The Enhanced ACT Linking Study Report

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Executive Summary

Starting in April 2025, ACT will introduce enhanced forms of the ACT® test for national online testing, with a full rollout to all paper and online test takers in national, state and district, and international test administrations by Spring 2026. ACT introduced major updates by changing the test lengths and testing times, providing more time per item, rebalancing the reporting categories, adding embedded field-test items, making the science test optional, and changing the ACT Composite score from an average of the English, math, reading, and science (EMRS) scores to an average of only the English, math, and reading (EMR) scores. Details of these enhancements are available on the ACT website (www.act.org/actenhancements). Despite these changes, the enhanced ACT was designed to measure the same constructs as the legacy ACT. To ensure score consistency across years, ACT decided to maintain the legacy 1–36 scale for the enhanced tests.

Before the launch, two special studies were conducted: a linking study in June 2024 to link the enhanced forms to the legacy forms, and a mode study in October 2024 to examine score comparability between the paper and online formats of the enhanced ACT. This document focuses on analyses and findings from the June 2024 linking study.

The June 2024 linking study used a random groups design, where two enhanced forms and one legacy form were administered online and randomly assigned to participants. The final cleaned dataset included 6,882 students. The impact of the enhancements on the construct of measurement and student performance was examined before statistical linking was conducted. Subsequently, the psychometric properties of the enhanced forms were examined and compared with those of the legacy form.

To examine construct equivalence, ACT conducted confirmatory factor analyses using different models. The fit indices and factor loadings of the enhanced forms were similar to those of the legacy form for each model, indicating consistency in the construct of measurement. To examine the impact of the enhancements on student performance, ACT examined completion rates, rapid response rates, omit rates, and student responses to survey questions. For some test sections, there was some evidence of small positive effects on test completion rates and students' perceptions of having enough time to complete the test.

Equating methodology was used to link the enhanced forms to the legacy form. The robustness of the linking results was supported by evidence of subgroup invariance to an extent similar to that seen in the equating of recent parallel ACT forms. Further analyses were conducted to evaluate the psychometric properties of the linked scores, including reliability, standard error of

measurement (SEM), conditional SEM (CSEM), and classification consistency of the ACT College Readiness Benchmarks and the ACT® WorkKeys® NCRC® indicators.

Reliability for the enhanced forms was .96 for the EMRS Composite and .94 for the EMR Composite, and between .83 and .88 for the test sections. As expected, this was slightly lower than that for the legacy forms due to the reduction in test length. Consequently, the observed correlations between the test sections and the classification consistency of the College Readiness Benchmarks also decreased slightly, as anticipated.

In terms of SEM and CSEM, legacy ACT scores have an approximately equal CSEM of about 1 for the Composite score and about 2 for the test sections. Although the enhanced forms show an increase in CSEMs by about half a score point for each test section score, the variability in CSEMs along the score scales remains similar to that for the legacy test. In addition, the rounded SEMs of the enhanced forms are similar to those used for score reporting for the legacy test (about 1 for the Composite score and about 2 for the test section scores), except that the reading SEMs were slightly higher than 2.5. Therefore, the changes in measurement precision had a very small impact on score interpretation.

In summary, the enhanced ACT test measures the same constructs and reports scores on the same scales as the legacy ACT test. The enhancements had minimal impact on student performance, though there was some evidence of a small positive effect on test completion rates and students' perceptions of having enough time to complete the test. While the reduction in test length led to expected decreases in measurement precision, the impact on score interpretation was minimal. Therefore, scores on the enhanced ACT test and the legacy ACT test can be used interchangeably.

Overview of ACT Enhancements and Special Studies

Starting in April 2025, students who take the ACT online on a national test date will take the enhanced ACT test. Then, in September 2025, the enhanced ACT test will be launched for all national and international students. Finally, in Spring 2026, the enhanced ACT test will be offered to state and district students. Major enhancements include reduced test lengths and overall testing times, more time per item, the science test now being optional, embedded field-test items, and the ACT Composite score now being calculated not from the average of the English, math, reading, and science scores but instead from the average of only the English, math, and reading scores. Despite these changes, the enhanced ACT is intended to measure the same constructs as the legacy ACT and to maintain the 1–36 reporting scales.

To prepare for the launch of the enhanced ACT test starting in April 2025, ACT conducted two special studies: a linking study in June 2024 and a mode comparability study in October 2024. The goal of the linking study was to evaluate construct invariance and link the enhanced ACT test to the legacy ACT test. The goal of the mode comparability study was to evaluate whether scores on the paper and online administrations are equivalent and to obtain interchangeable scores across modes.

Table 1 summarizes the changes in test length and testing time by comparing the number of items, testing time, and average time per item for each test section of the enhanced and legacy ACT tests. In the legacy ACT, all items count toward students' total scores, but in the enhanced ACT, only operational items count toward students' total scores.

Table 1. Number of Items and Testing Time Comparison Between Legacy and Enhanced Forms

Test section	Number of items				Testing time			
	Legacy	Enhanced			Total time in minutes		Average time per item in seconds	
	Total	Operational	Field test	Total	Legacy	Enhanced	Legacy	Enhanced
English	75	40	10	50	45	35	36	42
Math	60	41	4	45	60	50	60	67
Reading	40	27	9	36	35	40	53	67
Science	40	34	6	40	35	40*	53	60*

*The total testing time for science was 45 minutes (with an average of 68 seconds per item) in the June linking study, but it was later changed to 40 minutes (with an average of 60 seconds per item).

The enhancements include a reduction in test length and total testing time but an increase in the average time per item. On the enhanced ACT, the number of operational items was reduced by 35 (47%), 19 (32%), 13 (33%), and 6 (15%) for the English, math, reading, and science tests, respectively. The EMRS Composite score for the legacy ACT test is based on 215 items, while the EMR Composite score for the enhanced ACT will be based on 108 items. The number of

items contributing to the EMR Composite score is reduced by 107 (50%) due to the reduction of test length and the exclusion of science in its calculation.

As pointed out in the note in Table 1, the enhanced science test was administered with different timing in the linking study in June 2024, where 45 minutes were allowed for testing (10 minutes more than the time allowed on the legacy ACT). After ACT reviewed the impact of the additional 10 minutes on science test performance and considered the need to maximize efficiency in test administration with science optional, timing for the enhanced science test was changed from 45 minutes to 40. The mode comparability study in October 2024 reexamined the timing adjustment and confirmed that a 5-minute increase was adequate for the science test.

This document focuses on findings from the June 2024 linking study. It first describes the data used for the study. Data analyses and results regarding construct equivalency and psychometric properties are presented next, followed by the methodology and detailed results of the linking study. Timing analysis results and a summary of major findings and conclusions are provided at the end.

Data Collection Design and Sample Demographics

In the June 2024 linking study, one legacy ACT form (hereafter referred to as the Legacy Form) and two enhanced ACT forms (hereafter referred to as Enhanced Form 1 and Enhanced Form 2) were used.

Table 2. Demographic Characteristics (Percentages)

Demographic characteristic		Study sample	5-year ACT testing volume
Gender	Another gender	0.2	0.3
	Female	54.3	52.2
	Male	44.7	44.4
	Prefer not to respond	0.8	0.9
	Missing	<0.1	2.3
Race/ethnicity	American Indian/Alaska Native	0.7	0.8
	Asian	4.8	5.2
	Black/African American	14.5	11.9
	Hawaii Native/Other Pacific Islander	0.1	13.6
	Hispanic/Latino	13.4	0.2
	White	58.0	54.2
	Two or more races	5.0	4.4
	Prefer not to respond	3.4	3.8
	Missing	0.1	5.9

Participants of the study were online testers from the June 2024 ACT national administration. When students registered for the test, they were given the option of testing online or on paper.

Those who selected the online test received additional permissions and information about the study. Students who did not agree to participate in the study could opt to register for the paper test instead. Data were collected during the online administration using a random groups design, where the Legacy Form, Enhanced Form 1, and Enhanced Form 2 were spiraled among students within test centers, including students who tested with extended time accommodations. Over 180 test centers across the country participated in the study. The final cleaned dataset included 6,882 students: 2,298 for the Legacy Form, 2,280 for Enhanced Form 1, and 2,304 for Enhanced Form 2.

Gender and race/ethnicity characteristics of the sample are provided in Table 2. For comparison, the demographic characteristics of the ACT national test population from the past 5 years are also included. The sample that took the legacy form had a mean ACT Composite score of 21.57 and a standard deviation (*SD*) of 5.53. In comparison, the mean Composite and *SD* of the ACT test population in the past 5 years were 20.72 and 5.81, respectively. The gender, race/ethnicity, and score distributions of the study sample are therefore representative of the ACT test population.

Construct Equivalence

One of the requirements for an effective linking is a high degree of similarity in test features, including constructs, populations, inferences, and measurement characteristics (Kolen & Brennan, 2014). The enhanced ACT was designed to yield the same inferences by measuring the same constructs. The test specifications for the enhanced ACT are similar to those for the legacy ACT, but the test sections have different lengths and/or timing.

Table 3. Model Fit Statistics of One-Factor Models

Subject	Form	χ^2	*df*	*p*-value of χ^2 test	RMSEA	CFI	Average standardized loading
English	Legacy	7,008.428	2,700	.00	.03	.95	0.55
	Enhanced 1	1,749.684	740	.00	.02	.97	0.52
	Enhanced 2	1,710.667	740	.00	.02	.97	0.51
Math	Legacy	4,150.435	1,710	.00	.03	.97	0.55
	Enhanced 1	1,739.304	779	.00	.02	.97	0.50
	Enhanced 2	2,197.379	779	.00	.03	.95	0.49
Reading	Legacy	1,771.695	740	.00	.03	.97	0.55
	Enhanced 1	594.894	324	.00	.02	.99	0.52
	Enhanced 2	514.656	324	.00	.02	.99	0.51
Science	Legacy	2,096.352	740	.00	.03	.97	0.56
	Enhanced 1	1,528.193	527	.00	.03	.95	0.50
	Enhanced 2	1,193.889	527	.00	.02	.97	0.51

To evaluate construct equivalence, ACT psychometricians estimated confirmatory factor models for the three forms. A series of models were fit using operationally scored items and a weighted

least squares estimator. These models were all one-factor models, where all items load on a single latent factor representing knowledge or ability in each test section (e.g., English). Table 3 reports the model fit statistics of the one-factor models for each test section. Hu and Bentler's (1999) guidelines for acceptable fit include a non-significant χ^2, a root mean square error of approximation (RMSEA) less than .06, and comparative fit index (CFI) values of greater than .95. Based on the RMSEA and CFI, the model fit is acceptable for all test forms and test sections. The results of χ^2 tests are known to be influenced by sample size, so even models with good fit can have statistically significant results when the sample size is large. The average standardized factor loadings for the one-factor models are also presented in Table 3. The average standardized loadings ranged from .49 to .56, indicating that items had moderate correlations with the latent factors for both the legacy and enhanced ACT tests.

In addition, confirmatory factor analysis models were fit for the reporting categories within each test section, with similar factor loadings obtained for the reporting categories across the legacy and enhanced forms.

Psychometric Properties

ACT investigated the impact of test changes on measurement precision, test score reliability, and observed score correlations among the ACT tests. The practical impact on score interpretations and the decision consistency of individual scores were also examined.

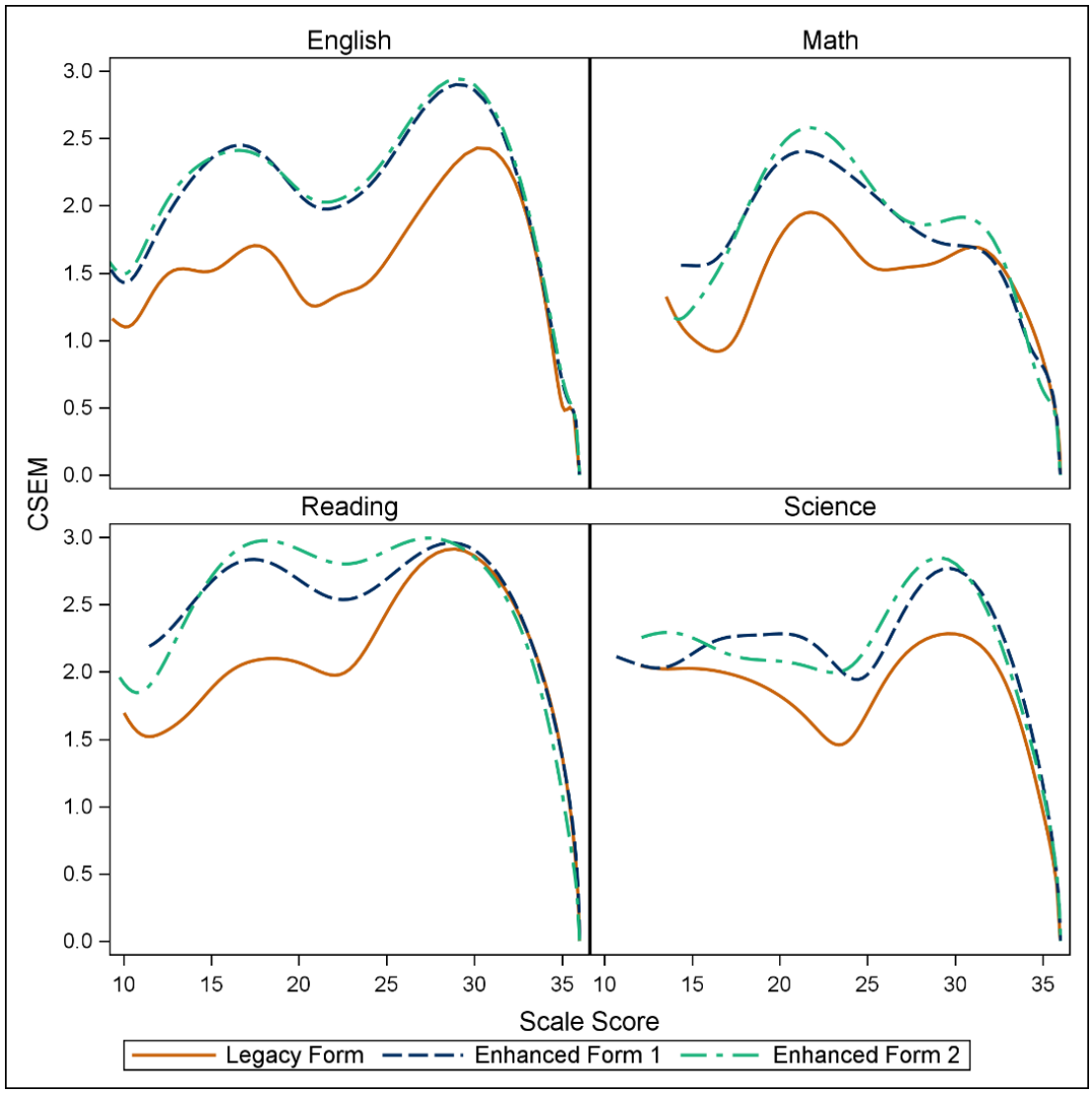
Conditional Standard Error of Measurement, Standard Error of Measurement, and Reliability

In 1989, the ACT test was scaled to have approximately equal conditional standard errors of measurement (CSEMs) along the score scale. Subsequent forms were equated to the base forms through chains of equating, and the CSEMs have been continuously monitored for all the ACT forms. It is expected that the new test forms will best preserve the constant CSEM property if they are as similar to the base form as possible in terms of statistical and content specifications. However, differences exist among the legacy forms due to gradual changes in the test specifications and form difficulty over time. As expected, the CSEMs along the score scale have shown increased variability over the years, but the legacy ACT multiple-choice test sections still have a roughly constant CSEM of about 2 (ACT, 2024).

ACT examined the scale score CSEMs and standard errors of measurement (SEMs) of the enhanced ACT test forms to evaluate whether measurement errors were still roughly equal across scores and whether the magnitude of the error exceeded that reported in the legacy ACT score report (i.e., 2 for each multiple-choice section test and 1 for the Composite score). Scale score CSEMs, SEMs, and reliability were estimated based on a four-parameter beta compound binomial model as described in Kolen et al. (1992). Figure 1 presents the CSEM plots for each test section. Although the CSEMs of the Legacy Form, Enhanced Form 1, and Enhanced Form 2 all have a similar pattern across the scale scores, both enhanced forms have increased CSEMs due to the reduction in test length. Nevertheless, the CSEMs for Enhanced Forms 1

and 2 are still about 2 along the majority of the score scale, except that they are getting close to 3 for reading.

Figure 1. Conditional Standard Errors of Measurement for Each Section Test



Reliability and SEM estimates are reported in Table 4. Despite the reduction in test length, which led to a slight increase in SEMs and a decrease in scale score reliability, the enhanced forms still demonstrated high reliability: .96 for the EMRS Composite, .94 for the EMR Composite, and between .83 and .88 for the test sections. The small increases in SEM—about 0.3 for the EMR and EMRS Composite scores and about 0.5 for the test sections—have minimal impact on score interpretations. Similar to the legacy form, the enhanced forms had an SEM around 1 for the EMR and EMRS Composite scores and SEMs around 2 for the test sections, with the exception of the enhanced reading test SEM, which was slightly higher than 2.5. Overall, the reliability of the enhanced forms remains robust, ensuring consistent and dependable score interpretations.

Table 4. Reliability Estimates and Standard Errors of Measurement for Each Section Test and Composite Scores

Test/score	Reliability			SEM		
	Legacy Form	Enhanced Form 1	Enhanced Form 2	Legacy Form	Enhanced Form 1	Enhanced Form 2
English	.94	.88	.88	1.58	2.23	2.26
Math	.93	.88	.88	1.43	1.92	1.94
Reading	.89	.84	.83	2.22	2.66	2.75
Science	.89	.85	.85	1.88	2.22	2.25
STEM	.95	.93	.92	1.18	1.47	1.49
EMR Composite	.97	.94	.94	1.03	1.32	1.35
EMRS Composite	.97	.96	.96	0.90	1.14	1.16

Note. STEM is a combination of a student's math and science scores.

Correlations and Disattenuated Correlations

Observed correlations and disattenuated correlations (from which the impact of measurement error is removed) among the test sections are presented in Table 5. Likely due to the decrease in reliability, all the observed correlations among the test sections of Enhanced Forms 1 and 2 are lower than those of the Legacy Form. The disattenuated correlations between the Legacy Form and Enhanced Forms 1 and 2 are similar.

Table 5. Correlations (Upper Diagonal in Bold) and Disattenuated Correlations (Lower Diagonal in Italics)

Form and section		English	Math	Reading	Science
Legacy	English	—	**.77**	**.83**	**.79**
	Math	*.82*	—	**.71**	**.82**
	Reading	*.91*	*.78*	—	**.79**
	Science	*.87*	*.90*	*.89*	—
Enhanced 1	English	—	**.69**	**.79**	**.74**
	Math	*.78*	—	**.63**	**.78**
	Reading	*.91*	*.73*	—	**.72**
	Science	*.86*	*.91*	*.85*	—
Enhanced 2	English	—	**.70**	**.79**	**.76**
	Math	*.80*	—	**.63**	**.80**
	Reading	*.92*	*.74*	—	**.74**
	Science	*.88*	*.92*	*.87*	—

Effective Weights

The ACT Composite scores are simple averages of the section test scores, indicating an equal nominal weight for all the component scores. However, the actual contribution of each component test to the Composite score variance may not be equal. Effective weights, which measure the proportion of the variability of a Composite score that can be attributed to each component test, are presented in Table 6 for the EMRS Composite score and Table 7 for the EMR Composite score. The effective weights for the Legacy Form and Enhanced Forms 1 and 2 are identical or very similar.

Table 6. Effective Weights of the Component Tests for the EMRS Composite Score

Form	English	Math	Reading	Science
Legacy	.27	.22	.27	.24
Enhanced 1	.27	.22	.27	.24
Enhanced 2	.27	.22	.27	.24

Table 7. Effective Weights of the Component Tests for the EMR Composite Score

Form	English	Math	Reading
Legacy	.35	.29	.36
Enhanced 1	.35	.28	.36
Enhanced 2	.36	.28	.36

Classification Accuracy of ACT College Readiness Benchmarks and WorkKeys NCRC Indicator

Table 8 presents the classification consistency of the ACT College Readiness Benchmarks and the Progress Toward the ACT® WorkKeys® National Career Readiness Certificate® (NCRC®) indicator. Classification consistency refers to how often students are placed in the same category over replications of a measurement procedure. However, since students can take the test once, classification consistency is typically estimated from a single test administration, with strong assumptions about distributions of measurement errors and true scores. Using the method described by Livingston and Lewis (1995), ACT estimated the classification consistency of the ACT College Readiness Benchmarks (18, 22, 22, and 23 for English, math, reading, and science, respectively). The classification consistency estimates are fairly high, with the values for the two enhanced forms ranging from .83 to .89, though slightly lower than those for the legacy form, which range from .87 to .92.

Table 8. Classification Consistency Indices of ACT College Readiness Benchmarks and WorkKeys NCRC Indicator

		Legacy Form	Enhanced Form 1	Enhanced Form 2
College Readiness Benchmarks	English	.90	.85	.85
	Math	.92	.89	.89
	Reading	.87	.84	.83
	Science	.87	.85	.85
NCRC indicator	EMRS Composite	.80	.75	.74
	EMR Composite	.77	.71	.70

Using the same methodology, ACT also estimated the classification consistency of the NCRC indicator. Based on their ACT Composite scores, students are classified into one of five categories corresponding to the WorkKeys NCRC levels, from unlikely to earn an NCRC to most likely to obtain a Bronze, Silver, Gold, or Platinum certificate. The cut scores on the ACT Composite score for these NCRC level predictions are 13, 17, 22, and 27, respectively. The classification of these cut scores for both the EMR Composite and the EMRS Composite were obtained. The classification consistency estimates for the enhanced forms range between .70 and .75 for the two Composite scores. Though these estimates are lower than those for the legacy form, which range from .77 to .80, the agreement rates for the enhanced forms are still fairly high considering that there are five NCRC categories.

Linking Method, Result, and Evaluation

ACT used the IRT true score equating method to link scores from Enhanced Forms 1 and 2 to those from the Legacy Form. The Legacy Form used in the study had been equated previously and was used as the anchor to link Enhanced Forms 1 and 2. First, item parameters on all three forms were calibrated. Then, the item parameters were transformed to be on the same scale as the legacy ACT item pool; ACT used the Stocking and Lord (1983) procedure to get scale transformation intercepts and slopes based on parameters for the legacy form. Finally, ACT conducted IRT true score linking to obtain raw-to-scale score conversions for the new ACT forms.

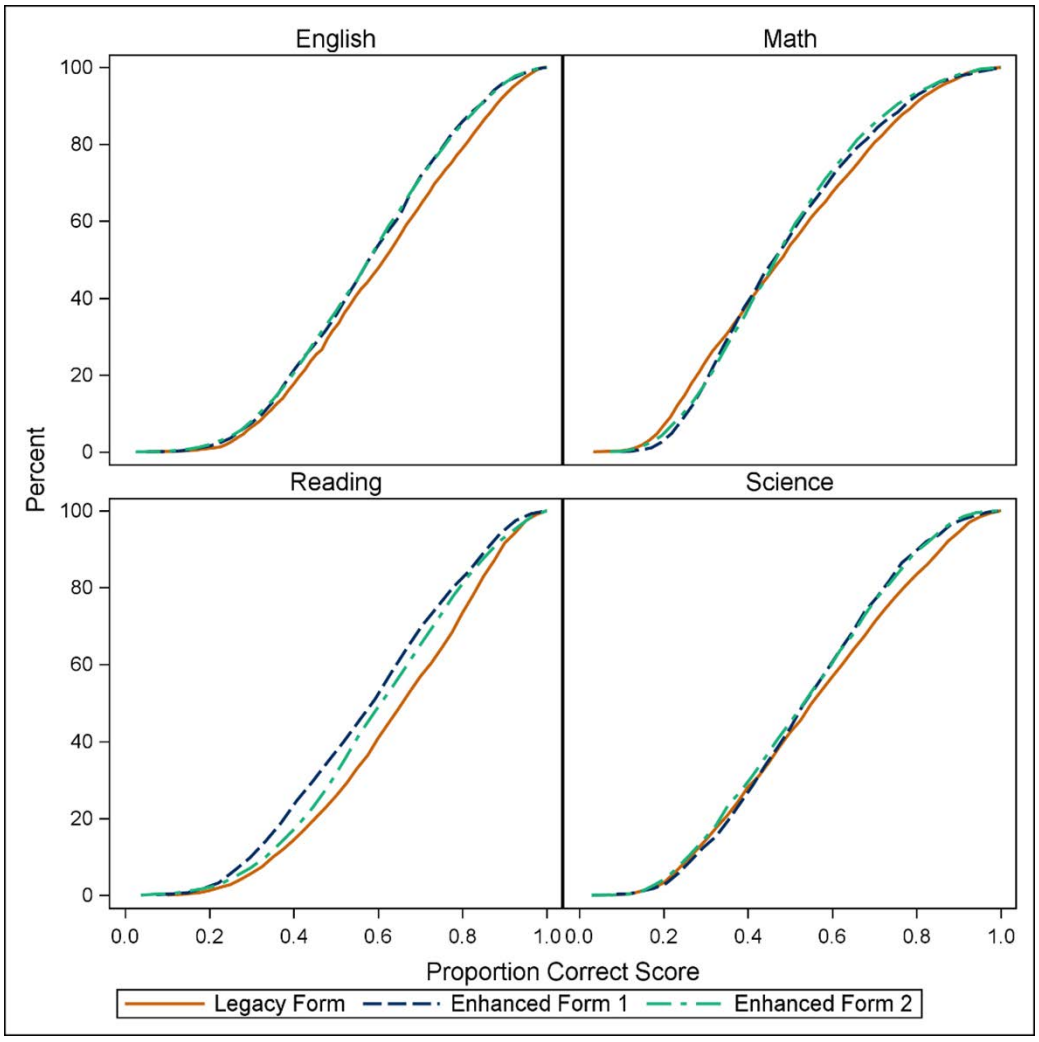
Descriptive Statistics and Distributions

The proportion correct score descriptive statistics are provided in Table 9, and their relative cumulative frequency distributions are presented in Figure 2. The difficulty of the enhanced forms is similar to that of the legacy test in all four test sections.

Table 9. Proportion Correct Raw Score Descriptive Statistics

Test section	Form	Mean	*SD*	Skewness	Kurtosis
English	Legacy	0.62	0.20	−0.08	−0.92
	Enhanced 1	0.59	0.19	−0.04	−0.76
	Enhanced 2	0.59	0.19	−0.05	−0.74
Math	Legacy	0.50	0.21	0.24	−0.93
	Enhanced 1	0.50	0.19	0.45	−0.61
	Enhanced 2	0.49	0.19	0.36	−0.50
Reading	Legacy	0.65	0.20	−0.34	−0.77
	Enhanced 1	0.60	0.21	−0.08	−0.90
	Enhanced 2	0.62	0.20	−0.18	−0.65
Science	Legacy	0.57	0.22	0.02	−0.99
	Enhanced 1	0.55	0.20	0.04	−0.75
	Enhanced 2	0.55	0.20	0.01	−0.93

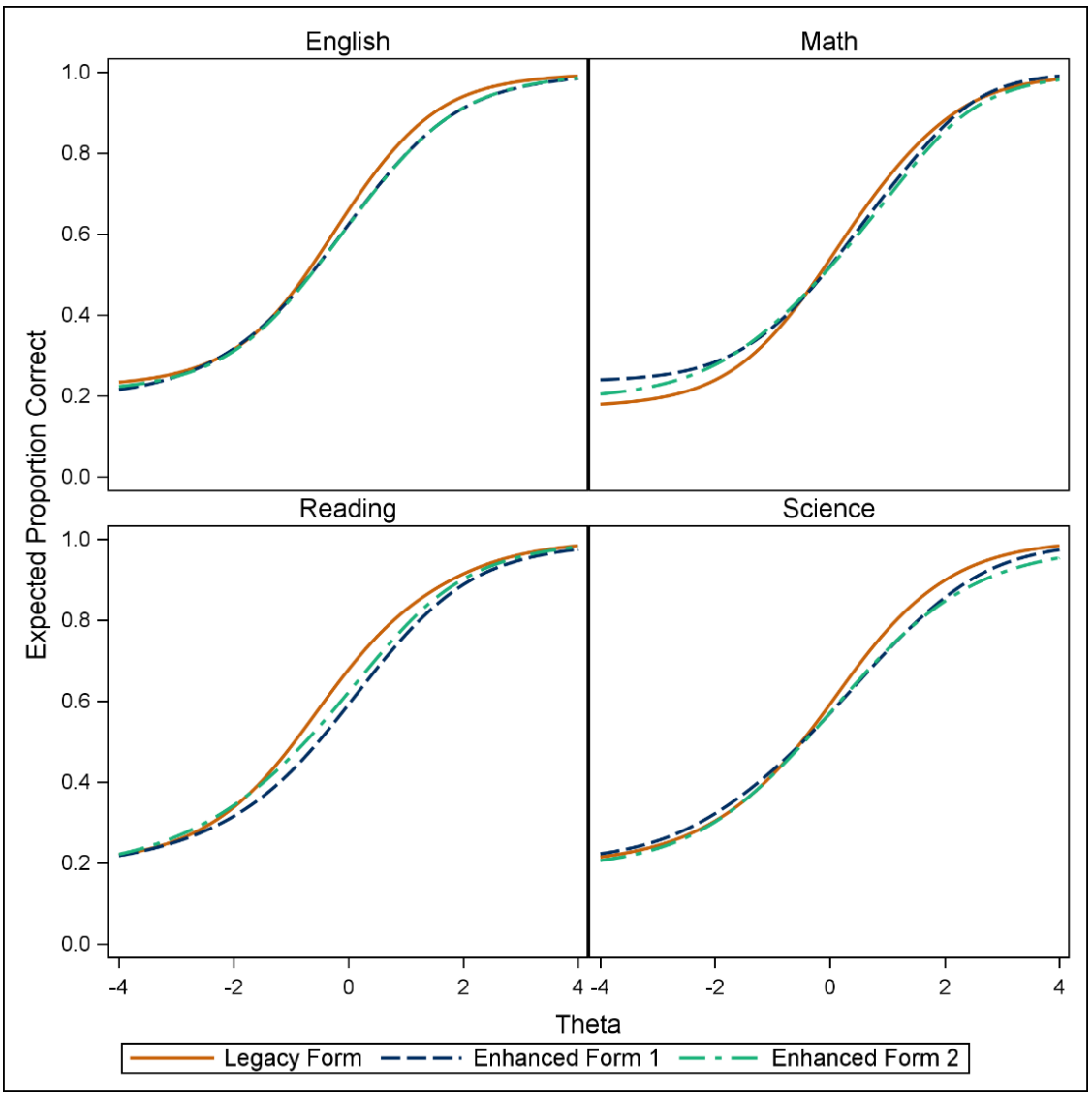
Figure 2. Relative Cumulative Distributions of Proportion Correct Scores



Test Characteristic Curves

ACT used the three-parameter logistic IRT model to fit the item score data. Item parameters were estimated for each test form and then transformed according to the Stocking–Lord method to the legacy ACT item pool using items in the legacy form. Figure 3 shows the test characteristic curves (TCCs) of the three study forms for each test section. The solid line denotes the legacy form, and the dashed lines denote the two enhanced forms. The *x*-axis represents the theta score, and the *y*-axis represents the proportion correct. In these graphs, the curves that are shifted to the left indicate easier forms. This is consistent with the proportion correct raw score distributions. Although there is a tendency for the enhanced forms to be slightly more difficult than the legacy form (especially for reading), the differences are small.

Figure 3. Test Characteristic Curves



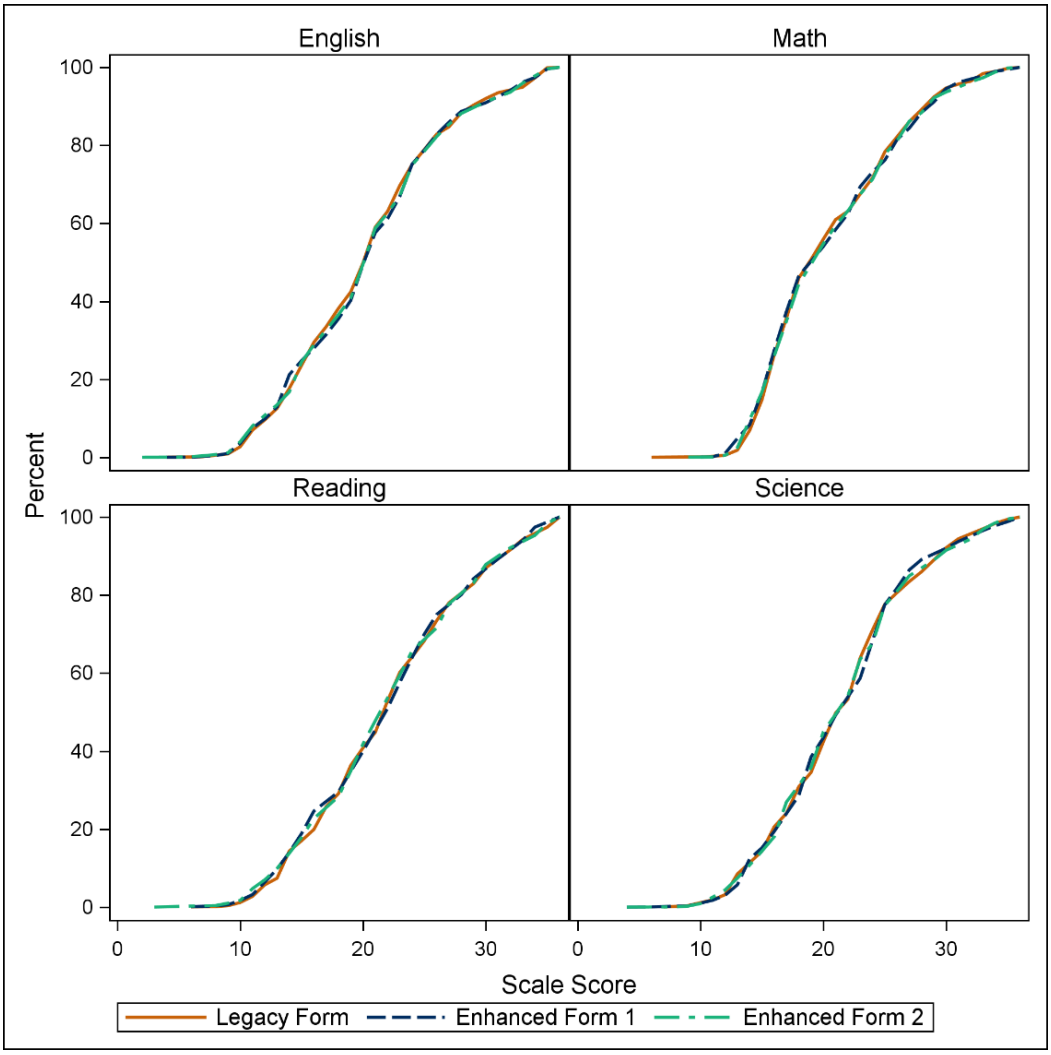
Scale Score Descriptive Statistics and Distributions

Using IRT true score linking, ACT obtained raw-to-scale score conversions for the two enhanced ACT forms. Descriptive statistics of section, STEM, EMR Composite, and EMRS Composite scores are provided in Table 10. The means of the Legacy Form and Enhanced Forms 1 and 2 are nearly identical. Note that the EMR Composite score means are about 0.2 lower than the EMRS Composite score means. Figure 4 presents the relative cumulative scale score distributions. As expected, the scale score descriptive statistics and distributions were very similar after equating.

Table 10. Scale Score Descriptive Statistics

Score	Form	Mean	*SD*	Skewness	Kurtosis
English	Legacy	20.68	6.31	0.36	−0.38
	Enhanced 1	20.78	6.40	0.29	−0.45
	Enhanced 2	20.76	6.44	0.28	−0.43
Math	Legacy	20.85	5.44	0.63	−0.50
	Enhanced 1	20.84	5.60	0.59	−0.59
	Enhanced 2	20.93	5.57	0.61	−0.52
Reading	Legacy	22.44	6.59	0.22	−0.71
	Enhanced 1	22.37	6.67	0.14	−0.75
	Enhanced 2	22.41	6.71	0.10	−0.70
Science	Legacy	21.76	5.74	0.23	−0.38
	Enhanced 1	21.79	5.73	0.26	−0.27
	Enhanced 2	21.78	5.83	0.26	−0.42
STEM	Legacy	21.55	5.33	0.47	−0.51
	Enhanced 1	21.56	5.35	0.47	−0.44
	Enhanced 2	21.61	5.39	0.48	−0.51
EMR Composite	Legacy	21.33	5.63	0.36	−0.59
	Enhanced 1	21.33	5.58	0.28	−0.69
	Enhanced 2	21.37	5.62	0.29	−0.61
EMRS Composite	Legacy	21.57	5.53	0.34	−0.59
	Enhanced 1	21.57	5.44	0.30	−0.62
	Enhanced 2	21.59	5.50	0.30	−0.62

Figure 4. Relative Cumulative Distributions of Scale Scores



Population Invariance Evaluation

Equating functions are expected to be population invariant. That is, the equating function should be the same for different subpopulations and for the whole population. Although this property never holds perfectly in practical situations, it is expected that the equating function will be more population dependent if there are more differences in the test forms to be equated (Dorans & Holland, 2000). Due to the changes in test specifications in Enhanced Forms 1 and 2, ACT examined the population invariance property by comparing conversion tables obtained using different subgroups in the equating sample and those using the total equating sample.

Population invariance evaluation is feasible only for major subgroups that have sufficient sample sizes. Therefore, in this study, linking was conducted for the male and female subgroups, as well as for the total group. Conversion tables from each subgroup were compared with those from the total group. The weighted root mean squared difference (WRMSD) statistic was calculated for each comparison to summarize the conversion table differences.

The WRMSD statistic for each comparison is presented in Table 11 by test form. The values of WRMSD range from 0.1 to 0.49 across all the comparisons. These statistics are all less than half a score point, indicating stability of the linking results in subgroups. In addition, similar analyses were conducted for 11 recently equated legacy ACT forms to serve as a baseline for comparison. The ranges of the WRMSD statistics among the 11 legacy forms are also presented in Table 11. Almost all the WRMSD statistics for the enhanced forms fell within these ranges, indicating that the extent of population invariance of the enhanced forms was similar to that of the legacy forms. These findings provide additional evidence for the robustness of the linking results.

Table 11. WRMSD Statistics of Subgroup Versus Total Group Comparisons

Section	Form	Female vs. Total	Male vs. Total
English	Enhanced 1	0.24	0.36
	Enhanced 2	0.13	0.17
	Previous legacy forms	0.10–0.43	0.12–0.55
Math	Enhanced 1	0.30*	0.20
	Enhanced 2	0.23	0.21
	Previous legacy forms	0.08–0.27	0.10–0.30
Reading	Enhanced 1	0.31	0.49
	Enhanced 2	0.23	0.32
	Previous legacy forms	0.16–0.44	0.17–0.55
Science	Enhanced 1	0.34*	0.19
	Enhanced 2	0.11	0.11
	Previous legacy forms	0.12–0.24	0.14–0.31

*This value does not fall within the range.

Timing Analyses and Results

Student responses and response times on the test were analyzed for both the legacy and enhanced forms. This evaluation was based on rapid response rates, completion rates, omit rates, and survey responses about whether students felt they had sufficient time. The results are presented in the section below.

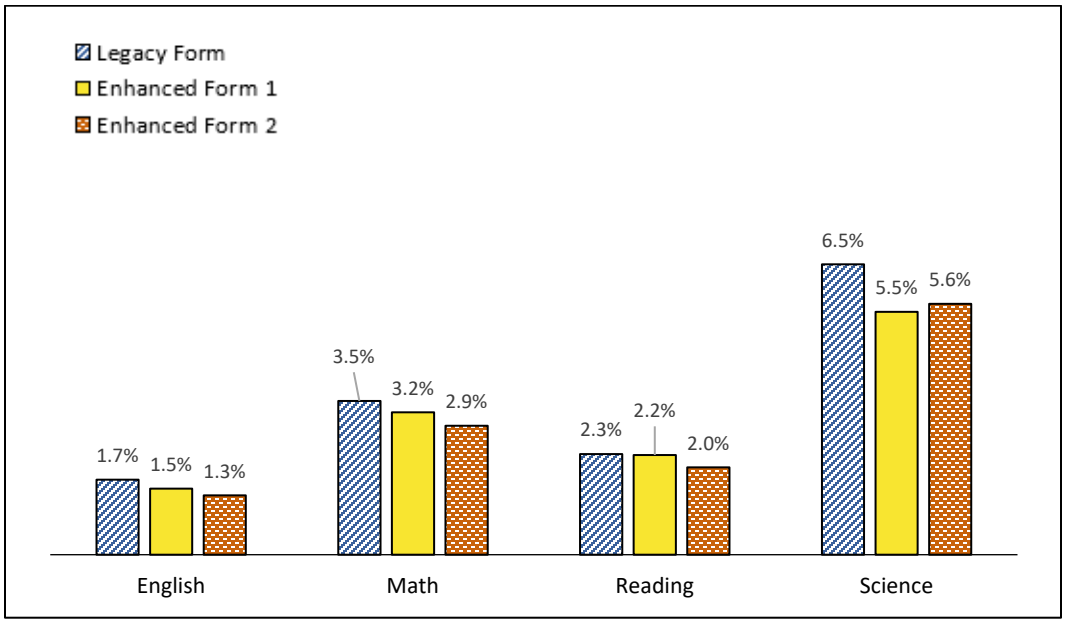
Rapid Response Rate

An analysis of rapid response rates can provide insights into the effects of extending the time allocated per item on examinees' test-taking behaviors. In this study, a response is considered rapid if the time taken to respond to an item is less than 5 seconds.

Figure 5 gives the average percentage of items to which examinees responded in less than 5 seconds on all three forms. As indicated in the graph, science had the highest number of items with rapid response rates for both the legacy and enhanced forms. On average, 6.5% of the items on the Legacy Form were answered in less than 5 seconds, while 5.5% and 5.6% of the items on Enhanced Forms 1 and 2, respectively, were answered in less than 5 seconds. For all

test sections, the average percentages of items with rapid responses across examinees are slightly lower on the enhanced forms than on the legacy form, by 0.1% to 1%.

Figure 5. Average Percentage of Items with Rapid Responses



Completion Rate

The completion rate, defined as the percentage of examinees who finish the test, can be calculated in different ways depending on the criteria for what constitutes completing a test. Figure 6 shows the percentage of examinees who completed the legacy and enhanced forms, where completion rate is defined as the percentage of examinees who answered **all** of the last five items, regardless of whether examinees answered the items with sufficient time or rapid responding. As indicated in Figure 6, completion rates increased slightly on the enhanced forms for reading (1%–2%) and science (3%–4%), but they decreased slightly on the enhanced forms for English (1%–3%) and math (3%).

Figure 6. Percentage of Examinees Who Answered All of the Last Five Items

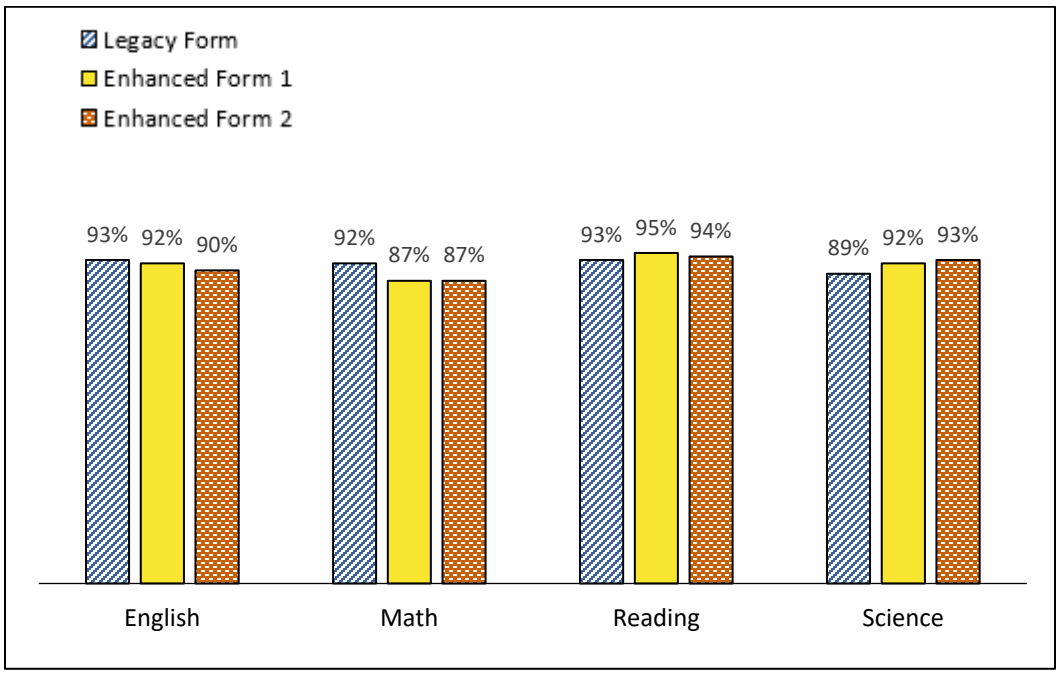
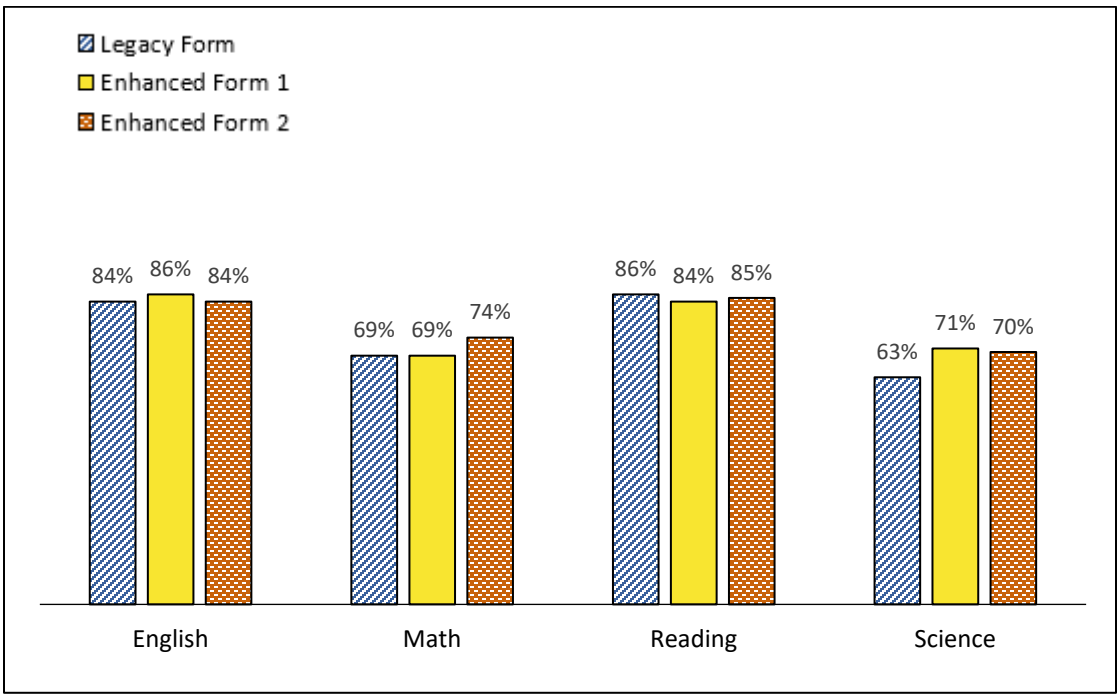


Figure 7 shows completion rates after examinees who answered any of the last five items in less than 5 seconds were excluded. Based on this calculation, compared to the Legacy Form, the completion rate for Enhanced Form 1 for English is slightly higher by 2%. The completion rate for Enhanced Form 2 for math is higher by 5%. The completion rates for Enhanced Forms 1 and 2 for science are higher by 8% and 7%, respectively. However, the completion rates for the enhanced forms for reading are 1%–2% lower than those for the legacy form.

Figure 7. Completion Rates After Removing Rapid Responses (Last Five Items)



Both methods showed an increase in the completion rate for science on the enhanced forms. For the other tests, the completion rate increased or decreased slightly depending on the method used.

Omit Rates

The number of items omitted (that is, not answered) is also used as a measure to determine whether the given time is sufficient for test completion. Figure 8 gives the average percentage of items omitted across all examinees. For English, no distinct pattern was observed between the legacy and enhanced forms, as the percentage of omits increased slightly on one form but decreased slightly on the other. In the case of math, there was a slight increase in the percentage of items omitted on the enhanced forms. The patterns for science and reading, with lower omit rates for the enhanced forms than for the legacy forms, were slightly more pronounced than those for English and math.

Figure 8. Average Percentage of Items Omitted Across Examinees

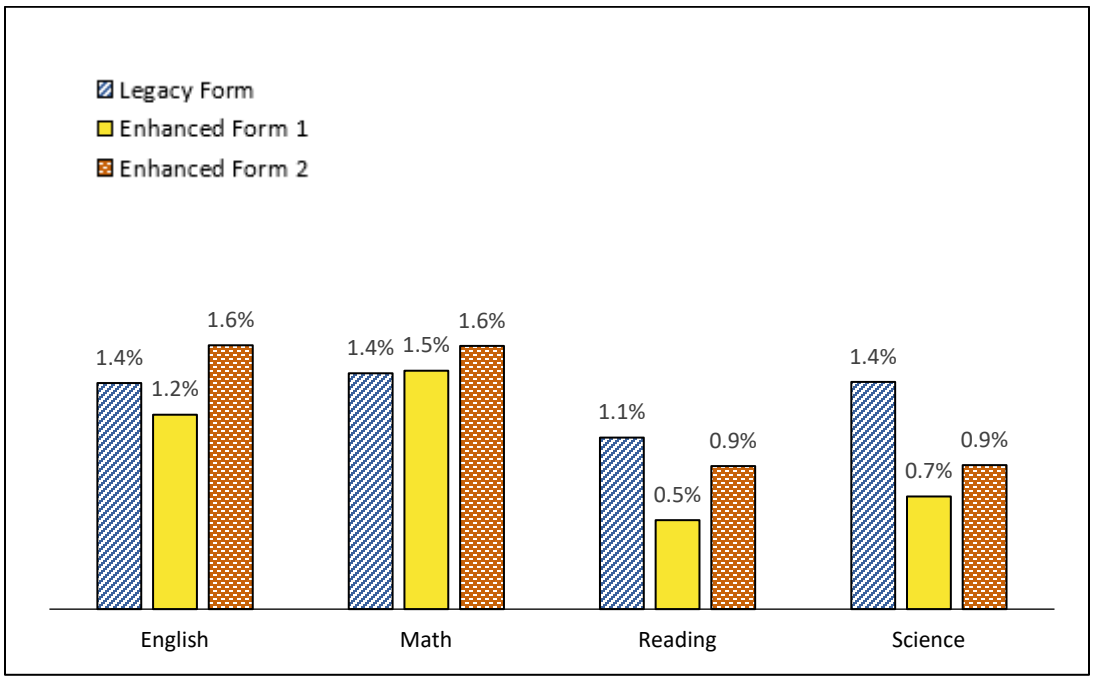
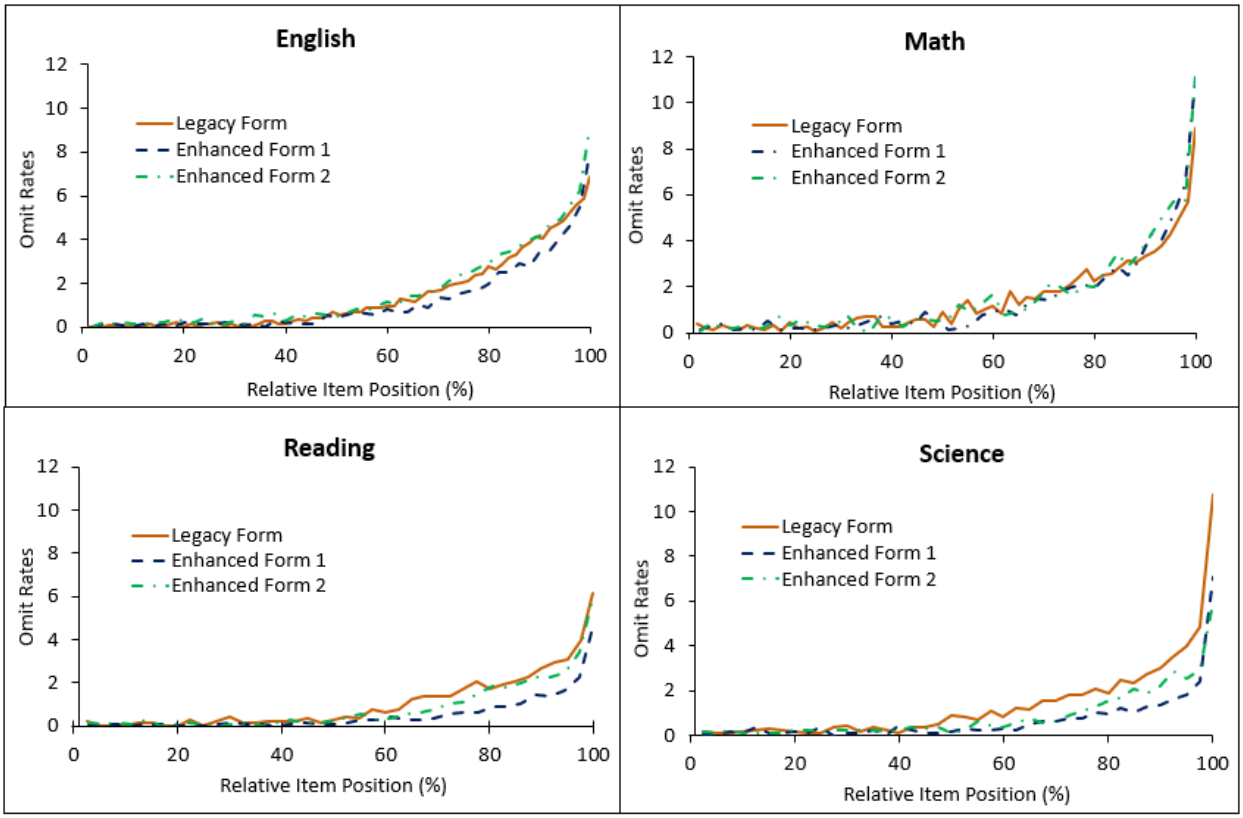


Figure 9 presents the omit rates across all items, providing a more comprehensive view by showing the specific items around which the omit rates begin to increase. To compare omit rates across the legacy and enhanced forms, which have different test lengths, ACT put item order on a common scale, shown as the relative item position percentage on the *x*-axis in Figure 9. Each block in the figure represents a test section, and the *y*-axis displays the percentage of examinees that omitted a particular item. A higher curve indicates a larger percentage of examinees omitting that item. Figure 9 indicates that omit rates begin to increase approximately halfway through the test across all subjects and forms. They are highest for the last few items for both the legacy and enhanced forms.

Omit rates for the English and math legacy and enhanced forms did not exhibit a distinct pattern. For reading and science, omit rates were lower for the enhanced forms than for the legacy form during the second half of the tests.

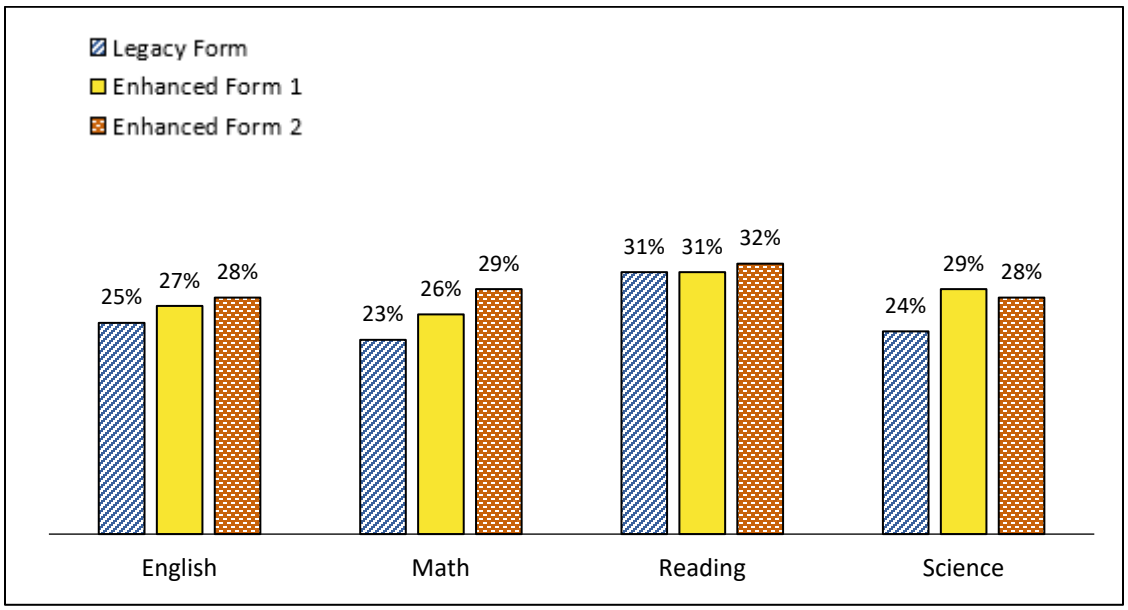
Figure 9. Omit Rate on Each Item



Percentage of Items Visited More Than Once

As indicated in Figure 10, across all tests, the percentage of items visited more than once was higher on the enhanced forms than on the legacy form. The maximum difference between the legacy and enhanced forms was in science and math, ranging from 4% to 5% and 3% to 6%, respectively. Assuming that examinees revisit items only after they have gone through all the items once and have sufficient time remaining, these results suggest that examinees had more time to review questions on the enhanced forms.

Figure 10. Percentage of Items Visited More Than Once

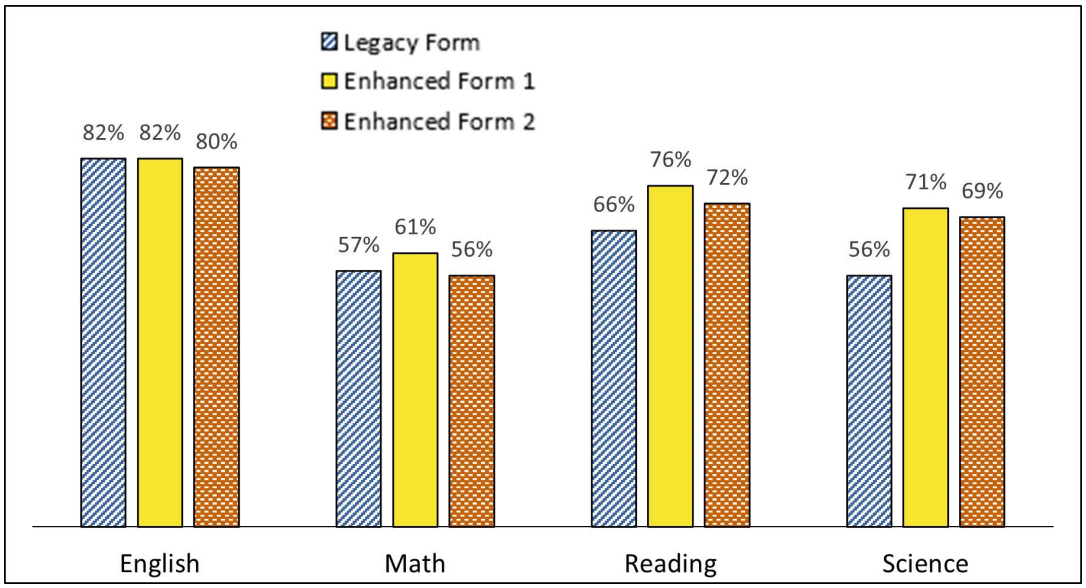


Survey Results: Perceived Sufficiency of Time

Examinees were asked whether they had enough time to complete each section of the test. Examinees who selected “Yes, I had a lot more time than I needed,” “Yes, I had slightly more time than I needed,” or “I had just enough time” were considered to have had enough time to complete the test.

Figure 11 shows the percentage of responses by test form. For English, the percentage of examinees who said they had enough or more than enough time to complete the test was similar for all three forms. For math, the percentages were inconsistent between the legacy and enhanced forms (for one enhanced form, they were higher than those for the legacy form, and for the other, they were lower). For reading, the percentages of examinees who said they had enough time on Enhanced Forms 1 and 2 were 10% and 6% higher, respectively, than the percentage for the Legacy Form. For science, the percentages were 15% and 13% higher, respectively, for Enhanced Forms 1 and 2.

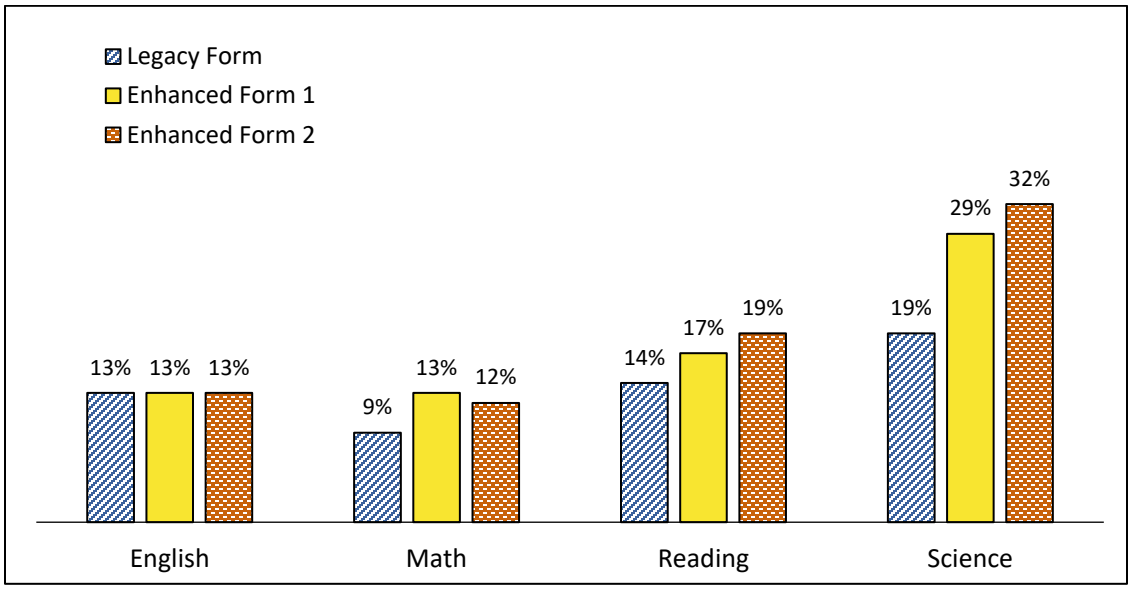
Figure 11. Survey Response for Perceived Sufficiency of Time



Extended-Time Examinees

To look at the impact of the enhancements on students with extended time accommodation, ACT included students with time-and-a-half accommodations in the study. Figure 12 shows the percentage of the extended time students who submitted their tests within the standard time. The percentage of extended time students who submitted their tests within the standard time increased for math (3%–4%), reading (3%–5%), and science (10%–13%).

Figure 12. Percentage of Time-and-a-Half Students Who Submitted Tests Within Standard Testing Time



Summary

In summary, the enhanced ACT test measures the same constructs and reports scores on the same scales as the legacy ACT test. The enhancements had minimal impact on student performance, though there was some evidence of a small effect on test completion rates and students' perceptions of having enough time to complete the test. While the reduction in test length led to expected decreases in measurement precision, the impact on score interpretation was minimal. Therefore, scores on the enhanced ACT test and the legacy ACT test can be used interchangeably.

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