

Does ACT® Test Prediction Accuracy Depend on Testing Accommodations Received in Grades 10 and 11?

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Introduction

Recent research has shown that grade 10 ACT Aspire® scores are strongly correlated with grade 11 ACT test scores.¹ To enhance interpretation of ACT Aspire scores and inform student planning, predicted ACT score ranges are reported for students who take ACT Aspire in grades 9 or 10.² The correlations and predicted ACT score ranges were estimated using all available data, including students who tested with special accommodations. Predictive accuracy was not examined separately for students who received testing accommodations, however. To date, the number of students who have taken ACT Aspire in early high school and the ACT is limited and likely too small to examine predictive accuracy for each group of students who tested with different types of accommodations.

Prior to the launch of ACT Aspire though, the ACT Plan® assessment was administered to students in grade 10; as a result, there are thousands of students who took ACT Plan in grade 10 and the ACT in grade 11, including many who tested with accommodations on one or both tests. In this brief, ACT Plan-to-ACT prediction accuracy is examined for each subgroup of students defined by different types of testing accommodations.

Data and Method

Records from three ACT Plan testing years were matched to those from three ACT testing years (Table 1). Students were included in the sample if they took ACT Plan in grade 10 and the ACT in grade 11 and took the two tests between 12 and 18 months apart. The sample consisted of 1,583,067 students, of whom 95.8% took

Table 1. Sample Size by Student Cohort

Cohort	ACT Plan Testing Year	ACT Testing Year	N	Percent with Accommodations			
				Grade 10	Grade 11	Grades 10 & 11	Any
1	2009–2010	2010–2011	467,766	2.3	2.6	1.2	3.8
2	2010–2011	2011–2012	502,531	2.5	2.9	1.3	4.1
3	2011–2012	2012–2013	612,770	3.0	3.2	1.5	4.7
Total			1,583,067	2.6	3.0	1.4	4.2

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both tests with no accommodations. The remaining 4.2% took one or both tests with accommodations.

The demographics (gender and race/ethnicity) of the study sample are given in Table 2 for the total group and for students who received any accommodations.

The accommodated group has a higher concentration of male students.

Students were classified according to the accommodations they received in grade 10 and grade 11.³ Table 3 provides the marginal frequencies of the different types of accommodations for grade 10 (ACT Plan) and grade 11 (the ACT). As expected, students who tested with accommodations in grade 10 were more likely to also test with accommodations in grade 11.⁴

Some students received more than one accommodation in grade 10 and/or grade 11. In these cases, extended time testing was often used along with another accommodation. Some categories of accommodations were only available on the ACT. For ACT Plan, certain accommodations were only available with extended time testing (assistive communication device [ACD], braille, reader). Later, results are presented using the cross-classifications of the two sets of accommodations.

For students who received accommodations in both grade levels, the relationship of the grade 11 accommodations to the grade 10 accommodations can be categorized as:

- **Same or similar**—for example, students who received an extended time accommodation only in grade 10 and grade 11
- **Grade 11 accommodations were more than the grade 10 accommodations**—for example, students who used a reader with extended time in grade 11 but only received extended time in grade 10

Table 2. Sample Demographics

Demographics	Total Group		Accommodated Group	
	N	Percent	N	Percent
Gender				
Female	831,803	52.5	25,592	38.3
Male	737,506	46.6	40,540	60.7
Missing	13,758	0.9	713	1.1
Race/Ethnicity				
African American	148,718	9.4	7,637	10.5
Asian	42,969	2.7	735	1.1
Hispanic	144,935	9.2	5,506	8.2
Native American	10,547	0.7	581	0.9
Native Hawaiian	2,684	0.2	95	0.1
White	1,081,052	68.3	40,973	61.3
Two or More Races	49,873	3.2	1,647	2.5
Missing	102,289	6.4	9,671	14.5

Table 3. Frequencies of Accommodations

Type of Accommodation	Grade 10 ACT Plan	Grade 11 ACT
<i>ACT Plan or the ACT Test</i>		
Extended Testing Time	41,075	30,969
Reader or DVD ⁵	16,551	
Reader		8,981
DVD		13,686
Scribe	771	1,749
Large Print	425	649
Assistive Communication Device (ACD)	180	165
Braille	93	91
<i>The ACT Test Only</i>		
Multiple Days of Testing ⁶		759
Additional Breaks ⁶		636
Repeated Instructions		479
Snacks or Beverage		484
Extra Prompts or Cues		371
Testing at Home or Hospital		45
Other		135

- **Grade 11 accommodations were less than the grade 10 accommodations**—for example, students who used a scribe with extended time in grade 10 but only used a scribe in grade 11
- **Different** (not including cases where accommodations were greater in one grade level relative to the other)—for example, students who used a reader with extended time in grade 10 but used a scribe in grade 11

Similar to the system used for ACT Aspire, predicted ACT score ranges can be defined based on the 25th and 75th percentiles of the ACT Composite score distribution, conditional on ACT Plan Composite score. For the total group, the correlation between ACT Plan Composite score and ACT Composite score is 0.90, and the predicted ACT score ranges for each possible ACT Plan Composite score are given in Figure 1. For example, among students with a grade 10 ACT Plan Composite score of 15, the 25th percentile of the ACT Composite score distribution is 15 and the 75th percentile is 18. Therefore, the predicted ACT Composite score range is 15 to 18.

Analyses were performed to assess whether the accuracy of predicting ACT scores from ACT Plan scores is influenced by testing accommodations received. The following statistics are presented for each accommodations subgroup:

- The **accuracy rate** is the proportion of students whose ACT Composite score is included in the predicted ACT Composite score range.
- The **under-prediction rate** is the proportion of students whose ACT Composite score exceeded the predicted ACT Composite score range. Under-prediction is more likely to occur when growth from grade 10 to grade 11 is greater than expected for some subgroups, when the predictive accuracy of ACT Plan scores varies across subgroups, or when both conditions exist.
- The **over-prediction rate** is the proportion of students whose ACT Composite score was below the predicted ACT Composite score range. Over-prediction is more likely to occur when growth from grade 10 to grade 11 is less than expected for some subgroups, when the predictive accuracy of ACT Plan scores varies across subgroups, or when both conditions exist.

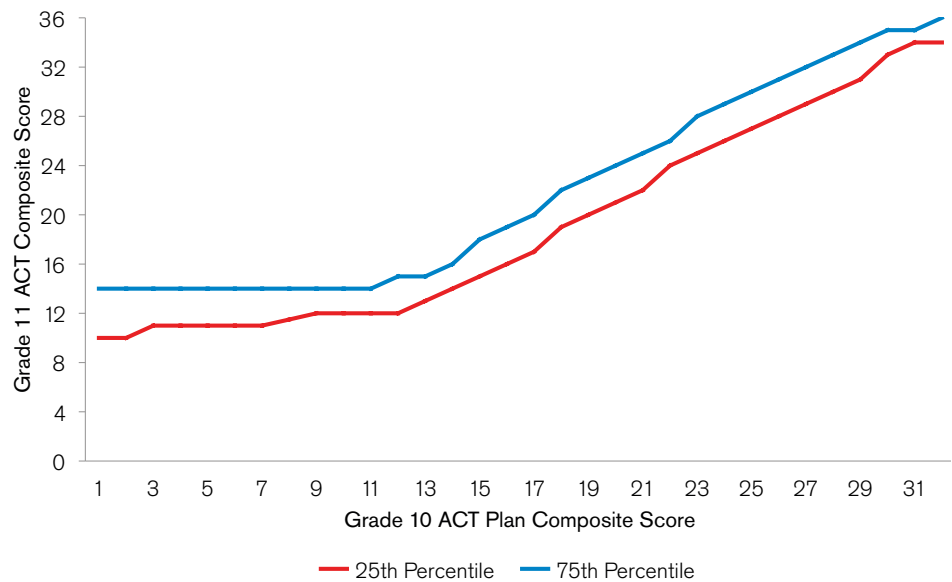


Figure 1. Predicted ACT Composite score ranges

- The **median student growth percentile (SGP)**, describing growth (relative to academic peers) from the grade 10 ACT Plan test to the grade 11 ACT test. The SGPs used for this study are based on the Composite scores and thus describe growth across four subject areas (English, mathematics, reading, and science).⁷

If the accuracy rates are similar across subgroups, it suggests that the strength of prediction is similar across all accommodations received. Similarly, if the median SGP values are similar across subgroups, it suggests that students from the different subgroups tend to demonstrate similar levels of growth between the two assessments.

If the accuracy rates vary across subgroups, it suggests that either the strength of prediction varies by accommodations received, or that growth from grade 10 to grade 11 varies by subgroup. Therefore, both accuracy rates and median SGPs are assessed for each subgroup.

Results

Each accommodations subgroup was defined by the accommodations received in grade 10 (ACT Plan) and grade 11 (the ACT). Table 4 provides the sample size (N), mean Composite scores, ACT prediction accuracy rates, and median SGP for summary groups. The summary groups are defined by the relationship of the grade 11 accommodations to the grade 10 accommodations, as well as other aggregations (any accommodations; any grade 10 accommodations but no grade 11 accommodations; any grade 11 accommodations but no grade 10 accommodations; any accommodations for both grade 10 and grade 11; total group). The results for the total group provide a point of reference for comparing the subgroup results.

For the total group, the accuracy rate was 0.63, the over-prediction rate was 0.19, and the under-prediction rate was 0.18. Because the predicted ACT score ranges are based on the 25th and 75th percentiles of the conditional score distribution, one might

Table 4. ACT Score Prediction Accuracy and Median Student Growth Percentiles, by Accommodations Summary Subgroups

Accommodations Summary Subgroup	N	Mean Composite Scores		ACT Prediction Accuracy			Median SGP
		Grade 10 ACT Plan	Grade 11 ACT	Over	Accurate	Under	
Any Grade 10 or Grade 11	66,845	15.1	16.7	0.26	0.53	0.20	46
Any Grade 10, No Grade 11	19,942	15.4	16.1	0.36	0.54	0.11	37
No Grade 10, Any Grade 11	25,450	15.0	17.5	0.19	0.50	0.31	55
Any Grade 10 and Grade 11	21,453	14.8	16.1	0.27	0.56	0.17	44
Grade 11 Different Than Grade 10	1,932	13.5	14.4	0.29	0.59	0.12	40
Grade 11 Less Than Grade 10	8,443	13.6	14.3	0.32	0.58	0.10	37
Grade 11 More Than Grade 10	1,398	15.1	17.2	0.20	0.53	0.27	53
Grade 11 Same or Similar to Grade 10	8,135	16.1	18.1	0.22	0.54	0.23	50
Total Sample	1,583,067	18.8	21.1	0.19	0.63	0.18	49

have expected the accuracy rate to be 0.50 by design. However, because an inclusive definition is used (that is, students who have a score equal to the 25th or 75th percentile are counted as being within the predicted score range), the overall accuracy rate is 0.63. As expected, the over- and under-prediction rates are similar (0.19 and 0.18).

Relative to the total group, accuracy rates were somewhat lower for students who received accommodations. Across all students receiving any accommodations, the accuracy rate was 0.53. For students who received accommodations in both grade 10 and grade 11, the accuracy rate was 0.56. When a student received accommodations in grade 11 but not grade 10, under-prediction tended to occur more frequently, which means that students achieved a higher ACT Composite score than was predicted. Under-prediction also means that students demonstrated higher-than-expected growth: For students who received accommodations in grade 11 but not grade 10, the median SGP was 55. For the other summary groups for which students received accommodations in grade 10, over-prediction (and lower student growth) was more common.

For students who received accommodations in both grade 10 and grade 11, the accuracy

rates varied by the relationship of the grade 10 accommodations to the grade 11 accommodations:

- The accuracy rate was 0.54 when the accommodations were the same or similar (not including students with no accommodations at either grade level).
- The accuracy rate was 0.59 when the accommodations were different.
- The accuracy rate was 0.53 when the grade 11 accommodations were more than the grade 10 accommodations.
- The accuracy rate was 0.58 when the grade 11 accommodations were less than the grade 10 accommodations.

In all four cases, the accuracy rates are lower than the accuracy rate for the total group. As explained earlier, this could be due to the strength of prediction varying by subgroup, or growth from grade 10 to grade 11 varying by subgroup. When the grade 11 accommodations were more than the grade 10 accommodations, students demonstrated higher growth from grade 10 to grade 11 (median SGP = 53). Therefore, the under-prediction rate (0.27) is higher than expected, and the accuracy rate is lower than expected.

When the grade 11 accommodations were less than the grade 10 accommodations,

students demonstrated lower growth from grade 10 to grade 11 (median SGP = 37). Therefore, the over-prediction rate (0.32) is higher than expected. The same pattern of results is observed when the two sets of accommodations are different. When the two sets of accommodations are the same or similar, students tend to demonstrate typical growth (median SGP = 50), but the accuracy rate (0.54) is somewhat lower than expected.

Table 5 provides the results for all accommodations subgroups (considering the cross-classification of grade 10 and grade 11 accommodations) with a sample size of at least 50. For subgroups with accommodations in both grade levels, the color shading of the row in Table 5 indicates the relationship of the grade 11 accommodations to the grade 10 accommodations:

- Rows shaded in blue represent cases where the accommodations were the same or similar.
- Rows shaded in yellow represent cases where the accommodations were different.
- Rows shaded in green represent cases where the grade 11 accommodations were more than the grade 10 accommodations.

- Rows shaded in pink represent cases where the grade 11 accommodations were less than the grade 10 accommodations.

Across accommodations subgroups, the lowest accuracy rates (ranging from 0.37 to 0.47) occurred when no accommodations were used in grade 10, but accommodations were used in grade 11, including:

- Scribe with extended time (accuracy rate = 0.37, median SGP = 81)
- Large print with extended time (accuracy rate = 0.40, median SGP = 77)
- Extended time only (accuracy rate = 0.45, median SGP = 68)
- DVD with extended time (accuracy rate = 0.47, median SGP = 68)

In each of these cases, students demonstrated higher-than-expected growth, and under-prediction was more common. The higher growth was likely due to the extra accommodations received for the grade 11 ACT test.

The highest accuracy rate (0.64) occurred when no accommodations were used in either grade level. Other groups with large sample sizes and relatively high accuracy rates include:

- No accommodations in grade 10, DVD only in grade 11 (accuracy rate = 0.59, median SGP = 41)

- Extended time only grade 10, DVD only in grade 11 (accuracy rate = 0.59, median SGP = 35)
- Reader/DVD with extended time in grade 10, extended time only in grade 11 (accuracy rate = 0.58, median SGP = 30)
- Reader/DVD with extended time in grade 10, DVD only in grade 11 (accuracy rate = 0.58, median SGP = 30)

In each of these cases, students tended to demonstrate less growth than expected, and over-prediction was more common than under-prediction.

Summary

For the total group of students, the correlation between grade 10 ACT Plan Composite scores and grade 11 ACT Composite score was 0.90, suggesting that ACT Plan scores are highly predictive of ACT scores for general student populations. A similar result has been found with ACT Aspire, and predicted ACT score ranges are reported for students who take ACT Aspire in grades 9 and 10.

The study presented here examined the accuracy of total-group predictions when applied to students with different types of testing accommodations in grades 10 and 11. For most accommodations subgroups, the accuracy rate was similar to the total-group accuracy rate of 0.63. Accuracy rates were

assessed for 38 subgroups (Table 5), and the accuracy rate was within 0.10 (10 percentage points) of the total-group accuracy rate for 29 of the subgroups comprising 77% of the students who received accommodations. The lowest accuracy rate (0.37) was observed for students who had no accommodations in grade 10 but used a scribe with extended time in grade 11.

Median SGPs varied by accommodations received. Students who received more accommodations in grade 11 than in grade 10 (or any accommodations in grade 11 and no accommodations in grade 10) tended to demonstrate higher growth. Conversely, when students receive fewer accommodations in grade 11 than in grade 10, they tend to demonstrate lower growth. SGP differences across subgroups could be due to actual differences in growth related to disability, differences in accommodations received, or both. Subgroup differences in student growth were closely related to subgroup differences in accuracy rates. Groups with higher growth had higher under-prediction rates and groups with lower growth had higher over-prediction rates. ■

Notes

- 1 Allen, J. & Liu, R. (2015). *How do grade 10 ACT Aspire scores relate to grade 11 ACT scores?* (ACT Data Byte 2015-7). Iowa City, IA: ACT.
- 2 Predicted ACT score ranges for ACT Aspire are provided at <http://www.act.org/content/act/en/products-and-services/act-aspire.html>.
- 3 Procedures for testing students with accommodations with ACT Plan are documented at <https://www.act.org/content/dam/act/unsecured/documents/Plan-SupervisorsManual.pdf>; information for the ACT is provided at <http://www.actstudent.org/register/disab/>.
- 4 Among students who tested with accommodations in 10th grade, 51.8% tested with accommodations in 11th grade. Among students who tested without accommodations in 10th grade, 1.8% tested with accommodations in 11th grade.
- 5 The ACT Plan data available did not distinguish having the test read from a DVD or from other readers.
- 6 This is included in ACT Plan accommodations described in the *ACT Plan Supervisor's Manual* but not recorded in ACT Plan data.
- 7 The Student Growth Percentiles were estimated using the total sample as the reference group.

Table 5. ACT Score Prediction Accuracy and Median Student Growth Percentiles, by Accommodations Subgroup

Grade 10 Accommodation	Grade 11 Accommodation	N	Mean Composite Scores		ACT Prediction			Median SGP
			Grade 10 ACT Plan	Grade 11 ACT	Over	Accurate	Under	
None	None	1,516,222	19.0	21.2	0.19	0.64	0.18	49
	Breaks Only	126	19.0	21.3	0.20	0.57	0.23	51
	Breaks, Plus Snacks or Beverage	303	19.0	21.6	0.18	0.57	0.25	55
	DVD Only	5,421	13.1	14.4	0.25	0.59	0.16	41
	DVD and Extended Time	499	14.1	17.0	0.14	0.47	0.39	68
	Extended Time Only	13,116	16.1	19.2	0.15	0.45	0.40	68
	Large Print and Extended Time	113	16.2	19.8	0.15	0.40	0.45	77
	Multiple Days Only	397	17.4	19.2	0.24	0.58	0.18	48
	Multiple Days and Extended Time	100	19.7	23.5	0.09	0.55	0.36	71
	Prompts or Cues and Extended Time	73	13.7	15.6	0.18	0.63	0.19	49
	Reader Only	1,305	13.1	14.0	0.30	0.57	0.13	32
	Reader and Extended Time	2,803	13.5	15.5	0.19	0.53	0.27	51
	Repeat Instructions and Extended Time	146	14.2	15.6	0.22	0.60	0.18	48
	Scribe and Extended Time	356	17.2	21.4	0.13	0.37	0.50	81
	ACD and Extended Time	None	69	15.0	15.7	0.39	0.52	0.09
Extended Time Only	None	14,494	15.7	16.7	0.34	0.54	0.12	32
	DVD Only	1,499	13.5	14.5	0.27	0.59	0.13	35
	DVD and Extended Time	143	15.3	18.5	0.10	0.52	0.38	68
	Extended Time Only	5,196	17.1	19.4	0.19	0.54	0.27	53
	Multiple Days Only	84	16.4	17.1	0.40	0.51	0.08	29
	Prompts or Cues and Extended Time	65	13.9	14.4	0.35	0.58	0.06	31
	Reader Only	363	13.3	13.9	0.33	0.61	0.06	29
	Reader and Extended Time	761	14.0	15.9	0.19	0.55	0.26	51
	Repeat Instructions and Extended Time	128	14.8	16.2	0.30	0.54	0.16	41
	Scribe and Extended Time	301	18.1	21.0	0.17	0.47	0.36	62

Note: N = sample size; SGP = student growth percentile; blue shading indicates the same or similar accommodations used in grade 10 and grade 11; yellow shading indicates different accommodations used; green shading indicates that the grade 11 accommodations were more than the grade 10 accommodations; pink shading indicates that the grade 11 accommodations were less than the grade 10 accommodations

Table 5. (continued)

Grade 10 Accommodation	Grade 11 Accommodation	N	Mean Composite Scores		ACT Prediction			Median SGP
			Grade 10 ACT Plan	Grade 11 ACT	Over	Accurate	Under	
Large Print and Extended Time	None	102	16.0	17.7	0.22	0.58	0.21	43
	Large Print and Extended Time	58	17.2	19.6	0.17	0.55	0.28	48
Reader/DVD and Extended Time	None	4,913	14.1	14.3	0.41	0.53	0.06	27
	DVD Only	5,303	13.4	14.1	0.32	0.58	0.10	30
	DVD and Extended Time	283	14.5	16.3	0.25	0.53	0.22	44
	Extended Time Only	2,261	14.2	14.8	0.33	0.58	0.09	30
	Reader Only	800	13.3	14.0	0.36	0.56	0.09	29
	Reader and Extended Time	2,353	14.0	15.1	0.29	0.55	0.16	41
Scribe Only	Scribe and Extended Time	70	15.2	15.7	0.37	0.53	0.10	27
Scribe and Extended Time	None	118	17.1	17.9	0.36	0.54	0.09	30
	None	185	16.9	17.1	0.39	0.50	0.10	29
Scribe and Extended Time	Extended Time Only	79	18.6	21.6	0.13	0.58	0.29	57
	Scribe and Extended Time	161	18.0	20.5	0.19	0.53	0.29	54

Note: N = sample size; SGP = student growth percentile; blue shading indicates the same or similar accommodations used in grade 10 and grade 11; yellow shading indicates different accommodations used; green shading indicates that the grade 11 accommodations were more than the grade 10 accommodations; pink shading indicates that the grade 11 accommodations were less than the grade 10 accommodations