Research Report

2023-02

Score Gains of Students With Disabilities Testing With Accommodations on the ACT

JOANN L. MOORE, PHD & JOYCE Z. SCHNIEDERS, PHD

ACT®

Conclusions

This study found that students who first took the ACT without accommodations and retested with accommodations tended to have higher score gains than students who tested twice with accommodations, tested twice without accommodations, or first tested with accommodations and retested without accommodations, suggesting that the accommodations are benefitting students with disabilities.

So What?

ACT is committed to eliminating barriers for students taking the ACT to ensure that students have an equitable and accessible test experience and receive scores that are accurate reflections of their knowledge and skills. This study contributes to our understanding of who students with disabilities are and how they perform when taking the ACT with accommodations.

Now What?

ACT has developed a comprehensive accommodations research agenda and will continue to conduct research to ensure the validity and predictive value of students' scores.

About the Authors

Joann L. Moore, PhD

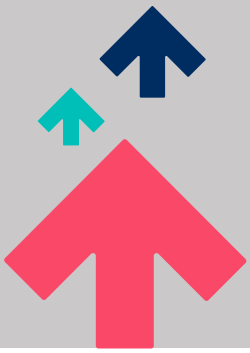
Joann L. Moore is a senior research scientist in Applied Research at ACT specializing in prediction of secondary and postsecondary outcomes from academic and non-cognitive factors.

Joyce Z. Schnieders, PhD

Joyce Z. Schnieders is a research scientist in Applied Research. Her research interests include K-Postsecondary students' learning experiences and education/career navigation experiences.

Acknowledgements

The authors would like to thank Ty Cruce, Edgar Sanchez, and Jeff Allen for their comments on earlier drafts of this report.



Executive Summary

This study examined the performance and score gains of students who took the ACT® test with or without accommodations. Four groups were compared: students who tested twice with accommodations (Both Tests), students who first tested with accommodations and retested without accommodations (First Test), students who first tested without accommodations and retested with accommodations (Second Test), and students who tested twice without accommodations (Neither Test).

Most students showed consistent testing patterns from Test 1 to Test 2, testing twice with accommodations or testing twice without accommodations. However, a substantial number of students tested with accommodations only on Test 1 or only on Test 2. It is unclear why some students tested on one occasion with accommodations and on another occasion without accommodations. Students testing with accommodations only on Test 1 may have determined that they did not find the accommodations helpful and retested without them, or students testing with accommodations only on Test 2 may have determined that they did need accommodations after first testing without accommodations. It is also possible that students have difficulty obtaining support from their school when requesting accommodations. Students were more likely to test with accommodations in a State and District Testing context, where schools make the initial accommodations request, compared to a National Testing context where students make the initial request, but additional research is needed to further explore this issue.

Students testing with accommodations tended to score lower than students testing without accommodations, but there were some differences by disability type; for example, students with psychological disabilities tended to score higher than their peers and students with neurodevelopmental disabilities tended to score lower than their peers. Average performance increased from Test 1 to Test 2 for all retest groups, but score gains were lowest for students in the First Test group and highest for students in the Second Test group. Score disparities were reduced but not eliminated upon retest for students in the Second Test group. Demographic characteristics such as gender, race/ethnicity, family income, and parent education level were related to score gains, but controlling for these variables had a minimal impact on the relationship between retest group and predicted score gains.

Students who tested with accommodations tended to have lower self-reported high school grade point average (HSGPA) than students who tested without accommodations, but relationships between ACT scores and HSGPA were similar across retest groups. Correlations between ACT scores and HSGPA tended to be higher for Test 2 than for Test 1, potentially due to practice effects or exposure to additional academic content between Test 1 and Test 2.

In summary, this study found that accommodations were positively related to students' performance on the ACT, but additional research is needed to further understand whether students have adequate access and support to ensure that they are receiving the accommodations they need to accurately demonstrate their true levels of academic achievement.

Introduction

A recent study (Moore & Schnieders, 2022) examined the ACT score performance, demographic characteristics, and high school experiences of students with disabilities (SWD) taking the ACT® test with accommodations. This study continues that research by investigating score gains of a subset of those students who tested more than once with or without accommodations. Examination of score gains provides us with insights into whether SWD may be benefiting from testing accommodations. This study also partially replicates and extends a previous study conducted by ACT which compared ACT Composite score gains of students retesting with or without extended time (Ziomek & Andrews, 1998).

SWD are students who have a physical or mental impairment that substantially impacts their ability to participate in school and other major life activities. The Individuals with Disabilities Education Act (Individuals with Disabilities Education Act, 2004) and Section 504 of the Rehabilitation Act of 1973 (U.S. Department of Education, Office for Civil Rights, 2010) require that all SWD receive a free and appropriate public education. Approximately 7.3 million students between the ages of 3 and 21 received special education services in the United States during the 2018-2019 school year, corresponding to 14% of all public school students (National Center for Education Statistics, 2021). SWD are a broad, diverse group of students with varying needs. There are many different types of disabilities, and even within a specific disability diagnosis, there are large differences in how a student's disability or disabilities impact the student's ability to participate in major life activities.

ACT defines three high-level categories of disabilities and more specific sub-categories of disabilities based on their groupings in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association, 2013): neurodevelopmental, physical/sensory, and psychological.

Neurodevelopmental disorders include:

- attention deficit/hyperactivity disorder (ADHD)
- autism
- communication disorders (including language, speech, or stutter)
- intellectual developmental delays or disorders
- learning disorders (including math, reading, writing, and others)
- motor disorders (including tics or Tourette's)
- other disorders that tend to impact functioning of a student's neurological system and brain

Physical/sensory disorders include:

- hearing

- vision
- motor (including cerebral palsy, muscular dystrophy, or paralysis)
- physical or medical disorders (including diabetes, epilepsy, or other medical conditions)
- other disorders that impact students' physical function (including limbs, motor control, or bodily systems) or senses (including hearing, vision, smell, touch, taste, or spatial awareness)

Psychological disorders include:

- anxiety
- depression
- behavioral disorders (including opposition, adjustment, or emotional/behavioral disorders)
- other psychological disorders (including obsessive compulsive disorder, eating disorders, addictions, or post-traumatic stress disorder)

Some students have multiple disabilities, and a small number of students in this study are categorized as "other" due to limitations of the data available in ACT's Test Accessibility and Accommodations (TAA) system. For the purposes of this study, "multiple disabilities" are defined as having more than one disability across high-level disability categories; students also may have multiple disabilities within a single high-level disability category, but they are not disaggregated in this study. Only high-level disability type is explored in this study due to small sample sizes when attempting to disaggregate by more specific disability categories for students who took the ACT more than once. Students' ACT performance by specific disability categories can be found in the larger sample studied in Moore and Schnieders (2022).

The ACT test is a measure of college readiness in English, math, reading, and science (there is also an optional writing test, which was not considered for this study). The ACT is used for college admissions, college course placement, scholarship eligibility, and is also used in several states to meet 11th grade state and federal accountability requirements. There are two main contexts in which students take the ACT: National Testing and State and District Testing. National Testing is the traditional testing model in which students register to take the ACT at a test center, typically on a Saturday. State and District Testing is provided by school districts or states and is typically administered in school to all 11th graders at no cost to the student. Students opting to test on a National test date tend to be higher-achieving, college-bound students, whereas State and District Testing is administered to virtually all students, and as a result average scores tend to be higher for National populations compared to State and District populations (Allen, 2015).

Testing accommodations are changes to test administration conditions that allow examinees to more accurately demonstrate their knowledge and skills. SWD may request accommodations when they register to take the ACT. ACT collects information about students' disabilities from school officials and approves accommodations that are aligned with the accommodations they

typically receive in the classroom or are specified by an individualized education plan (IEP) or 504 plan.

There are four generally recognized categories of testing accommodations: changes to timing, presentation, response mode, and/or the setting in which the test is administered (DePascale & Gong, 2020). Accommodations of each category are available on the ACT. ACT provides several timing conditions depending on students' individual needs. Extra time conditions include one and one-half time, double time, or triple time on the multiple-choice tests, and double time on the writing test. Other changes to timing conditions include allowing breaks between test sections or as needed or testing over multiple days. Accommodations related to the presentation of test content include use of a screen reader, braille, large print, or other changes to how the test instructions or content are presented to examinees. Accommodations related to how students respond to test items include pointing to or verbally indicating answers, making answers in the test booklet instead of an answer sheet, using a computer for the writing test, or other changes to how the student responds to items. Accommodations to the test setting include small group, individual testing, preferential seating, testing in a hospital, or testing in a wheelchair-accessible environment. In addition to the four categories of accommodations described above, ACT also offers several accommodations related to health or medical conditions, such as allowing food, drinks, medications, or medical devices during the test, allowing examinees to stand during the test, use of assistive furniture or other devices, or having someone position test materials or turn pages for the examinee.

The types of accommodations available for National and State and District Testing are largely the same, with some differences in how requests are made, and in some cases, how scores can be used. With respect to how requests are made, in a National Testing context, students indicate whether they need accommodations when they register for the ACT, whereas for State and District Testing, schools make the initial accommodations requests. In both contexts, school officials provide documentation to ACT as part of the approval process. In terms of the specific accommodations offered, for National Testing, some accommodations, including one and one-half time, wheelchair accessibility, large print test booklets, and sign language interpreters for verbal instructions can be administered at a test center on a National test date. Other accommodations such as timing conditions spanning multiple days or alternate test formats such as pre-recorded audio, a reader, or braille are administered through Special Testing (ACT, 2021a; ACT, 2022). Special Testing is arranged during a specified time period, and some students receiving the same accommodations are tested as a group, while others may require individual testing.

The accommodations available for State and District Testing fall into three categories: ACT-Authorized, Designated Supports, and Non-College Reportable (ACT, 2021b). With the exception of Non-College Reportable, the types of accommodations allowed on the ACT are largely the same for National and State and District Testing. ACT-Authorized accommodations require approval from ACT and include extra time, alternate test formats, scribes, and other accessibility supports that are not a Designated Support. Designated Supports are authorized by local test accommodations coordinators and do not require ACT approval. These supports include small group or individual testing; wheelchair accessibility; preferential seating; access to

food, drinks, or medications; color filters; sign language interpreter for verbal instructions; written verbal instructions; visual notifications of time; marking answers in the test booklet instead of in the answer document; and audio amplification. Because Designated Supports do not require ACT approval, they are not tracked by ACT and students testing with Designated Supports but no other accommodations would be categorized as having tested without accommodations.[1] Non-College Reportable accommodations are accommodations that are not ACT-Authorized or Designated Supports and result in scores that can be used for state and district assessment purposes but are not reportable to colleges or scholarship agencies. Non-College Reportable accommodations include unapproved extra time, unapproved alternate test formats, or other unapproved accommodations. Students who tested with Non-College Reportable accommodations were not included in this study.

Results are not disaggregated by accommodation type in this study, primarily because most students are approved for multiple accommodations (60% of students testing with accommodations on at least one test in this study were approved for more than one accommodation), sample sizes are small for many individual accommodations, and it is thus difficult to disentangle the impact of specific accommodations on student performance. For more information about the prevalence of specific accommodations approved for use on the ACT, please refer to Moore and Schnieders (2022).

ACT is committed to providing an equitable testing experience for SWD and continually conducts research into how to best serve all students. This study contributes to our understanding of the benefits of providing accommodations to SWD by examining performance, score gains, and relationships between ACT performance and high school grades for students testing with or without accommodations on the ACT. If accommodations allow students to more accurately demonstrate their knowledge and skills, then we expect that SWD will have higher ACT scores when testing with accommodations than when testing without accommodations. We also expect that correlations between high school grades and ACT scores will be higher when SWD are testing with accommodations if the scores are indeed better reflections of their academic performance, and if high school grades are also accurate reflections of students' academic performance.

Research Questions

1. To what extent are documented disabilities and approved accommodations stable across test events?

    a. Do patterns of testing with or without accommodations differ by National Testing or State and District Testing contexts?

    b. Do patterns of testing with or without accommodations differ by high-level disability category (i.e., neurodevelopmental, physical/sensory, psychological, multiple, and other)?

For students who tested with accommodations on both tests (Both Tests retest group), accommodations on the first test only (First Test retest group), accommodations on the second test only (Second Test retest group), or accommodations on neither test (Neither Test retest group):

2. How do ACT scores and score gains compare across test events and retest groups?
3. How do relationships between high school grade point average (HSGPA) and ACT scores compare across test events and retest groups?
4. How do ACT score gains compare across retest groups after taking into account demographics, previous ACT performance, and other factors?

Study Sample

The study sample included students in the United States who took the ACT twice within a 12-month window between September 2016 and July 2019. The sample included students who tested under both National Testing and State and District Testing contexts, and students with Non-College Reportable scores were excluded from the study sample. Students who tested prior to the testing window were excluded (15% of the sample) because accommodations information was not available to the study authors prior to the September 2016 test date and we do not know whether they tested with or without accommodations prior to that test date. Students were also excluded if they were not in Grades 10–12 at the time of Test 1 (2% of the sample). Students' first test date was retained as Test 1 and their second test date within the testing window and within a 12-month retest period was retained as Test 2. Any subsequent test events beyond Test 1 and Test 2 were not considered for this analysis. English learners who tested with accommodations for SWD and/or testing supports for English learners were also excluded from the study sample to limit the focus of this study to the impact of accommodations for students with disabilities (ACT has also conducted research focusing on the impact of testing supports for English learners: see Moore, 2021 and Moore et al., 2021). Students were also excluded from any analyses beyond Table 3 (Research Question 1) if they had inconsistent accommodations or inconsistent disabilities from Test 1 to Test 2 due to small sample sizes (less than 1% of the sample). The resulting study sample included 119,966 (5%) students who tested with accommodations at least once and 2,135,519 (95%) students who tested without accommodations. Disability and accommodations information was collected from ACT's Test Accessibility and Accommodations (TAA) system. Student demographic information and self-reported high school grades were collected from students when they registered to take the ACT.

Four retest groups were the focus of this study: students who tested twice with accommodations (Both Tests), students who tested with accommodations on the first test and retested without accommodations (First Test), students who tested without accommodations on the first test and retested with accommodations (Second Test), and students who tested twice without accommodations (Neither Test). It should be noted that students who tested with accommodations have one or more disabilities, but students who tested twice without

accommodations may or may not have a disability; information about student disabilities is only collected for students who request accommodations that require ACT approval.

Table 1 contains demographic characteristics of students by retest group. To minimize missing data, the study sample used Test 2 demographics information, if available, for students whose Test 1 demographics information was missing. As can be seen in Table 1, there were still substantial percentages of students missing demographics information, particularly among students in the Both Tests group. Students in the Both Tests, First Test, and Second Test groups were more likely to report their gender as male. Students in the Both Tests and First Test groups were more likely to be in 11th grade at the time of Test 1 than students in the Second Test and Neither Test groups. Students in the First Test group and Second Test group tended to have a slightly smaller retest window (4.9 months) compared to the other two retest groups.

Table 1. Demographic Characteristics of Study Sample (Percentages Unless Noted)

	Retest Group – Test Accommodations			
Demographic Characteristic	**Both Tests**	**First Test**	**Second Test**	**Neither Test**
Female	45	49	48	58
Male	54	51	52	42
Other Gender/No Response/Missing[2]	0.7	0.2	0.2	0.4
Black/African American	10	11	12	13
American Indian/Alaska Native	0.7	0.7	0.8	0.7
White	45	64	64	59
Hispanic/Latino	6	10	9	13
Asian	1	2	2	6
Native Hawaiian/Pacific Islander	0.1	0.1	0.1	0.2
Two or More Races	3	4	4	4
Race/Ethnicity No Response/Missing	35	8	8	4
Low Income < $36,000	13	12	14	17
Not Low Income	31	51	55	59
Income No Response/Missing	55	37	31	24
Parent Education No College	9	8	9	14
Parent Education At Least Some College	43	77	76	75
Parent Education No Response/Missing	47	14	16	11
10th Grade at Time of Test 1	4	3	9	10
11th Grade at Time of Test 1	90	89	79	81
12th Grade at Time of Test 1	7	8	12	9
Months Between Test 1 & 2 (Mean)	5.3	4.9	4.9	5.1
Sample Size	60,213	33,279	26,474	2,135,519

Because of the disproportionate amount of missing data for students testing with accommodations, particularly those in the Both Tests group, we also calculated demographic characteristics conditioned on non-omitted responses. Table 2 contains the same demographic characteristics presented in Table 1, but the percentages were calculated based on the non-omitted responses for each demographic characteristic.

Conditioned on non-omitted responses, students in the Both Tests group had larger percentages of Black/African American students compared to the other retest groups. The Neither Test group had larger percentages of Hispanic/Latino and Asian students and a smaller percentage of White students compared to the other retest groups. Students in the Both Tests or Neither Test groups were more likely to report having low family income and parents who did not attend college compared to the two other groups. It should be noted that it is unknown whether the students who omitted responses were systematically different from those who completed the registration information; therefore, the results should be interpreted with some degree of caution about how representative they are of the full population.

Table 2. Demographic Characteristics of Study Sample Conditioned on Non-Omitted Responses (Percentages)

Demographic Characteristic	Retest Group – Test Accommodations			
	Both Tests	First Test	Second Test	Neither Test
Female	45	49	48	58
Male	55	51	52	42
Black/African American	16	12	13	13
American Indian/Alaska Native	1	0.8	0.9	0.7
White	69	69	70	62
Hispanic/Latino	9	11	10	13
Asian	2	3	2	6
Native Hawaiian/Pacific Islander	0.2	0.2	0.1	0.2
Two or More Races	4	4	4	5
Low Income < $36,000	30	19	20	22
Not Low Income	70	81	80	78
Parent Education No College	18	10	11	16
Parent Education At Least Some College	82	90	89	84

Results

Research Question 1: To what extent are documented disabilities and approved accommodations stable across test events?

Table 3 contains the counts and percentages of students in each retest group. There are three possible test-retest conditions for students who tested with accommodations: accommodations on both tests (52% of all students who tested with accommodations), accommodations only on

the first test (27% of all students who tested with accommodations), and accommodations only on the second test (21% of all students who tested with accommodations). Among students in the Both Tests group, we further explored whether these students reported the same type(s) of disabilities and whether they were approved for the same type(s) of accommodations across the first and second tests. Results show that most students who tested with accommodations on both tests reported the same type(s) of disabilities and were approved to have the same type(s) of accommodations across the two test events (95% of students with accommodations on both tests), whereas a small proportion (5% of students with accommodations on both tests) had different types of disabilities and/or different types of accommodations between their first and second tests. These findings indicate that for most students who tested with accommodations twice, their disability type(s) and accommodation type(s) were stable across the two test events. Due to their small sample sizes, students with inconsistent accommodations and/or disabilities across test events were excluded from further analyses.

Table 3. Study Sample

Retest Group	Count	Percent
Accommodations on both tests	63,698	3
Same accommodations, same disabilities	60,213	3
Same accommodations, different disabilities	585	<0.1
Different accommodations, same disabilities	2,017	0.1
Different accommodations, different disabilities	883	<0.1
Accommodations on first test	33,279	1
Accommodations on second test	26,474	1
Total students tested with accommodations	123,451	5
Total students tested without accommodations	2,135,519	95

Research Question 1a: Do patterns of testing with or without accommodations differ by National Testing or State and District Testing contexts?

Table 4 contains the counts and percentages of students by retest group and testing context (i.e., National or State and District Testing). National-National indicates that students tested both times as part of National Testing; National-State indicates that students first tested as part of National Testing and retested as part of State and District Testing; State-National indicates that students first tested as part of State and District Testing and retested as part of National Testing, and State-State indicates that students tested both times as part of State and District Testing.

Across all retest groups, National-National was the most common retest pattern, ranging from 47% of students in the Both Tests group to 71% of students in the First Test group. Students in the Both Tests group were more likely to test in a State-National pattern (27%, compared to 17%–25% in the other retest groups) or a State-State pattern (17%, compared to 4%–7% in the other retest groups), and less likely to test twice during National Testing (47%) compared to the other retest groups (53%–71%).

Students who tested with accommodations on only one test date and who tested in different contexts across test events (i.e., one test during National Testing and the other test during State and District Testing) were more likely to test with accommodations during State and District Testing than National Testing, with 22% of students in the First Test group testing in a State-National testing pattern (compared to 17% of students in the Second Test group), and 20% of students in the Second Test group testing in a National-State testing pattern (compared to 2% of students in the First Test group). These findings suggest that there may be differences in access to accommodations depending on testing context such that students are more likely to receive accommodations during State and District Testing than during National Testing.

Table 4. Retest Patterns by Testing Context

Retest Group	Testing Context	Count	Percent
Both Tests	**Total**	**60,213**	**50**
	National-National	28,018	47
	National-State	5,393	9
	State-National	16,381	27
	State-State	10,421	17
First Test	**Total**	**33,279**	**28**
	National-National	23,677	71
	National-State	685	2
	State-National	7,426	22
	State-State	1,491	4
Second Test	**Total**	**26,474**	**22**
	National-National	14,780	56
	National-State	5,408	20
	State-National	4,596	17
	State-State	1,690	6
Neither Test	**Total**	**2,135,519**	**—**
	National-National	1,125,450	53
	National-State	317,373	15
	State-National	542,537	25
	State-State	150,159	7

Note: The percentages in each total row are the percentages of all students tested with accommodations for that retest group, and the percentages in each testing context row are the percentages of students by testing context within that retest group.

Research Question 1b: Do patterns of testing with or without accommodations differ by high-level disability category (i.e., neurodevelopmental, physical/sensory, psychological, multiple, and other)?

We also investigated the extent to which patterns of testing with or without accommodations varied by high-level disability category (i.e., neurodevelopmental, psychological, physical/sensory, multiple, and other) among students who tested with accommodations. Table

5 contains the counts and percentages of the retest groups by high-level disability category. Neurodevelopmental disabilities were the most common disability category (68%), followed by multiple disabilities (16%), physical/sensory disabilities (9%), and psychological disabilities (7%). One percent of students were categorized as having “other” disabilities due to limitations of the data.

Across all students testing with accommodations, the most common retest pattern was to test with accommodations on Both Tests (50%). A larger percentage of students were in the First Test group (28%) than in the Second Test group (22%). The Both Tests group was the most prevalent across all disability types, but the distributions were slightly different by disability type. More than half of students with neurodevelopmental disabilities or multiple disabilities were in the Both Tests group (52% and 54%, respectively), whereas less than half of students with physical/sensory (43%), psychological (38%), or other disabilities (44%) were in the Both Tests group. While the percentages of students in the First Test group were similar across high-level disability types (25%–31%), students with neurodevelopmental disabilities or multiple disabilities were less likely to be in the Second Test group (21%) than students with physical/sensory disabilities (28%), psychological disabilities (31%), or other disabilities (27%).

To further explore the differences in retest patterns by high-level disability, we calculated the percentages of students testing within each testing context pattern (National-National, National-State, State-National, and State-State) by retest group and high-level disability type. Results can be found in the Appendix, Table A1. Students with neurodevelopmental disabilities were found to be more likely to have tested twice during State and District Testing (14%) compared to students with physical/sensory disabilities (7%) or psychological disabilities (6%). It is possible that at least some of these students are those who would not have taken the ACT if it were not offered at their school. Across high-level disabilities, students in the Second Test group were more likely to test in a National-State pattern (15%–28%) than students in the Both Tests (7%–14%) or First Test (1%–3%) groups. While further research is needed, these findings suggest that access to accommodations may be easier for students testing during State and District Testing.

Table 5. Retest Patterns by High-Level Disability Type

Disability Category	Retest Group	Count	Percent
All Students Tested With Accommodations	**Total**	**119,966**	**100**
	Both Tests	60,213	50
	First Test	33,279	28
	Second Test	26,474	22
Neurodevelopmental Disability	**Total**	**82,091**	**68**
	Both Tests	42,367	52
	First Test	22,838	28
	Second Test	16,886	21
Physical/Sensory Disability	**Total**	**10,316**	**9**
	Both Tests	4,396	43
	First Test	2,981	29
	Second Test	2,939	28
Psychological Disability	**Total**	**7,766**	**6**
	Both Tests	2,928	38
	First Test	2,422	31
	Second Test	2,416	31
Multiple Disabilities	**Total**	**18,616**	**16**
	Both Tests	10,001	54
	First Test	4,696	25
	Second Test	3,919	21
Other Disability	**Total**	**1,177**	**1**
	Both Tests	521	44
	First Test	342	29
	Second Test	314	27

Note: The percentages in each total row are the percentages of all students tested with accommodations for that high-level disability category, and the percentages in each retest group row are the percentages of students by retest group within that high-level disability category.

Research Question 2: How do ACT scores and score gains compare across test events and retest groups?

Table 6 contains mean scores, standard deviations, disparities, and score gains for each test event by retest group. The Disparity Index (DI) was calculated to assess the extent to which mean scores differed for the focal group (students with disabilities who tested with accommodations) compared to the reference group (students who tested without accommodations). The DI is calculated by subtracting the mean score of the reference group from the mean score for the focal group, dividing the difference by the mean score for the focal group, and multiplying by 100. The DI can be interpreted as the percent difference in scores between the focal and reference groups (Abedi, 2002, 2009). A positive value indicates a performance difference favoring the focal group, while a negative value indicates a performance difference favoring the reference group.

On Test 1, students in the First Test group and students in the Neither Test group had very similar mean Composite scores and subject test scores, with the exception of the reading test, in which the mean score for the First Test group was nearly a point higher than the mean score for the Neither Test group. Students in the Both Tests group had lower Composite and subject test scores than students in the First Test and Neither Test groups, but had higher Composite and subject test scores than students in the Second Test group. Students in the Second Test group had relatively low performance on Test 1 compared to their peers, but it is important to note that this was the test in which they did not have accommodations.

On Test 2, the mean Composite and subject test scores of students in the First Test group were less similar to those of students in the Neither Test group than they were on Test 1. Students in the First Test group had slightly lower score gains than students in the Neither Test group, resulting in slightly lower Test 2 scores than students in the Neither Test group, with the exception of the reading test. Again, it is important to note that students in the First Test group tested without accommodations on Test 2. Students in the Second Test group had lower mean Composite and subject test scores than students in the First Test and Neither Test groups, but the highest score gains, particularly in reading. Students in the Both Tests group had the lowest Test 2 scores of the four retest groups.

In terms of disparities, students in the First Test group had the lowest disparities on Test 1, followed by students in the Both Tests group; students in the Second Test group had the largest disparities on Test 1. Comparing Test 1 and Test 2, students in the Both Tests group had similar disparities from Test 1 to Test 2, as they made similar score gains as students in the Neither Test group. Disparities for students in the First Test group, however, increased from Test 1 to Test 2, as these students made smaller gains than students in the Neither Test group. These smaller gains relative to the Neither Test group may be due to the fact that these students did not have accommodations for Test 2 but did have accommodations for Test 1. Lastly, students in the Second Test group had the largest disparities on Test 1 but had the largest reduction in disparities from Test 1 to Test 2, likely due to the fact that these students had accommodations on Test 2.

Table 6. ACT Scores, Score Gains, and Disparity Indices (DI) by Retest Group

Retest Group	Subject	Test 1			Test 2			Gain	
		Mean	SD	DI	Mean	SD	DI	Mean	SD
Both Tests	English	19.1	6.9	-9.3	20.0	7.3	-10.2	0.9	3.2
	Math	19.4	5.4	-8.4	20.0	5.8	-8.3	0.6	2.5
	Reading	21.2	7.3	-3.9	22.0	7.6	-3.5	0.8	4.2
	Science	20.3	6.0	-5.4	21.0	6.3	-5.0	0.7	3.8
	Composite	20.1	5.9	-6.7	20.9	6.3	-6.6	0.8	2.2
First Test	English	20.9	7.0	0.0	21.7	7.5	-2.0	0.8	3.3
	Math	20.7	5.7	-1.5	21.2	6.0	-2.0	0.5	2.5
	Reading	22.9	7.4	4.1	23.3	7.7	2.3	0.4	4.3
	Science	21.4	6.1	0.1	21.9	6.4	-0.6	0.5	3.9
	Composite	21.6	6.0	0.7	22.1	6.4	-0.5	0.5	2.2
Second Test	English	18.2	6.4	-14.9	20.6	6.9	-7.1	2.4	3.5
	Math	19.0	4.8	-10.9	20.4	5.6	-6.0	1.5	2.8
	Reading	19.2	6.2	-14.5	22.6	7.2	-0.8	3.4	4.9
	Science	19.2	5.0	-11.7	21.3	6.1	-3.3	2.2	4.1
	Composite	19.0	5.1	-12.9	21.4	6.0	-4.2	2.4	2.7
Neither Test	English	20.9	6.4	—	22.1	6.6	—	1.2	3.1
	Math	21.1	5.2	—	21.7	5.4	—	0.6	2.5
	Reading	22.0	6.3	—	22.7	6.5	—	0.8	3.9
	Science	21.4	5.1	—	22.0	5.3	—	0.6	3.4
	Composite	21.5	5.2	—	22.3	5.4	—	0.8	2.0

Note: The DI is calculated by subtracting the mean score of the reference group (students who tested without accommodations) from the mean score for the focal group (students who tested with accommodations), dividing the difference by the mean score for the focal group, and multiplying by 100, and can be interpreted as the percent difference in scores between the focal and reference groups (Abedi, 2002, 2009).

Students' performance and score gains were also disaggregated by retest group and testing context (National-National, National-State, State-National, and State-State). Table 7 contains mean Composite scores, standard deviations, disparities, and score gains by retest group and testing context. Large differences in Composite scores were found by testing context. Across all retest groups, Test 1 Composite scores were highest for students who tested twice as part of National Testing (National-National), followed by students testing with a National-State pattern, then students testing with a State-National pattern, and students testing with a State-State pattern had the lowest Test 1 Composite scores. Similar Composite score patterns were found for Test 2, with the exception of students in the Second Test group, where students testing with a National-State pattern had very similar Test 2 scores as students testing with a State-National pattern.

There were also notable differences in disparities and score gains by testing context. Across retest groups, the largest gains were found for students testing in a National-National context, the smallest gains were found for students testing in a State-State context, and students testing in a National-State or State-National context tended to have gains in between. For State-State testing, the smaller gains may be due in part to summer learning loss, as most of these students took the ACT first in spring of 11th grade and retested in fall of 12th grade, meaning that there was a summer break between the two test events. Larger disparities were seen for students testing in a State-State context compared to the other three testing contexts, and changes in DI from Test 1 to Test 2 varied by retest group and testing context. For students in the Both Tests group, reductions in DI were seen for students testing with a National-National or State-National pattern, and increases in DI were seen for students testing with a National-State or State-State pattern, meaning that score gains for students in the Both Tests group were larger relative to those of students in the Neither Test group when Test 2 occurred during National Testing, and score gains for students in the Both Tests group were smaller relative to those of students in the Neither Test group when Test 2 was during State and District Testing. Students in the First Test group had increases in DI from Test 1 to Test 2 across all testing contexts, with smaller increases in DI when they tested in a National-National testing context. Students in the First Test group with a National-National pattern also had higher Test 1 and Test 2 Composite scores compared to students in the Neither Test group with a National-National pattern. Students in the Second Test group had the largest score gains and largest reductions in DI across retest groups, with the largest gains and largest reductions in DI for students in the Second Test group in a National-National testing context.

Table 7. ACT Composite Scores, Score Gains, and Disparity Indices (DI) by Retest Group and Testing Context

Retest Group	Testing Context	Test 1			Test 2			Gain	
		Mean	SD	DI	Mean	SD	DI	Mean	SD
Both Tests	National-National	23.0	5.5	1.7	24.0	5.8	2.3	1.0	2.2
	National-State	20.1	5.6	-6.1	20.7	5.9	-7.5	0.6	2.1
	State-National	18.3	4.9	-9.7	19.1	5.3	-8.8	0.8	2.2
	State-State	15.1	3.4	-17.5	15.2	3.6	-19.0	0.1	1.9
First Test	National-National	23.4	5.6	3.1	24.1	5.9	2.5	0.7	2.2
	National-State	20.3	5.8	-5.0	20.5	6.0	-8.4	0.2	2.5
	State-National	17.5	4.6	-15.0	17.5	4.7	-19.1	0.0	2.2
	State-State	15.0	3.1	-18.7	14.8	3.3	-22.3	-0.2	2.1
Second Test	National-National	20.1	5.1	-12.7	22.9	5.8	-2.7	2.8	2.7
	National-State	18.3	4.8	-16.5	20.0	5.7	-11.0	1.7	2.6
	State-National	17.9	4.5	-12.3	20.1	5.4	-3.5	2.2	2.7
	State-State	14.8	3.5	-19.8	15.8	4.2	-14.5	1.0	2.3
Neither Test	National-National	22.6	5.2	—	23.5	5.4	—	0.9	2.0
	National-State	21.3	4.9	—	22.2	5.1	—	0.9	1.9
	State-National	20.1	4.6	—	20.8	4.8	—	0.7	1.9
	State-State	17.8	4.1	—	18.1	4.4	—	0.3	2.1

Students' performance and score gains were further disaggregated by high-level disability category. Tables A2–A4 in the Appendix contains mean scores, standard deviations, disparities, and score gains by test event and retest group for each high-level disability category. Across retest groups, students with psychological disabilities tended to have higher performance on the ACT and students with neurodevelopmental disabilities tended to have lower performance. Score gains within high-level disability categories were generally consistent with the overall findings that students in the First Test groups tended to have higher scores on Test 1 but lower score gains than the other retest groups, while students in the Second Test groups tended to have lower initial scores but higher score gains, and students in the Both Tests groups tended to have score gains that were similar to those of the Neither Test group. Across high-level disability categories, students with Neurodevelopmental disabilities in the Both Tests and First Test groups tended to have lower score gains than other students in the Both Tests and First Test groups.

Research Question 3: How do relationships between high school grade point average (HSGPA) and ACT scores compare across test events and retest groups?

Research Question 3 investigates relationships between HSGPA and ACT scores across test events and retest groups. Because not all students provide information about high school grades when they register to take the ACT, response rates were examined prior to conducting the correlation analyses. Table 8 contains the response rates of students reporting their high school grade point average (HSGPA) by retest group and test occasion both overall and for each subject area. Response rates were extremely low for students in the Both Tests group, ranging from 26% to 33% across the two test events.

Table 8. Response Rate (Percent) for HSGPA by Retest Group and Test Occasion

Retest Group	Test Occasion	English	Math	Social Studies	Science	Overall
Both Tests	Test 1	33	32	31	32	32
	Test 2	26	26	26	26	26
First Test	Test 1	65	64	64	64	64
	Test 2	75	74	74	73	74
Second Test	Test 1	70	69	69	69	69
	Test 2	54	54	54	53	54
Neither Test	Test 1	78	78	77	77	78
	Test 2	82	81	81	81	81

Due to the prevalence of missing HSGPA data, we attempted to minimize its impact by combining Test 1 and Test 2 HSGPA. The justification for this approach is two-fold. First, the two test events occurred within a 12-month window, meaning there would be at most two

semesters of additional coursework to influence HSGPA, which is likely to have a small impact on students' cumulative HSGPA. Second, there were high correlations between Test 1 and Test 2 in cases where data were non-missing, meaning that students' HSGPA from Test 1 and Test 2 were highly similar. Table 9 shows correlations between the HSGPA reported at Test 1 and HSGPA reported at Test 2 by retest group both overall and for each subject area. For all retest groups, overall HSGPAs were highly correlated across the two test events, ranging from 0.90 to 0.96. Subject-specific correlations were also high, ranging from 0.82 to 0.94. Correlations were somewhat lower for the Both Tests group compared to the other retest groups.[3]

Table 9. Correlations Between HSGPA Reported at Test 1 and HSGPA Reported at Test 2

Retest Group	English	Math	Social Studies	Science	Overall	Count, Overall
Both Tests	0.86	0.85	0.82	0.83	0.90	9,986
First Test	0.94	0.94	0.93	0.93	0.96	20,332
Second Test	0.90	0.90	0.87	0.89	0.93	12,136
Neither Test	0.92	0.93	0.90	0.92	0.95	1,497,872

Note: Counts are provided for overall HSGPA; counts for subject-specific HSGPA may be slightly different but are very close to the overall counts.

To combine Test 1 and Test 2 data, in cases where Test 1 HSGPA was missing, Test 2 HSGPA was used in its place, and in cases where Test 2 HSGPA was missing, Test 1 HSGPA was used in its place. Using this procedure, the HSGPA for each test event can be interpreted as a snapshot of student HSGPA at that time and compared to ACT performance for that test event.[4]

Table 10 contains the response rates after replacing missing HSGPA with non-missing HSGPA from the other test event. While the response rates improved across all retest groups, HSGPA is still missing for more than half of students in the Both Tests group, and any analyses of HSGPA for this group should be interpreted with caution.

Table 10. Response Rate (Percent) for HSGPA After Replacing Missing Data by Retest Group

Retest Group	Count	English	Math	Social Studies	Science	Overall
Both Tests	60,213	42	41	41	41	41
First Test	33,279	78	77	77	77	77
Second Test	26,474	78	77	77	77	77
Neither Test	2,135,519	89	89	88	88	89

Table 11 contains the average HSGPA by retest group and test occasion, both overall and for each subject area, after combining Test 1 and Test 2 HSGPA. For both Test 1 and Test 2, students in the Neither Test group had the highest HSGPA, both overall and in each subject area, while students in the Both Tests group had the lowest HSGPA. Students in the First Test group and the Second Test group had very similar HSGPAs, both overall and in each subject

area. Average HSGPA was also very similar from Test 1 to Test 2 for all retest groups, either remaining the same or increasing by 0.01 point. HSGPA in English and math increased by 0.01 point from Test 1 to Test 2 across all four retest groups, and HSGPA in science did not increase for any of the four retest groups.

Table 11. Average HSGPA by Retest Group and Test Occasion After Replacing Missing Data

Retest Group	Test Occasion	English	Math	Social Studies	Science	Overall
Both Tests	Test 1	3.04	2.93	3.14	3.00	3.03
	Test 2	3.05	2.94	3.15	3.00	3.03
First Test	Test 1	3.26	3.12	3.33	3.19	3.22
	Test 2	3.27	3.13	3.34	3.19	3.23
Second Test	Test 1	3.23	3.10	3.32	3.17	3.21
	Test 2	3.24	3.11	3.32	3.17	3.21
Neither Test	Test 1	3.52	3.38	3.58	3.46	3.48
	Test 2	3.53	3.39	3.59	3.46	3.49

Table 12 contains correlations between HSGPA and ACT scores by retest group and test occasion, both overall and for each subject area, using the HSGPA for Test 1 and Test 2 derived as described above using non-missing data from the other test event if available. Correlations between overall HSGPA and ACT Composite scores were similar across retest groups, with slightly smaller correlations for students in the Second Test group. Correlations between subject-specific ACT scores and subject-specific HSGPA were lower than correlations between ACT Composite scores and overall HSGPA. Subject-specific correlations for the First Test group and the Neither Test group were similar. Compared to the other retest groups, correlations were lower in math for the Both Tests group and lower in reading for the Second Test group.

Comparing correlations across the two test events, correlations between ACT scores and HSGPA tended to be slightly higher for Test 2 than for Test 1. This was found across all retest groups and nearly all subject areas. Increases in correlations from Test 1 to Test 2 were slightly higher for students in the Both Tests and Second Test groups (0.02–0.03 points) compared to students in the First Test and Neither Test groups (0.00–0.02 points). The findings that students in the Both Tests and Neither Test groups had similar correlations between HSGPA and ACT scores, as well as the higher increases in correlations for students in the Both Tests and Second Test groups suggest that the accommodations are removing construct-irrelevant variance and helping students more accurately demonstrate their academic achievement on the ACT.

Table 12. Correlations Between ACT Scores and HSGPA, by Subject Area and Retest Group

Retest Group	Test Occasion	English	Math	Reading/ Social Studies	Science	Composite/ Overall
Both Tests	Test 1	0.44	0.43	0.39	0.41	0.52
	Test 2	0.46	0.45	0.42	0.43	0.54
First Test	Test 1	0.45	0.50	0.41	0.44	0.55
	Test 2	0.47	0.51	0.41	0.45	0.56
Second Test	Test 1	0.40	0.45	0.34	0.38	0.49
	Test 2	0.42	0.47	0.37	0.41	0.51
Neither Test	Test 1	0.44	0.49	0.38	0.43	0.54
	Test 2	0.46	0.51	0.39	0.44	0.55

Note: All correlations were significant at $p < 0.0001$.

Table 13 contains the average overall HSGPA by retest group and testing context (National-National, National-State, State-National, and State-State). Similar to the results presented in Table 11, there were very small differences (0.00–0.02) in HSGPA from Test 1 to Test 2, and students in the Neither Test group tended to have the highest HSGPAs. Large differences in HSGPA were found, however, when disaggregating by testing context. For all retest groups, students testing twice during National Testing (National-National) had the highest HSGPAs, and students testing twice during State and District Testing (State-State) had the lowest HSGPAs. Students in the Both Tests group with a State-State pattern had the lowest HSGPA, and students in the Neither Test group with a National-National pattern had the highest HSGPA. Comparing across testing context, students in the Second Test group tended to have lower HSGPAs than the other retest groups when testing with a National-National or National-State pattern, but students in the Both Tests and First Test groups tended to have lower HSGPAs than the other retest groups when testing with a State-National or State-State pattern. Similar to the findings for average ACT scores disaggregated by retest group and testing context (Table 7), students with a National-State pattern tended to have somewhat higher HSGPAs than students with a State-National pattern. Because students in State and District Testing typically first test in spring of 11th grade, students with a National-State pattern may be higher-achieving students who choose to take the ACT earlier in high school, hence their higher HSGPAs and ACT scores.

Table 13. Average Overall HSGPA by Retest Group and Testing Context

Retest Group	Test Occasion	National-National	National-State	State-National	State-State
Both Tests	Test 1	3.34	3.23	3.05	2.65
	Test 2	3.34	3.24	3.05	2.67
First Test	Test 1	3.34	3.26	2.97	2.69
	Test 2	3.34	3.27	2.98	2.72
Second Test	Test 1	3.28	3.15	3.15	2.75
	Test 2	3.29	3.16	3.14	2.75
Neither Test	Test 1	3.57	3.53	3.36	3.06
	Test 2	3.57	3.53	3.37	3.08

Table 14 contains correlations between ACT Composite scores and overall HSGPA by retest group and testing context. As seen in Table 12, small increases in correlations were found from Test 1 to Test 2. Large differences in correlations were found by testing context. Across retest groups, correlations were similar for students testing with a National-National or National-State pattern, and correlations tended to be smaller for students testing with a State-National pattern and smallest with a State-State pattern, except for students in the Neither Test group. Students in the Neither Test group tended to have the highest correlations between ACT Composite scores and HSGPA when testing with a State-National pattern, and students in the Neither Test group with a State-State pattern had only slightly lower correlations than those with a National-National or National-State pattern. Students in the Both Tests groups with a State-State pattern had the lowest correlations between ACT Composite scores and HSGPA. Students with lower ACT scores and lower HSGPA tended to have lower correlations between ACT scores and HSGPA; this is likely due to the differences in score distributions across the groups.

Table 14. Correlations Between ACT Composite Scores and Overall HSGPA by Retest Group and Testing Context

Retest Group	Test Occasion	National-National	National-State	State-National	State-State
Both Tests	Test 1	0.49	0.50	0.45	0.32
	Test 2	0.53	0.52	0.47	0.32
First Test	Test 1	0.51	0.50	0.43	0.34
	Test 2	0.52	0.50	0.42	0.35
Second Test	Test 1	0.48	0.47	0.44	0.37
	Test 2	0.50	0.49	0.46	0.41
Neither Test	Test 1	0.51	0.51	0.54	0.49
	Test 2	0.53	0.53	0.54	0.51

Note: All correlations were significant at $p < 0.0001$.

Average HSGPA and correlations between ACT scores and HSGPA were also disaggregated by high-level disability category, and results are presented in the Appendix, Tables A5–A7.

Tables A5 and A6 contain overall and subject-specific HSGPA by retest group and high-level disability category for each test event. Students with physical/sensory disabilities had the highest HSGPA (subject-specific and overall) across test events, whereas students with neurodevelopmental disabilities had the lowest HSGPA. Differences between Test 1 and Test 2 HSGPA were very small, likely due in part to replacing missing values in cases where HSGPA for only one test event was available. In general, HSGPAs of students in the First Test and Second Test groups were similar, whereas students in the Both Tests group had the lowest HSGPA. Students with neurodevelopmental disabilities tended to have lower HSGPAs compared to the students in all other disability categories.

Table A7 contains correlations between ACT scores and HSGPA by test events for each disability category. Correlations between ACT Composite score and overall HSGPA were relatively low for students with neurodevelopmental disabilities compared to students in the corresponding test groups of other categories of disabilities. Correlations between ACT reading scores and social studies HSGPA tended to be lower than those of other subject areas. In most cases, correlations between ACT scores and HSGPA were higher for Test 2 than Test 1.

Research Question 4: How do ACT score gains compare across retest groups after taking into account demographics, previous ACT performance, and other factors?

The purpose of the regression analyses was to estimate the effect of accommodations on ACT score gains, controlling for other covariates. In the regression models, we controlled for students' section test scores on Test 1, the number of months between Test 1 and Test 2, and the pattern of testing contexts for the two test events (National or State and District). We also included demographic characteristics (i.e., family income, parent education, race/ethnicity, and gender) in the models and controlled for students' high-level disability categories on Test 1, Test 2, or Both Tests. Reference groups for the covariates included Neither Test for retest group, not low income (annual income of $36,000 or greater) for family income, at least some college for parent education, White for race/ethnicity, female for gender, National-National for testing context, and no disability or other disability for disability category.

Multiple model specifications were considered due to the large proportions of missing HSGPA data, particularly for students in the Both Tests group. HSGPA was missing for 59% of students in the Both Tests group, 23% of students in the First Test group, 23% of students in the Second Test group, and 11% of students in the Neither Test group—after replacing missing HSGPA with data from the other test occasion if available. Three sets of models were calculated and compared; one set of models contained all of the covariates of interest except for HSGPA (the advantage of this model was that it retained the largest sample sizes because students missing HSGPA were not excluded), one set of models included Test 1 HSGPA (meaning that students were excluded from the model if HSGPA was missing), and a third set of models excluded HSGPA but only included the subset of students who had non-missing HSGPA after HSGPA data were combined (the advantage of this model was to be able to see if the regression coefficients were substantially different when students were excluded from the model if HSGPA

was missing, which would indicate that students who were excluded were systematically different from students who were included). Comparisons across the three sets of regression models found very small differences in the regression coefficients, meaning that the models were robust to whether HSGPA (or the students who provided HSGPA or not) was included or excluded. Because the models including HSGPA were found to be robust and HSGPA is a strong predictor of performance on the ACT, the models that included Test 1 HSGPA are presented in this paper.

Table 15 contains a summary of the retest group coefficients from regression models predicting score gains in each subject score and ACT Composite scores. The full results are in the Appendix, Tables A8–A12. As shown in Table 15, after controlling for other covariates, we found that students in the Both Tests group had score gains in English, science, and the ACT Composite score that were not significantly different than those in the Neither Test group. Students in the Second Test group had significantly higher gains than students in the Neither Test group across all subject tests and the Composite score, with larger gains in reading, which was consistent with the descriptive findings seen in Table 6. Meanwhile, students in the First Test group had lower score gains in English, math, and the Composite score than those in the Neither Test group, and gains that were not significantly different in reading and science. These findings were consistent with the descriptive analyses and provide evidence that accommodations are helping to level the playing field for students testing with accommodations.

Table 15. Summary of Retest Group Coefficients Across Regression Models

Section	Retest Group	Coefficient	SE	t Value	Pr > |t|
English	Both Tests	-0.17	0.10	-1.68	0.09
	First Test	-0.48	0.10	-4.69	< 0.0001
	Second Test	1.23	0.10	12.01	< 0.0001
Math	Both Tests	-0.23	0.08	-2.80	0.01
	First Test	-0.42	0.08	-5.07	< 0.0001
	Second Test	0.58	0.08	6.93	< 0.0001
Reading	Both Tests	0.25	0.12	2.01	0.04
	First Test	-0.15	0.12	-1.26	0.21
	Second Test	2.19	0.12	17.72	< 0.0001
Science	Both Tests	0.04	0.10	0.38	0.70
	First Test	-0.20	0.10	-1.94	0.05
	Second Test	1.29	0.10	12.74	< 0.0001
Composite	Both Tests	-0.03	0.07	-0.41	0.68
	First Test	-0.31	0.07	-4.55	< 0.0001
	Second Test	1.33	0.07	19.33	< 0.0001

Discussion

This study investigated performance and score gains of students who took the ACT more than once during a 12-month window with or without accommodations. Four retest groups were compared: students who tested twice with accommodations (Both Tests), students who first tested with accommodations and retested without accommodations (First Test), students who first tested without accommodations and retested with accommodations (Second Test), and students who tested twice without accommodations (Neither Test). Stability of documented disabilities and approved accommodations across test events, relationships with high school grades, and performance and score gains by retest group and high-level disability type were examined.

Stability of Disabilities and Accommodations Across Test Events

Accommodations were largely stable across test administrations, with only a small proportion of students' specific disabilities or specific accommodations changing across test events. A large proportion of students tested twice with accommodations, and smaller proportions of students only used accommodations on their first test or their second test.

ACT does not collect information about why students take the ACT with or without accommodations. For students in the Second Test group, it is possible that after testing without accommodations and receiving scores below their expectations, some students decided to seek out accommodations. It is also possible that students may receive more support in school for requesting accommodations and obtaining documentation for accommodations when students are testing as part of State and District Testing, where the school makes the initial request and provides documentation, as compared to National Testing, where the student makes the initial request and relies on the school to provide documentation; the larger proportion of students in the Second Test group who first tested as part of National Testing and retested as part of State and District Testing supports this hypothesis, although further research is needed to investigate the issue.

It is less clear why a student would test with accommodations and retest without accommodations. It is possible that some students may have used Designated Supports (which are available for State and District Testing but not National Testing) on Test 2, meaning that they did receive local accommodations that ACT did not track, but looking at Table 4, only 6% of students in the First Test group tested as part of State and District Testing on Test 2, so that would only represent a small proportion of students. There may also be some students who had a temporary disability and no longer needed accommodations, but this is likely to be a very small proportion of the retest group. It is also possible that some students found the accommodations unhelpful or burdensome, for example if they decided that they did not need extra time, or if after testing once, they were confident that they did not need the accommodations to demonstrate their competencies when taking the ACT a second time. Another potential explanation as mentioned above is the availability of assistance from schools in obtaining accommodations. Students in the First Test group were more likely to test first as part of State and District Testing and retest as part of National Testing compared to the other

retest groups. Again, additional research is needed to verify whether students are facing barriers to obtaining accommodations in a National Testing context. An interesting follow-up study could survey students who tested with accommodations and retested without accommodations to understand why they retested without accommodations. This could potentially help ACT improve the accommodations process, understand students' perspectives on the accommodations, and better serve this population of students.

ACT Performance and Score Gains

Students in the Second Test group had higher score gains than students in the other retest groups. This makes sense given that the purpose of the accommodations is to remove construct-irrelevant variance that may be suppressing students' scores and allow them to more accurately demonstrate what they know and can do. The lower scores of these students on Test 1 suggests that they may have been at a disadvantage when they tested without accommodations.

Students in the First Test group tended to have scores on Test 1 that were comparable to students in the Neither Test group. They also saw score gains, on average, rather than score declines, but their score gains were lower than those of the other testing groups. More research is needed to explore whether this group would have higher score gains if they retested with accommodations and whether the resulting scores would be more accurate reflections of their true achievement level. It is possible that some of these students may have felt that they did not need the accommodations and thus did not seek them out upon retest. It is also possible that some students requested accommodations but were not approved, or did not realize that they needed to request accommodations for their second test. The majority of these students tested in a National-National or State-National context. If it is easier to obtain approval for accommodations during State and District Testing, then some students may not have received the accommodations they needed upon retest.

Students in the Both Tests group tended to have lower scores than students in the Neither Tests group across Test 1 and Test 2, but had comparable score gains. Overall, the patterns of score gains across retest groups (smaller gains for the First Test group, larger gains for the Second Test group, and similar gains for the Both Tests group compared to the Neither Test group) provide evidence that the accommodations are allowing students to better demonstrate their knowledge and skills.

The disparity analyses comparing students who tested with accommodations to students who tested without accommodations showed that score differences were reduced for students in the Second Test group, and in reading the disparity was eliminated. The disparity index (DI) was similar across test events for students in the Both Tests group, and DI increased for students in the First Test group. This suggests that the accommodations are beneficial to student performance.

Relationships with HSGPA

In general, relationships between HSGPA and ACT scores supported the validity of interpretations of ACT scores as measures of academic achievement for students who tested with accommodations. Students with lower ACT scores tended to have lower HSGPAs. Students who tested with accommodations tended to have lower HSGPAs than students who tested without accommodations, and those in the Both Tests group had the lowest HSGPAs. Correlations between HSGPA and ACT scores were generally comparable across retest groups, although students in the Second Test group tended to have lower correlations between ACT scores and HSGPA. There were small increases in the correlations from Test 1 to Test 2 across retest groups and subject areas, with some exceptions for students in the First Test group. This general pattern was also found in a recent study comparing correlations across test events for English learners and non-English learners (Moore, 2021). It is hypothesized that the increase in correlations for repeat testers could be due to practice effects such as increased familiarity with the test, lower anxiety, better pacing through the test, learning that has occurred between Test 1 and Test 2, or other factors.

Regression Analyses Predicting Score Gains

Regression analyses were conducted predicting score gains accounting for multiple covariates including first test scores for each subject, number of months between tests, retest group, testing context (National or State and District testing patterns), family income, parent education, race/ethnicity, gender, high-level disability category, and Test 1 HSGPA. Across both the descriptive analyses and after accounting for these other factors, we saw similar patterns of score gains across the four retest groups; students in the Both Test group had score gains similar to those of the Neither Test group, students in the Second Test group had the highest score gains, and students in the First Test group had the lowest score gains. That these findings held even after controlling for other predictors of student performance provides additional evidence that the accommodations are benefitting students with disabilities.

Revisiting the Ziomek and Andrews (1998) Score Gain Study

This study also partially replicated and extended a previous study conducted by ACT (Ziomek & Andrews, 1998). Their analysis compared students testing with extra time on Test 1 only, Test 2 only, or both, and only focused on Composite scores, whereas this study included students testing with many types of accommodations and compared performance across subject area and Composite scores. This study also provided demographic characteristics of the students in the study samples and conducted regression analyses to account for demographic characteristics, performance on the first test, and number of months between test events. Despite the differences in the two study samples, the findings of this study were similar to those of Ziomek & Andrews (1998). Their study found the largest Composite score gains for students who tested without extra time and retested with extra time (3.2, compared to 2.2 in our study sample). They found a Composite score gain of 0.9 for students who tested twice with extra time, compared to 0.8 in our study sample, and noted that the gains for this group were similar to those testing twice without extra time, which we also found. However, students who tested

first with extra time and retested without extra time showed a Composite score decline of 0.6 points, whereas our study sample showed a gain of 0.5 points.

Another interesting difference between the two studies involves the relative proportions of students in each retest group. In the Ziomek and Andrews (1998) study, 47% of students tested twice with extra time, 47% of students tested with extra time only on Test 2, and 6% tested with extra time only on Test 1. In the current study, 45% tested twice with accommodations, 30% tested with accommodations on Test 2 only, and 25% tested with accommodations on Test 1 only. It is unclear why there were such large increases in the proportion of students who retested without accommodations in the current study, but there are several potential explanations. There have been changes to the accommodations request process, the specific accommodations available to students, and the criteria by which students are diagnosed with a disability in the time since the 1998 study, all of which may play a role in accommodations requests. There have also been changes in the population of students taking the ACT, including the introduction of State and District Testing during the 2000-2001 school year, in which all 11th grade students take the ACT rather than only higher-achieving college-bound students; this is likely to have had an impact on the population of students requesting accommodations, particularly if there are differences in access to accommodations for students testing in a State and District Testing context compared to a National Testing context.

Limitations

There were several limitations of this study. First, we only know students have a disability if they request and are approved to test with accommodations. It is likely that there were students who tested without accommodations who had a disability and chose not to request accommodations, students who requested accommodations but were not approved, or students who had an undiagnosed disability and therefore did not request accommodations. It is likely that there are many US students who are unaware that they have a disability, particularly those who have an "invisible" disability. The Learning Disabilities Association of America estimates that 60% of adults with severe literacy problems have an undiagnosed learning disability (Learning Disabilities Association of America, n.d.). Additionally, we only know if a student was approved for an accommodation, and do not know whether they actually made use of it during test administration, and we do not know who may have tested with Designated Supports but no other accommodations.[1] There was also a disproportionate amount of missing demographics and high school grades data, particularly for students testing with accommodations on both tests. This has implications for the representativeness of the sample, as we do not know whether there are systematic differences between students who did and did not complete the registration items. Third, self-reported high school grades were used for the analyses rather than official high school grades, but previous research by ACT (Sanchez & Buddin, 2015) has found them to be highly accurate, as students may be aware that what they report can be verified against high school transcripts. Lastly, we do not know why some students first tested with accommodations and later tested without accommodations, or vice versa. Students may avoid testing with accommodations to avoid a stigma, or not realize that they have a disability until later in their education. Conversely, students may develop strategies to overcome any limitations due to the disability, or "outgrow" or overcome a disability.

Conclusions and Future Research

This study examined retest patterns and score gains of SWD taking the ACT with accommodations. We found evidence that the accommodations are benefitting students with disabilities, but further research is needed to understand some of the findings of this study. Students were more likely to test with accommodations during State and District Testing than National Testing. This could be due in part to some students taking the ACT who otherwise would not have tested, but could also be related to access—are schools more responsive to providing documentation when the school is making the request and the scores are used for state and/or federal accountability vs. when the student is making the request? Or are students less likely to initiate the accommodations process themselves when registering for National Testing? There were also large proportions of students who tested with accommodations on their first test but retested without accommodations. Are students choosing to retest without accommodations, or are they having difficulty obtaining them? Further research is needed to explore this issue. This study contributes to our understanding of students taking the ACT with accommodations. As part of ACT's pledge to increase equity and access for all students, we will continue to conduct research that can inform educators and policy makers and potentially guide future policy changes.

References

Abedi, J. (2002). Standardized achievement tests and English language learners: Psychometric issues. *Educational Assessment, 8*(3), 231–257.

Abedi, J. (2009). English Language Learners with disabilities: Classification, assessment, and accommodation issues. *Journal of Applied Testing Technology, 10*(2), 1–30.

ACT. (2021a). *National vs. special* [PDF]. https://www.act.org/content/dam/act/unsecured/documents/Accommodations-National-Special.pdf

ACT. (2021b). *Accommodations vs. state testing accessibility supports: Which option is appropriate?* [PDF]. https://www.act.org/content/dam/act/unsecured/documents/AccomsvsArrangements-SandD.pdf

ACT. (2022). *ACT test accommodations and English learner supports*. https://www.act.org/content/act/en/products-and-services/the-act/registration/accommodations.html

Allen, J. (2015). *Anticipated changes in ACT scores and participation rates with ACT statewide adoption*. [Issue brief]. ACT. *https://www.act.org/content/dam/act/unsecured/documents/Statewide-Adoption.pdf*

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

DePascale, C., & Gong, B. (2020). Comparability of individual students' scores on the "same test." In A. I. Berman, E. H. Haertel, & J. W. Pellegrino (Eds.) *Comparability of large-scale educational assessments: Issues and recommendations.* (pp. 25–48). National Academy of Education. https://files.eric.ed.gov/fulltext/ED608446.pdf

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004)

Learning Disabilities Association of America (n.d.). *New to LD*. https://ldaamerica.org/support/new-to-ld/

Moore, J. M. (2021). *English learners who take the ACT with testing supports: An examination of performance, demographics, and contextual factors*. [Working paper]. ACT.

https://www.act.org/content/dam/act/unsecured/documents/R2101-contextualizing-EL-performance-07-2021.pdf

Moore, J. M., Li, T., & Lu, Y. (2021). *Score gains and validity evidence for English learners testing with supports on the ACT*. [Working paper]. ACT. *https://www.act.org/content/dam/act/unsecured/documents/R2124-EL-Supports-Retesters-2021-07.pdf*

Moore, J. L., & Schnieders, J. Z. (2022). *Students who take the ACT with accommodations: An examination of performance, demographics, and contextual factors*. ACT. *https://www.act.org/content/dam/act/unsecured/documents/2022/R2143-SWD-Demographics-HS-Experiences-05-2022.pdf*

National Center for Education Statistics (2021). *Fast facts: Students with disabilities*. *https://nces.ed.gov/fastfacts/display.asp?id=64*

Sanchez, E., & Buddin, R. (2015). *How accurate are self-reported high school courses, course grades, and grade point average?* [Working paper]. ACT. *http://www.act.org/content/dam/act/unsecured/documents/WP-2015-03.pdf*

U.S. Department of Education, Office for Civil Rights (2010). *Free Appropriate Public Education for Students with Disabilities: Requirements Under Section 504 of the Rehabilitation Act of 1973*. https://www2.ed.gov/about/offices/list/ocr/docs/edlite-FAPE504.html

Ziomek, R. L., & Andrews, K. M. (1998). *ACT assessment score gains of special-tested students who tested at least twice*. ACT. *https://www.act.org/content/dam/act/unsecured/documents/ACT_RR98-08.pdf*

Notes

1. The lack of information about Designated Supports is a limitation of the data available for this study. It is likely that there were some students who tested as part of State and District Testing and used Designated Supports. If students tested with Designated Supports and no other accommodations, they are classified as having tested without accommodations. As a result, there may be some students who are misclassified; for example, some students in the First Test or Second Test group may actually belong in the Both Tests group, and some students in the Neither Test group may actually belong in one of the other retest groups. To account for this issue, we disaggregated the results by the testing context of Test 1 and Test 2 (i.e., National-National, National-State, State-National, and State-State). Because Designated Supports are only available for State and District Testing, we know that students testing twice as part of National Testing (i.e., the National-National testing context) did not test with Designated Supports.
2. ACT introduced an “Another Gender” option beginning in the 2019-2020 school year. Because this category was not available for all students in the study sample, this category was combined with missing and prefer not to respond options in the data analyses. A very small number of students in the 2019-2020 data sample (less than 1%) selected “Another Gender.”
3. Students in the Both Tests group also had slightly higher average number of months between Test 1 and Test 2 (5.3 months compared to 5.1 months for the Neither Test group and 4.9 months for the First Test and Second Test groups), which could help explain the lower correlations between Test 1 and Test 2 HSGPAs, due to these students possibly having a greater amount of additional coursework contributing to Time 2 HSGPA compared to their peers. While not reported here, we also examined the number of courses that contributed to students’ subject-specific and overall HSGPAs by retest group from Test 1 to Test 2, and found that students in the Both Tests group did in fact have slightly higher average increases in the numbers of courses that contributed to their HSGPA from Time 1 to Time 2 (1.4 additional courses, compared to 0.8-1.0 additional courses for the other three retest groups). It is also possible that there is just additional noise in the HSGPA of students in the Both Tests group, given that there is more missing data for this group.
4. Average HSGPAs after combining Test 1 and Test 2 HSGPA data were very similar to the average HSGPAs calculated before combining Test 1 and Test 2 HSGPA data. In general, differences ranged from 0.0 to 0.04 points. Larger differences in average HSGPA were found for students in the Both Tests group at Test 2, ranging from 0.05 to 0.06 points. This group also had the highest non-response rates, with only 26% providing HSGPA information at Test 2.

Appendix

Table A1. Retest Patterns by High-Level Disability and Testing Context

Disability Category	Retest Group	Count	Testing Context (percentage)			
			National-National	National-State	State-National	State-State
All Students Tested With Accommodations	**Total**	**119,966**	**55**	**10**	**24**	**11**
	Both Tests	60,213	47	9	27	17
	First Test	33,279	71	2	22	4
	Second Test	26,474	56	20	17	6
Neurodevelopmental Disability	**Total**	**82,091**	**52**	**9**	**25**	**14**
	Both Tests	42,367	42	9	28	21
	First Test	22,838	69	2	24	6
	Second Test	16,886	54	21	17	8
Physical/Sensory Disability	**Total**	**10,316**	**52**	**14**	**27**	**7**
	Both Tests	4,396	44	14	31	11
	First Test	2,981	63	3	30	3
	Second Test	2,939	52	25	19	4
Psychological Disability	**Total**	**7,766**	**61**	**10**	**23**	**6**
	Both Tests	2,928	46	10	32	12
	First Test	2,422	79	2	18	2
	Second Test	2,416	60	18	18	5
Multiple Disabilities	**Total**	**18,616**	**71**	**7**	**17**	**4**
	Both Tests	10,001	68	7	19	6
	First Test	4,696	84	2	13	2
	Second Test	3,919	64	15	18	3
Other Disability	**Total**	**1,177**	**53**	**12**	**28**	**8**
	Both Tests	521	47	9	31	13
	First Test	342	58	1	37	4
	Second Test	314	56	28	13	3

Table A2. ACT Scores, Score Gains, and Disparity Indices (DI) by High-Level Disability Type for Students in Both Tests Retest Group

Disability Category	Subject	Test 1			Test 2			Gain	
		Mean	SD	DI	Mean	SD	DI	Mean	SD
Neurodevelopmental Disability	English	18.0	6.6	-16.2	18.8	7.0	-17.4	0.8	3.1
	Math	18.7	5.1	-12.4	19.2	5.6	-12.6	0.5	2.4
	Reading	20.1	7.0	-9.4	20.9	7.4	-9.1	0.8	4.2
	Science	19.5	5.8	-9.6	20.1	6.2	-9.5	0.6	3.8
	Composite	19.2	5.6	-11.7	19.9	6.1	-11.9	0.7	2.2
Physical/Sensory Disability	English	20.1	7.1	-4.0	21.2	7.3	-4.1	1.2	3.1
	Math	20.3	5.6	-3.5	21.0	6.0	-3.2	0.6	2.4
	Reading	22.0	7.2	-0.1	23.0	7.4	0.9	1.0	4.0
	Science	21.1	5.8	-1.5	21.9	6.2	-0.5	0.8	3.6
	Composite	21.0	5.9	-2.2	21.9	6.2	-1.6	0.9	2.1
Psychological Disability	English	22.2	7.0	5.9	23.4	7.3	5.6	1.2	3.4
	Math	21.1	5.5	0.2	21.9	5.9	1.0	0.8	2.6
	Reading	24.1	7.2	8.7	25.2	7.4	9.6	1.1	4.4
	Science	22.2	6.0	3.4	23.2	6.3	4.8	1.0	3.9
	Composite	22.5	5.9	4.6	23.5	6.2	5.4	1.0	2.3
Multiple Disability	English	22.4	6.8	7.0	23.6	7.0	6.6	1.2	3.3
	Math	21.3	5.6	1.2	22.2	5.9	2.3	0.9	2.6
	Reading	24.4	6.9	9.8	25.4	7.1	10.3	1.0	4.3
	Science	22.7	5.8	5.5	23.6	6.1	6.6	0.9	3.8
	Composite	22.8	5.7	5.9	23.8	6.0	6.6	1.0	2.3
Other Disability	English	20.9	7.1	0.0	22.2	7.4	0.5	1.3	3.2
	Math	20.9	5.8	-0.8	21.4	6.2	-1.2	0.5	2.6
	Reading	22.4	7.4	2.0	23.5	7.6	3.4	1.1	4.3
	Science	21.5	6.0	0.5	22.4	6.1	1.7	0.9	3.7
	Composite	21.6	6.0	0.5	22.5	6.3	1.2	0.9	2.2

Table A3. ACT Scores, Score Gains, and Disparity Indices (DI) by High-Level Disability Type for Students in First Test Retest Group

Disability Category	Subject	Test 1			Test 2			Gain	
		Mean	SD	DI	Mean	SD	DI	Mean	SD
Neurodevelopmental Disability	English	19.9	6.9	-5.0	20.6	7.4	-7.3	0.7	3.3
	Math	20.1	5.6	-4.6	20.6	5.9	-5.2	0.5	2.5
	Reading	22.0	7.4	0.0	22.3	7.7	-2.2	0.3	4.3
	Science	20.8	6.1	-3.2	21.2	6.4	-4.1	0.4	3.9
	Composite	20.8	6.0	-3.1	21.3	6.3	-4.6	0.5	2.2
Physical/Sensory Disability	English	21.6	6.9	3.2	22.6	7.2	2.5	1.1	3.1
	Math	21.6	5.6	2.5	22.2	5.8	2.2	0.6	2.5
	Reading	23.2	6.9	5.1	23.8	7.1	4.4	0.6	4.1
	Science	22.2	5.5	3.4	22.7	5.9	3.0	0.5	3.6
	Composite	22.3	5.7	3.6	23.0	6.0	3.1	0.7	2.0
Psychological Disability	English	24.3	6.7	13.9	25.1	7.0	12.0	0.9	3.4
	Math	22.5	5.5	6.5	23.2	5.8	6.4	0.6	2.6
	Reading	26.3	7.0	16.5	26.7	7.1	14.7	0.4	4.4
	Science	23.5	5.9	8.7	24.1	6.1	8.7	0.7	4.0
	Composite	24.3	5.7	11.5	24.9	5.9	10.6	0.6	2.2
Multiple Disability	English	23.5	6.6	11.1	24.4	6.9	9.5	0.9	3.4
	Math	22.2	5.6	5.1	22.8	5.9	5.0	0.6	2.7
	Reading	25.6	7.0	14.0	26.0	7.2	12.7	0.5	4.4
	Science	23.2	5.9	7.8	23.8	6.2	7.6	0.6	4.0
	Composite	23.7	5.7	9.6	24.4	6.0	8.8	0.7	2.3
Other Disability	English	21.2	6.7	1.6	22.3	7.3	0.9	1.1	3.2
	Math	21.3	5.4	1.0	21.7	5.7	0.2	0.4	2.5
	Reading	23.1	7.2	4.8	23.6	7.5	3.7	0.5	4.3
	Science	21.9	5.7	2.0	22.5	6.2	1.9	0.6	3.7
	Composite	22.0	5.7	2.3	22.6	6.1	1.7	0.7	2.2

Table A4. ACT Scores, Score Gains, and Disparity Indices (DI) by High-Level Disability Type for Students in Second Test Retest Group

Disability Category	Subject	Test 1			Test 2			Gain	
		Mean	SD	DI	Mean	SD	DI	Mean	SD
Neurodevelopmental Disability	English	16.8	5.9	-24.1	19.2	6.7	-14.9	2.4	3.5
	Math	18.2	4.5	-15.8	19.5	5.4	-10.8	1.4	2.7
	Reading	18.0	5.9	-22.2	21.3	7.1	-6.8	3.3	4.9
	Science	18.3	4.8	-16.9	20.4	6.0	-8.1	2.1	4.1
	Composite	18.0	4.7	-19.6	20.2	5.8	-10.0	2.3	2.7
Physical/Sensory Disability	English	20.2	6.3	-3.3	22.0	6.6	-0.4	1.8	3.4
	Math	20.5	5.0	-2.7	21.6	5.4	-0.5	1.1	2.6
	Reading	21.3	6.4	-3.2	23.3	6.6	2.4	2.0	4.6
	Science	20.8	5.0	-3.1	22.2	5.4	0.8	1.4	3.7
	Composite	20.8	5.1	-3.1	22.4	5.5	0.6	1.6	2.4
Psychological Disability	English	21.2	6.3	1.5	24.2	6.6	8.8	3.0	3.6
	Math	20.6	4.8	-2.3	22.5	5.7	3.9	2.0	2.9
	Reading	21.9	6.1	-0.3	26.2	6.9	13.1	4.3	4.9
	Science	20.9	4.7	-2.7	23.8	6.0	7.3	2.9	4.2
	Composite	21.3	4.9	-1.0	24.3	5.8	8.4	3.1	2.7
Multiple Disability	English	20.5	6.4	-2.0	23.3	6.6	5.2	2.8	3.7
	Math	20.2	4.9	-4.3	22.1	5.8	2.0	1.9	2.9
	Reading	21.1	6.2	-4.4	25.2	6.9	9.8	4.2	5.1
	Science	20.5	4.9	-4.7	23.2	6.0	5.2	2.8	4.2
	Composite	20.7	5.0	-3.8	23.6	5.7	5.6	2.9	2.8
Other Disability	English	20.3	7.0	-2.7	22.3	7.3	0.8	1.9	3.5
	Math	20.7	5.4	-1.6	21.6	6.0	-0.4	0.9	2.9
	Reading	21.2	6.7	-3.8	23.4	6.9	2.8	2.2	4.7
	Science	20.7	5.7	-3.5	22.3	6.1	1.1	1.6	3.9
	Composite	20.8	5.7	-3.0	22.5	6.1	1.1	1.7	2.5

Table A5. Average HSGPA at First Test by Retest Group and Disability Category

Disability Category	Retest Group	Count	English	Math	Social Studies	Science	Overall
Neurodevelopmental Disability	Both Tests	18,258	2.95	2.86	3.07	2.93	2.95
	First Test	17,390	3.18	3.06	3.26	3.12	3.15
	Second Test	12,940	3.12	3.00	3.22	3.07	3.10
Physical/Sensory Disability	Both Tests	2,101	3.36	3.18	3.44	3.29	3.31
	First Test	2,540	3.50	3.34	3.56	3.42	3.45
	Second Test	2,400	3.53	3.36	3.57	3.46	3.48
Psychological Disability	Both Tests	1,366	3.29	3.14	3.34	3.20	3.25
	First Test	1,906	3.48	3.27	3.51	3.35	3.40
	Second Test	1,921	3.48	3.28	3.50	3.36	3.40
Multiple Disabilities	Both Tests	2,862	3.21	3.07	3.28	3.13	3.17
	First Test	3,442	3.35	3.20	3.42	3.26	3.31
	Second Test	2,947	3.34	3.19	3.40	3.27	3.30
Other Disability	Both Tests	235	3.27	3.14	3.30	3.25	3.23
	First Test	277	3.39	3.22	3.44	3.33	3.35
	Second Test	265	3.46	3.34	3.51	3.39	3.42

Note: Counts are provided for overall HSGPA; counts for subject-specific HSGPA may be slightly different but are very close to the overall counts.

Table A6. Average HSGPA at Second Test by Retest Group and Disability Category

Disability Category	Retest Group	Count	English	Math	Social Studies	Science	Overall
Neurodevelopmental Disability	Both Tests	18,258	2.96	2.87	3.07	2.93	2.96
	First Test	17,390	3.19	3.06	3.27	3.12	3.16
	Second Test	12,940	3.12	3.00	3.22	3.07	3.10
Physical/Sensory Disability	Both Tests	2,101	3.37	3.18	3.44	3.29	3.31
	First Test	2,540	3.51	3.34	3.57	3.42	3.45
	Second Test	2,400	3.52	3.36	3.57	3.45	3.47
Psychological Disability	Both Tests	1,366	3.30	3.14	3.34	3.20	3.25
	First Test	1,906	3.49	3.28	3.52	3.35	3.40
	Second Test	1,921	3.48	3.28	3.51	3.37	3.40
Multiple Disabilities	Both Tests	2,862	3.22	3.08	3.29	3.13	3.18
	First Test	3,442	3.36	3.21	3.42	3.26	3.31
	Second Test	2,947	3.35	3.20	3.41	3.26	3.30
Other Disability	Both Tests	235	3.28	3.12	3.31	3.25	3.24
	First Test	277	3.42	3.22	3.46	3.34	3.36
	Second Test	265	3.45	3.34	3.50	3.37	3.41

Note: Counts are provided for overall HSGPA; counts for subject-specific HSGPA may be slightly different but are very close to the overall counts.

Table A7. Correlations Between ACT Scores and HSGPA by Subject Area and Retest Group

Disability Category	Retest Group	Grades	English	Math	Reading/Social Studies	Science	Composite /Overall
Neurodev. Disability	Both Tests	Test 1	0.40	0.39	0.37	0.38	0.48
		Test 2	0.42	0.41	0.39	0.39	0.50
	First Test	Test 1	0.42	0.48	0.40	0.42	0.53
		Test 2	0.43	0.49	0.39	0.43	0.53
	Second Test	Test 1	0.35	0.40	0.30	0.34	0.43
		Test 2	0.38	0.43	0.35	0.37	0.47
Physical/ Sensory Disability	Both Tests	Test 1	0.46	0.51	0.41	0.45	0.56
		Test 2	0.50	0.53	0.43	0.46	0.58
	First Test	Test 1	0.45	0.52	0.43	0.47	0.58
		Test 2	0.47	0.54	0.44	0.45	0.58
	Second Test	Test 1	0.41	0.48	0.37	0.41	0.52
		Test 2	0.44	0.50	0.37	0.43	0.54
Psych. Disability	Both Tests	Test 1	0.44	0.46	0.42	0.44	0.54
		Test 2	0.44	0.50	0.46	0.47	0.57
	First Test	Test 1	0.46	0.54	0.41	0.41	0.57
		Test 2	0.48	0.53	0.41	0.44	0.57
	Second Test	Test 1	0.40	0.48	0.35	0.40	0.52
		Test 2	0.43	0.52	0.37	0.42	0.54
Multiple Disabilities	Both Tests	Test 1	0.43	0.47	0.38	0.40	0.52
		Test 2	0.44	0.50	0.41	0.44	0.54
	First Test	Test 1	0.46	0.50	0.38	0.43	0.54
		Test 2	0.48	0.53	0.41	0.44	0.56
	Second Test	Test 1	0.36	0.44	0.29	0.36	0.45
		Test 2	0.38	0.48	0.33	0.38	0.48
Other Disability	Both Tests	Test 1	0.53	0.45	0.44	0.47	0.58
		Test 2	0.57	0.49	0.44	0.51	0.59
	First Test	Test 1	0.51	0.57	0.45	0.47	0.63
		Test 2	0.52	0.58	0.46	0.50	0.64
	Second Test	Test 1	0.36	0.44	0.29	0.36	0.45
		Test 2	0.46	0.50	0.37	0.46	0.56

Note: All correlations were significant at $p < 0.0001$.

Table A8. Regression Predicting Gains in ACT Composite Score

Variable	Coefficient	SE	t Value	Pr > |t|
Intercept	0.39	0.01	33.54	< 0.0001
ACT English (First Test)	0.03	0.00	62.26	< 0.0001
ACT Math (First Test)	0.04	0.00	93.92	< 0.0001
ACT Reading (First Test)	-0.06	0.00	-164.36	< 0.0001
ACT Science (First Test)	-0.08	0.00	-162.24	< 0.0001
Months Between Tests	0.05	0.00	93.56	< 0.0001
Accommodations on Both Tests	-0.03	0.07	-0.41	0.68
Accommodations on First Test	-0.31	0.07	-4.55	< 0.0001
Accommodations on Second Test	1.33	0.07	19.33	< 0.0001
Low Income (Less than $36,000)	-0.18	0.00	-44.44	< 0.0001
Income Missing	0.05	0.00	11.66	< 0.0001
Parent Education No College	-0.23	0.00	-54.52	< 0.0001
Parent Education Missing	-0.12	0.01	-18.51	< 0.0001
Black/African American	-0.37	0.00	-80.88	< 0.0001
American Indian/Alaska Native	-0.32	0.02	-19.95	< 0.0001
Hispanic/Latino	-0.21	0.00	-47.38	< 0.0001
Asian	0.01	0.01	1.04	0.30
Native Hawaiian/Pacific Islander	-0.21	0.03	-6.87	< 0.0001
Two or More Races	-0.08	0.01	-11.31	< 0.0001
Missing Race/Ethnicity	-0.02	0.01	-2.68	0.01
Male	0.12	0.00	41.45	< 0.0001
Gender Missing	0.06	0.04	1.52	0.13
National-State	0.00	0.00	0.26	0.79
State-National	-0.20	0.00	-58.59	< 0.0001
State-State	-0.65	0.01	-97.76	< 0.0001
Neurodevelopmental Disability	0.09	0.07	1.26	0.21
Physical/Sensory Disability	-0.06	0.07	-0.85	0.39
Psychological Disability	0.68	0.07	9.29	< 0.0001
Multiple Disability	0.56	0.07	7.92	< 0.0001
Overall HSGPA	0.59	0.00	180.85	< 0.0001

Table A9. Regression Predicting Gains in ACT English Score

Variable	Coefficient	SE	t Value	Pr > |t|
Intercept	-0.70	0.02	-40.07	< 0.0001
ACT English (First Test)	-0.38	0.00	-617.87	< 0.0001
ACT Math (First Test)	0.15	0.00	205.32	< 0.0001
ACT Reading (First Test)	0.15	0.00	260.99	< 0.0001
ACT Science (First Test)	0.07	0.00	99.03	< 0.0001
Months Between Tests	0.04	0.00	53.47	< 0.0001
Accommodations on Both Tests	-0.17	0.10	-1.68	0.09
Accommodations on First Test	-0.48	0.10	-4.69	< 0.0001
Accommodations on Second Test	1.23	0.10	12.01	< 0.0001
Low Income (Less than $36,000)	-0.25	0.01	-41.65	< 0.0001
Income Missing	0.11	0.01	18.26	< 0.0001
Parent Education No College	-0.38	0.01	-59.78	< 0.0001
Parent Education Missing	-0.21	0.01	-21.43	< 0.0001
Black/African American	-0.34	0.01	-50.42	< 0.0001
American Indian/Alaska Native	-0.56	0.02	-23.50	< 0.0001
Hispanic/Latino	-0.31	0.01	-46.92	< 0.0001
Asian	-0.05	0.01	-5.77	< 0.0001
Native Hawaiian/Pacific Islander	-0.21	0.04	-4.79	< 0.0001
Two or More Races	-0.11	0.01	-10.94	< 0.0001
Missing Race/Ethnicity	0.04	0.01	3.85	< 0.001
Male	-0.28	0.00	-64.16	< 0.0001
Gender Missing	-0.17	0.05	-3.17	< 0.001
National-State	-0.10	0.01	-17.03	< 0.0001
State-National	-0.36	0.01	-70.58	< 0.0001
State-State	-0.66	0.01	-67.18	< 0.0001
Neurodevelopmental Disability	-0.10	0.10	-1.00	0.32
Physical/Sensory Disability	-0.14	0.11	-1.33	0.18
Psychological Disability	0.52	0.11	4.77	< 0.0001
Multiple Disability	0.40	0.11	3.78	< 0.001
Overall HSGPA	0.64	0.00	133.20	< 0.0001

Table A10. Regression Predicting Gains in ACT Math Score

Variable	Coefficient	SE	t Value	Pr > |t|
Intercept	-0.09	0.01	-6.41	< 0.0001
ACT English (First Test)	0.08	0.00	167.03	< 0.0001
ACT Math (First Test)	-0.32	0.00	-549.76	< 0.0001
ACT Reading (First Test)	0.01	0.00	11.40	< 0.0001
ACT Science (First Test)	0.14	0.00	234.40	< 0.0001
Months Between Tests	0.02	0.00	40.43	< 0.0001
Accommodations on Both Tests	-0.23	0.08	-2.80	0.01
Accommodations on First Test	-0.42	0.08	-5.07	< 0.0001
Accommodations on Second Test	0.58	0.08	6.93	< 0.0001
Low Income (Less than $36,000)	-0.16	0.00	-33.54	< 0.0001
Income Missing	0.10	0.00	20.64	< 0.0001
Parent Education No College	-0.16	0.01	-30.46	< 0.0001
Parent Education Missing	-0.05	0.01	-6.83	< 0.0001
Black/African American	-0.31	0.01	-55.29	< 0.0001
American Indian/Alaska Native	-0.27	0.02	-13.93	< 0.0001
Hispanic/Latino	-0.14	0.01	-25.40	< 0.0001
Asian	0.51	0.01	68.44	< 0.0001
Native Hawaiian/Pacific Islander	-0.07	0.04	-1.87	0.06
Two or More Races	-0.10	0.01	-11.86	< 0.0001
Missing Race/Ethnicity	0.05	0.01	5.25	< 0.0001
Male	0.47	0.00	135.02	< 0.0001
Gender Missing	0.13	0.04	2.86	< 0.001
National-State	0.08	0.00	17.70	< 0.0001
State-National	-0.27	0.00	-65.62	< 0.0001
State-State	-0.53	0.01	-66.29	< 0.0001
Neurodevelopmental Disability	0.27	0.08	3.20	< 0.01
Physical/Sensory Disability	0.16	0.09	1.85	0.06
Psychological Disability	0.53	0.09	6.01	< 0.0001
Multiple Disability	0.47	0.09	5.54	< 0.0001
Overall HSGPA	0.65	0.00	164.33	< 0.0001

Table A11. Regression Predicting Gains in ACT Reading Score

Variable	Coefficient	SE	t Value	Pr > |t|
Intercept	0.62	0.02	29.59	< 0.0001
ACT English (First Test)	0.28	0.00	375.23	< 0.0001
ACT Math (First Test)	0.05	0.00	57.06	< 0.0001
ACT Reading (First Test)	-0.54	0.00	-778.29	< 0.0001
ACT Science (First Test)	0.16	0.00	174.67	< 0.0001
Months Between Tests	0.08	0.00	89.62	< 0.0001
Accommodations on Both Tests	0.25	0.12	2.01	0.04
Accommodations on First Test	-0.15	0.12	-1.26	0.21
Accommodations on Second Test	2.19	0.12	17.72	< 0.0001
Low Income (Less than $36,000)	-0.13	0.01	-18.78	< 0.0001
Income Missing	-0.02	0.01	-3.06	< 0.01
Parent Education No College	-0.21	0.01	-27.62	< 0.0001
Parent Education Missing	-0.10	0.01	-8.16	< 0.0001
Black/African American	-0.33	0.01	-40.38	< 0.0001
American Indian/Alaska Native	-0.22	0.03	-7.46	< 0.0001
Hispanic/Latino	-0.10	0.01	-12.88	< 0.0001
Asian	-0.39	0.01	-35.19	< 0.0001
Native Hawaiian/Pacific Islander	-0.25	0.05	-4.59	< 0.0001
Two or More Races	0.01	0.01	0.91	0.36
Missing Race/Ethnicity	-0.02	0.01	-1.43	0.15
Male	-0.16	0.01	-30.86	< 0.0001
Gender Missing	-0.13	0.07	-2.01	0.04
National-State	-0.10	0.01	-13.98	< 0.0001
State-National	-0.17	0.01	-26.73	< 0.0001
State-State	-0.81	0.01	-68.26	< 0.0001
Neurodevelopmental Disability	0.18	0.12	1.48	0.14
Physical/Sensory Disability	-0.20	0.13	-1.52	0.13
Psychological Disability	1.03	0.13	7.86	< 0.0001
Multiple Disability	0.89	0.13	7.00	< 0.0001
Overall HSGPA	0.46	0.01	79.79	< 0.0001

Table A12. Regression Predicting Gains in ACT Science Score

Variable	Coefficient	SE	t Value	Pr > |t|
Intercept	1.74	0.02	100.47	< 0.0001
ACT English (First Test)	0.12	0.00	196.17	< 0.0001
ACT Math (First Test)	0.30	0.00	428.20	< 0.0001
ACT Reading (First Test)	0.13	0.00	229.54	< 0.0001
ACT Science (First Test)	-0.71	0.00	-943.89	< 0.0001
Months Between Tests	0.04	0.00	58.80	< 0.0001
Accommodations on Both Tests	0.04	0.10	0.38	0.70
Accommodations on First Test	-0.20	0.10	-1.94	0.05
Accommodations on Second Test	1.29	0.10	12.74	< 0.0001
Low Income (Less than $36,000)	-0.16	0.01	-27.54	< 0.0001
Income Missing	0.00	0.01	0.77	0.44
Parent Education No College	-0.19	0.01	-30.16	< 0.0001
Parent Education Missing	-0.13	0.01	-13.81	< 0.0001
Black/African American	-0.49	0.01	-72.84	< 0.0001
American Indian/Alaska Native	-0.25	0.02	-10.46	< 0.0001
Hispanic/Latino	-0.28	0.01	-43.02	< 0.0001
Asian	-0.05	0.01	-5.26	< 0.0001
Native Hawaiian/Pacific Islander	-0.30	0.04	-6.85	< 0.0001
Two or More Races	-0.11	0.01	-11.29	< 0.0001
Missing Race/Ethnicity	-0.14	0.01	-12.67	< 0.0001
Male	0.44	0.00	102.36	< 0.0001
Gender Missing	0.38	0.05	7.01	< 0.0001
National-State	0.12	0.01	20.28	< 0.0001
State-National	-0.03	0.01	-5.36	< 0.0001
State-State	-0.58	0.01	-58.75	< 0.0001
Neurodevelopmental Disability	0.00	0.10	0.04	0.97
Physical/Sensory Disability	-0.07	0.11	-0.69	0.49
Psychological Disability	0.56	0.11	5.23	< 0.0001
Multiple Disability	0.50	0.10	4.80	< 0.0001
Overall HSGPA	0.60	0.00	124.69	< 0.0001

ABOUT ACT

ACT is a mission-driven, nonprofit organization dedicated to helping people achieve education and workplace success. Grounded in 60 years of research, ACT is a trusted leader in college and career readiness solutions. Each year, ACT serves millions of students, job seekers, schools, government agencies, and employers in the U.S. and around the world with learning resources, assessments, research, and credentials designed to help them succeed from elementary school through career.

For more information, visit act.org