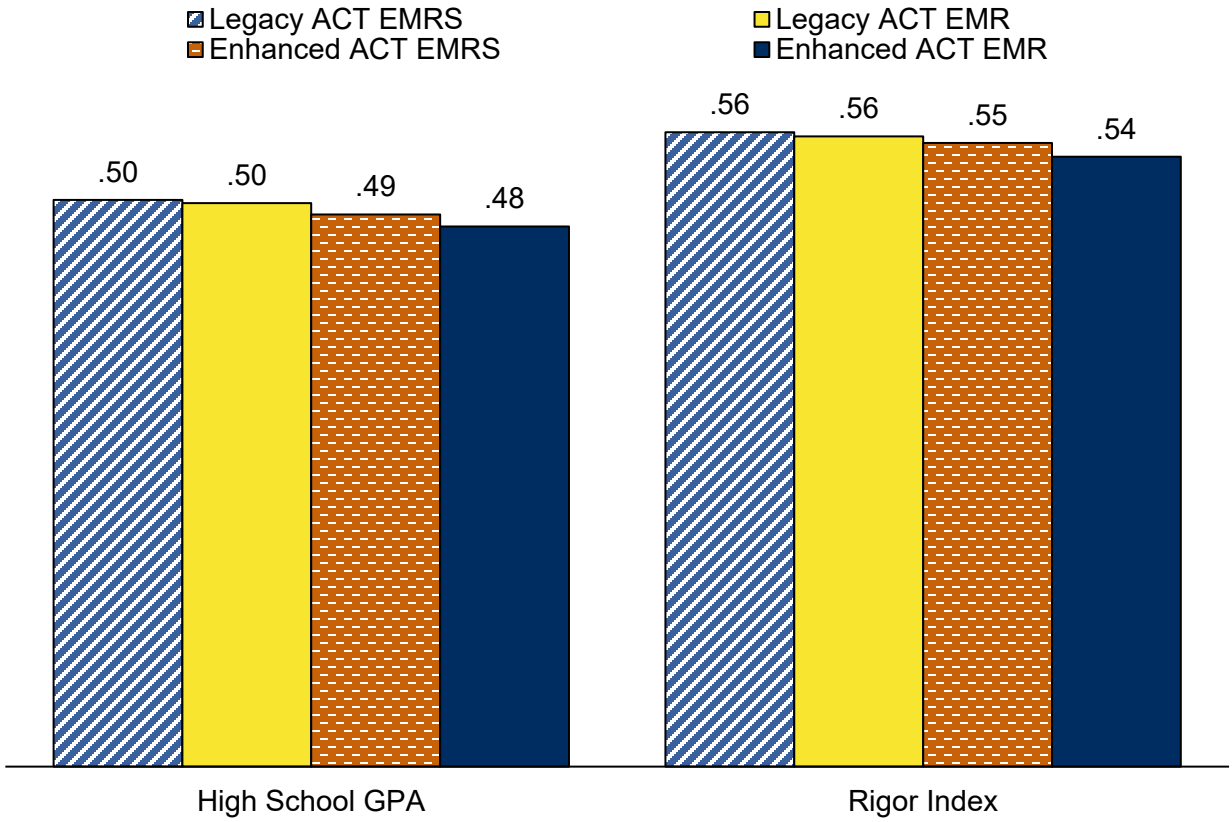


Using the historical predictive validity dataset, we replicated the analysis of correlations among ACT section test scores. This analysis lets us examine results for a simulated enhanced ACT, which has the same number of scored items as the enhanced ACT. Similar to the findings for the enhanced ACT, Appendix Table A1 shows that the correlations among the ACT section scores are somewhat lower for the simulated enhanced ACT but exhibit similar patterns as the legacy ACT tests. Again, the lower correlations for the simulated enhanced ACT may be explained by the lower reliability of the test scores.

Enhanced ACT Scores Are Reflective of High School Grades and Course Rigor

Figure 5 shows the correlations of the ACT Composite scores with the two measures of academic achievement. The correlations are based on students who participated in the June 2024 Linking Study (see Table 2 for sample summary) and reported their high school coursework and grades. This included 89% of the students who took the enhanced ACT and 90% of the students who took the legacy ACT.

Figure 5. Correlations of ACT Composite Scores With Measures of High School Academic Achievement: Enhanced and Legacy ACT



The correlations were slightly lower for the enhanced ACT relative to the legacy ACT. For HSGPA, the correlation was .49 for the enhanced EMRS score and .50 for the legacy EMRS

score. For the enhanced EMR score, the HSGPA correlation was slightly lower (.48) than both the legacy EMR score (.50) and the enhanced EMRS score (.49). The differences in EMRS and EMR correlations with HSGPA between the enhanced ACT and legacy ACT were not statistically significant.

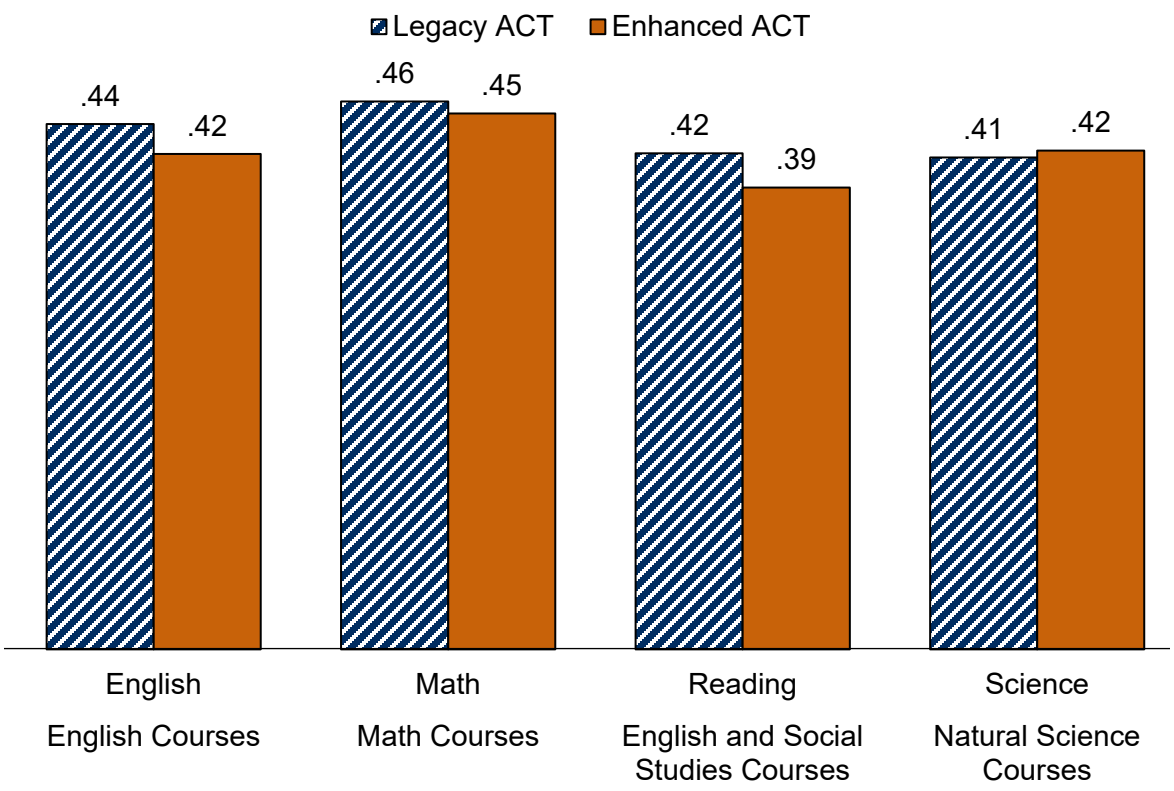
For the rigor index, the correlation was .56 for both the enhanced and legacy EMRS score. For the enhanced EMR score, the rigor index correlation was slightly lower (.54) than both the legacy EMR score (.56) and the enhanced EMRS score (.55). The differences in EMRS and EMR correlations with the rigor index between the enhanced ACT and legacy ACT were not statistically significant. There was no evidence of significant differences in differential validity across the student subgroups and test preparation indicators examined.

Using the historical predictive validity data set, we examined correlations of ACT Composite scores and the two measures of high school academic achievement. This analysis lets us examine results for a simulated enhanced version of the ACT, which has the same number of scored items as the enhanced ACT. From Appendix Table A2, we see a similar pattern of results as observed in Figure 5. Correlations with HSGPA and the ACT Rigor Index were only slightly lower for the simulated enhanced ACT compared to the legacy ACT. While Figure 5 and Appendix Table A2 both show small declines in correlation relative to the legacy ACT, the declines were slightly larger for the actual enhanced ACT than it was for the simulated enhanced ACT. This might be because of factors other than lower reliability, such as timing or differences in test content, that might affect the enhanced ACT but not the simulated enhanced ACT.

Next, using the data collected from the June 2024 Linking Study, we compared correlations of section test scores and high school subject area GPA for the enhanced and legacy ACT (Figure 6). Correlations were calculated for ACT English, math, and science scores with English, math, and natural science course GPAs, respectively. However, we correlated the ACT reading score with the average of the social studies and English course GPAs.

We found that the correlations were slightly lower for the enhanced ACT relative to the legacy ACT for English and reading. However, none of the differences in correlations were statistically significant. For science, the correlations were the same for the enhanced and legacy ACT. These results suggest that the enhanced ACT and legacy ACT are similarly reflective of subject-area GPAs. Further, there was no evidence of significant differences in differential validity across the student subgroups and test preparation indicators examined.

Figure 6. Correlations of ACT Section Test Scores With High School Subject GPA: Enhanced and Legacy ACT



Using the historical predictive validity data set, we replicated the analysis of correlations between section test scores and high school subject area GPA. This analysis lets us examine results for a simulated enhanced version of the ACT, which has the same number of scored items as the enhanced ACT. From Appendix Table A3, we see a similar pattern of results as what we observed in Figure 6, where correlations with subject area GPA were only slightly lower for the simulated enhanced ACT compared to the legacy ACT.

Enhanced ACT Scores are Highly Correlated with Prior ACT Scores

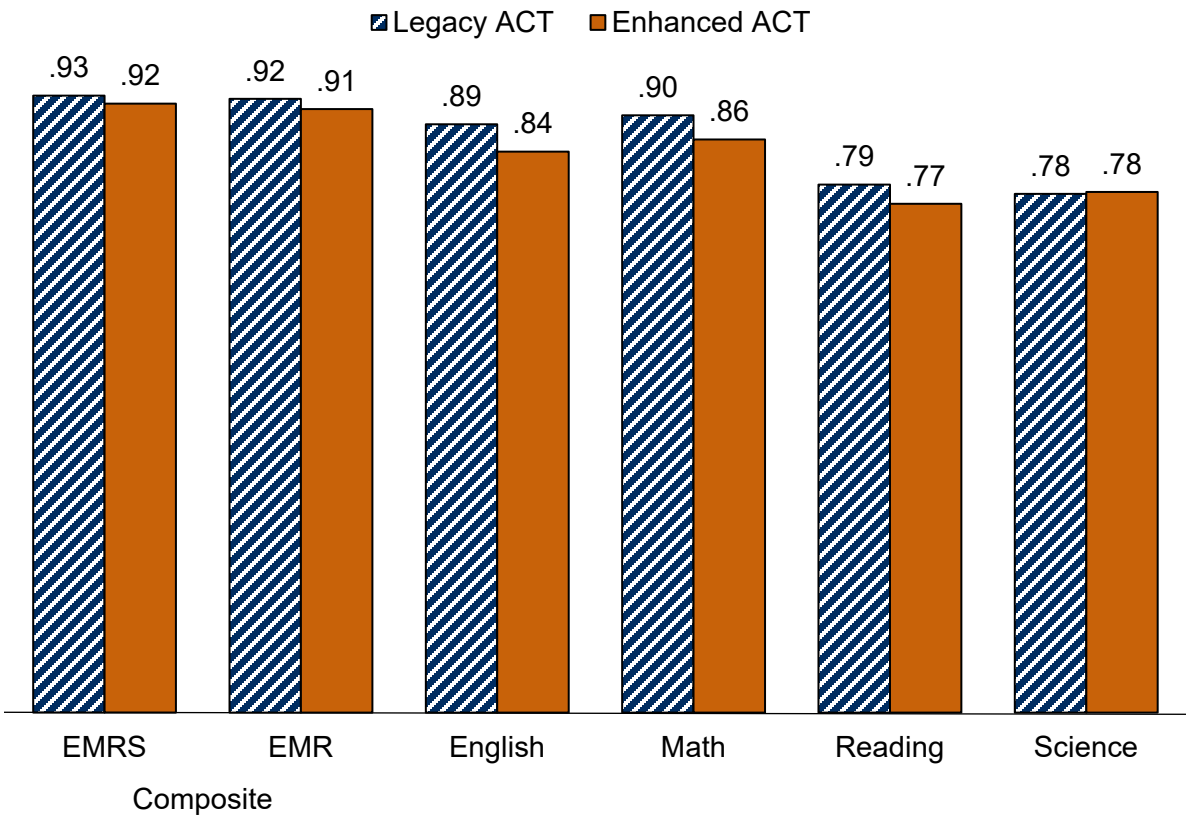
Among the students who participated in the June 2024 Linking Study, 54% had taken the ACT previously (54% of students taking the enhanced ACT, 54% taking the legacy ACT). We examined the extent that relationships with prior ACT test scores were different for students who took the enhanced ACT instead of the legacy ACT.

Figure 7 shows the correlations of the June 2024 ACT scores with prior ACT scores. Note that the students took their prior ACT tests from September 2022 through May 2024, and so all tests were the legacy ACT.

We found that the Composite score correlations were very similar for the enhanced ACT and legacy ACT. Further, the Composite score correlations were very similar for the versions with and without the science score. For the enhanced ACT, the Composite retest correlations were

.91 (EMR) and .92 (EMRS). For the legacy ACT, the Composite retest correlations were .92 (EMR) and .93 (EMRS). This suggests that Composite scores are consistent across tests, even when the first test is the legacy ACT and the second test is the enhanced ACT.

Figure 7. Correlations of ACT Test Scores With Prior ACT Test Scores: Enhanced and Legacy ACT



For science, the retest correlation was .78 for both the enhanced ACT and the legacy ACT. For English, math, and reading, the retest correlations were higher for the legacy ACT relative to those for the enhanced ACT. However, the differences in correlations were only statistically significant for English and math. As discussed earlier, slightly lower correlations are expected for the enhanced ACT because of its shorter test length. Therefore, it is surprising that the retest correlations for science are the same for the enhanced ACT and legacy ACT. This may be explained by the number of scored items for the enhanced science test (34 items) being only 15% less than the number of scored items for the legacy science test (40 items). There was no evidence of significant differences in differential validity across the student subgroups and test preparation indicators examined.

Using the historical predictive validity data set, we compared correlations of ACT scores with prior ACT scores for a simulated enhanced ACT and the legacy ACT. Note that all prior ACT scores were based on a full-length legacy ACT. From Appendix Table A4, we see a similar pattern of results as what we observed in Figure 7, with slightly lower correlations for the simulated enhanced ACT relative to the legacy ACT.

Shortening the ACT Test Will Likely Have Little Impact on the Predictive Validity of the Composite Score

Figure 8 shows the correlation of the ACT Composite score with three college outcomes: first-year college GPA, having earned a bachelor's degree within 6 years of first enrolling in college, and having earned any undergraduate degree or certificate within 6 years of first enrolling in college. As seen in the figure, the correlation between the ACT Composite score and each of the three outcomes was essentially the same for the simulated enhanced ACT and legacy ACT. Removing science from the simulated enhanced ACT Composite score did not change the relationship in any meaningful way.

Figure 8. Correlations of ACT Composite Scores With FYGPA and Degree Attainment: Legacy ACT and Simulated Enhanced ACT

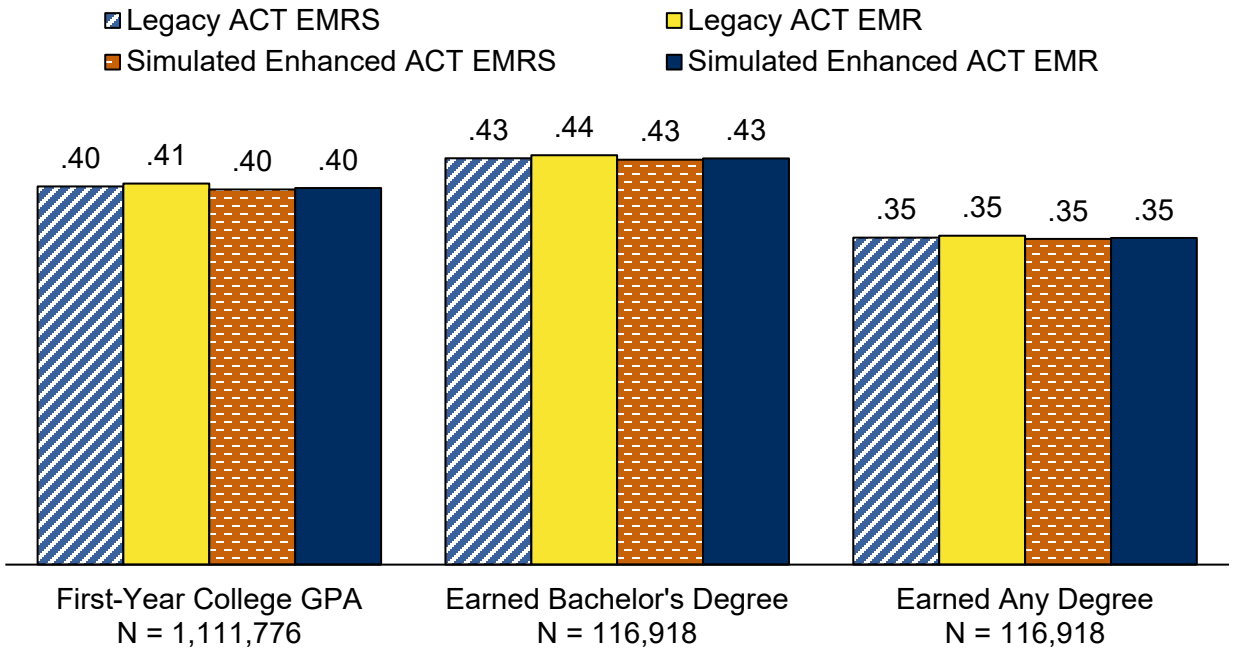
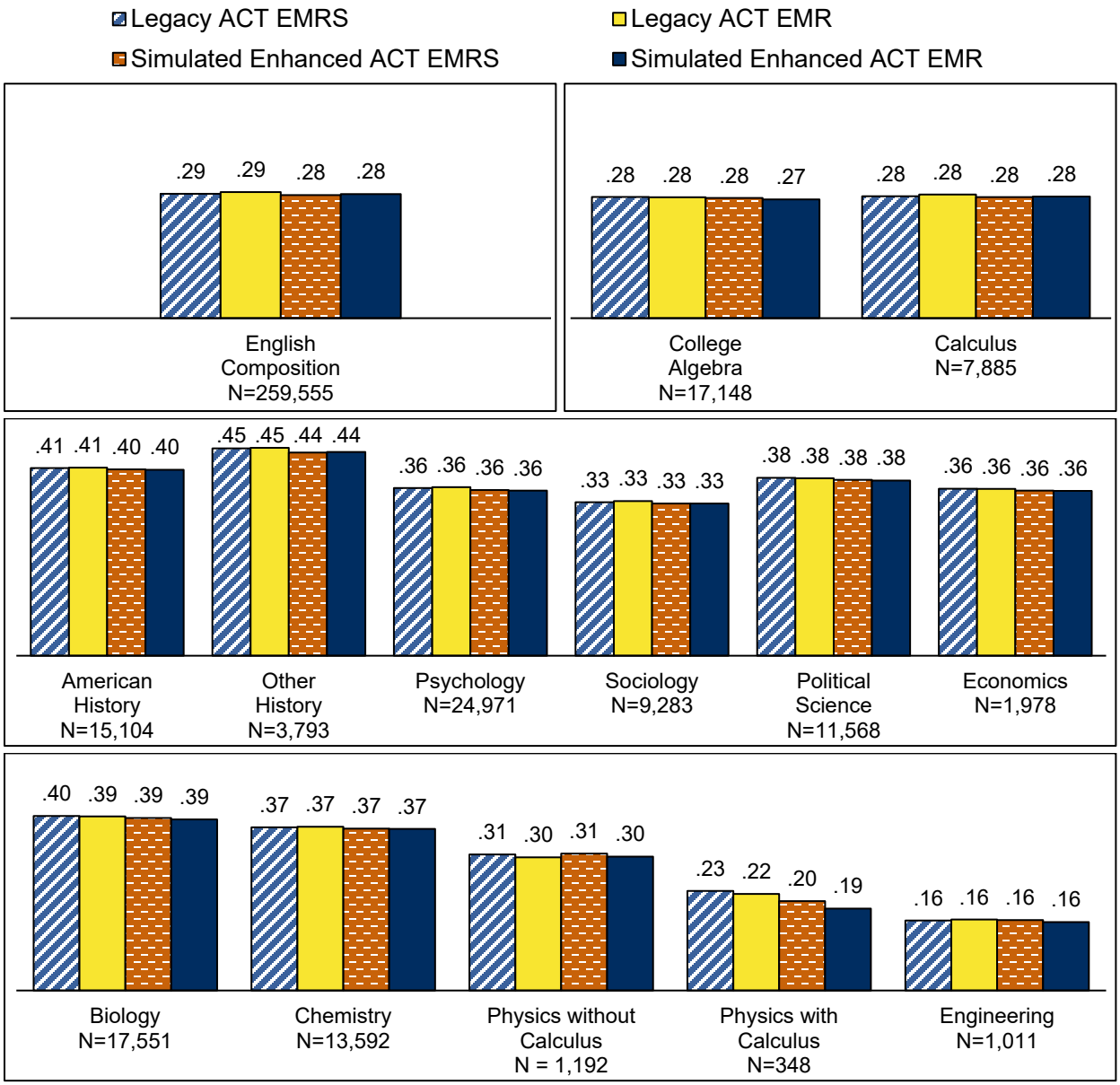


Figure 9 provides the correlations of the ACT Composite Score with course grades (on a scale of F = 0 to A = 4) among a selection of courses commonly taken during the first year of college. Each correlation is based on a different number of students, ranging from a high of 259,555 students in English Composition to a low of 348 students in Physics with Calculus. As seen in the figure, across all courses but one (Physics with Calculus), there is relatively little difference in the correlations with course grades among the ACT Composite scores from the legacy ACT and simulated enhanced ACT, regardless of whether the EMR or EMRS score was used.

Figure 9. Correlations of ACT Composite Score With First-Year College Course Grades

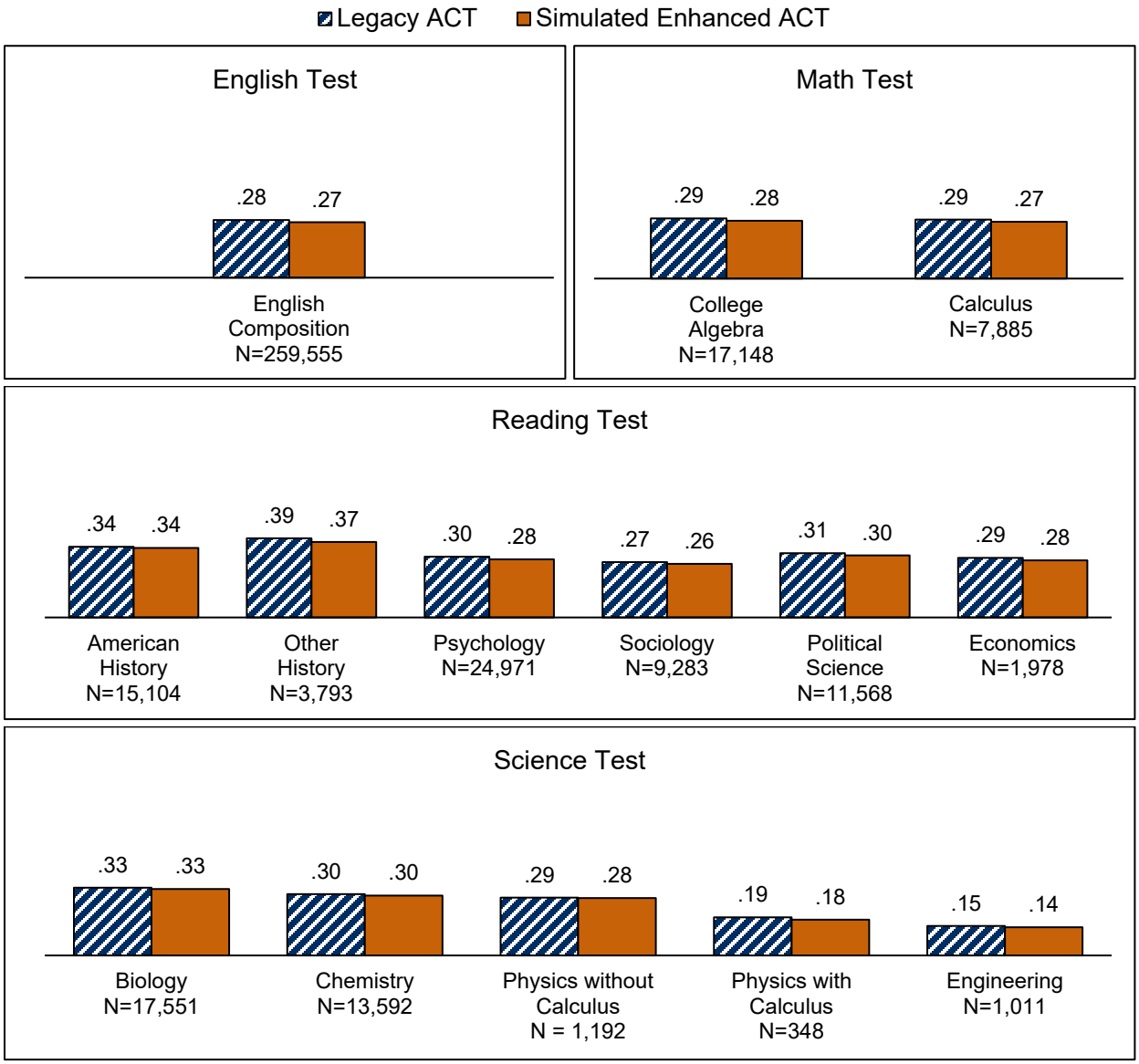


Overall, the results suggest that shortening the ACT will have very little effect on the relationship between the Composite score and individual first-year course grades, first-year college GPA, and timely undergraduate degree attainment. However, as discussed earlier in this paper, we caution that this simulation of the enhanced ACT test does not fully capture the differences between the enhanced ACT test and the legacy ACT test. Therefore, the predictive validity evidence presented here is provisional and will require additional analyses based on actual postsecondary outcomes data for students who take the enhanced ACT test.

Shortening the Section Tests Will Likely Have Only a Small Impact on the Predictive Validity of Section Test Scores

Figure 10 shows the correlations between section test scores and course grades (on a scale of F = 0 to A = 4) among a selection of courses commonly taken during the first year of college. Each correlation is based on a different number of students, ranging from a high of 259,555 students in English Composition to a low of 348 students in Physics with Calculus. As seen in the figure, the correlations between each section test and respective first-year course grade are slightly lower (by about .01 point on average) for the simulated enhanced shortened section test than for the legacy full-length section test, suggesting comparability in the predictive power of the shortened section test relative to the full-length section test.

Figure 10. Correlations of ACT Section Test Scores With First-Year College Course Grades



Again, we caution that scoring a simulated enhanced version of the legacy ACT for students who actually took the legacy ACT does not fully capture the differences between the enhanced ACT test and the legacy ACT test. The predictive validity evidence presented here is provisional and will require additional analyses based on actual postsecondary outcomes data for students who take the enhanced ACT test.

Removing Science from the Composite Score Has Little Impact on the Normative Interpretation of Composite Scores.

Beginning in April 2025 for online national testing and September 2025 for all other ACT testing, the ACT science test will be optional and reported Composite scores will be based only on English, math, and reading scores (EMR). We examined the impact of removing science from the Composite score for the six different ACT-tested groups described earlier.

As measures of general academic achievement, the constructs represented by EMR and EMRS scores have significant overlap. Not only are three out of the four section test scores included in both measures, but also students' English, math, and reading scores are highly correlated with their science score (see Figure 4 and Appendix Table A1). As a result of the overlap in the constructs being measured by EMR and EMRS, these two scores are also very highly correlated with one another. Across the six different ACT-tested student groups, the correlation between EMR and EMRS is 0.99, suggesting that very little unique information about the student is lost when science is removed from the Composite score.[3] Given the very strong relationship between EMR and EMRS, we would expect EMR and EMRS to be similarly related to other concurrent and subsequent measures of academic achievement. Evidence from the analyses summarized in this report supports this presumption; we found differences that were never any larger than one-hundredth of a point when comparing EMR and EMRS correlations with concurrent measures such as HSGPA and the high school rigor index (see Figure 5 and Appendix Table A2) and prior ACT test scores (see Figure 7 and Appendix Table A4), and with subsequent measures such as grades in individual first-year college courses (see Figure 9) and first-year college GPA and college degree attainment (see Figure 8).

Although EMR and EMRS are very highly correlated, it is possible for differences to exist across the 1–36 score scale for the two measures of general academic achievement. We used equipercentile concordance to examine the comparability of EMRS and EMR scores across the score scale. For each possible EMRS score, we identified the EMR score that has the closest percentile rank. Table 4 presents the results for each of the six groups. Note that concordance estimates are not provided for EMRS score points with a cumulative frequency of fewer than 50 examinees because the estimates are not reliable when based on a small number of examinees.

[3] This phenomenon is not particular to the absence of the science score. A measure of general academic achievement based on any three of the four section test scores is very highly correlated with a measure of general academic achievement based on all four section test scores, implying that any of the four would add very little unique information once the other three section test scores have been included in the measure of general academic achievement.

For EMRS scores from 14 to 36, the most comparable EMR score was equal to the EMRS score. EMRS scores below 14 were typically most comparable to EMR scores that were 1 point lower. We contend that Composite scores below 14 are generally regarded as very low scores, and that the comparability of EMR and EMRS is not as important in that region of the score distribution. The results were very consistent across the six ACT testing groups and suggest that EMR scores support the same normative interpretations as EMRS scores.

It is important to note that the concordance results presented in Table 4 are based on analyses of students who took either the legacy or enhanced ACT test and thus only inform EMRS/EMR score comparability within each version of the ACT. Therefore, there is strong evidence of score comparability for the enhanced ACT EMRS score and the enhanced ACT EMR score, and also for the legacy ACT EMRS score and the legacy ACT EMR score. However, the concordances in Table 4 do not directly address score comparability for the legacy ACT EMRS score and enhanced ACT EMR score.

Table 4. Concordances of EMR and EMRS, by ACT Tested Population

EMRS score	Comparable EMR score					
	June 2024 enhanced ACT	Spring 2024 school day	2024 high school cohort	Select college applicants	2022 college enrollees	2022 four-year college enrollees
1	*	*	*	*	*	*
2	*	*	*	*	*	*
3	*	2**	2**	*	*	*
4	*	3**	3**	*	*	*
5	*	4**	4**	*	*	*
6	*	5**	5**	*	5**	*
7	*	6**	6**	*	6**	6**
8	*	7**	7**	*	7**	7**
9	*	8**	8**	*	8**	8**
10	*	9**	9**	9**	9**	9**
11	*	10**	10**	10**	10**	10**
12	11**	11**	11**	11**	11**	11**
13	13	12**	13	12**	13	13
14	14	14	14	14	14	14
15	15	15	15	15	15	15
16	16	16	16	16	16	16
17	17	17	17	17	17	17
18	18	18	18	18	18	18
19	19	19	19	19	19	19
20	20	20	20	20	20	20
21	21	21	21	21	21	21
22	22	22	22	22	22	22
23	23	23	23	23	23	23
24	24	24	24	24	24	24
25	25	25	25	25	25	25
26	26	26	26	26	26	26
27	27	27	27	27	27	27
28	28	28	28	28	28	28
29	29	29	29	29	29	29
30	30	30	30	30	30	30
31	31	31	31	31	31	31
32	32	32	32	32	32	32
33	33	33	33	33	33	33
34	34	34	34	34	34	34
35	35	35	35	35	35	35
36	36	36	36	36	36	36

Note. *Estimates are not available for EMRS score points with cumulative frequencies < 50.
**These comparable scores are different.

To establish score comparability for the legacy ACT EMRS score and enhanced ACT EMR score, we estimated an additional concordance using data from the June 2024 Linking Study (see Table 5). Examinees who took the enhanced ACT and legacy ACT are random equivalent groups, so concordance can be estimated using the equipercentile method.

Table 5. Concordance of EMR from the Enhanced ACT and EMRS from the Legacy ACT

Legacy ACT EMRS score	Enhanced ACT EMR score
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36

Note. Estimates are not available for score points with cumulative frequencies < 50.

We found that EMR from the enhanced ACT is concordant with EMRS from the legacy ACT for EMRS scores of 14 or higher. Concordance estimates for EMRS scores below 14 were not obtained because the cumulative frequency of scores was less than 50 in that score range, resulting in unreliable estimates.

Taken together, the evidence presented here supports the comparability of EMR and EMRS as measures of general academic achievement and predictors of future academic success.

Most Students' Composite Score Without Science Should Fall Within the Standard Error of Measurement of Their Composite Score With Science

There are some practical differences between the ACT Composite score with and without science that will result in some students having an EMR score that is either higher or lower than their EMRS score would have been. The first difference is in the rounding logic that gets applied to the score when moving from a Composite score that is based on four section tests to a Composite score that is based on three section tests. Both EMR and EMRS are calculated by rounding the average of the section test scores to the nearest whole number. Under EMRS, the mean of the four section test scores can take one of four possible values after the decimal: .00, .25, .50, and .75. Given that about one-quarter of all students fall into each scenario, about 25% have a mean score that does not require rounding, 25% have a mean score that is rounded down, and 50% of students have a mean score that is rounded up. Under EMR, the mean of the three section test scores can take one of three possible values after the decimal: .00, .33, and .67. Given that about one-third of all students fall into each scenario, about 33% have a mean score that does not require rounding, about 33% have a mean score that is rounded down, and about 33% of students have a mean score that is rounded up. This shift from EMRS to EMR means that fewer students will have a mean score that has been rounded up.

The second practical difference between EMR and EMRS is the presence or absence of the science score within the computation of the Composite score. In particular, when students' science score is higher than their other three section test scores, the absence of the science score from the Composite means that these students are far more likely to have an EMR score that is lower than their EMRS score would have been. Conversely, when students' science score is lower than their other three section test scores, the absence of the science score from the Composite means that these students are far more likely to have an EMR score that is higher than their EMRS score would have been.

To examine the extent to which students' EMR score might differ from their EMRS score, we calculated a difference measure as

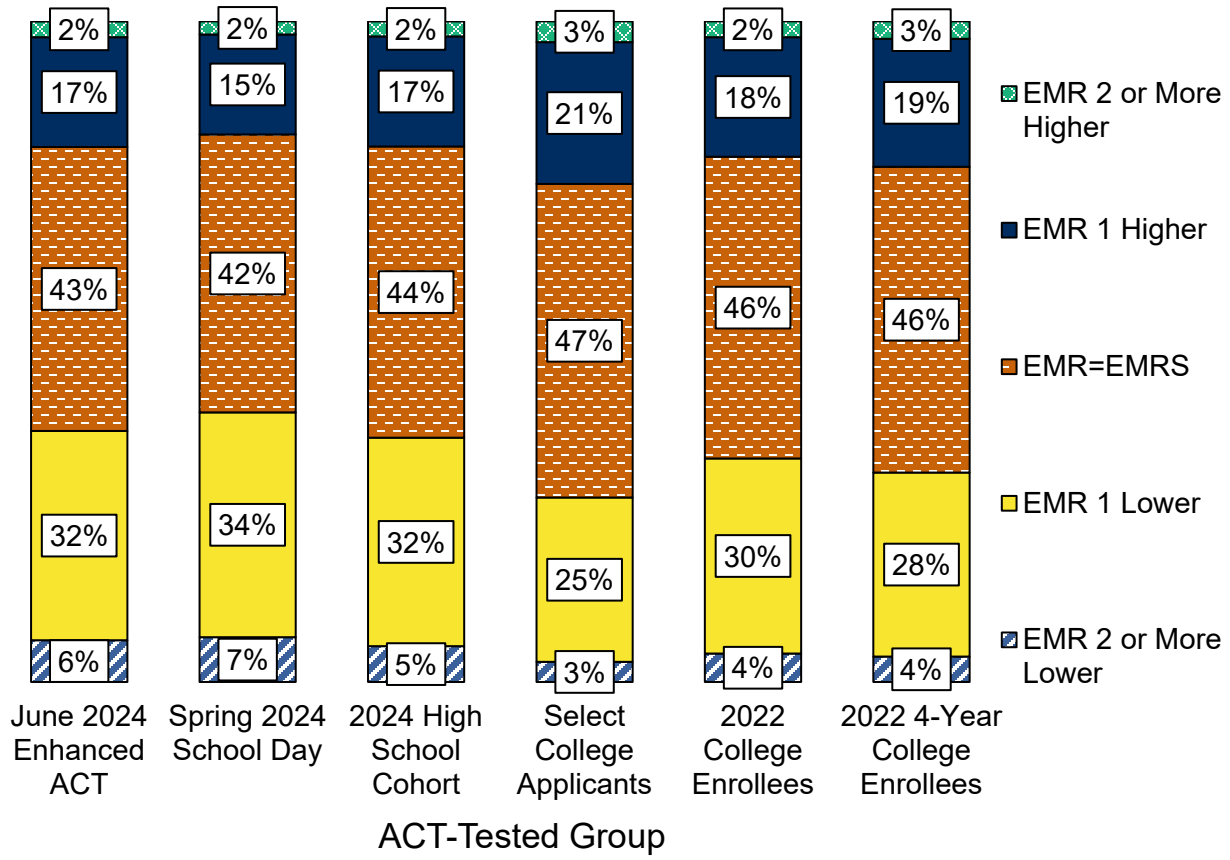
$$\text{Difference} = \text{EMR} - \text{EMRS}$$

We classified the difference scores as the following:

- EMR score is **2 or more points higher** than the EMRS score
- EMR score is **1 point higher** than the EMRS score
- EMR score is **the same** as the EMRS score
- EMR score is **1 point lower** than the EMRS score
- EMR score is **2 or more points lower** than the EMRS score

Figure 11 shows the percentage of students in each difference score category. Across the six different ACT-tested groups, 42% to 47% of the students had no change in Composite score when moving from EMRS to EMR. The percentage of students whose EMR score was within 1 score point of their EMRS score ranged from 91% for the school-day testing population to 94% for the select college applicants and college enrollees; the standard error of measurement for EMRS is +/− 1 point.

Figure 11. Differences in ACT Composite Scores With and Without Science



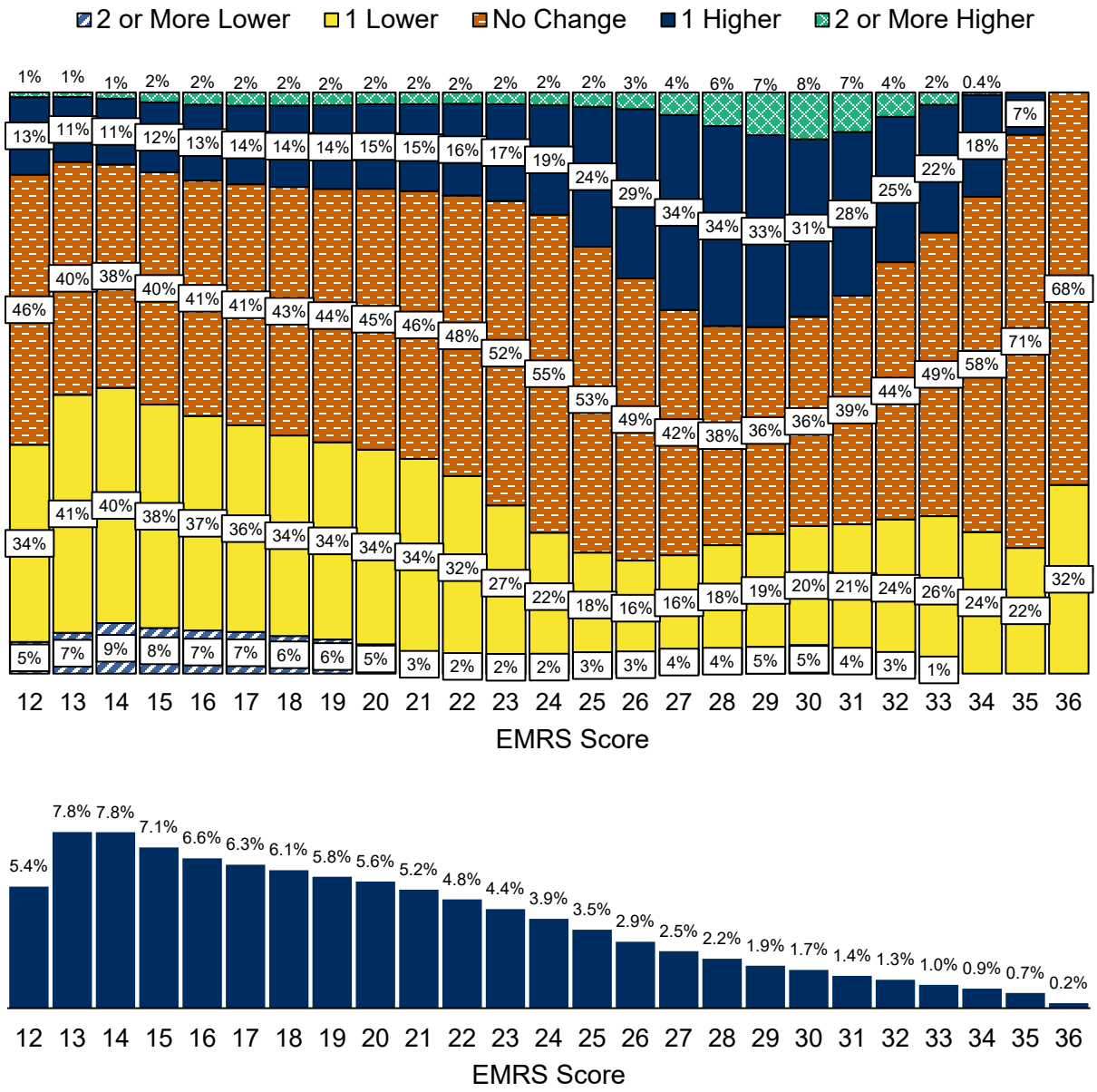
For students where the Composite scores differed, it was more common for their EMR score to be lower than the EMRS score. For example, while 37% of the students in the 2024 high school graduating cohort had an EMR score that was lower than their EMRS score, only 19% had an EMRS score that was lower than their EMR score. Although some of this imbalance between the share of students whose EMR score is lower than (as opposed to higher than) their EMRS score can be explained by the differences in the rounding logic between the calculations of EMR and EMRS, the imbalance is also because of more students having a science test score that is high relative to their other three section test scores.

Figure 12 shows the percentage of students in each difference score category by their EMRS score for the 2024 high school graduating cohort. As seen in the figure, at every point along the EMRS score scale, over 50% of students have an EMR score that is either the same as or higher than their EMRS score. However, students at the lower range of the score scale have

greater chances than other students of having an EMR score that is lower than their EMRS score, whereas students at the higher range of the score scale have greater chances than other students of having an EMR score that is higher than their EMRS score. This means that many students in the lower score range have a science score that is high relative to their other three section test scores, whereas many students in the higher score range have a science score that is low relative to their other three section test scores. This difference in the role of science across the EMRS score scale is perhaps more evident when examining mean science scores for students at each point on the EMRS score scale. As seen in Table 6, at the lower range of the EMRS score scale, the average science score is higher than the students' EMRS score, suggesting that science is often one of the higher section test scores for these students. Conversely, at the higher range of the EMRS score scale, the average science score is lower than the EMRS score, suggesting that science is often one of the lower section test scores for these students.

Also provided in Figure 12 is a histogram showing the percentage of the 2024 high school graduating cohort by their EMRS score. As is evident by the juxtaposition of the histogram with the chart showing the percentage of students in each difference score category, the score range in which most students are located is also the area in which students are most likely to have an EMR score that is lower than their EMRS score. This explains the overall imbalance that we see in Figure 11 between the share of students whose EMR score is lower than (as opposed to higher than) their EMRS score.

Figure 12. Differences in ACT Composite Scores With and Without Science by EMRS Score



Note. Because of space constraints, EMRS scores below 12 are not provided in the figure. About 3.2% of the 2024 high school graduating cohort receives an EMRS score of 11 or lower.

Table 6. Mean Science Score by EMRS Score, 2024 High School Cohort

EMRS Score	Mean science score
14	14.8
15	15.6
16	16.5
17	17.4
18	18.4
19	19.3
20	20.2
21	21.1
22	22.0
23	22.8
24	23.6
25	24.3
26	25.1
27	26.0
28	26.9
29	27.9
30	28.9
31	30.1
32	31.3
33	32.4
34	33.6
35	34.7
36	35.7

For students in the 2024 high school graduating cohort, we also examined the share of students in each difference score category by gender and racial/ethnic group (Figure 13). Over 91% of students within each student group had an EMR score that fell within +/− 1 point of their EMRS score (which is the standard error of measurement for EMRS). Moreover, within each group, over half of all students had an EMR score that was either the same as or higher than their EMRS score. For students whose EMRS and EMR scores were different, it was more common for the EMR score to be lower than the EMRS score, no matter which student group is considered. However, the extent of the imbalance between the share of students whose EMR score is lower than (as opposed to higher than) their EMRS score differs by gender and by race/ethnicity. This suggests that some groups of students are more likely than others to have science scores that are high relative to their other three section test scores. Mean scores reported by student group for the 2024 high school graduating cohort provide further evidence to support this conclusion (see Table 7). Specifically, we found that the higher the student group's mean science score compared to their mean EMRS score, the greater the imbalance

seen in Figure 13 for that student group; in contrast, the lower the student group's mean science score compared to their mean EMRS score, the better the balance seen in Figure 13 for that student group.

Figure 13. Differences in ACT Composite Scores With and Without Science, by Student Group

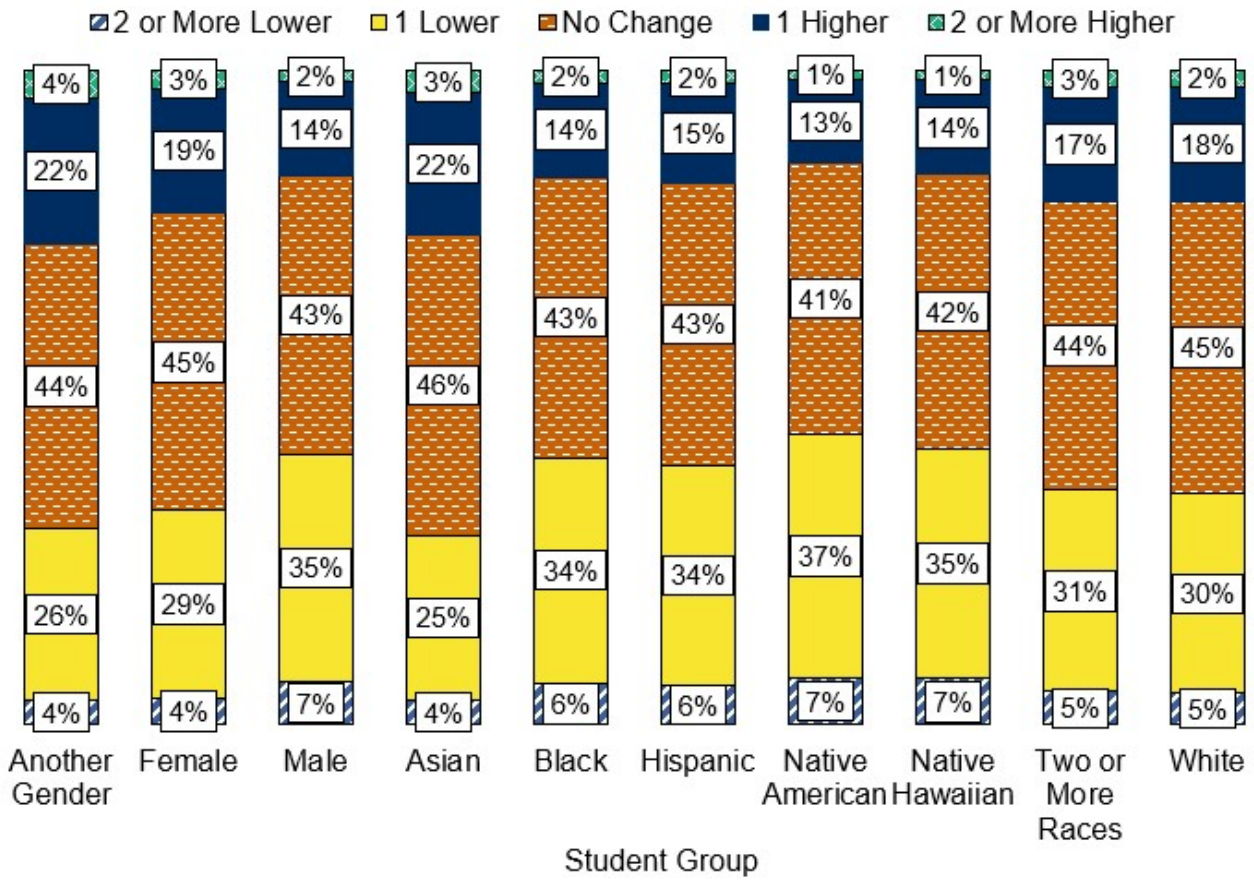


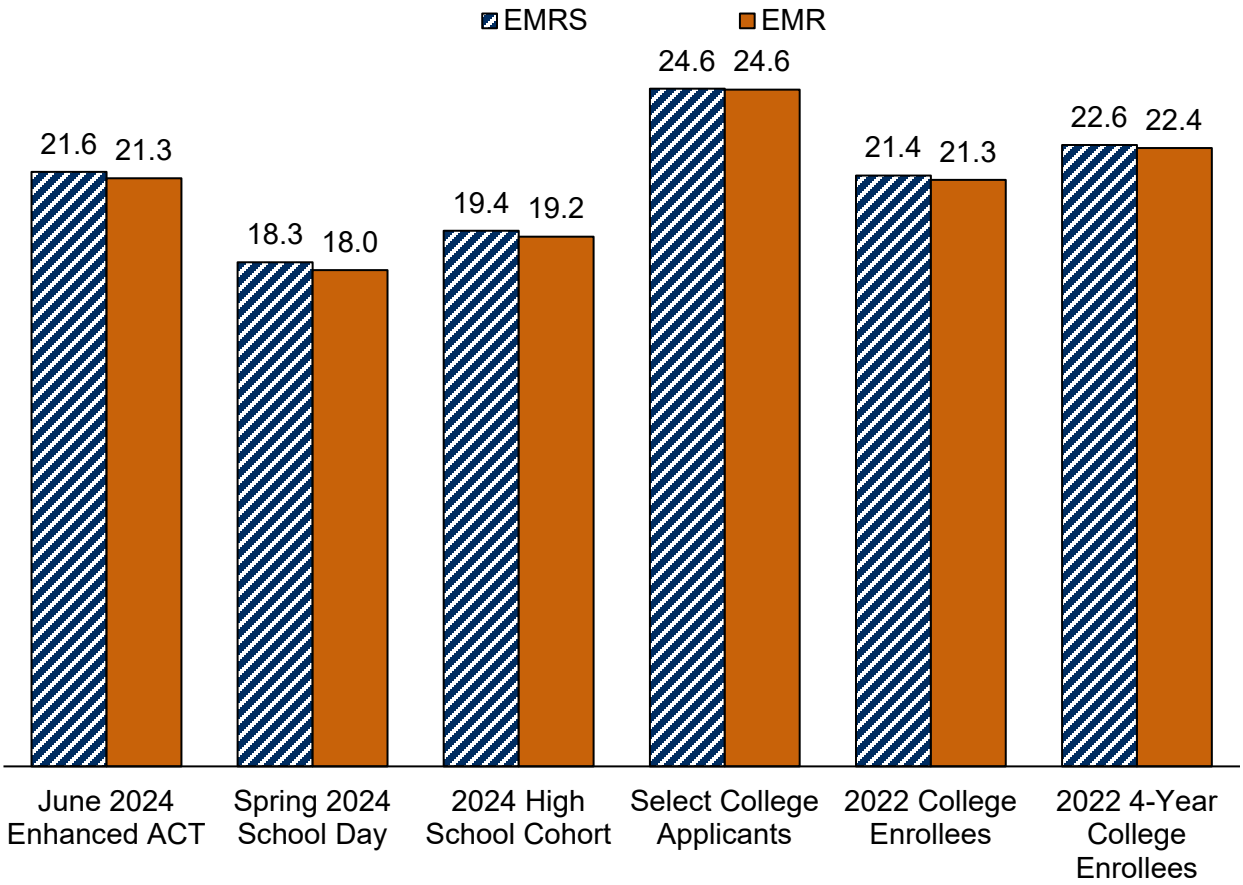
Table 7. Mean Science Score and EMRS Score by Student Group, 2024 High School Cohort

Student group	Science	EMRS
Another gender	20.7	21.1
Female	19.5	19.6
Male	19.8	19.4
Asian	23.7	24.1
Black	16.3	16.0
Hispanic	17.6	17.4
Native American	16.5	15.9
Native Hawaiian	16.8	16.3
Two or more races	19.8	19.7
White	21.0	20.9

ACT Composite Scores With and Without Science Will Have Similar but Not Identical Summary Statistics

Given the individual student differences between EMR and EMRS previously noted, the two scores will have similar, but not identical, distributions. In fact, there is a 95.7% overlap in the two distributions. As suggested by the information presented in Figure 12, however, the distribution for EMR will have a flatter peak with more students at the lower tail when compared to the distribution for EMRS. The small differences in the EMR and EMRS score distributions means that the summary statistics for these distributions will also be similar but not identical. The average EMRS and EMR scores are presented in Figure 14. For five of the six groups of ACT-tested students, the average EMR score was slightly lower than the average EMRS score. The difference was 0.3 score points for the 2024 school-day tested population and for the June 2024 enhanced ACT, 0.2 score points for the 2024 high school cohort and 2022 4-year college enrollees, and 0.1 score points for the 2022 college enrollees. For the group of applicants to select colleges, the average EMRS and EMR scores were the same.

Figure 14. Average ACT Composite Scores



Given that some groups of students are more likely than others to have science scores that are high relative to their other three section test scores, we would anticipate that differences in the summary statistics for the ACT Composite score with and without science would vary across

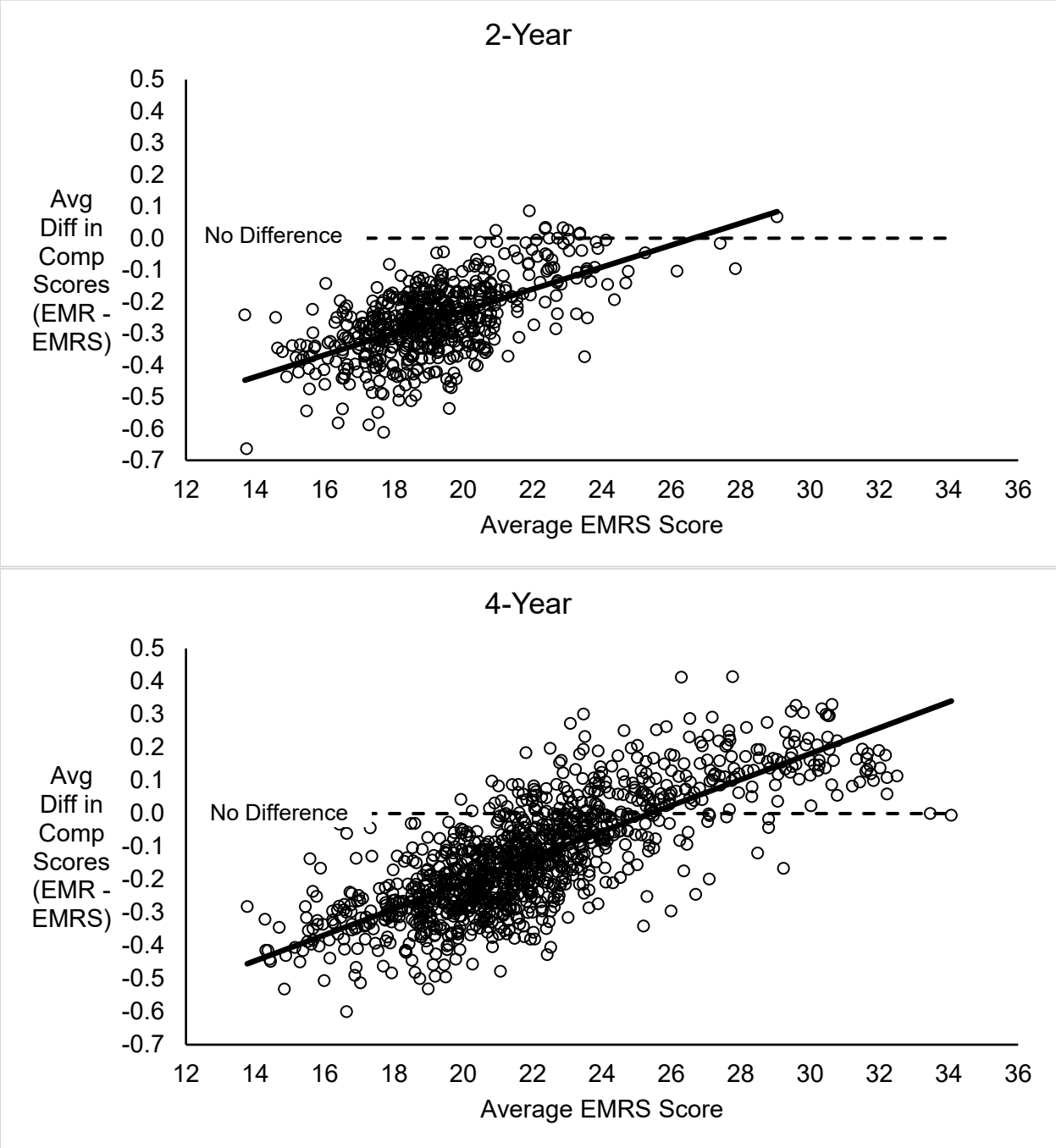
student groups. Table 8 provides the mean EMR and EMRS scores by student group for the 2024 high school graduating cohort. Across all student groups, the mean ACT Composite score without science is either slightly lower than or the same as the mean ACT Composite score with science, with differences between the two means ranging from 0.0 to 0.3 points. As anticipated, student groups that were more likely to have science scores that are high relative to their other three section test scores had larger mean differences between EMR and EMRS.

Table 8. Mean EMR Score and EMRS Score by Student Group, 2024 High School Cohort

Student Group	EMR	EMRS
Another gender	21.1	21.1
Female	19.5	19.6
Male	19.1	19.4
Asian	24.0	24.1
Black	15.7	16.0
Hispanic	17.1	17.4
Native American	15.6	15.9
Native Hawaiian	16.0	16.3
Two or more	19.5	19.7
White	20.8	20.9

In addition to examining differences by student groups, we used the college enrollee data to examine differences in average Composite scores with and without science by postsecondary institution. We considered 569 2-year colleges and 1,117 4-year colleges, each with at least 100 enrolled ACT-tested students. In Figure 15, we plot each college's difference in average Composite scores with and without science (EMR-EMRS) against the college's average EMRS score. We find that the difference in Composite scores with and without science tends to shrink as the average ACT Composite score increases, and that for four-year institutions with very high average ACT Composite scores (e.g., above 25), many colleges are more likely to see an increase in their average ACT Composite score when science is removed from the Composite. Two-year institutions are more likely to see declines in their average ACT Composite score when science is removed from the Composite. This variability between colleges in the direction and magnitude of the difference between EMR and EMRS by the average achievement of their enrolled students is expected given the differences in students' science score relative to their other three section test scores at different ranges of the EMRS score scale that we see in Figure 12 and Table 6.

Figure 15. Average Difference in Composite Scores, by Postsecondary Institution



Removing the Science Score from the Composite Has Little Impact on Aggregated College Applicant Pool Data

Colleges and universities across the United States use ACT scores to better understand their pools of applicants. We compared the average ACT scores, with and without science, of the applicant pools of 14 colleges and universities and three prospective student cohorts.

We found that the average EMRS and EMR scores were very similar. Across institutions and cohorts, the typical difference in the averages of the two Composite scores was +/− 0.1 score points. Across cohorts, the typical change in average EMRS scores for an institution was +/− 0.5 score points. Therefore, we can conclude that the variation in Composite scores associated with removing the science score is considerably less than the typical cohort-to-cohort variation institutions see in the average Composite score of their applicant pool.

For five 4-year institutions of varying selectivity levels, Figure 16 shows the average Composite scores with and without science for three prospective student cohorts (2021, 2022, and 2023). For each institution and each cohort, the difference between the average EMRS and EMR scores is small. There is more variation in Composite scores across cohorts than there is across Composite score versions.

Figure 16. Average ACT Composite Scores With and Without Science, by Institution Applicant Pool

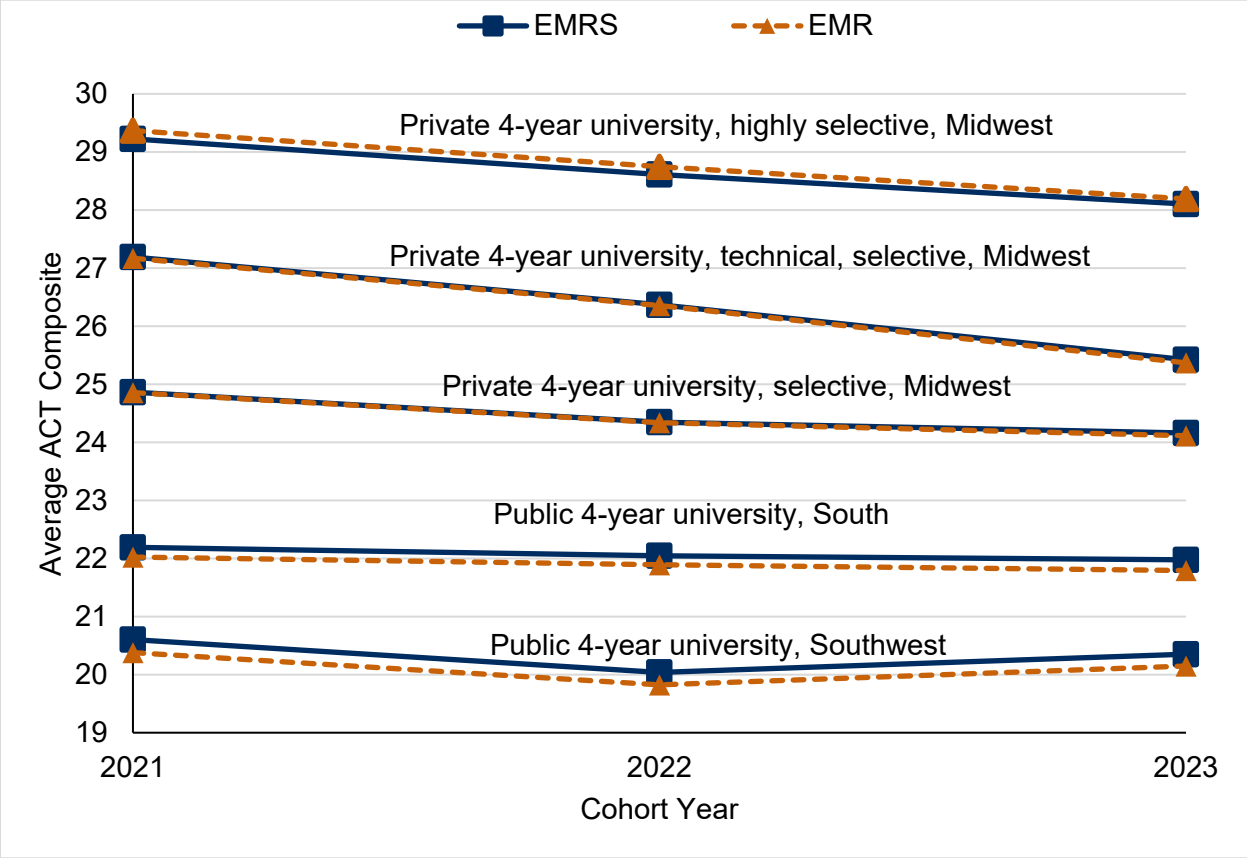


Figure 16 also illustrates that the difference between the EMRS and EMR scores is related to institution selectivity, which was observed earlier in our analysis of enrolled students. As the achievement level of the applicant pool increases, the difference between the two Composite scores decreases. For the most selective institutions, average EMR scores tend to be higher than average EMRS scores. For the least selective institutions, average EMR scores tend to be lower than average EMRS scores.

Discussion

The enhanced ACT has several important changes from the legacy ACT, with notable reductions in test length and testing time, and more time allowed per test question. The enhanced ACT also has other important changes to test design, including shorter reading passages and fewer response options for math items. With changes to the test, it is important to evaluate evidence supporting interpretations of enhanced ACT test scores for different uses. In this report, we presented evidence from the June 2024 Linking Study, in which students were randomly assigned to take either the legacy or enhanced ACT. We also presented predictive analyses of historical ACT data matched to college outcomes data, in which scores were simulated to match the enhanced ACT's test length. Because ACT Composite scores will no longer include the science score as of April 2025 for national online tests and as of fall 2025 for all test administrations, we examined the predictive strength of the Composite score with and without science. We also examined the comparability of normative interpretations of the ACT Composite score with and without science.

Summarizing the Findings

With a reduction in test length, we used statistical theory to hypothesize that the enhanced ACT would have lower reliability than the legacy ACT, and that scores from the enhanced ACT would therefore have slightly lower correlations with measures of current and future academic performance relative to the legacy ACT. Using the data collected from the June 2024 Linking Study, both hypotheses are supported, though the changes in validity coefficients are not practically significant. Data collected from several populations of ACT examinees suggest strong comparability of ACT scores with and without science.

Reliability and Interrelationships of ACT Section Test Scores

Coefficients of reliability were smaller for the enhanced ACT compared to the legacy ACT, with differences ranging from .01 for the Composite score with science to .06 for English (which had the largest reduction in test length). The reliability analyses suggest that scores from the enhanced ACT are still relatively precise measures of educational achievement, and that the Composite score either with or without science is a highly reliable overall measure of educational achievement.

Relative to the legacy ACT, the intercorrelations of ACT section test scores were lower for the enhanced ACT. This finding was expected because of the lower reliability of the enhanced ACT. The largest differences were observed for the reading/math correlation, which was .71 for the legacy ACT and .63 for the enhanced ACT and for the English/math correlation, which was .77

for the legacy ACT and .69 for the enhanced ACT. These results may also suggest that the enhanced ACT has stronger divergent validity than the legacy ACT.

Concurrent Validity

Composite scores from the enhanced ACT were reflective of high school coursework and grades. Correlations of ACT Composite scores with high school GPA and the ACT Rigor Index were slightly lower for the enhanced ACT relative to the legacy ACT. Correlations of ACT section test scores with high school subject GPA were similar for the enhanced ACT and legacy ACT.

We also compared correlations of scores from the enhanced and legacy ACT with prior ACT test scores. We found that the correlations were very similar, with some of the correlations for the enhanced ACT slightly lower than those for the legacy ACT. The largest differences in correlations were observed for English (.84 for enhanced ACT, .89 for legacy ACT) and math (.86 for enhanced ACT, .90 for legacy ACT) and no difference was observed for science (.78 for enhanced and legacy ACT). The differences for the Composite scores were very small (.91 compared to .92 for the EMR score, .92 compared to .93 for the EMRS score).

We tested for differences in differential validity between the enhanced and legacy ACT but found no cases of significant differences.

Predictive Validity

Because the enhanced ACT was first administered in June 2024, we have not yet collected college outcomes data for students who took the enhanced ACT and enrolled in college. Instead, we used historical ACT data linked to college outcomes and simulated scores from a shortened ACT test. The test was shortened by selecting items at random to match the number of scored items on the enhanced ACT test.

Consistent with statistical theory, we found that, relative to scores from the legacy ACT, scores from the simulated enhanced ACT had negligible decreases in correlations with first-year college GPA, college degree attainment, and grades in specific types of first-year college courses. To help us better understand how the simulation of the enhanced ACT compares to the actual enhanced ACT, we conducted several analyses comparing enhanced ACT to the legacy ACT, comparing the simulated enhanced ACT to the legacy ACT, and contrasting the results. The analyses included comparisons of the intercorrelations of ACT section test scores, correlations with high school coursework and grades, and correlations with prior test scores. In Table 9, we summarize the differences in validity coefficients, contrasting the enhanced ACT/legacy ACT differences to the simulated enhanced ACT/legacy ACT differences. We argue that, because the differences are small and in a consistent direction, we can predict that the differences in predictive validity coefficients between enhanced and legacy ACT scores will also be small and in a consistent direction.

Table 9. Summarizing Differences in Validity Coefficients

Analysis			Difference in validity coefficient	
			June 2024 Linking Study legacy–enhanced	Historical validity data legacy–simulated enhanced
Interrelationships of section test scores	Math with science		.03	.02
	English with reading		.04	.05
	English with science		.04	.04
	Reading with science		.06	.03
	English with math		.08	.04
	Reading with math		.08	.03
Concurrent validity	Correlations with high school GPA	EMRS	.01	.01
		EMR	.02	.01
	Correlations with ACT Rigor Index	EMRS	.01	.00
		EMR	.02	.01
	Correlations with high school subject GPA	English	.02	.01
		Math	.01	.01
		Reading	.03	.01
		Science	−.01	.01
	Correlations with prior ACT scores	English	.05	.03
		Math	.04	.02
		Reading	.02	.03
		Science	.00	.01
		EMRS	.01	.01
		EMR	.01	.01
Predictive validity	Correlations with first-year college GPA	EMRS	Unknown	.00
		EMR	Unknown	.01
	Correlations with degree attainment	EMRS	Unknown	.00
		EMR	Unknown	.01
	Correlations with first-year course grades	English	Unknown	.01
		Math	Unknown	.02
		Reading	Unknown	.01
		Science	Unknown	.01

The evidence presented in this report strengthens the argument that scores from the enhanced ACT will have predictive utility like scores from the legacy ACT. We caution, however, that scoring a shortened version of the ACT for students who took the legacy ACT does not fully capture the differences between the enhanced ACT test and the legacy ACT test. Because the simulated enhanced ACT was based on items drawn at random from the legacy ACT, we

believe that the simulated scores measured the same constructs as the legacy ACT. Therefore, the slight decline in predictive validity observed for the simulated enhanced ACT is due solely to a decline in reliability. Because the enhanced ACT is different than the legacy ACT in several ways, it is possible that it measures slightly different constructs. Therefore, changes in predictive validity for the enhanced ACT could be because of changes in reliability, but also because of slight changes in the constructs being measured. For these reasons, the predictive validity evidence presented in this report is provisional and we will need to conduct additional analyses to draw more concrete conclusions.

Because section test scores from the enhanced ACT are linked to section test scores from the legacy ACT using equipercentile equating methods, the enhanced ACT supports continued interpretations of specific ACT section test scores that were established using scores from the legacy ACT, such as the ACT College Readiness Benchmarks.

Comparability of Composite Scores With and Without Science

As measures of general academic achievement, there is significant overlap in the constructs represented by EMR and EMRS scores. We found that EMR and EMRS are very highly correlated with one another and are similarly related to other concurrent and subsequent measures of academic achievement. We further found that Composite scores without science have nearly the same normative interpretation as Composite scores with science. Using equipercentile concordance, Composite scores with science were comparable to those without science for scores from 14 to 36. For very low scores, it was common for the comparable Composite score without science to be one point lower than the Composite score with science. Comparability of Composite scores was evaluated for a broad array of ACT testing groups, including the June 2024 Linking Study sample that took the enhanced ACT, a school-day testing group, an ACT-tested high school graduating class, college applicants at select institutions, and college enrollees. The equipercentile concordance results were very consistent across all groups. Further, differences in Composite scores with and without science were mostly consistent across student demographic groups.

There are some practical differences between the ACT Composite score with and without science, however, that will result in some students having an EMR score that is either higher or lower than their EMRS score would have been. However, most students' EMR score will fall within the standard error of measurement for their EMRS score, which is +/− 1 point. We found that when students EMR and EMRS scores differ, it is more common for students to have a lower EMR score than EMRS score. Given these individual student differences between EMR and EMRS scores, the two scores will have similar, but not identical, distributions and summary statistics. We found slightly smaller means for the EMR score distribution when compared to the EMRS score distribution. We also found that some groups of students were more likely than others to have science scores that were high relative to their other three section test scores, leading those student groups to have slightly larger mean differences between EMR and EMRS.

Colleges and universities across the United States use ACT scores to better understand their pools of applicants. We found that the variation in Composite scores associated with removing

the science score is considerably less than the typical cohort-to-cohort variation institutions see in the average Composite score of their applicant pool. And, as the general achievement level of the applicant pool or enrolled student body increases, the difference between the two Composite scores decreases. For the most selective institutions, average Composite scores without science tend to be higher than the average Composite scores with science. For the least selective institutions, average Composite scores without science tend to be lower than the average Composite scores with science.

Conclusion

With the launch of the enhanced ACT test, multiple types of evidence should be evaluated to determine if scores from the enhanced ACT support the same interpretations and uses as scores from the legacy ACT test. We consistently found that measures of concurrent and predictive validity were very similar for the two tests. While a small loss in reliability was expected for the enhanced ACT because of its shorter test length, we found that validity coefficients were remarkably similar for the enhanced and legacy ACT. Moreover, virtually the same normative interpretations of ACT Composite scores are supported, regardless of whether the Composite score is based on the enhanced ACT and excludes science, or whether the Composite score is based on the legacy ACT and includes science. The initial evidence supports the continued use of ACT scores from the enhanced ACT for informing college admissions decisions, awarding college scholarships, placing students into programs and courses, identifying students in need of academic support, and measuring academic achievement at the school and district level for accountability systems. Given this evidence, the current ACT/SAT concordance (ACT & The College Board, 2018) can continue to be used to align ACT Composite scores with SAT Total Scores, ACT Math scores with SAT Math scores, and ACT English + Reading scores with SAT Reading/Writing scores. Should it be determined at a future date that an update to the current ACT/SAT concordance is necessary, ACT researchers are prepared to collaborate with our College Board counterparts. Any review and update of the concordance between ACT and SAT scores would require sufficient data from students who have taken both the enhanced ACT and the digital SAT.

References

ACT. (2025). Design framework for the ACT enhancements. https://www.act.org/content/dam/act/unsecured/documents/R2519-Design-Framework-for-the-ACT-Enhancements-2025-03.pdf

ACT & The College Board. (2018). Guide to the 2018 ACT/SAT Concordance. https://www.act.org/content/dam/act/unsecured/documents/ACT-SAT-Concordance-Information.pdf

Allen, J., & Mattern, K. (2019). Examination of indices of high school performance based on the graded response model. *Educational Measurement: Issues and Practice, 38*(2), 41–52. https://doi.org/10.1111/emip.12250

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.

Brown, W. (1910). Some experimental results in the correlation of mental abilities. *British Journal of Psychology, 3*, 296–322.

Li, D., Kapoor, S., Arthur, A., Huang, C., Cho, Y., Qiu, C, & Wang, H. (2025). The enhanced ACT linking study report. https://www.act.org/content/dam/act/unsecured/documents/R2515-The-Enhanced-ACT-Linking-Study-Report-2025-03-updated.pdf

Spearman, C.C. (1910). Correlation calculated from faulty data. *British Journal of Psychology, 3*, 271–295.

Appendix

Table A1. Correlations Among Section Test Scores: Legacy and Simulated Enhanced ACT

Section test scores	Historical FYGPA data *N* = 1,111,776		Historical FY course data *N* = 330,794		Historical college degree attainment data *N* = 116,918	
	Legacy ACT	Simulated enhanced ACT	Legacy ACT	Simulated enhanced ACT	Legacy ACT	Simulated enhanced ACT
Math with science	0.76	0.73	0.73	0.71	0.80	0.78
English with reading	0.77	0.72	0.74	0.69	0.82	0.77
English with science	0.70	0.67	0.67	0.63	0.78	0.74
Reading with science	0.69	0.66	0.66	0.63	0.76	0.74
English with math	0.69	0.65	0.66	0.63	0.77	0.73
Reading with math	0.61	0.58	0.58	0.55	0.70	0.67

Table A2. Correlations of ACT Composite Scores With Measures of High School Academic Achievement: Legacy and Simulated Enhanced ACT

Measure	Historical FYGPA data *N* = 977,023				Historical FY course data *N* = 285,041				Historical college degree attainment data *N* = 102,169			
	Legacy ACT		Simulated enhanced ACT		Legacy ACT		Simulated enhanced ACT		Legacy ACT		Simulated enhanced ACT	
	EMRS	EMR	EMRS	EMR	EMRS	EMR	EMRS	EMR	EMRS	EMR	EMRS	EMR
HSGPA	0.55	0.55	0.54	0.54	0.49	0.49	0.48	0.48	0.56	0.56	0.56	0.56
Rigor Index	0.59	0.59	0.59	0.59	0.54	0.54	0.53	0.53	0.61	0.61	0.61	0.60

Table A3. Correlations of ACT Section Test Scores With High School Subject GPA: Legacy and Simulated Enhanced ACT

Section test scores	Historical FYGPA data			Historical FY course data			Historical college degree attainment data		
	Legacy ACT	Simulated enhanced ACT	*N*	Legacy ACT	Simulated enhanced ACT	*N*	Legacy ACT	Simulated enhanced ACT	*N*
English score with English grades	0.45	0.44	976,174	0.40	0.38	285,130	0.46	0.45	102,994
Math score with math grades	0.54	0.52	968,912	0.49	0.48	282,907	0.53	0.53	102,236
Reading score with social studies grades	0.42	0.41	963,013	0.37	0.36	280,692	0.45	0.43	101,595
Science score with science grades	0.42	0.41	965,815	0.36	0.35	281,599	0.45	0.44	101,751

Table A4. Correlations of ACT Test Scores With Prior ACT Test Scores: Legacy and Simulated Enhanced ACT

Test score	Historical FYGPA data *N* = 694,535		Historical FY course data *N* = 196,893		Historical college degree attainment data *N* = 61,493	
	Legacy ACT	Simulated enhanced ACT	Legacy ACT	Simulated enhanced ACT	Legacy ACT	Simulated enhanced ACT
EMRS	0.91	0.90	0.90	0.89	0.93	0.92
EMR	0.90	0.89	0.89	0.88	0.92	0.91
English	0.85	0.82	0.83	0.80	0.88	0.86
Math	0.87	0.85	0.86	0.84	0.89	0.88
Reading	0.77	0.75	0.75	0.72	0.81	0.78
Science	0.72	0.71	0.70	0.68	0.78	0.77

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