

ACT Research Report

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Students Who Take the ACT With Accommodations

An Examination of Performance, Demographics, and Contextual Factors

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Conclusions

Students taking the ACT with accommodations were more likely to be male, White, and from families with either very high or very low income than students testing without accommodations. Students testing with accommodations were less likely to take upper-level core academic courses in high school and tended to score lower than non-accommodated students, but there was a large amount of variation in performance by disability type. A substantial amount of the variance in scores was related to students' demographic characteristics.

So What?

ACT is committed to eliminating barriers for students taking the ACT to ensure that all 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.

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Abstract

This study examined the performance, demographics, and contextual factors of students taking the ACT® test with accommodations compared to students taking the ACT without accommodations. We examined the prevalence of accommodations provided and disability categories as well as performance by disability type. We also examined demographic characteristics and high school experiences of students testing with and without accommodations. We found that students testing with accommodations had demographics similar to students testing without accommodations, but they were somewhat more likely to be male, White, from high or low-income families, and less likely to be female, Hispanic/Latino, Asian, or from middle-income families. Students testing with accommodations were less likely to take upper-level core academic courses in high school, but they expressed similar college aspirations as their peers who tested without accommodations. The most common accommodations were extra time or testing in a small group setting, and additional accommodations tended to be associated with specific disabilities. The most common disabilities were ADHD and learning disabilities, and a substantial proportion of students had multiple disabilities. Students who tested with accommodations tended to score somewhat lower on the ACT, but there was a large amount of variation in average performance by disability type, and demographic characteristics accounted for a substantial amount of variance in scores. Students with intellectual or conduct disorders tended to have the lowest scores, while students with anxiety or depression tended to have the highest scores. High school grades followed a similar pattern in that groups with higher average ACT scores tended to have higher grades. In general, correlations between ACT scores and high school grades were comparable for students who tested with and without accommodations, but again there was variability by disability type, with lower correlations for students with autism, intellectual disorders, math learning disabilities, and conduct disorders.

Keywords: Accommodations, standardized testing, college admissions testing, students with disabilities

Introduction

ACT's mission is to help people be successful in their education and in their careers. In service of this mission, ACT has developed a North Star, a vision for removing barriers to success and creating a fairer and more equitable world for everyone. In order to better serve all students, it is important to understand their aspirations, the contexts in which they learn, and the challenges that they face. This study focuses on students with disabilities taking the ACT with accommodations and provides information about their demographic characteristics, high school experiences, and performance on the ACT. Such information can help educators and policymakers better understand who these students are and how they performed on the ACT, which could be used to propose or improve adequate supports for these students and guide future policymaking.

Definitions, Barriers, and Outcomes

The Individuals with Disabilities Education Act (IDEA) and Section 504 of the Rehabilitation Act of 1973 require that students with disabilities (SWD) are provided a free, appropriate public education. IDEA defines children with disabilities as children “with intellectual disabilities, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, ... orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities who by reason thereof, needs special education and related services” (IDEA, 2004, Section 300.8). Section 504 of the Rehabilitation Act of 1973 defines a person with a disability as “any person who has a physical or mental impairment which substantially limits one or more major life activities” (US Department of Education, Office for Civil Rights, 2010).

Approximately 7.3 million students aged 3–21 received special education services in the US during the 2018–2019 school year, which is 14% of all public school students (NCES, 2021a). SWD are a broad group of students with varying needs. There are many different types of disabilities, and even within a group of students with the same disability, many different degrees or differences exist in how the disability impacts students' ability to participate in major life activities. As such a heterogeneous population, there is no one-size-fits-all approach for how to properly teach and assess SWD, as their needs vary from person to person. Accordingly, both IDEA and Section 504 explicitly indicate that SWD have the right to an education that is designed to meet their specific needs.

Having a disability is associated with a variety of challenges and barriers in school and in life. SWD tend to score lower than students without disabilities on standardized academic achievement assessments. The 2019 Nation's Report Card revealed large differences in the percentages of proficient students, ranging from a 27 percentage-point difference in 4th grade reading (12% SWD proficient vs. 39% non-SWD proficient) to a 29 percentage-point difference in 8th grade math (9% SWD proficient vs. 38% non-SWD proficient; NCES, 2019a; 2019b). Huh and Huang (2016) found that ACT-tested SWD tended to have lower self-reported high school GPAs (2.95 vs. 3.41) as well as lower ACT Composite scores than students without disabilities

(19.8 vs. 22.8). SWD are also less likely to graduate high school (68%) than the national average (86%; NCES, 2021b).

After high school, SWD are less likely to enroll in college, tend to earn lower grades in college, and are less likely to complete a college degree. Shifrer and Freeman (2021) found that 48%–58% of SWD enrolled in college within three years of graduating high school compared to 73% of students without disabilities. Huh and Huang (2016) found that ACT-tested SWD tended to have lower first-year college GPAs than their peers without disabilities (2.27 vs. 2.74). A report from the National Longitudinal Transition Study indicated that SWD were less likely to attend postsecondary education (60% vs. 67%) and less likely to complete a degree or program (41% vs 52%) compared to the general population (Newman, Wagner, Knokey, Marder, Nagle, Shaver, & Wei, 2011). The US Bureau of Labor Statistics reported that 16% of adults aged 25 and older with a disability completed at least a bachelor's degree compared to 35% of adults without a disability, and adults with a disability were less likely to complete high school compared to adults without a disability (79% vs. 90%; Bureau of Labor Statistics, US Department of Labor, 2015). SWD also face disparate employment rates; in 2020, 29% of people ages 16 to 64 with a disability were employed compared to 70% of those without a disability (Bureau of Labor Statistics, US Department of Labor, 2021).

Various factors contribute to the lower performance of SWD on academic assessments. For some students, the nature of the disability itself may contribute to lower levels of achievement; for example, an intellectual or cognitive impairment can impact learning, memory, and problem solving (American Psychiatric Association, 2021). Other factors contributing to lower academic performance may include differences in educational experiences, access to a rigorous academic curriculum, inadequate supports or services, or lower expectations (Butrymowicz & Mader, 2017; Schwartz, Hopkins, & Stiefel, 2019). In college, many students do not report their disability status; in one study, 95% of a sample of SWD received accommodations in high school but only 23% did so in college, and only 35% disclosed their disability to their college (Newman & Madaus, 2015). While some students may “outgrow” their disabilities or learn strategies that allow them to be successful in college without school-provided accommodations, it is likely that some students choose not to disclose their disabilities because they fear being stigmatized, but they would likely benefit from accommodations if they obtained them.

SWD have unique challenges when learning and being assessed. For example, a student with a visual impairment may not be able to access written text or pictures, or a student with a motor disability may not be able to hold a pencil to write or draw. However, with accommodations such as a screen reader for students with visual impairments or use of a computer or other assistive technology for students with motor disabilities, students can access the content to be learned and can demonstrate their knowledge and skills during assessment. The *Standards for Educational and Psychological Testing* defines accommodations as “relatively minor changes to the presentation and/or format of the test, test administration, or response procedures that maintain the original construct and result in scores comparable to those on the original test” (AERA, APA, & NCME, 2014, p. 58). Accommodations are an important component of fair and valid assessments for SWD.

ACT Testing and Accommodations

ACT is committed to providing a fair and equitable experience for SWD taking the ACT® test. Students may request testing accommodations, which are changes to test administration conditions that allow the examinee to more accurately demonstrate their knowledge and skills. Testing accommodations generally fall into one of four categories: timing (e.g., extra time or breaks), presentation (e.g., braille, large print), response (e.g., having a scribe to transfer answers to the answer document), and setting (e.g., small group/familiar setting).

Students request accommodations when registering to take the ACT test, school officials provide relevant documentation, and ACT approves accommodations for eligible students, aligned with students' individualized education plans (IEPs) or 504 plans. The purpose of accommodations is to remove construct-irrelevant variance, thereby allowing SWD to more accurately demonstrate their knowledge and skills. The purpose of this study is to examine performance, demographic characteristics, and contextual factors for SWD taking the ACT with accommodations.

There are two main contexts in which most 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 test at a test center, typically on a Saturday. State and District testing is a testing context in which school districts or states provide in-school testing, typically for all students in 11th grade at no cost to the student (ACT, 2019). Because the ACT is administered to all students during State and District testing while students opt into National testing, the two populations are slightly different. Students testing during National administrations tend to be slightly higher achieving, college-bound students, whereas State and District samples include students who otherwise would not have taken the ACT. Consequently, average scores for the State and District population tend to be slightly lower than average scores for students testing in the National context (Allen, 2015).

There are two general categories of accommodations available for National testing: National with Accommodations and Special 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, 2022; ACT 2021a). Special Testing is arranged during a specified period of time, 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. 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.

Research Questions

The purpose of this study was to understand the characteristics of students with disabilities taking the ACT with accommodations. We were also interested in their ACT performance and how their scores were related to student characteristics and high school grades. We tried to get a comprehensive picture of who they were, what their experiences were, how they performed on the ACT, and what demographic and contextual factors were related to their ACT performance. This study was designed to address the following research questions:

1. How do demographic characteristics of students testing with accommodations on the ACT compare to those of students testing without accommodations?
2. How do high school experiences of students testing with accommodations compare to those of students testing without accommodations?
3. What accommodations are most commonly provided on the ACT?
4. What are the most common accommodations by disability type?
5. How do ACT performance and high school grades of students testing with accommodations compare to those of students testing without accommodations? Are there differences by disability category?
6. What is the relationship between high school grades and ACT scores of students testing with accommodations and students testing without accommodations?
7. To what extent do student demographics account for differences in the average ACT scores of students testing with accommodations and students testing without accommodations?

Methods

Study Sample

This study examined the performance and characteristics of students who took the ACT between fall 2016 and summer 2020 either with accommodations (SWA) or with no

accommodations (SWNA). The sample included students who tested under both National and State and District contexts, but students with Non-College Reportable scores were excluded from this study. The sample was not limited to first-time testers to maximize sample sizes, but most students in the sample were first-time testers (86% of SWA and 87% of SWNA). For the SWA sample, students' first test within the testing window in which they tested with accommodations was retained. For the SWNA sample, students' first test within the testing window was retained, and students who later tested with accommodations within the testing window were excluded from the sample. English learners who tested with accommodations were also not included in the sample. The resulting study sample included 436,695 (6%) SWA and 7,252,520 SWNA (94%).

Students are asked to provide information about themselves when they register to take the ACT. Relevant information used in this study included demographic information: gender, race/ethnicity, parent income, parent education, grade level at time of testing, and high school information: educational aspirations, courses taken, courses planned, and grades earned. This information was used to calculate high school grade point average (HSGPA). HSGPA is based on self-reported information, but previous research has found it to be highly accurate (Sanchez & Buddin, 2015). Parent/guardian education level was collected to identify potential first-generation college students. First-generation status is defined as neither parent having any college experience, meaning that if the student enrolls in college, they will be a first-generation college student.

Accommodation and Disability Categories

ACT's Test Accessibility and Accommodations (TAA) system contains the disability and accommodations data that were used in this study. Students' ACT records were merged with TAA data, and disability and accommodations categories were created based on the information in TAA. When school officials provide information to ACT as part of an accommodations request, they provide information about which disability or disabilities the student has and which accommodations are requested. For disabilities and accommodations, there are lists of options that can be selected as well as "Other" options for which an open-ended response can be provided. We used this information to create categories of disabilities and categories of accommodations.

Three general categories of disabilities were identified: neurodevelopmental, physical/sensory, and psychological. More specific sub-categories of disabilities were identified based on their groupings in the *Diagnostic and statistical manual of mental disorders* (DSM-5; American Psychiatric Association, 2013). While the DSM-5 uses the medical term "disorder," "disability" is a legal term used by IDEA and Section 504 of the Rehabilitation Act. We use the terms "disability" and "disorder" interchangeably to describe the conditions under which students are eligible for testing accommodations.

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

There were a small number of students (3,963; less than 1% of SWA) whose disabilities were categorized as "other" due to limitations of the data available in TAA.

Accommodations are generally described as changes to the timing, presentation, response mode, and/or setting in which the test is administered (DePascale & Gong, 2020). ACT provides accommodations of each type. This includes several timing conditions depending on students' individual needs. Extra time conditions include one and one-half time, double time, and 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, breaks during test sections as needed, or testing over multiple days. Accommodations related to presentation of test content include use of a screen reader, text-to-speech, 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, marking answers in the test booklet instead of in an answer sheet, using a computer for the writing test, and other changes to how the student responds to items. Accommodations to the testing

environment include small group, individual testing, preferential seating, testing in a hospital, or testing in a wheelchair-accessible environment. In addition to accommodations for presentation, response, timing, and setting, ACT also provides several accommodations related to health conditions, including food, drinks, medications, or medical devices during the test; standing during the test; use of assistive furniture or other devices; and someone to position test materials or turn pages for the examinee.

Results

Research Question 1: How do demographic characteristics of students testing with accommodations on the ACT compare to those of students testing without accommodations?

Table 1 contains demographic characteristics of students testing with and without accommodations. A higher percentage of students testing with accommodations (SWA) tested in a State and District context (59%) than in a National testing context (41%), whereas students testing without accommodations (SWNA) were more likely to test in a National context (60%) than in a State and District context (41%). Higher percentages of SWA tested in 11th grade (79%) compared to SWNA (66%), which makes sense given the higher percentage of SWA who tested as part of State and District testing.

Table 1. Demographic Characteristics (Percentages) of Students Testing With and Without Accommodations

Demographic Characteristic	Accommodations	No Accommodations
Test Type		
National	41	60
State and District	59	41
Grade Level Tested		
11th grade	79	66
12th grade	16	24
Other/missing	5	10
Gender		
Female	41	53
Male	56	45
Other/missing	3	2
Race/Ethnicity		
Black/African American	11	12
American Indian/Alaska Native	1	1
White	50	52
Hispanic/Latino	8	16
Asian	1	5
Native Hawaiian/Pacific Islander	0	0
Two or More Races	3	4
Missing/Prefer Not to Respond	25	10
Income		
Less than \$24,000	7	8
\$24,000–\$36,000	6	7
\$36,000–\$50,000	4	6
\$50,000–\$60,000	3	5
\$60,000–\$80,000	4	7
\$80,000–\$100,000	3	6
\$100,000–\$120,000	3	6
\$120,000–\$150,000	2	4
More than \$150,000	6	8
Missing/prefer not to respond	62	42
Parent Education		
No college	10	14
At least some college	37	55
Missing/prefer not to respond	53	31
Sample Size	436,695	7,252,520

Note. Percentages may not sum to 100% due to rounding.

SWA were more likely to be male (56%) than SWNA (45%). SWA were less likely to identify as Hispanic (8%) or Asian (1%) than SWNA (16% and 5%, respectively), and SWA were also more likely to omit information about their race/ethnicity (25%) than SWNA (10%). Distributions of income categories were similar for both groups of students, but large proportions of students overall did not report family income (62% of SWA and 42% of SWNA). SWA were somewhat less likely to report that neither parent or guardian had any college experience (10%) than SWNA (14%), but SWA were also much more likely to omit information about their parents' education levels (53%) than SWNA (31%).

Because of the large and disproportionate percentages of students omitting information about their race/ethnicity, income, and parent education, Table 2 contains the proportions of SWA and SWNA reporting each race/ethnicity, income, and parent education category only for students who provided a response to that question. SWA were still less likely to report Hispanic and Asian race/ethnicity, but larger proportions of SWA reported White race/ethnicity (67%) compared to SWNA (57%). For income, SWA were more likely than SWNA to report family income of less than \$36,000 per year (34% and 28%, respectively) or greater than \$150,000 per year (17% and 14% respectively), while smaller percentages of SWA reported income between \$36,000 and \$150,000. The percentages of students indicating that neither of their parents/guardians had any college experience increased for both groups, and SWA were slightly more likely to indicate that their parents/guardians had no college experience (22%) than SWNA (20%).

Table 2. Race/Ethnicity and Income Distributions (Percentages) Conditioned on Non-Omitted Responses

Demographic Characteristic	Accommodations	No Accommodations
Race/Ethnicity		
Black/African American	15	14
American Indian/Alaska Native	1	1
White	67	57
Hispanic/Latino	11	18
Asian	2	5
Native Hawaiian/Pacific Islander	0	0
Two or More Races	5	5
Income		
Less than \$24,000	19	15
\$24,000–\$36,000	15	13
\$36,000–\$50,000	10	11
\$50,000–\$60,000	8	8
\$60,000–\$80,000	9	11
\$80,000–\$100,000	9	11
\$100,000–\$120,000	8	10
\$120,000–\$150,000	6	8
More than \$150,000	17	14
Parent Education		
No college	22	20
At least some college	78	80

Note. Percentages may not sum to 100% due to rounding.

Research Question 2: How do high school experiences of students testing with accommodations compare to those of students testing without accommodations?

Table 3 contains the percentages of SWA and SWNA who reported having taken or planning to take common high school courses before graduating high school, conditioned on non-omitted responses. As we saw with response rates for student demographic characteristics, there were also missing data in the high school course-taking items, with more data missing for SWA (47% to 79%) than SWNA (20% to 44%). For about half of the 30 courses listed, there were small differences (less than 5 percentage points) in course-taking for SWA and SWNA. There were 10 courses with a difference of at least 5 percentage points favoring SWNA: algebra 2, trigonometry, calculus, other advanced math, chemistry, physics, economics, geography, psychology, and Spanish. Conversely, there were three courses with a difference of at least 5 percentage points favoring SWA: general/earth science, languages other than Spanish, French, or German, and art.

Table 3. Percentages of Students Testing With and Without Accommodations Taking or Planning to Take High School Courses, Conditioned on Non-Omitted Responses, with Percentages of Non-Response in Parentheses

Courses Taken/Planned	Accommodations		No Accommodations	
	Taking or Planned	(No Response)	Taking or Planned	(No Response)
English, grade 9	100	(47)	100	(20)
English, grade 10	100	(47)	100	(20)
English, grade 11	99	(48)	99	(21)
English, grade 12	97	(51)	98	(22)
Other English	25	(64)	26	(32)
Algebra 1	98	(48)	99	(21)
Algebra 2	91	(50)	97	(21)
Geometry	95	(49)	98	(21)
Trigonometry	40	(56)	52	(25)
Calculus	34	(56)	51	(26)
Other advanced math	57	(55)	69	(25)
Computer science	26	(57)	25	(27)
General/earth science	90	(49)	84	(22)
Biology	99	(48)	99	(21)
Chemistry	79	(52)	91	(22)
Physics	56	(55)	66	(25)
Us history	99	(48)	99	(21)
World history	95	(49)	95	(21)
Other history	42	(57)	39	(27)
American government	85	(52)	88	(23)
Economics	59	(55)	67	(25)
Geography	46	(55)	51	(25)
Psychology	39	(56)	47	(26)
Spanish	71	(79)	76	(43)
French	14	(79)	16	(43)
German	5	(79)	6	(43)
Other language	21	(79)	16	(43)
Art	66	(79)	60	(43)
Music	41	(79)	44	(43)
Drama	24	(79)	21	(44)

Table 4 contains the educational aspirations reported by SWA and SWNA, conditioned on non-omitted responses (51% of SWA and 28% of SWNA did not respond to this item). Nearly half of students in both groups aspired to earn a bachelor's degree (46% of SWA and 49% of SWNA). SWA were somewhat more likely to aspire to earn a business/technical degree or certificate (6% vs. 2%) or an associate degree (12% vs. 5%), whereas SWNA were more likely to aspire to earn an advanced degree (30% vs. 42%).

Table 4. Educational Aspirations of Students Testing With and Without Accommodations, Conditioned on Non-Omitted Responses

Educational Aspirations	Accommodations	No Accommodations
Business/tech/certificate	6	2
Associate degree	12	5
Bachelor's degree	46	49
1–2 years graduate study	16	18
Doctorate/professional degree	14	24
Other	5	2

Research Question 3: What accommodations are most commonly provided on the ACT?

Table 5 contains the counts and percentages of accommodations provided to students in the SWA study sample. The most common accommodation provided was extra time, with 94% of SWA obtaining extra time, most commonly one and one-half time (49%). Other common accommodations included small group testing (46%) and a screen reader or read aloud (20%). Most SWA (67%) were provided more than one accommodation; for example, extra time is often necessary for the student to be able to make use of another accommodation, and small group or individual testing is common so that students are not distracted by others testing under differing administration conditions.

Table 5. Prevalence of Accommodations Provided on the ACT Among Students Receiving Accommodations

Accommodation	Count	Percent
Extra time during testing	408,824	93.6
One and one-half time	215,759	49.4
Triple time over multiple days	89,209	20.4
One and one-half time over multiple days	68,401	15.7
Double timing over multiple days	32,004	7.3
Double time on writing section	4,018	0.9
Small group testing	201,579	46.2
Screen reader or read aloud	87,969	20.1
Assistive technology	29,074	6.7
Environment (e.g., hospital, preferential seating)	28,419	6.5
Other unspecified accommodations	25,011	5.7
Individual testing	20,814	4.8
Scribe (e.g., speech to text, pointing to answers)	19,917	4.6
Breaks between test sections or as needed	18,936	4.3
Health (e.g., food, drink, medication, medical device)	9,697	2.2
Standard time over multiple days	6,654	1.5
Visual accommodations (e.g., braille, large print)	6,047	1.4
Instructions (e.g., read aloud, repeated, printed)	5,177	1.2
Time remaining indicator	1,400	0.3
Audio amplification system	1,101	0.3
Physical (e.g., adaptive furniture, wheelchair)	701	0.2
Examinee may read test items out loud	594	0.1
Sign language interpreter	489	0.1
Scratch paper	431	0.1

Note. Percentages do not sum to 100% because most students (67%) tested with more than one accommodation.

Research Question 4: What are the most common accommodations by disability type?

Table 6 contains the prevalence of accommodations overall and by high-level disability category. In general, the patterns of most common accommodations were similar for students with neurodevelopmental, psychological, and multiple disabilities, with greater than 90% receiving extra time and nearly half testing in a small group setting. Students with neurodevelopmental disabilities were more likely to have a screen reader or read aloud compared to students with psychological or multiple disabilities. Patterns were different for students with physical/sensory and other disabilities, with fewer students receiving extra time and more students receiving individual testing, breaks between test sessions, or health-related accommodations (such as food, drinks, medication, or medical devices).

Tables 7 and 8 contain the prevalence of accommodations for students with neurodevelopmental disabilities overall and by disability type. About 33% of students with neurodevelopmental disabilities received one accommodation, 44% received two accommodations, and 23% received three or more accommodations. Patterns of accommodations were similar across students with ADHD, autism, communication disorders, and learning disabilities in math or reading or an unspecified learning disability. Over 95% of students with these disabilities received extra time, typically one and one-half time (42%–69%), and approximately half tested in a small group setting (45%–57%). Students with intellectual disabilities were more likely to test using triple time over multiple days (65%) and use a screen reader or read aloud (65%), as well as testing in a small group setting (52%). Students with a learning disability in writing were more likely to have extra time on the writing test (65%), make use of assistive technology (19%), and have breaks between test sections (17%). Students with motor neurodevelopmental disabilities were less likely to test with extra time (43%), but more likely to test in an individual setting (36%), have breaks between test sections (40%), and test under standard timing conditions but over multiple days (14%).

Table 9 contains the prevalence of accommodations for students with physical/sensory disabilities overall and by disability type. About 29% of students with physical/sensory disabilities received one accommodation, 33% received two accommodations, and 38% received three or more accommodations. Patterns of common accommodations were different depending on disability type. As might be expected, students with hearing disabilities were more likely to have modified test instructions (37%), likely having printed instructions instead of having instructions read aloud, and audio amplification (15%). Students with motor disabilities were more likely to use assistive technology (25%), a scribe (41%), or accommodations to the physical environment such as adaptive furniture or a wheelchair (10%). Students with visual disabilities were more likely to use a scribe (68%) or visual accommodations such as braille or large print (68%). Students with other physical/sensory disabilities were more likely to take breaks between test sections (55%), have health-related accommodations (37%), or test under standard timing conditions but over multiple days (20%).

Table 10 contains the prevalence of accommodations for students with psychological disabilities. About 41% of students with psychological disabilities received one accommodation, 50% received two accommodations, and 9% received three or more accommodations. With the exception of students in the other psychological disabilities category, patterns of accommodations were fairly similar across disability types, with most students using one and one-half time (54%–78%) and small group testing (42%–61%). Students with other psychological disabilities were less likely to use extra time (72% compared to 94% across all students with psychological disabilities) or a small group setting (29% vs. 49%), but were more likely to take breaks between test sections (14% vs. 3%) or test under standard timing conditions but over multiple days (14% vs. 1%).

Table 6. Percentages of Accommodations Approved by High-Level Disability Category

Accommodation	Neurodev.	Physical/ Sensory	Psych.	Multiple	Other	All
Extra time during testing	98	50	94	96	63	94
One and one-half time	51	21	63	48	32	49
Triple time over multiple days	24	13	2	11	10	20
One and one-half time over multiple days	15	8	22	23	11	16
Double timing over multiple days	7	6	6	12	7	7
Double time on writing section	1	1	0	1	4	1
Small group testing	49	22	49	44	26	46
Screen reader or read aloud	25	9	2	11	10	20
Assistive technology	6	6	2	14	9	7
Environment (e.g., hospital, preferential seating)	6	9	7	9	7	7
Other unspecified accommodations	4	16	4	11	14	6
Individual testing	3	13	5	7	10	5
Scribe (e.g., speech to text, pointing to answers)	3	17	1	9	13	5
Breaks between test sections or as needed	1	36	3	4	21	4
Health (e.g., food, drink, medication, medical device)	0	22	1	3	12	2
Standard time over multiple days	0	13	1	1	12	2
Visual accommodations (e.g., braille, large print)	0	12	0	2	3	1
Instructions (e.g., read aloud, repeated, printed)	1	6	1	1	1	1
Time remaining indicator	0	0	1	0	0	0
Audio amplification system	0	2	0	1	0	0
Physical (e.g., adaptive furniture, wheelchair)	0	1	0	0	3	0
Examinee may read test items out loud	0	0	0	0	1	0
Sign language interpreter	0	1	0	0	0	0
Scratch paper	0	0	0	0	0	0

Table 7. Percentages of Accommodations Approved by Neurodevelopmental Disability Category

Accommodation	Neurodev.	ADHD	Autism	Comm.	Intellectual	LD-Math
Extra time during testing	98	98	96	98	98	97
One and one-half time	51	69	54	59	23	94
Triple time over multiple days	24	3	7	10	65	2
One and one-half time over multiple days	15	23	18	21	5	1
Double timing over multiple days	7	3	17	8	6	1
Double time on writing section	1	0	0	0	0	0
Small group testing	49	45	54	50	52	57
Screen reader or read aloud	25	3	7	11	65	2
Assistive technology	6	4	7	3	3	1
Environment (e.g., hospital, preferential seating)	6	8	6	5	4	4
Other unspecified accommodations	4	4	5	4	3	2
Individual testing	3	2	7	3	9	1
Scribe (e.g., speech to text, pointing to answers)	3	2	3	1	1	0
Breaks between test sections or as needed	1	1	2	0	1	2
Health (e.g., food, drink, medication, medical device)	0	0	0	0	0	0
Standard time over multiple days	0	1	1	0	0	0
Visual accommodations (e.g., braille, large print)	0	0	0	0	0	0
Instructions (e.g., read aloud, repeated, printed)	1	1	1	2	1	1
Time remaining indicator	0	0	1	0	0	0
Audio amplification system	0	0	0	0	0	0
Physical (e.g., adaptive furniture, wheelchair)	0	0	0	0	0	0
Examinee may read test items out loud	0	0	0	0	0	0
Sign language interpreter	0	0	0	0	0	0
Scratch paper	0	0	0	0	0	0

Table 8. Percentages of Accommodations Approved by Neurodevelopmental Disability Category, Continued

Accommodation	LD-Reading	LD-Writing	LD-Unspec.	Motor-Neuro	Other	Multiple
Extra time during testing	99	76	95	43	96	99
One and one-half time	42	9	51	28	51	40
Triple time over multiple days	41	3	24	2	1	37
One and one-half time over multiple days	10	3	11	10	34	12
Double timing over multiple days	6	1	7	3	8	9
Double time on writing section	0	65	2	0	1	0
Small group testing	43	40	45	20	17	52
Screen reader or read aloud	41	4	25	2	1	37
Assistive technology	4	19	4	4	34	9
Environment (e.g., hospital, preferential seating)	4	4	4	6	6	5
Other unspecified accommodations	3	4	5	12	6	5
Individual testing	3	5	4	36	3	4
Scribe (e.g., speech to text, pointing to answers)	2	6	2	5	10	4
Breaks between test sections or as needed	0	17	2	40	1	1
Health (e.g., food, drink, medication, medical device)	0	0	0	1	1	0
Standard time over multiple days	0	0	0	14	4	0
Visual accommodations (e.g., braille, large print)	0	0	0	0	3	0
Instructions (e.g., read aloud, repeated, printed)	0	1	3	1	0	1
Time remaining indicator	0	0	1	1	0	0
Audio amplification system	0	0	0	0	0	0
Physical (e.g., adaptive furniture, wheelchair)	0	0	0	0	0	0
Examinee may read test items out loud	0	0	1	0	0	0
Sign language interpreter	0	0	0	0	0	0
Scratch paper	0	0	0	0	0	0

Table 9. Percentages of Accommodations Approved by Physical/Sensory Disability Category

Accommodation	Physical/ Sensory	Hearing	Motor- Physical	Visual	Other	Multiple
Extra time during testing	50	80	85	84	28	75
One and one-half time	21	31	37	37	13	29
Triple time over multiple days	13	32	15	27	4	18
One and one-half time over multiple days	8	8	11	11	7	13
Double timing over multiple days	6	9	17	9	3	11
Double time on writing section	1	0	6	0	1	3
Small group testing	22	31	23	28	18	28
Screen reader or read aloud	9	16	8	20	4	14
Assistive technology	6	1	25	15	3	19
Environment (e.g., hospital, preferential seating)	9	17	6	11	6	13
Other unspecified accommodations	16	14	17	25	13	23
Individual testing	13	8	14	10	14	12
Scribe (e.g., speech to text, pointing to answers)	17	1	41	68	4	41
Breaks between test sections or as needed	36	8	7	8	55	17
Health (e.g., food, drink, medication, medical device)	22	0	2	0	37	9
Standard time over multiple days	13	3	2	3	20	9
Visual accommodations (e.g., braille, large print)	12	0	6	68	1	26
Instructions (e.g., read aloud, repeated, printed)	6	37	0	0	0	5
Time remaining indicator	0	0	0	0	0	0
Audio amplification system	2	15	0	0	0	4
Physical (e.g., adaptive furniture, wheelchair)	1	0	10	0	1	4
Examinee may read test items out loud	0	0	0	0	0	0
Sign language interpreter	1	8	0	0	0	1
Scratch paper	0	0	0	0	0	1

Table 10. Percentages of Accommodations Approved by Psychological Disability Category

Accommodation	Psych.	Anxiety	Conduct	Depression	Other	Multiple
Extra time during testing	94	96	94	98	72	96
One and one-half time	63	72	54	78	44	66
Triple time over multiple days	2	1	5	1	3	1
One and one-half time over multiple days	22	17	31	14	15	20
Double timing over multiple days	6	6	4	5	9	9
Double time on writing section	0	0	0	0	0	0
Small group testing	49	42	61	45	29	48
Screen reader or read aloud	2	1	5	1	3	1
Assistive technology	2	2	1	1	4	2
Environment (e.g., hospital, preferential seating)	7	7	5	5	7	8
Other unspecified accommodations	4	4	3	3	9	4
Individual testing	5	4	6	2	8	6
Scribe (e.g., speech to text, pointing to answers)	1	1	1	1	4	2
Breaks between test sections or as needed	3	3	3	1	14	3
Health (e.g., food, drink, medication, medical device)	1	1	0	1	7	1
Standard time over multiple days	1	1	2	1	14	1
Visual accommodations (e.g., braille, large print)	0	0	0	0	0	0
Instructions (e.g., read aloud, repeated, printed)	1	0	1	1	1	0
Time remaining indicator	1	0	1	0	5	0
Audio amplification system	0	0	0	0	0	0
Physical (e.g., adaptive furniture, wheelchair)	0	0	0	0	0	0
Examinee may read test items out loud	0	0	0	0	0	0
Sign language interpreter	0	0	0	0	0	0
Scratch paper	0	0	0	0	0	0

Research Question 5: How do ACT performance and high school grades of students testing with accommodations compare to those of students testing without accommodations? Are there differences by disability category?

Table 11 contains sample sizes and average ACT scores of SWA, both overall and by high-level disability category and disability subcategory, and SWNA (standard deviations are presented in Appendix Table A1). Percentages are also provided in Table 11. For high-level disabilities (i.e., neurodevelopmental, physical/sensory, psychological, multiple, or other disabilities), the values reflect the percentages of all SWA, and for subcategories, the values reflect the percentages of students within that high-level disability category.

The most common high-level disability category was neurodevelopmental disability (73% of SWA); 7% of SWA had physical/sensory disabilities, 7% of SWA had psychological disabilities, and 12% of SWA had disabilities in multiple high-level categories. The most common neurodevelopmental disability was multiple disabilities (41% of students in the neurodevelopmental disability category had more than one neurodevelopmental disability), followed by ADHD (28%), and reading disability (14%). Most of the students with multiple neurodevelopmental disabilities had one or more learning disabilities (94%, not presented in the table). The most common physical or sensory disability was “other” (60%). This category comprises uncommon physical or sensory disabilities—mainly health conditions such as diabetes, epilepsy, or traumatic brain injury. The most common psychological disabilities were anxiety (36%) and conduct disorder (34%), and 23% of students with psychological disabilities had multiple psychological disabilities. Most of the students with multiple psychological disabilities had both anxiety and depression among their disabilities (76%, not presented in the table).

When examining ACT score performance, on average, SWA scored below SWNA, with SWA earning an average ACT Composite score of 18.4 and SWNA earning an average ACT Composite score of 20.5. However, there were large differences in performance by disability category. Overall, students with psychological disabilities tended to score the highest on the ACT among all SWA, with an average Composite score of 20.9, which is slightly higher than the average Composite score of SWNA (20.5). Students with neurodevelopmental disabilities tended to have the lowest average Composite score (17.4), but their average performance varied depending on the specific disability. Students with intellectual disorders tended to have the lowest performance, with an average Composite score of 13.3, whereas students with “other” neurodevelopmental disabilities and motor disabilities tended to have the highest performance (25.5 and 21.7 respectively). It should be noted, however, that these two categories comprised less than 1% of the study sample, meaning that different samples of students (e.g., students tested in different years) could have very different performance depending on their specific disabilities and achievement levels. Of students with physical/sensory disabilities, students with hearing impairments tended to score lower (16.9) than students with visual or motor impairments (20.0–20.1). Of students with psychological disabilities, students with conduct disorder tended to score lower (16.1) than students with other

psychological disabilities, and students with anxiety (23.6), depression (22.0), and multiple psychological disabilities (23.5) tended to score higher than SWNA.

Table 12 contains self-reported high school grade point averages (HSGPA) of SWA, both overall and by disability category, and SWNA (standard deviations are provided in Appendix Table A2). SWA were less likely to report their HSGPAs (with response rates ranging from 41% to 43% across subject areas) than SWNA (with response rates around 70% across subject areas). In general, HSGPA patterns were similar across disability categories compared to patterns of ACT performance, such that students who earned higher scores on the ACT tended to have higher HSGPAs, and students who earned lower scores on the ACT tended to have lower HSGPAs. Students with intellectual disorders and conduct disorders tended to have the lowest average HSGPA (2.6 and 2.5, respectively), and students with anxiety tended to have the highest average HSGPA (3.4), comparable to that of SWNA (3.4).

Table 11. Average ACT Scores for Students Testing With and Without Accommodations, by Disability Category

Disability Category	N	Percent	English	Math	Reading	Science	Composite
Neurodevelopmental Disability	317,603	73	16.0	17.4	18.0	17.8	17.4
ADHD	87,626	28	18.8	19.3	20.7	19.8	19.8
Autism	18,076	6	18.5	18.6	19.8	19.5	19.3
Communication Disorder	6,954	2	14.6	16.5	16.4	16.7	16.2
Intellectual Disorder	9,179	3	11.2	14.3	13.1	14.0	13.3
Learning Disability, Math	16,286	5	14.3	15.0	16.3	15.3	15.4
Learning Disability, Reading	44,479	14	15.4	17.7	17.9	18.0	17.4
Learning Disability, Writing	3,829	1	15.4	17.9	17.6	18.1	17.4
Learning Disability, Unspecified	1,722	1	13.8	15.8	15.9	15.9	15.5
Motor Disability	431	0	21.4	21.1	22.3	21.5	21.7
Other Neurodevelopmental Disability	71	0	26.1	23.7	26.7	24.9	25.5
Multiple Neurodevelopmental Disabilities	128,950	41	14.6	16.5	16.8	16.8	16.3
Physical/Sensory Disability	32,001	7	19.5	19.9	21.3	20.5	20.4
Hearing Impairment	4,738	15	15.1	17.1	17.4	17.7	16.9
Motor Impairment	2,014	6	20.2	19.9	22.6	21.0	21.0
Visual Impairment	4,777	15	20.1	20.4	22.5	21.0	21.1
Other Physical/Sensory Disability	19,139	60	20.3	20.5	21.7	21.0	21.0
Multiple Physical/Sensory Disabilities	1,333	4	19.8	20.0	22.1	20.9	20.8
Psychological Disability	28,712	7	20.3	19.8	22.3	20.6	20.9
Anxiety	10,261	36	23.3	21.9	25.4	23.1	23.6
Conduct Disorder	9,899	34	14.9	16.0	16.7	16.3	16.1
Depression	1,000	3	21.6	20.7	23.8	21.6	22.0
Other Psychological Disability	1,089	4	21.6	21.2	23.3	21.9	22.1
Multiple Psychological Disabilities	6,463	23	23.4	21.8	25.5	23.0	23.5
Multiple Disabilities	54,416	12	20.7	20.2	22.6	21.2	21.3
Other Disability	3,963	1	19.1	19.6	20.8	20.1	20.0
All SWA	436,695		17.1	18.1	19.2	18.6	18.4
SWNA	7,252,520		19.7	20.2	21.0	20.5	20.5

Note. Left-aligned percentages are the percentages of all SWA, and right-aligned percentages are the percentages of students within that high-level disability category.



Table 12. Average Self-Reported HSGPA for Students Testing With and Without Accommodations, by Disability Category

Disability Category	N	English	Math	Social Studies	Science	Overall
Neurodevelopmental Disability	133,417	2.84	2.75	2.80	2.94	2.83
ADHD	40,564	2.93	2.83	2.91	3.05	2.93
Autism	7,297	3.04	2.96	3.03	3.17	3.05
Communication disorder	3,123	2.86	2.76	2.81	2.92	2.84
Intellectual disorder	3,523	2.67	2.56	2.54	2.66	2.62
Learning disability, math	8,063	2.74	2.48	2.64	2.85	2.69
Learning disability, reading	19,071	2.91	2.88	2.89	3.01	2.92
Learning disability, writing	1,716	2.79	2.70	2.80	2.91	2.80
Learning disability, unspecified	755	2.68	2.65	2.65	2.83	2.70
Motor disability	227	3.33	3.17	3.32	3.43	3.31
Other neurodevelopmental disability	19					
Multiple neurodevelopmental disabilities	49,059	2.75	2.66	2.68	2.81	2.73
Physical/Sensory Disability	14,768	3.31	3.16	3.26	3.40	3.28
Hearing impairment	1,872	3.18	3.09	3.16	3.26	3.17
Motor impairment	762	3.30	3.10	3.21	3.44	3.26
Visual impairment	2,066	3.33	3.16	3.27	3.40	3.29
Other physical/sensory disability	9,557	3.34	3.19	3.28	3.42	3.30
Multiple physical/sensory disabilities	511	3.32	3.14	3.23	3.38	3.27
Psychological Disability	13,235	3.14	2.99	3.07	3.19	3.09
Anxiety	5,400	3.48	3.27	3.36	3.50	3.40
Conduct disorder	3,837	2.50	2.44	2.51	2.62	2.53
Depression	485	3.13	2.94	3.07	3.20	3.09
Other psychological disability	464	3.32	3.16	3.24	3.38	3.28
Multiple psychological disabilities	3,049	3.31	3.14	3.21	3.34	3.25
Multiple Disabilities	20,421	3.10	2.97	3.04	3.17	3.07
Other Disability	1,701	3.17	3.05	3.11	3.26	3.15
All SWA	183,542	2.93	2.83	3.02	2.89	2.92
SWNA	5,010,829	3.41	3.26	3.48	3.35	3.37

Note. Results are not reported for any groups containing fewer than 20 students to protect students' privacy.

Research Question 6: What is the relationship between ACT performance and high school grades of students testing with accommodations and students testing without accommodations, and are there differences by disability category?

Table 13 contains correlations between ACT scores and HSGPAs for SWA and SWNA, by disability category. Correlations were calculated within each subject area and overall, meaning that correlations were calculated between English HSGPA and ACT English, math HSGPA and ACT math, social studies HSGPA and ACT reading, science HSGPA and ACT science, and overall HSGPA and ACT Composite. The correlations were generally similar when comparing all SWA to SWNA, indicating that the relationships between ACT scores and HSGPA were similar for the two populations of students. Some differences emerged when comparing correlations across specific disability groups. Correlations between ACT scores and HSGPA were markedly lower for students with intellectual disorders and conduct disorders; these students also had lower average ACT scores and lower HSGPA, as well as lower standard deviations of ACT scores compared to students with other disabilities (Tables 11, 12, and A1). All else being equal, scores with lower standard deviations tend to result in lower correlations than scores with higher standard deviations due to range restriction, so the lower correlations do not necessarily indicate that the underlying relationships between ACT scores and HSGPA are different for these groups. Interestingly, students with intellectual and conduct disorders had somewhat higher standard deviations of HSGPA compared to students with other disabilities (Table A2). Students with autism or a learning disability in math also tended to have lower correlations between ACT scores and HSGPA than students with other disabilities or SWNA.

A few disability categories showed higher correlations between ACT Composite scores and HSGPA than SWNA (0.56), including students with ADHD (0.58), motor disabilities (0.61), physical/sensory disabilities (0.60) including visual impairment (0.60) and other physical/sensory disabilities (0.62), and psychological disabilities (0.62) including other psychological disabilities (0.58) and multiple psychological disabilities (0.60). Students with multiple disabilities (0.58) and other disabilities (0.63) also had higher correlations between ACT Composite scores and HSGPA than SWNA.

Table 13. Subject-Specific and Overall Correlations between ACT Scores and HSGPA for Students Testing With and Without Accommodations, by Disability Category

Disability Category	N	English	Math	Reading/ Social Studies	Science	Composite/ Overall
Neurodevelopmental Disability	133,417	0.42	0.42	0.40	0.40	0.51
ADHD	40,564	0.49	0.51	0.45	0.46	0.58
Autism	7,297	0.32	0.39	0.32	0.36	0.42
Communication disorder	3,123	0.40	0.39	0.39	0.36	0.49
Intellectual disorder	3,523	0.17	0.14	0.16	0.12	0.22
Learning disability, math	8,063	0.35	0.21	0.33	0.25	0.39
Learning disability, reading	19,071	0.46	0.45	0.43	0.43	0.55
Learning disability, writing	1,716	0.39	0.42	0.39	0.42	0.50
Learning disability, unspecified	755	0.41	0.32	0.36	0.28	0.45
Motor disability	227	0.56	0.56	0.44	0.51	0.61
Other neurodevelopmental disability	19					
Multiple neurodevelopmental disabilities	49,059	0.36	0.35	0.36	0.33	0.45
Physical/Sensory Disability	14,768	0.51	0.54	0.46	0.50	0.60
Hearing impairment	1,872	0.42	0.43	0.40	0.42	0.52
Motor impairment	762	0.45	0.47	0.44	0.43	0.54
Visual impairment	2,066	0.50	0.55	0.45	0.50	0.60
Other physical/sensory disability	9,557	0.53	0.56	0.47	0.52	0.62
Multiple physical/sensory disabilities	511	0.45	0.45	0.44	0.45	0.54
Psychological Disability	13,235	0.54	0.55	0.50	0.50	0.62
Anxiety	5,400	0.45	0.52	0.41	0.43	0.56
Conduct disorder	3,837	0.28	0.29	0.28	0.29	0.36
Depression	485	0.42	0.50	0.38	0.37	0.50
Other psychological disability	464	0.50	0.56	0.39	0.47	0.58
Multiple psychological disabilities	3,049	0.50	0.56	0.47	0.47	0.60
Multiple Disabilities	20,421	0.50	0.52	0.46	0.47	0.58
Other Disability	1,701	0.55	0.54	0.51	0.51	0.63
All SWA	183,542	0.47	0.47	0.44	0.44	0.55
SWNA	5,010,829	0.47	0.52	0.41	0.46	0.56

Note. Results are not reported for any groups containing fewer than 20 students to protect students' privacy. All correlations were significant at $p < 0.05$.

Research Question 7: To what extent do student demographics account for differences in average ACT scores of students testing with accommodations and students testing without accommodations?

To account for potential differences in ACT performance due to demographic characteristics, students' grade level at the time of testing, and how many times students had previously taken the ACT, we conducted a series of regression analyses including these factors as covariates. Due to the large amount of missing data in high school grades, we did not include this variable as a factor in the regression models. Tables 14–18 contain the results of the regression analyses. Table 14 contains the models predicting ACT Composite scores, and Tables 15–18 contain the models predicting each test section score.

For each set of analyses, the first model only includes dummy variables for disability type. The second model adds student demographic variables (gender, race/ethnicity, family income, and parent/guardian education level). The third model adds student grade level and number of times tested. R-squared estimates from each model are also reported. The reference groups for the dummy variables are SWNA, female gender, White race/ethnicity, not from low-income family, at least one parent/guardian had at least some college, and tested in grade 12.

As the models in Table 14 show, based on disability type alone, SWA in several disability categories tended to have lower Composite scores than SWNA, including students with ADHD, autism, communication disorder, intellectual disorder, any type of learning disability, multiple neurodevelopmental disabilities, hearing impairment, conduct disorder, and other disabilities. Once demographic characteristics, grade level, and number of times tested were taken into account, the predicted differences between SWA and SWNA were smaller for most disability categories (except for ADHD and other disabilities), although they were still predicted to have statistically significant differences in performance.

SWA in some disability categories had higher average Composite scores than SWNA based on disability type alone, including neurodevelopmental motor disability, other neurodevelopmental disability, physical/sensory motor impairment, visual impairment, other physical/sensory disability, multiple physical/sensory disabilities, anxiety, depression, other psychological disability, multiple psychological disabilities, and multiple disabilities. After controlling for demographics, grade level, and number of times tested, the predicted differences in Composite scores between most of these SWA groups and the SWNA group were not as large, although scores of these SWA groups were still predicted to be significantly higher than the SWNA group (except for neurodevelopmental motor disability and multiple physical/sensory disabilities). In addition, students' Composite scores were strongly related to demographics, grade level, and number of times tested, with only 2% of the variance in students' Composite scores attributable to disability category, but 22% of the variance in students' scores was accounted for when demographics, grade level, and number of times tested were added to the model.

When looking at predicted performance by test section (Tables 15–18), similar patterns emerged such that for most disability categories, performance differences between SWA and SWNA were smaller after taking into account student demographics, grade level, and number of times tested, with some differences by subject area. Student demographics, grade level, and number of times tested were strong predictors across subject areas, accounting for substantial variance in students' subject area scores (16% in reading, 18% in science, and 20% in English and math) as compared to the amount of variance accounted for by disability type (1%–2%).

There were also some disability categories and subject areas for which performance differences were not found between SWA and SWNA. Predicted English scores of students with multiple physical/sensory disabilities were not significantly different than those of SWNA across the three models predicting ACT English. Students with neurodevelopmental motor disabilities, visual impairments, and other physical/sensory disabilities' predicted math scores were significantly higher than SWNA in Model 1, but not significantly different than those of SWNA when demographics, grade level, and number of times tested were taken into account (Model 3). Students with multiple physical/sensory disabilities and multiple disabilities had non-significant performance differences in math in Models 1 and 2, but significantly lower performance than SWNA in Model 3. Students with other disabilities had non-significant performance differences in reading in Models 1 and 2, but significantly lower performance than SWNA in Model 3. Students with neurodevelopmental motor disabilities predicted science scores were significantly higher than SWNA in Model 1, but not significantly different than those of SWNA when demographics, grade level, and number of times tested were taken into account (Model 3).

Table 14. Regression Models Predicting ACT Composite Score

Variable	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Intercept	20.45	0.00	22.94	0.00	21.49	0.01
ADHD	-0.69	0.02	-0.58	0.02	-0.71	0.02
Autism	-1.20	0.04	-0.89	0.04	-0.89	0.04
Communication disorder	-4.29	0.07	-3.31	0.06	-3.35	0.06
Intellectual disorder	-7.18	0.06	-5.42	0.05	-5.39	0.05
Learning disability, math	-5.10	0.04	-4.04	0.04	-4.03	0.04
Learning disability, reading	-3.09	0.03	-2.42	0.02	-2.49	0.02
Learning disability, writing	-3.07	0.09	-2.60	0.08	-2.64	0.08
Learning disability, unspecified	-4.96	0.13	-3.58	0.12	-3.63	0.12
Motor disability (neurodevelopmental)	1.26	0.26	0.74**	0.23	0.40 ^{ns}	0.23
Other neurodevelopmental disability	5.05	0.65	4.84	0.58	4.49	0.57
Multiple neurodevelopmental disabilities	-4.17	0.02	-3.20	0.01	-3.23	0.01
Hearing impairment	-3.52	0.08	-2.90	0.07	-2.98	0.07
Motor impairment (physical/sensory)	0.59	0.12	0.78	0.11	0.61	0.11
Visual impairment	0.69	0.08	0.69	0.07	0.50	0.07
Other physical/sensory disability	0.57	0.04	0.41	0.04	0.18	0.04
Multiple physical/sensory disabilities	0.39**	0.15	0.39**	0.13	0.25 ^{ns}	0.13
Anxiety	3.11	0.05	2.52	0.05	2.24	0.05
Conduct disorder	-4.36	0.06	-3.29	0.05	-3.27	0.05
Depression	1.59	0.17	1.67	0.15	1.51	0.15
Other psychological disability	1.67	0.17	1.66	0.15	1.39	0.15
Multiple psychological disabilities	3.09	0.07	2.77	0.06	2.57	0.06
Multiple disabilities	0.85	0.02	0.85	0.02	0.72	0.02
Other disability	-0.42	0.09	-0.28	0.08	-0.50	0.08
Male			-0.11	0.00	-0.10	0.00
Gender unknown			-1.78	0.01	-1.78	0.01
Black			-4.05	0.01	-4.02	0.01
American Indian			-3.72	0.02	-3.66	0.02
Hispanic			-1.98	0.01	-1.90	0.01
Asian			2.81	0.01	2.82	0.01
Pacific Islander			-2.95	0.03	-2.86	0.03
Multiple race/ethnicities			-0.66	0.01	-0.61	0.01
Missing race/ethnicity			-0.66	0.01	-0.58	0.01
Low income (< \$36,000)			-2.09	0.01	-2.04	0.01
Income missing			-0.01 ^{ns}	0.01	0.08	0.01
Parent education no college			-2.67	0.01	-2.60	0.01
Parent education missing			-2.88	0.01	-2.81	0.01
Grade 11					0.23	0.00
Grade other/missing					-0.14	0.01
Number of times tested					1.00	0.00
R-square		0.018		0.221		0.234

Note. All estimates are significant at $p < 0.0001$ except where ns ($p > 0.05$) or asterisked. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table 15. Regression Models Predicting ACT English Score

Variable	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Intercept	19.65	0.00	22.90	0.00	20.95	0.01
ADHD	-0.85	0.02	-0.60	0.02	-0.76	0.02
Autism	-1.14	0.05	-0.50	0.04	-0.50	0.04
Communication disorder	-5.09	0.08	-3.91	0.07	-3.95	0.07
Intellectual disorder	-8.47	0.07	-6.39	0.06	-6.35	0.06
Learning disability, math	-5.36	0.05	-4.16	0.05	-4.14	0.05
Learning disability, reading	-4.23	0.03	-3.42	0.03	-3.51	0.03
Learning disability, writing	-4.21	0.11	-3.44	0.10	-3.50	0.10
Learning disability, unspecified	-5.84	0.16	-4.19	0.14	-4.26	0.14
Motor disability (neurodevelopmental)	1.77	0.32	1.34	0.29	0.90**	0.28
Other neurodevelopmental disability	6.46	0.78	6.22	0.70	5.77	0.70
Multiple neurodevelopmental disabilities	-5.08	0.02	-3.87	0.02	-3.89	0.02
Hearing impairment	-4.60	0.10	-3.88	0.09	-3.98	0.09
Motor impairment (physical/sensory)		0.15	0.80	0.13	0.58	0.13
Visual impairment	0.44	0.10	0.43	0.09	0.18*	0.09
Other physical/sensory disability	0.66	0.05	0.44	0.04	0.13**	0.04
Multiple physical/sensory disabilities	0.19 ^{ns}	0.18	0.15 ^{ns}	0.16	-0.02 ^{ns}	0.16
Anxiety	3.67	0.07	2.83	0.06	2.48	0.06
Conduct disorder	-4.80	0.07	-3.43	0.06	-3.39	0.06
Depression	1.93	0.21	1.93	0.19	1.73	0.19
Other psychological disability	1.95	0.20	1.95	0.18	1.59	0.18
Multiple psychological disabilities	3.71	0.08	3.18	0.07	2.92	0.07
Multiple disabilities	1.00	0.03	1.02	0.03	0.85	0.03
Other disability	-0.51	0.10	-	0.09	-0.66	0.09
Male			-0.90	0.00	-0.87	0.00
Gender unknown			-2.43	0.02	-2.41	0.02
Black			-4.48	0.01	-4.44	0.01
American Indian			-4.48	0.02	-4.40	0.02
Hispanic			-2.37	0.01	-2.26	0.01
Asian			2.88	0.01	2.90	0.01
Pacific Islander			-3.27	0.04	-3.14	0.04
Multiple race/ethnicities			-0.75	0.01	-0.67	0.01
Missing race/ethnicity			-0.67	0.01	-0.57	0.01
Low income (< \$36,000)			-2.39	0.01	-2.33	0.01
Income missing			0.06	0.01	0.17	0.01
Parent education no college			-3.20	0.01	-3.10	0.01
Parent education missing			-3.46	0.01	-3.37	0.01
Grade 11					0.31	0.01
Grade other/missing					-0.10	0.01
Number of times tested					1.34	0.00
R-square		0.018		0.206		0.221

Note. All estimates are significant at $p < 0.0001$ except where ns ($p > 0.05$) or asterisked. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table 16. Regression Models Predicting ACT Math Score

Variable	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Intercept	20.18	0.00	21.85	0.00	20.41	0.01
ADHD	-0.90	0.02	-0.92	0.02	-1.07	0.02
Autism	-1.54	0.04	-1.57	0.04	-1.60	0.04
Communication disorder	-3.65	0.06	-2.86	0.06	-2.92	0.06
Intellectual disorder	-5.85	0.06	-4.33	0.05	-4.35	0.05
Learning disability, math	-5.23	0.04	-4.24	0.04	-4.28	0.04
Learning disability, reading	-2.48	0.03	-1.92	0.02	-2.01	0.02
Learning disability, writing	-2.25	0.09	-2.05	0.08	-2.14	0.08
Learning disability, unspecified	-4.36	0.13	-3.18	0.11	-3.26	0.11
Motor disability (neurodevelopmental)	0.96 ^{***}	0.25	0.33 ^{ns}	0.23	0.00 ^{ns}	0.23
Other neurodevelopmental disability	3.51	0.63	3.30	0.56	2.94	0.56
Multiple neurodevelopmental disabilities	-3.66	0.01	-2.90	0.01	-2.96	0.01
Hearing impairment	-3.09	0.08	-2.55	0.07	-2.64	0.07
Motor impairment (physical/sensory)	-0.28 [*]	0.12	-0.18 ^{ns}	0.11	-0.36 ^{***}	0.10
Visual impairment	0.26 ^{***}	0.08	0.28	0.07	0.09 ^{ns}	0.07
Other physical/sensory disability	0.30	0.04	0.23	0.03	-0.01 ^{ns}	0.03
Multiple physical/sensory disabilities	-0.20 ^{ns}	0.14	-0.15 ^{ns}	0.13	-0.30 [*]	0.13
Anxiety	1.77	0.05	1.44	0.05	1.16	0.05
Conduct disorder	-4.14	0.05	-3.31	0.05	-3.32	0.05
Depression	0.54 ^{**}	0.17	0.71	0.15	0.54 ^{***}	0.15
Other psychological disability	0.99	0.16	0.99	0.14	0.72	0.14
Multiple psychological disabilities	1.60	0.07	1.52	0.06	1.31	0.06
Multiple disabilities	0.03 ^{ns}	0.02	0.02 ^{ns}	0.02	-0.13	0.02
Other disability	-0.62	0.08	-0.46	0.08	-0.69	0.07
Male			0.79	0.00	0.80	0.00
Gender unknown			-1.11	0.01	-1.18	0.01
Black			-3.56	0.01	-3.52	0.01
American Indian			-3.19	0.02	-3.13	0.02
Hispanic			-1.59	0.01	-1.52	0.01
Asian			3.92	0.01	3.94	0.01
Pacific Islander			-2.35	0.03	-2.27	0.03
Multiple race/ethnicities			-0.65	0.01	-0.61	0.01
Missing race/ethnicity			-0.59	0.01	-0.46	0.01
Low income (< \$36,000)			-1.95	0.01	-1.90	0.01
Income missing			0.05	0.01	0.12	0.01
Parent education no college			-2.32	0.01	-2.26	0.01
Parent education missing			-2.50	0.01	-2.46	0.01
Grade 11					0.39	0.00
Grade other/missing					-0.28	0.01
Number of times tested					0.93	0.00
R-square		0.015		0.207		0.219

Note. All estimates are significant at $p < 0.0001$ except where ns ($p > 0.05$) or asterisked. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table 17. Regression Models Predicting ACT Reading Score

Variable	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Intercept	20.98	0.00	23.93	0.00	22.77	0.01
ADHD	-0.31	0.02	-0.12	0.02	-0.21	0.02
Autism	-1.16	0.05	-0.65	0.05	-0.62	0.04
Communication disorder	-4.60	0.08	-3.54	0.07	-3.54	0.07
Intellectual disorder	-7.85	0.07	-5.98	0.06	-5.92	0.06
Learning disability, math	-4.67	0.05	-3.60	0.05	-3.55	0.05
Learning disability, reading	-3.11	0.03	-2.41	0.03	-2.45	0.03
Learning disability, writing	-3.41	0.11	-2.78	0.10	-2.78	0.10
Learning disability, unspecified	-5.09	0.16	-3.60	0.15	-3.63	0.15
Motor disability (neurodevelopmental)	1.30	0.32	0.86**	0.29	0.58*	0.29
Other neurodevelopmental disability	5.69	0.78	5.47	0.72	5.17	0.72
Multiple neurodevelopmental disabilities	-4.24	0.02	-3.17	0.02	-3.17	0.02
Hearing impairment	-3.63	0.10	-2.99	0.09	-3.05	0.09
Motor impairment (physical/sensory)	1.65	0.15	1.88	0.13	1.74	0.13
Visual impairment	1.49	0.10	1.47	0.09	1.31	0.09
Other physical/sensory disability	0.75	0.05	0.54	0.04	0.35	0.04
Multiple physical/sensory disabilities	1.13	0.18	1.07	0.17	0.96	0.17
Anxiety	4.43	0.07	3.66	0.06	3.44	0.06
Conduct disorder	-4.31	0.07	-3.12	0.06	-3.06	0.06
Depression	2.86	0.21	2.85	0.19	2.74	0.19
Other psychological disability	2.30	0.20	2.28	0.18	2.05	0.18
Multiple psychological disabilities	4.53	0.08	4.05	0.08	3.89	0.08
Multiple disabilities	1.65	0.03	1.64	0.03	1.53	0.03
Other disability	-0.16 ^{ns}	0.10	-0.05 ^{ns}	0.10	-0.23*	0.10
Male			-0.71	0.00	-0.69	0.00
Gender unknown			-2.30	0.02	-2.23	0.02
Black			-4.32	0.01	-4.31	0.01
American Indian			-3.89	0.02	-3.84	0.02
Hispanic			-2.08	0.01	-2.02	0.01
Asian			1.97	0.01	1.97	0.01
Pacific Islander			-3.32	0.04	-3.23	0.04
Multiple race/ethnicities			-0.58	0.01	-0.53	0.01
Missing race/ethnicity			-0.64	0.01	-0.61	0.01
Low income (< \$36,000)			-2.13	0.01	-2.09	0.01
Income missing			-0.06	0.01	0.03	0.01
Parent education no college			-2.84	0.01	-2.77	0.01
Parent education missing			-3.00	0.01	-2.91	0.01
Grade 11					-0.01 ^{ns}	0.01
Grade other/missing					-0.10	0.01
Number of times tested					0.89	0.00
R-square		0.014		0.166		0.173

Note. All estimates are significant at $p < 0.0001$ except where ns ($p > 0.05$) or asterisked. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table 18. Regression Models Predicting ACT Science Score

Variable	Model 1		Model 2		Model 3	
	b	SE	b	SE	b	SE
Intercept	20.47	0.00	22.57	0.00	21.32	0.01
ADHD	-0.70	0.02	-0.67	0.02	-0.78	0.02
Autism	-0.95	0.04	-0.84	0.04	-0.84	0.04
Communication disorder	-3.77	0.07	-2.92	0.06	-2.95	0.06
Intellectual disorder	-6.53	0.06	-4.96	0.05	-4.94	0.05
Learning disability, math	-5.14	0.04	-4.18	0.04	-4.17	0.04
Learning disability, reading	-2.52	0.03	-1.94	0.02	-2.00	0.02
Learning disability, writing	-2.40	0.09	-2.11	0.08	-2.15	0.08
Learning disability, unspecified	-4.59	0.13	-3.36	0.12	-3.40	0.12
Motor disability (neurodevelopmental)	1.01 ^{***}	0.26	0.43 ^{ns}	0.24	0.14 ^{ns}	0.24
Other neurodevelopmental disability	4.39	0.65	4.25	0.59	3.95	0.58
Multiple neurodevelopmental disabilities	-3.70	0.02	-2.87	0.01	-2.89	0.01
Hearing impairment	-2.78	0.08	-2.20	0.07	-2.26	0.07
Motor impairment (physical/sensory)	0.47	0.12	0.62	0.11	0.47	0.11
Visual impairment	0.55	0.08	0.56	0.07	0.40	0.07
Other physical/sensory disability	0.56	0.04	0.44	0.04	0.24	0.04
Multiple physical/sensory disabilities	0.45 ^{**}	0.15	0.48 ^{***}	0.14	0.36 ^{**}	0.13
Anxiety	2.58	0.05	2.13	0.05	1.90	0.05
Conduct disorder	-4.18	0.05	-3.29	0.05	-3.27	0.05
Depression	1.08	0.17	1.20	0.16	1.07	0.16
Other psychological disability	1.42	0.16	1.43	0.15	1.20	0.15
Multiple psychological disabilities	2.52	0.07	2.33	0.06	2.16	0.06
Multiple disabilities	0.72	0.02	0.72	0.02	0.61	0.02
Other disability	-0.38	0.09	-0.24 ^{**}	0.08	-0.43	0.08
Male			0.36	0.00	0.38	0.00
Gender unknown			-1.30	0.01	-1.29	0.01
Black			-3.84	0.01	-3.81	0.01
American Indian			-3.33	0.02	-3.28	0.02
Hispanic			-1.86	0.01	-1.80	0.01
Asian			2.46	0.01	2.48	0.01
Pacific Islander			-2.85	0.03	-2.78	0.03
Multiple race/ethnicities			-0.67	0.01	-0.63	0.01
Missing race/ethnicity			-0.75	0.01	-0.68	0.01
Low income (< \$36,000)			-1.87	0.01	-1.83	0.01
Income missing			-0.08	0.01	-0.01 [*]	0.01
Parent education no college			-2.32	0.01	-2.26	0.01
Parent education missing			-2.56	0.01	-2.51	0.01
Grade 11					0.22	0.00
Grade other/missing					-0.10	0.01
Number of times tested					0.85	0.00
R-square		0.015		0.189		0.198

Note. All estimates are significant at $p < 0.0001$ except where ns ($p > 0.05$) or asterisked. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

To summarize the extent to which average score differences changed when accounting for covariates in the models, adjusted and unadjusted coefficients were examined. Table 19 contains a summary of the change in unadjusted (Model 1) and adjusted (Model 3) coefficients by disability category for each test section and the ACT Composite score. The change in coefficients is calculated by subtracting the absolute value of the Model 3 beta from the absolute value of the Model 1 beta. The change in coefficients can be interpreted as the number of points on the ACT score scale that is estimated to be attributable to factors other than students' disability type (i.e., controlling for demographics, grade level, and number of times tested). A positive value indicates that the score difference increased when controlling for covariates, and a negative value indicates that the score difference decreased when controlling for covariates.

Most of the values in Table 19 are negative, meaning that, in general, most of the average score differences decreased when controlling for covariates in the models across subject areas and the Composite score, with some exceptions. Students with ADHD (who scored lower than SWNA) showed small increases in score differences in math (0.17) and science (0.08), but the Composite score difference increase was small (0.02). Students with physical/sensory motor impairments (who scored higher than SWNA) also showed small increases in score differences in English (0.06), math (0.08), and reading (0.09), with a small Composite score difference increase (0.02). Students with other disabilities (who scored lower than SWNA) showed the largest score difference increases, ranging from 0.05 in science to 0.15 in English, with a Composite score difference increase of 0.08.

Table 19. Score Point Change in Unadjusted and Adjusted Regression Coefficients by Test Group

Disability Category	English	Math	Reading	Science	Composite
ADHD	-0.09	0.17	-0.10	0.08	0.02
Autism	-0.64	0.06	-0.53	-0.11	-0.31
Communication disorder	-1.14	-0.73	-1.06	-0.82	-0.94
Intellectual disorder	-2.13	-1.50	-1.94	-1.59	-1.79
Learning disability, math	-1.22	-0.95	-1.12	-0.96	-1.06
Learning disability, reading	-0.72	-0.47	-0.66	-0.52	-0.59
Learning disability, writing	-0.71	-0.12	-0.63	-0.25	-0.43
Learning disability, unspecified	-1.58	-1.10	-1.46	-1.19	-1.33
Motor disability (neurodevelopmental)	-0.87	-0.96	-0.72	-0.86	-0.85
Other neurodevelopmental disability	-0.70	-0.57	-0.52	-0.44	-0.56
Multiple neurodevelopmental disabilities	-1.19	-0.70	-1.07	-0.81	-0.94
Hearing impairment	-0.62	-0.45	-0.58	-0.52	-0.54
Motor impairment (physical/sensory)	0.06	0.08	0.09	0.00	0.02
Visual impairment	-0.26	-0.17	-0.18	-0.15	-0.19
Other physical/sensory disability	-0.52	-0.29	-0.40	-0.32	-0.39
Multiple physical/sensory disabilities	-0.17	0.10	-0.17	-0.09	-0.14
Anxiety	-1.19	-0.60	-0.99	-0.68	-0.87
Conduct disorder	-1.41	-0.81	-1.25	-0.91	-1.10
Depression	-0.20	0.00	-0.12	0.00	-0.08
Other psychological disability	-0.36	-0.27	-0.25	-0.22	-0.28
Multiple psychological disabilities	-0.78	-0.29	-0.64	-0.36	-0.52
Multiple disabilities	-0.15	0.10	-0.11	-0.11	-0.13
Other disability	0.15	0.07	0.07	0.05	0.08

Discussion

This study investigated demographic characteristics, high school experiences, and ACT performance of students taking the ACT with or without testing accommodations. Relationships between ACT scores and HSGPA were also explored, as well as common patterns of accommodations across different types of disabilities.

Extra time was the most common accommodation, specifically one and one-half time, followed by testing in a small group setting. Other accommodations tended to be associated with specific disabilities, such as visual accommodations for students with visual impairments, audio accommodations for students with hearing impairments, or physical accommodations for students with physical disabilities. In general, the accommodations associated with specific disabilities were aligned with expectations, although it should be noted that each student's disability may manifest in unique ways, and there is no one-size-fits-all accommodation that should be universally applied to a group of students. It may seem counterintuitive to make changes to testing conditions to meet the needs of individual students, given that the purpose of standardized testing is to provide a comparable testing experience for all students, but pragmatically, the goal of standardized testing should be to level the playing field so that students can accurately demonstrate what they know and can do, not necessarily to ensure that all students have an identical testing experience (Sireci, 2020).

With respect to demographic characteristics, students testing with accommodations (SWA) were more likely to be White, low income or high income, less likely to be Hispanic/Latino or Asian, and reported similar parent education levels compared to SWNA. It is worth noting that compared to students testing with no accommodations (SWNA) students, SWA were less likely to report race/ethnicity, family income, and parental education level when registering to take the ACT. It is unclear why this discrepancy occurred, and further investigation of this issue is warranted. It is possible that SWD had difficulty navigating the registration process, or that parents or school officials completed registration on the students' behalf. Regardless, it is important to investigate and mitigate any barriers to successful completion of the registration process so that all students have equitable access.

While it is outside of the scope of this paper to determine causes of observed differences in prevalence of disability by demographic characteristics, previous research has examined how disability was related to income and race/ethnicity. While this study found comparable rates of Black students testing with or without accommodations, other research has found disparities in disability rates of Black students, with some studies reporting underrepresentation and others reporting overrepresentation (Elder, Figlio, Imberman, & Persico, 2019; Shifrer & Fish, 2019). The reasons for these disparities are complex and likely include a combination of factors related to poverty, stereotypes about Black student achievement, and structural racism.

Other studies have indicated that Asian students are underrepresented in populations of SWD (NCLD, 2020; Ross & Bateman, 2018). Suggested reasons for this discrepancy include confounding of disability with lack of English proficiency, fear of stigma, stereotypes about Asian

student achievement, cultural differences related to deference to teachers, and lack of awareness about special education opportunities (Lum, 2010).

This study also revealed that students at the lowest and highest incomes were somewhat more likely to have a disability than students at middle incomes. Previous research suggests that students living in poverty may be more likely to have a disability due to prenatal stressors such as poor nutrition or environmental toxins (US Environmental Protection Agency, 2015). The US Environmental Protection Agency compiled evidence across several studies linking exposure to lead and mercury to neurodevelopmental disabilities. They also reported that students living below the poverty level were more likely to have an intellectual disability (1.2%) than students living at or above the poverty level (0.7%). Other studies have shown that poorer neighborhoods tend to have higher pollution levels (Bell & Ebisu, 2012).

Conversely, students from higher income families may be less likely to have a disability because their mothers received better prenatal care and had better nutrition options, as well as living in areas with less environmental pollution. However, students with disabilities from more affluent backgrounds may be more likely to be diagnosed because their parents have greater access to healthcare and specialists who can provide evaluation and diagnosis, whereas students with disabilities from less affluent families may be less likely to have access to the resources needed to receive a diagnosis.

Differences in high school course-taking patterns of SWA and SWNA were minimal for about half of the courses surveyed. For those courses where there were differences in course-taking of at least five percentage points, SWNA were more likely to report taking or planning to take rigorous core academic courses in math and science (trigonometry, calculus, chemistry, and physics), whereas SWA were more likely to report taking courses in general/earth science and art. Art courses are beneficial for all students and may be particularly beneficial for SWD, providing opportunities for students to improve their self-esteem, self-confidence, motor skills, hand-eye coordination, problem-solving skills, creative thinking, and engagement (Cruse, 2017; Ruppert, 2006). However, the finding that SWD are taking fewer rigorous STEM courses raises concerns about SWDs' access to rigorous core courses, particularly given that SWD want to attend college at rates comparable to their peers. ACT has consistently found that students who take a core curriculum, which includes three years each of math and science, are more likely to be prepared for college than those who do not (ACT, 2016).

Overall, the performance of SWD on the ACT was about two points lower than the performance of SWNA on the 1–36 ACT score scale, but there was wide variability in performance by disability type. Students with intellectual or conduct disorders tended to have the lowest performance, while students with anxiety or depression tended to have the highest performance. Students' high school grades largely followed the same patterns, with students with intellectual and conduct disorders reporting the lowest grades, while students with anxiety reported the highest grades. Student demographics, grade level, and number of times tested were also related to performance on the ACT, and estimated score differences between SWA and SWNA were reduced for students in most of the disability categories in regression models accounting for these factors.

Correlations between ACT scores and high school grades were comparable for SWA and SWNA overall, with some variation by disability type. Correlations were lower for students with autism, intellectual disorders, math learning disabilities, and conduct disorders. All else being equal, scores with lower variability tend to exhibit lower correlations than scores with higher variability due to range restriction. Students with intellectual disorders and conduct disorders had lower standard deviations of ACT scores, but they also had greater variability in HSGPA.

Correlations could also be suppressed due to construct-irrelevant variance or differences in the constructs reflected by the test scores or the grades. ACT scores and high school grades measure somewhat different aspects of academic achievement; ACT scores are a snapshot measure of skills considered important for success in college and careers, whereas grades reflect academic skills, social and emotional skills, effort, and other factors measured over a semester or school year. To the extent that ACT scores and grades measure different constructs, correlations between the two measures will be lower.

We also know that students within a given disability category are likely to have wide variation in the degree to which their disability impacts their ability to participate in learning and assessment. Thus, it is difficult to make any definitive statements about why we found differences in performance and correlations across disability types.

Overall, the results of this study provide a picture of who is taking the ACT with accommodations, what types of accommodations they are receiving, and how they are performing. Much of the existing literature points to the need for additional research on the benefits of accommodations (Sireci & O’Riordan, 2020), and findings have been mixed on the extent to which accommodations help SWD and whether some accommodations might help all students. ACT will continue to monitor the performance of students testing with accommodations and focus on how we can improve students’ experiences with registration, requesting accommodations, and the testing experience itself.

ACT introduced a new policy beginning with the 2021–2022 testing year to streamline the process for requesting accommodations on the ACT and will automatically approve allowable accommodations included in students Individualized Education Plans (IEPs) or 504 plans (ACT, 2021c). The current study is based on data collected prior to the introduction of the new policy. ACT will continue to monitor the impacts of the new policy on student access to and performance on the ACT.

Limitations

There were several limitations to this study. High school grades were self-reported, but previous research has shown self-reported grades to be highly accurate (Sanchez & Buddin, 2015). Not all students provided information about demographics, courses taken or planned, or postsecondary aspirations, and SWD disproportionately omitted this information compared to the general population of ACT-tested students. It is possible that students who completed the registration items differed systematically from students who did not complete the registration items. Also, this study compared students who tested with accommodations to students who

tested without accommodations. We only know whether a student had a disability if they tested with accommodations. It is likely that there were some students in the testing with no accommodations sample that had a disability but did not request accommodations. Finally, the accommodations reported in this study were accommodations that were approved to use during the test. Information about whether a student actually used the approved accommodation while testing is not available.

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Table A1. Standard Deviations of ACT Scores for Students Testing With and Without Accommodations, by Disability Category

Disability Category	N	English	Math	Reading	Science	Composite
Neurodevelopmental Disability	317,603	6.46	4.92	6.95	5.79	5.57
ADHD	87,626	7.14	5.59	7.61	6.41	6.22
Autism	18,076	7.03	5.61	7.50	6.38	6.06
Communication disorder	6,954	5.22	3.96	5.61	4.74	4.37
Intellectual disorder	9,179	3.01	2.09	3.61	3.21	2.38
Learning disability, math	16,286	4.45	2.16	5.27	3.65	3.28
Learning disability, reading	44,479	5.60	4.61	6.35	5.34	5.00
Learning disability, writing	3,829	5.84	4.74	6.51	5.41	5.16
Learning disability, unspecified	1,722	5.00	3.40	5.51	4.40	4.06
Motor disability	431	7.29	6.00	7.32	6.12	6.20
Other neurodevelopmental disability	71	6.81	6.13	6.83	6.35	6.07
Multiple neurodevelopmental disabilities	128,950	5.79	4.34	6.38	5.31	5.00
Physical/Sensory Disability	32,001	7.21	5.67	7.27	6.01	6.06
Hearing impairment	4,738	5.97	4.56	6.36	5.17	5.03
Motor impairment	2,014	7.23	5.82	7.46	6.35	6.20
Visual impairment	4,777	6.90	5.82	7.21	6.24	6.01
Other physical/sensory disability	19,139	7.16	5.66	7.14	5.91	6.00
Multiple physical/sensory disabilities	1,333	7.25	5.70	7.55	6.18	6.15
Psychological Disability	28,712	7.68	5.84	8.07	6.66	6.59
Anxiety	10,261	6.87	5.72	7.03	6.11	5.88
Conduct disorder	9,899	5.53	3.68	6.33	5.01	4.60
Depression	1,000	7.39	5.89	7.84	6.67	6.44
Other psychological disability	1,089	7.70	6.00	7.63	6.32	6.42
Multiple psychological disabilities	6,463	7.20	5.86	7.41	6.47	6.19
Multiple disabilities	54,416	7.54	5.95	7.83	6.59	6.49
Other disability	3,963	7.42	5.75	7.54	6.27	6.30
All SWA	436,695	7.02	5.31	7.41	6.14	6.02
SWNA	7,252,520	6.61	5.30	6.57	5.42	5.47

Table A2. Standard Deviations of Self-Reported HSGPA for Students Testing With and Without Accommodations, by Disability Category

Disability Category	N	English	Math	Social Studies	Science	Overall
Neurodevelopmental Disability	133,417	0.82	0.90	0.86	0.86	0.72
ADHD	40,564	0.81	0.88	0.83	0.82	0.71
Autism	7,297	0.79	0.88	0.82	0.81	0.68
Communication disorder	3,123	0.78	0.86	0.82	0.84	0.68
Intellectual disorder	3,523	0.84	0.93	0.92	0.91	0.72
Learning disability, math	8,063	0.83	0.92	0.86	0.86	0.69
Learning disability, reading	19,071	0.80	0.85	0.83	0.84	0.70
Learning disability, writing	1,716	0.82	0.91	0.88	0.87	0.74
Learning disability, unspecified	755	0.82	0.85	0.86	0.85	0.68
Motor disability	227	0.75	0.84	0.72	0.66	0.65
Other neurodevelopmental disability	19	0.62	0.81	0.62	0.72	0.60
Multiple neurodevelopmental disabilities	49,059	0.82	0.90	0.88	0.88	0.72
Physical/Sensory Disability	14,768	0.75	0.81	0.75	0.72	0.66
Hearing impairment	1,872	0.75	0.81	0.77	0.75	0.64
Motor impairment	762	0.74	0.80	0.74	0.68	0.64
Visual impairment	2,066	0.72	0.79	0.73	0.68	0.63
Other physical/sensory disability	9,557	0.75	0.82	0.76	0.73	0.67
Multiple physical/sensory disabilities	511	0.70	0.81	0.73	0.68	0.60
Psychological Disability	13,235	0.87	0.91	0.88	0.86	0.76
Anxiety	5,400	0.63	0.74	0.67	0.63	0.56
Conduct disorder	3,837	0.92	0.98	0.96	0.95	0.79
Depression	485	0.78	0.86	0.79	0.77	0.67
Other psychological disability	464	0.73	0.84	0.77	0.70	0.65
Multiple psychological disabilities	3,049	0.76	0.82	0.79	0.76	0.68
Multiple disabilities	20,421	0.80	0.86	0.82	0.82	0.71
Other disability	1,701	0.81	0.86	0.84	0.80	0.72
All SWA	183,542	0.83	0.90	0.86	0.86	0.73
SWNA	5,010,829	0.67	0.75	0.69	0.65	0.60



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