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Research Brief: CAASPP Accessibility Resources Usage Patterns

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BACKGROUND

The California Assessment of Student Performance and Progress (CAASPP) System encompasses assessments in English language arts/literacy (ELA) and mathematics (the Smarter Balanced Summative Assessments), science, and Spanish language arts. To provide fairness and access to the tested content for all students, including students with disabilities and English learner (EL) students, various accessibility resources are made available to support students' specific learning needs. Facilitating access to test content through accessibility resources offers students the opportunity to demonstrate their knowledge, skills, or abilities more fully than they may otherwise be able to without those supports.¹

This brief presents a summary of an exploratory study conducted by Cambium Assessment, Inc. (CAI) on patterns and trends in selected accessibility resources used during a student's testing experience on the CAASPP Smarter Balanced ELA and mathematics assessments.² CAASPP local educational agency (LEA) and test site coordinators, as well as test administrators and educators, can use the preliminary findings from this exploratory study to better prepare students for accessing test content to demonstrate their proficiency in ELA and mathematics. The results described in this brief are observational and therefore it is not appropriate to make causal interpretations from the results. Following this background section, the brief includes three sections: Study Methods, Results and Findings, and Conclusions.

Research Questions

The CAI study examined four broad research questions to explore trends and patterns in the usage of CAASPP accessibility resources:³

- 1. What is the relationship between assignment of accessibility resources and usage of those resources?**
 - a. Explore the degree to which students who are assigned accessibility resources, by schools and LEAs with jurisdiction to do so, are using the assigned resources.

¹ Roelofs, E. (2019). A framework for improving the accessibility of assessment tasks. In B. P. Veldkamp & C. Sluiter (Eds.), *Theoretical and practical advances in computer-based educational measurement* (pp. 21–45). Springer. https://doi.org/10.1007/978-3-030-18480-3_2

² Doran, H., & Pepper, A. (2021). *Assessment accessibility resources in California: Usage and impacts*. Cambium Assessment, Inc.

³ This brief reorders the presentation of the research questions to ease the interpretation of complex usage data.

2. **How does accessibility resource usage vary across demographic student groups?**
 - a. Examine whether the overall usage patterns differ by various student characteristics.
3. **Do students use accessibility resources consistently throughout the test?**
 - a. Examine the frequency of usage during different periods of the test.
4. **How do item characteristics affect how accessibility resources are used?**
 - a. Explore the degree to which usage patterns appear to be related to certain item attributes (e.g., item difficulty, item depth of knowledge, passage length, and item claim level).

Overview of CAASPP Accessibility Resources

The California Department of Education (CDE) approves approximately 80 accessibility resources for use on the CAASPP (Refer to the *CAASPP and ELPAC Accessibility Guide*).⁴ The CDE identifies three categories of available resources: (a) universal tools, (b) designated supports, and (c) accommodations. The accessibility resources are either *embedded* within the test delivery system (TDS) student interface or *non-embedded*. Embedded resources are part of the online assessment system and activated by students through the screen menu as they take the test. For example, if a student is eligible for the text-to-speech (TTS) resource, then “Speak Question” or “Speak Option” may be selected from a menu to hear the question or response options. Non-embedded resources, such as bilingual dictionaries or magnification, are provided outside of the TDS. Each of the accessibility resource categories includes both embedded and non-embedded resources.

ACCESSIBILITY RESOURCE CATEGORIES

- **Universal tools** (e.g., highlighter, zoom) are available to all students.
- **Designated supports** (e.g., masking, color contrast) are available to students based on eligibility as determined by educators.
- **Accommodations** (e.g., American Sign Language [ASL], braille) are available to students with an individualized education program (IEP) or a Section 504 plan based on student needs.

⁴ CAASPP and ELPAC Accessibility Guide (2021–22). <https://ca-toms-help.ets.org/accessibility-guide/introduction/manual-content/>

Studied Accessibility Resources

As students activate an accessibility resource during the test, the CAASPP TDS stores that interaction. While the CAASPP TDS captures usage data on every accessibility resource available to students—including universal tools, designated supports, and accommodations—how those resources are made available impacts the usefulness of the data. Universal tools are continuously available for all students; however, for designated supports and accommodations to be available to students, these resources must be assigned in the Test Operations Management System (TOMS) before the test administration by the designated test administrator. Resources assigned as accommodations are intentionally restricted to students who have an IEP or Section 504 plan, whereas resources assigned as designated supports are not as restricted.

The TDS captures usage of available resources in different ways. When some resources are assigned in TOMS, the TDS captures when a student interacts with that resource. For others, the TDS is unable to capture specific instances of student interaction with the resource; instead, the resource appears to be available throughout the assessment, resulting in the inability to differentiate when a student does and does not actually interact with a resource (e.g., highlighter). Therefore, the study focused on five accessibility resources that (1) were able to be meaningfully captured by the TDS usage data, (2) had a sufficient number of eligible students, and (3) were of specific interest to CAASPP stakeholders. The five resources—TTS, masking, ASL, audio transcript, and print-on-demand—are described in [Table 1](#).

Table 1. Five Accessibility Resources Included in the Study

Accessibility Resource	Resource Type	Description	Designated Support	Accommodation
TTS	Embedded	This resource provides read-aloud technology using a simulated, nonhuman voice. Students can control the speed and volume of the voice.	ELA (items), mathematics	ELA (passages)
Masking	Embedded	This resource blocks off content that may be distracting. Students can hide and reveal individual answer options, as well as all navigational buttons and menus.	ELA, mathematics	N/A

Table 1 (continuation)

Accessibility Resource	Resource Type	Description	Designated Support	Accommodation
ASL	Embedded	This resource provides a video of an ASL human signer on screen. Students may view the video as often as needed.	N/A	ELA (listening), mathematics
Audio transcript	Embedded	This resource presents full text of audio content on screen compared to one line at a time presentation for closed-captioning.	N/A	ELA (listening)
Print-on-demand	Non-embedded	This resource provides printed paper copies of passages, stimuli, questions, or any combination of these for a student. Students request print-on-demand within the TDS and use the print materials outside of the testing system.	N/A	ELA, mathematics

STUDY METHODS

The study focused on examining usage patterns on the computer adaptive test (CAT) sections of the 2018–19 Smarter Balanced Summative Assessments in ELA and mathematics in grades three, five, eight, and eleven to represent elementary and secondary students enrolled in California public schools.

Two usage metrics were computed to facilitate the analysis:

- 1. Percent Usage of Assigned Resources:** The percentage of all students assigned a resource who actually used that particular resource during the test. Because individual student IEPs or Section 504 plans were not available, calculating the percent usage of *eligible* students was not possible; thus, the calculation (i.e., the denominator) uses the number of students *assigned* an accessibility resource in TOMS. For the purposes of this analysis, usage (i.e., the numerator) is limited to students who interacted with a resource at least once anywhere in the test. Percent usage expresses the breadth of resource usage among students who were assigned a resource.
- 2. Usage Frequency:** The average number of items on which a student used a resource out of the number of items on which it was possible to use a resource. For example, the TTS usage frequency for a single EL student assigned TTS who used a resource on 3 out of 10 items would be 30 percent. The usage frequency for a student group is the average of the usage frequencies of the group's members. For example, the usage frequency of all EL students assigned TTS would be the average of every EL student's usage frequency for TTS. Usage frequency considers the extent of usage per student or student group.

RESULTS AND FINDINGS

The following section presents abbreviated findings, organized by research question. To better understand the observed usage patterns, it is important to consider percentages of the entire tested student population in each grade level that is referenced in this study.⁵

⁵ See also two informational flyers for practical tips about using accessibility resources based on the findings from this study at <https://www.caaspp.org/ta-resources/accessibility/index.html>.

Figure 1 shows the demographic characteristics of the tested student populations in grades three, five, eight, and eleven.

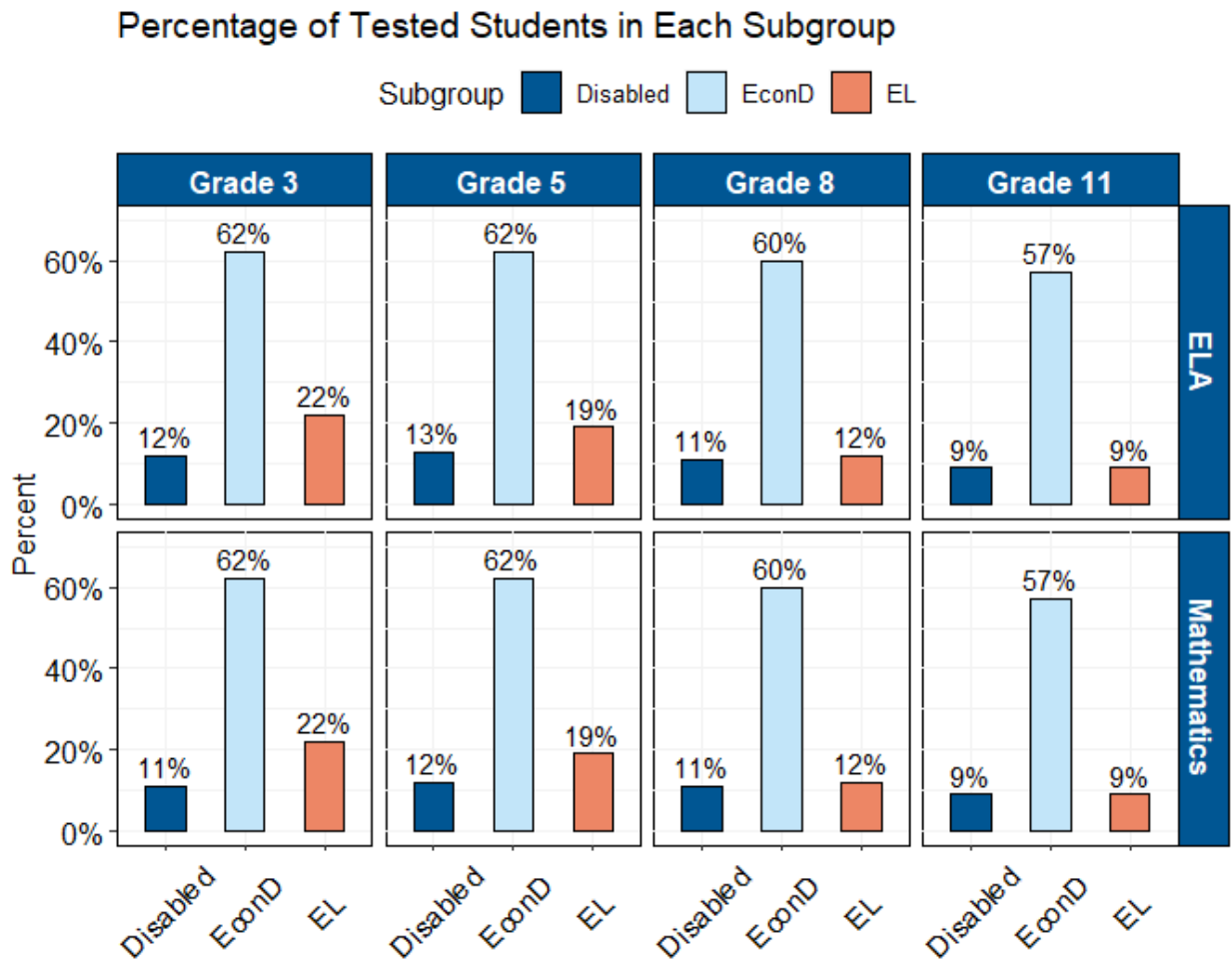


Figure 1. Percentage of tested students in each subgroup (Refer to [Appendix A: Figure Data Tables](#) for corresponding data tables.)

Note: EconD = Economically Disadvantaged, EL = English learner; this data was obtained from <https://www.cde.ca.gov/ta/tg/ca/caaspp19datasummary.asp>.

[Figure 2](#) shows the percentage of tested students who were assigned any accessibility resource (i.e., a designated support or accommodation) at each grade level and by content area. Grade eleven students had the lowest percentage of students who were assigned any accessibility resource; the usage patterns explored for grade eleven students pertain to approximately 5 percent of the tested grade eleven student population.

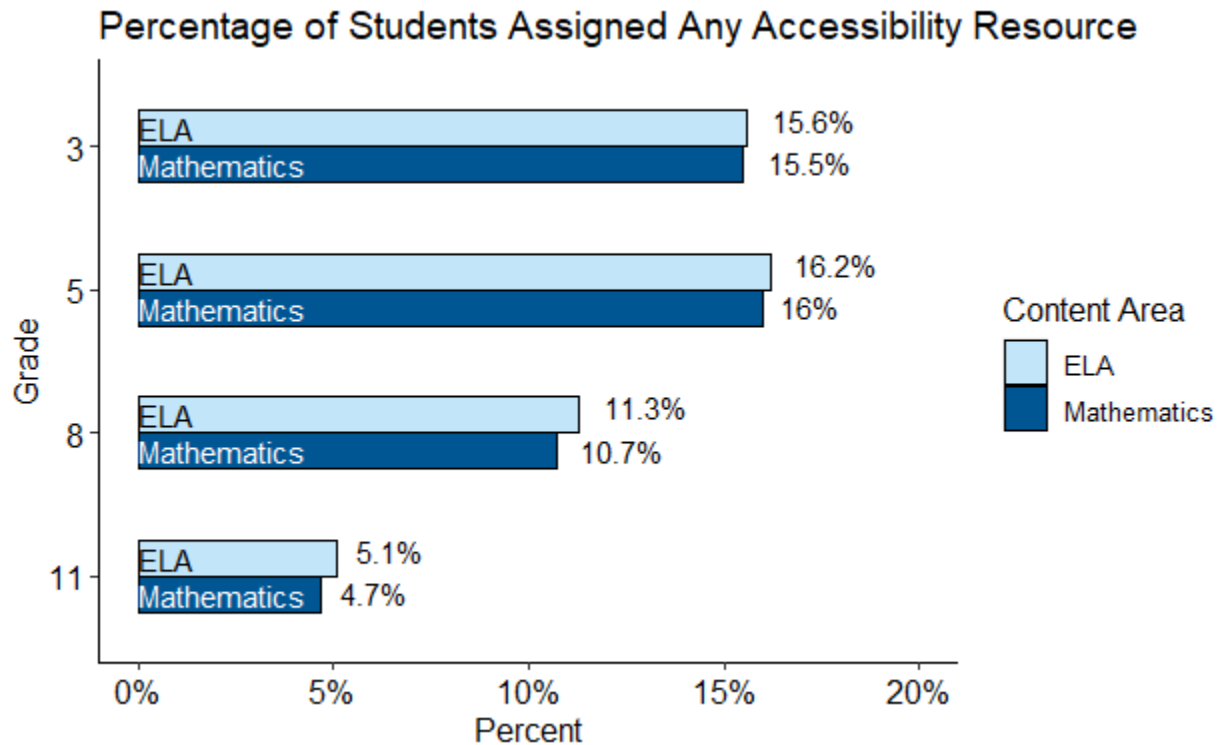


Figure 2. Percentage of students tested who were assigned any accessibility resource (Refer to [Appendix A: Figure Data Tables](#) for corresponding data tables)

While the study focused on five accessibility resources (TTS, masking, ASL, print-on-demand, and audio transcript), it is helpful to understand the extent to which all resources are assigned. TTS and separate setting resources were the most commonly assigned designated supports across all studied grade levels and content areas. The most commonly assigned accommodations for ELA were TTS and read aloud, while the most commonly assigned mathematics accommodations varied by grade level.

[Table 2](#) displays the most commonly assigned designated supports and accommodations.⁶

Table 2. Top Two Assigned Designated Supports and Accommodations by Content Area and Grade Level

Content Area and Grade Level	Designated Supports	Accommodations
ELA 3	TTS (E), Separate Setting (NE)	TTS (E), Read Aloud (NE)
Mathematics 3	TTS (E), Separate Setting (NE)	TTS (E), Word Prediction (NE)
ELA 5	TTS (E), Separate Setting (NE)	TTS (E), Read Aloud (NE)
Mathematics 5	TTS (E), Separate Setting (NE)	Multiplication Table (NE), 100s Number Table (NE)
ELA 8	TTS (E), Separate Setting (NE)	TTS (E), Read Aloud (NE)
Mathematics 8	TTS (E), Separate Setting (NE)	Multiplication Table (NE), Calculator, items only (NE)
ELA 11	TTS (E), Separate Setting (NE)	TTS (E), Read Aloud (NE)
Mathematics 11	TTS (E), Separate Setting (NE)	Calculator, items only (NE), Multiplication Table (NE)

Note. “E” indicates that the accessibility resource is embedded. “NE” indicates that the accessibility resource is non-embedded.

RQ1. What is the relationship between assignment of accessibility resources and usage of those resources?

To address this question, researchers first examined the most frequently assigned accessibility resource among students who were assigned to any accessibility resource. This was determined for tests in each content area and across all four grade levels. Among these tests, TTS stood out as the most frequently assigned resource; of students who were assigned any accessibility resource, over 90 percent were assigned the TTS resource.

⁶ Refer to <https://www.cde.ca.gov/ta/tg/ca/resourceassignments.asp> for a full list of assigned designated supports and resources.

[Table 3](#) presents the percentage of students who were assigned to each of the five accessibility resources examined in this study. In the final column, *Total Number of Students*, the numbers refer to all students who were assigned an accessibility resource in the content area and grade level.

Table 3. Percentage of Students Assigned to a Specific Accessibility Resource Out of Students Assigned to Any Accessibility Resource

Content Area and Grade Level	TTS (%)	Masking (%)	ASL (%)	Print-on-Demand (%)	Audio Transcript (%)	Total Number of Students
ELA 3	98.5	9.4	0.2	0.3	0.10	68,873
Mathematics 3	98.3	9.5	0.2	0.3	N/A	68,368
ELA 5	98.3	10.8	0.2	0.5	0.10	73,552
Mathematics 5	97.9	11.0	0.2	0.5	N/A	72,573
ELA 8	97.9	11.4	0.4	0.6	0.20	52,184
Mathematics 8	97.1	12.0	0.4	0.6	N/A	49,305
ELA 11	94.3	27.2	0.7	0.9	0.52	22,497
Mathematics 11	91.4	29.6	0.8	1.0	N/A	20,430

Note: “N/A” indicates that the accessibility resource was not available for the given content area.

Researchers then examined the percent usage for each of the five resources. No accessibility resource was used by all students to whom it was assigned, but some resources were used more consistently than others (as represented in [Figure 3](#)). ASL is the only resource that was consistently used at high rates. TTS usage declined as the grade level increased, from an average of 62 percent in grade three to 18 percent in grade eleven. Not only does the number of students who were assigned to the TTS resource decrease at higher grade levels, but students who were assigned to this resource used it less often at higher grade levels.

TTS Usage Across Grade Levels

TTS is the most commonly assigned accessibility resource, but not all students who were assigned TTS used it during the test.

Like TTS, the percent usage of the print-on-demand resource declined as the grade level increased. Although similar numbers of students were assigned the print-on-demand resource in the ELA and mathematics assessments, students used the assigned print-on-demand resource more in the ELA assessment than in the mathematics assessment.

The masking resource was used by 12 to 26 percent of the students to whom it was assigned. Elementary students who were assigned the masking resource used it more in the ELA assessment than in the mathematics assessment. Audio transcript was the least commonly assigned accessibility resource and had the lowest percent usage rates.

Usage Across Grade Levels

ASL is the only resource that is consistently used across tests and grade levels.

Figure 3 presents the percentage of students who used each assigned accessibility resource in the ELA and mathematics assessments.

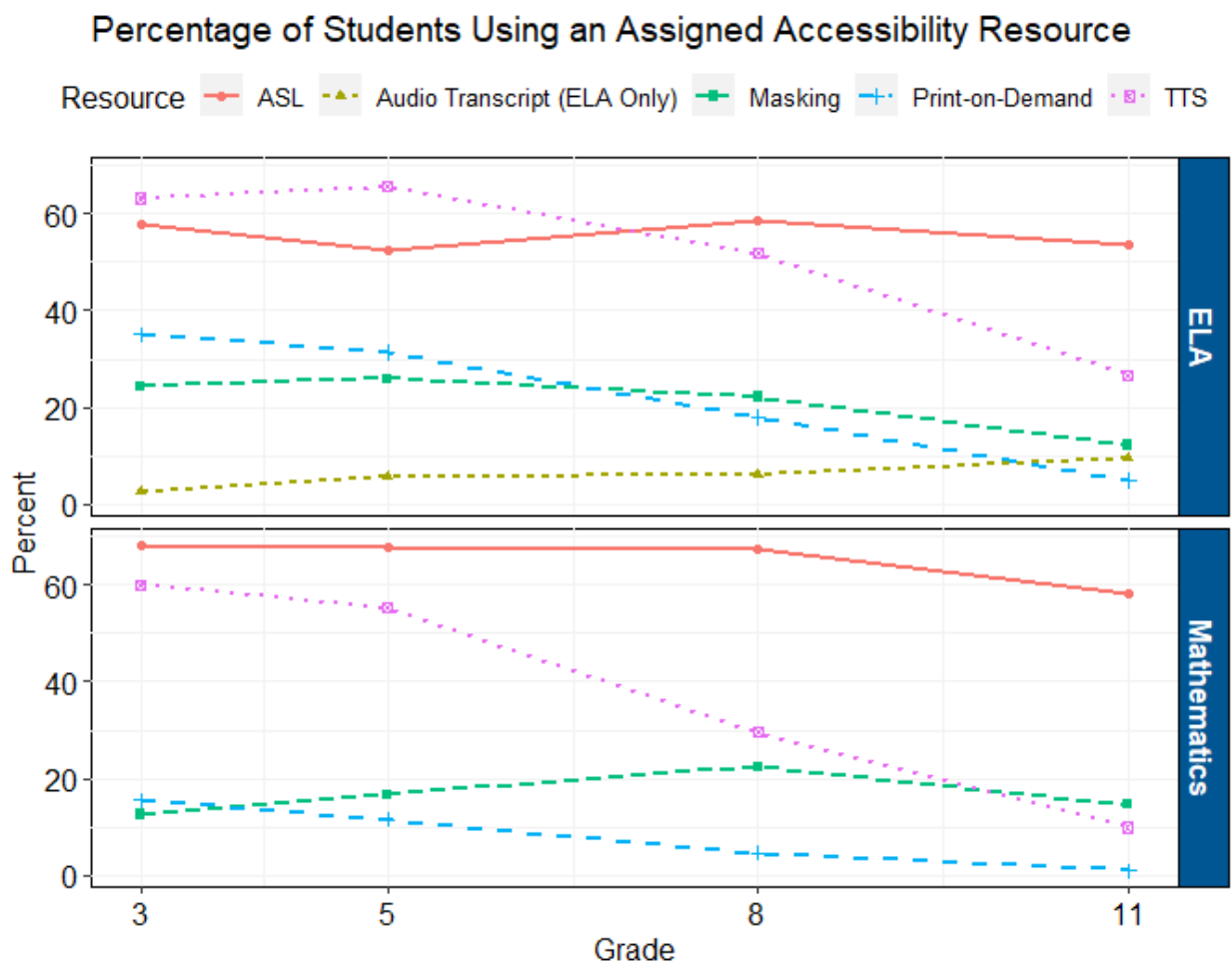


Figure 3. Percentage of students using an assigned accessibility resource (Refer to [Appendix A: Figure Data Tables](#) for corresponding data tables)

RQ2. How does accessibility resource usage vary across demographic student groups?

Researchers examined whether different demographic student groups showed differing usage patterns, specifically examining differences for EL students, special education students, students with a Section 504 plan or IEP, and socioeconomically disadvantaged students. At the demographic student-group level, the percent usage of the studied accessibility resources mirrored the patterns visible at the aggregate level. One exception, however, is that students with an IEP used the TTS resource more often than students without an IEP.

[Figure 4](#) presents students' usage of the TTS resource by IEP status.

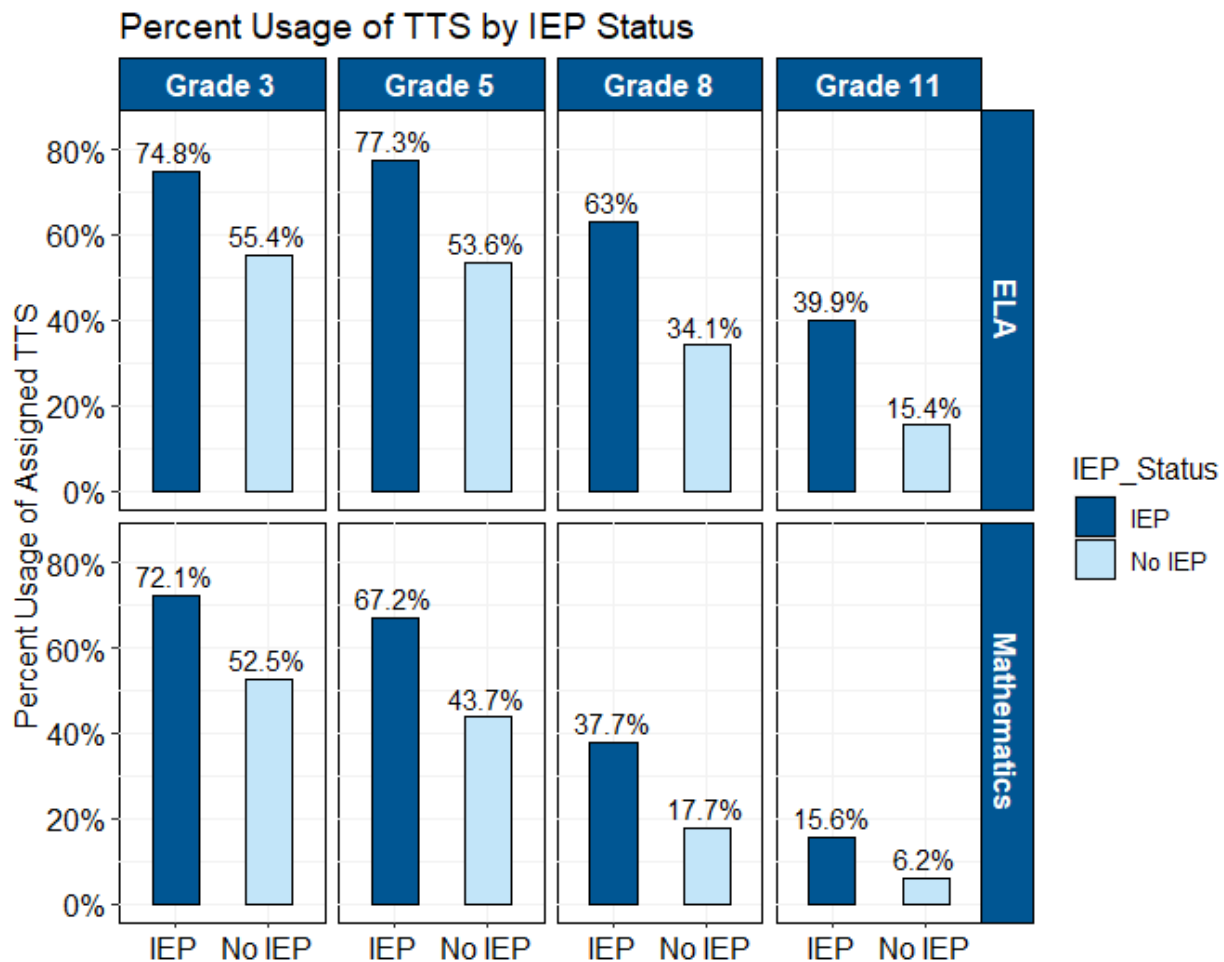


Figure 4. Percent usage of TTS among students with and without an IEP (Refer to [Appendix A: Figure Data Tables](#) for corresponding data tables)

RQ3. Do students use accessibility resources consistently throughout the test?

In addition to examining whether students used an assigned accessibility resource at all during a test, researchers assessed whether students used assigned resources *consistently* from the start to the end. To assess the degree to which students interacted with resources consistently within a test, each test was divided into three equal portions (which were numbered 1, 2, and 3) for analysis. Tests were divided into portions based on the total number of items, regardless of any built-in test segmentation. This resulted in 15 items per portion for the ELA test (i.e., 45 total items) and 12 items per portion for the mathematics test (i.e., 36 total items).

Usage Throughout the Test

- Students tended to use resources on one or two items per test portion.
- Students generally used resources more frequently at the beginning of the test and less so at the end.

Figure 5 presents usage frequency calculations for each test portion by content area and grade level.

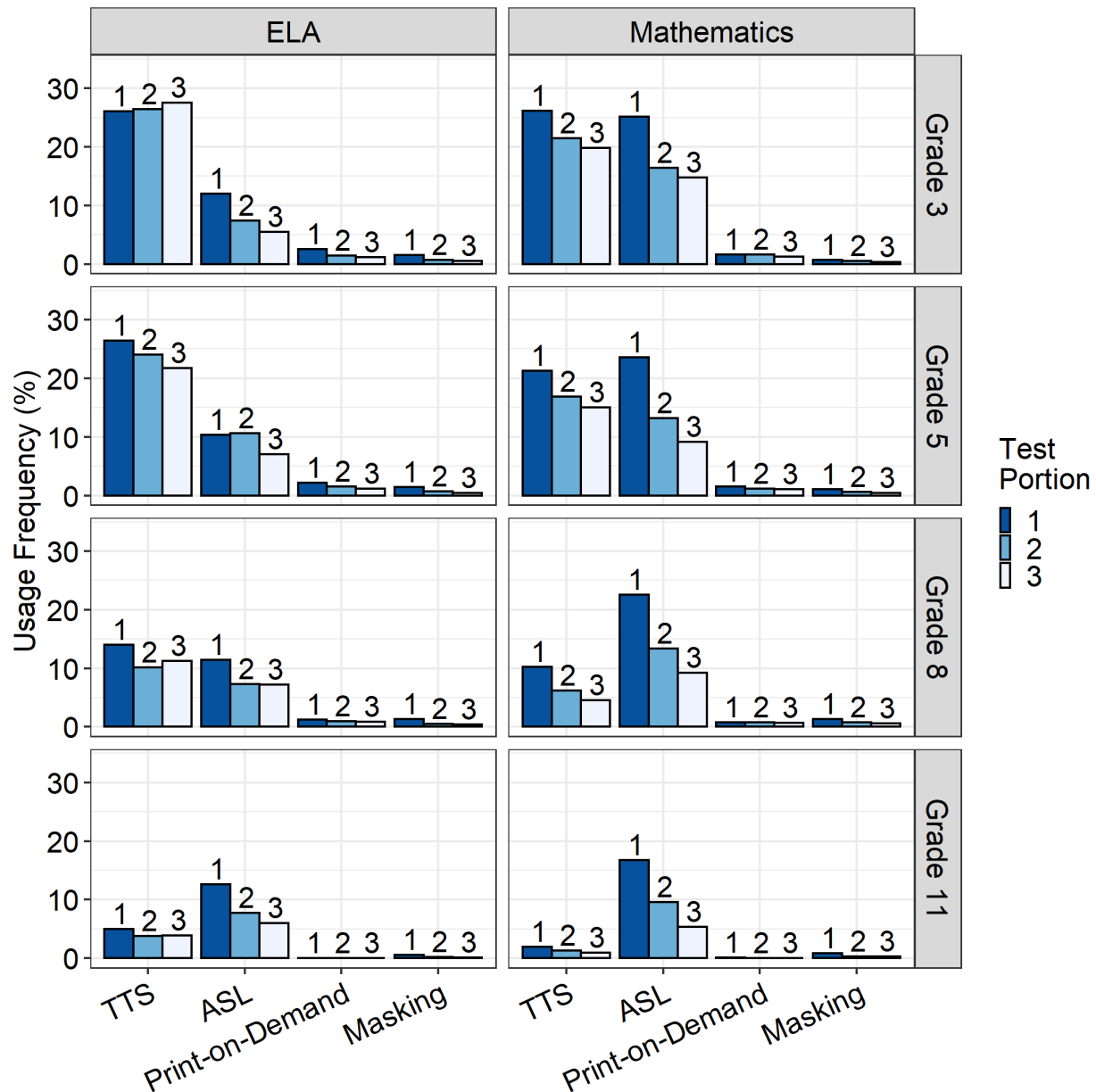


Figure 5. Usage frequency per test portion by accessibility resource, content area, and grade level (Refer to [Appendix A: Figure Data Tables](#) for corresponding data tables)

Note: Low usage of the audio transcript resource resulted in the exclusion of that resource from this analysis.

The usage frequency of the TTS resource in Portion 1 of the ELA grade five test is 26 percent. In other words, TTS was used, on average, on 26 percent of the items in Portion 1 of the ELA grade five test. On many tests, the usage frequency decreased over the course of the test. Students used accessibility resources on more items in the beginning of a test (Portion 1) than the middle of the test (Portion 2); they also used resources more in the middle of the test (Portion 2) than at the end of the test (Portion 3). An exception to this was TTS usage in the ELA grade three test, where students used TTS more in the middle of the test than in the beginning, and more at the end of the test than in the middle.

To further examine the consistency with which students interact with accessibility resources across the test, researchers explored consistency within each test portion by identifying the number of items for each test portion on which students used any resource. Overall, students tended to use resources on only one or two items per test portion.

RQ4. How do item characteristics affect how accessibility resources are used?

In this study, researchers looked at resource usage with regard to three features of item content: Depth of knowledge (DOK), item difficulty, and claim level. For the ELA assessment, researchers also examined how passage length affects resource usage. For certain usage patterns based on item characteristics, educators can provide more targeted instruction to students to access test content. For example, if accessibility resource usage is higher for items that require a higher cognitive demand, emphasizing how to use accessibility resources on items that require more steps might increase their usage among all students who were assigned a resource.

Depth of Knowledge

DOK is a measure of cognitive demand associated with an item. It is based upon the assumption that curricular elements may be categorized according to the cognitive demands required to produce an acceptable response.

- DOK 1—Recall and reproduction
- DOK 2—Skills and concepts
- DOK 3—Short-term strategic thinking
- DOK 4—Extended thinking (ELA only)

Mathematics tests only contain items associated with DOK levels 1–3; ELA tests contain items associated with DOK levels 1–4. Researchers examined how students used accessibility resources for differing levels of cognitive demand. In mathematics, students used resources more frequently as the DOK level of an item increased. In ELA, students' usage peaked at DOK level 2 and subsequently decreased. These patterns hold particularly true for the TTS and ASL resources; print-on-demand and masking usage frequency was less than 2 percent across all grade levels for both ELA and mathematics.

Item Difficulty

Item difficulty is a statistical measure that characterizes how easy or hard an item is based on the percentage of students who answer an item correctly. No meaningful patterns of resource usage and item difficulty emerged in this analysis. The distribution of difficulty level is nearly indistinguishable across accessibility resources, as demonstrated by a high degree of overlap. Likewise, the distribution of difficulty level is also similar between items on which a resource was used and those on which it was not used.

Claim Level

A claim level is an item-level indicator that groups related content and skills. In the ELA assessment there are four claims: Reading, Writing, Listening, and Research/Inquiry. In mathematics there are also four claims.⁷

[Table 4](#) presents brief descriptions of the ELA and mathematics claims.

Table 4. Claim-level Descriptors for ELA and Mathematics

Claim Level	ELA	Mathematics
1	Read Analytically: Informational Text and Literary Text (1-IT, 1-LT)	Concepts and Procedures
2	Write Effectively (2-W)	Problem Solving
3	Speak and Listen Purposefully (3-L)	Communicating and Reasoning
4	Conduct Research (4-CR)	Modeling and Data Analysis

ASL is an accommodation available to students who are deaf or hard of hearing to access text-based content in the assessment. ASL is approved for (a) ELA items only in Claim 3-L and (b) mathematics items in all claims.

Students tended to use accessibility resources more frequently on items associated with Claim 2-W (Write Effectively) and Claim 4-CR (Conduct Research) in ELA tests, especially the TTS resource. In mathematics tests, students in grades three, five, and eight used the TTS, ASL, and masking resources more often on items assessing Claim 4 (Modeling and Data Analysis). In the test for grade eleven mathematics, students used the ASL resource more often on items assessing Claim 1 (Concepts and Procedures) and Claim 3 (Communicating Reasoning); TTS, print-on-demand, and masking resource usage did not vary appreciably by claim.

⁷ For descriptions of the claims, refer to <https://caaspp-elpac.cde.ca.gov/caaspp/UnderstandingSBResults>

Passage Length

ELA tests contain both stand-alone items and items associated with passages. The Smarter Balanced Assessment Consortium sets passage-length specifications by grade level to accommodate the limited amount of time students have to complete an assessment.⁸ Passages are classified as *long* or *short* depending on the word count of the passage:

- Grade three: Short text (200–487 words); long text (488–650 words)
- Grade five: Short text (450–562 words); long text (563–750 words)
- Grade eight: Short text (650–712 words); long text (713–950 words)
- Grade eleven: Short text (800–825 words); long text (826–1100 words)

For the TTS resource, items not associated with a passage have slightly higher resource usage frequencies than those associated with a passage, regardless of its length. For example, grade five students used the TTS resource on 28 percent of items not associated with a text passage compared to 24 percent of items associated with short and long passages. Usage rates for the masking and print-on-demand resources were very low in general and did not indicate any meaningful patterns.

[Table 5](#) summarizes the usage for each analyzed item characteristic.

Table 5. Summary of Usage by Each Item Characteristic

Item Characteristic	Findings
Depth of Knowledge	<p>ELA: Students’ usage peaked at DOK level 2 and subsequently decreases.</p> <p>Mathematics: Students used resources more frequently as the DOK level of an item increased.</p>
Item Difficulty	<p>No meaningful patterns of resource usage and item difficulty emerged. The distribution of difficulty level was nearly indistinguishable across accessibility resources.</p>
Claim Level	<p>ELA: Students used resources more frequently on items associated with Claim 2-W and Claim 4-CR; this was especially the case for the TTS resource.</p> <p>Mathematics: Students in grades three, five, and eight used TTS, ASL, and masking more on items assessing Claim 4 (Modeling and Data Analysis).</p>

⁸For ELA passage specifications, see:

<https://portal.smarterbalanced.org/library/en/ela-stimulus-specifications.pdf>

Table 5 (continuation)

Item Characteristic	Findings
Passage Length	ELA only: Students used the TTS resource with slightly more frequency on items not associated with a passage than on items associated with a short or long passage.

CONCLUSIONS

This data only captures usage patterns, not explanations for why these patterns occur. As a result, the data is useful for understanding *how* students interact with selected designated supports and accommodations when taking the CAASPP. Findings from this research are relevant to differences between the elementary- and secondary-grade levels with respect to how often and when students interact with assigned accessibility resources. These patterns may inform practices for LEA and site coordinators in assigning accessibility resources to students. Educators may use these trends to help develop and conduct orientation and training for students on the use of accessibility resources and how they may be helpful when interacting with the CAASPP. Reminders may be added to use the resources throughout assessments.

The following are some broad considerations and implications for future test administrations:

- Ensure students are comfortable with using these resources and are made aware of and exposed to their assigned resources prior to taking the summative assessment.
 - Given the very low usage of some assigned resources (e.g., the TTS resource in the grade eight and grade eleven mathematics tests) and the low usage overall of some resources (e.g., the masking resource), some students might not have known how to use the assigned resource before the test administration; or, they were not provided with an opportunity to practice using the assigned resource (e.g., use on interim assessments, practice tests).
 - Similarly, ASL was the most consistently used resource across grade levels and content areas, with its usage ranging from 53 to 68 percent. ASL usage might be expected to be higher than observed, particularly if students are not assigned multiple resources for accessing audio content (e.g., amplification, closed-captioning, and audio transcript).
 - Using information from this study, educators may demonstrate the use of targeted resources (e.g., TTS) on items with different characteristics to show how to apply these resources to a wide variety of items.

- Engage with students to understand their awareness of and engagement with accessibility resources.
 - With evidence of declining usage during a test, consider talking to students before the CAASPP test administration to ask about their prior summative test experience using the resources. Questions could include the following:
 - Which resources did they find helpful, and on what tests?
 - How did they decide when to use or not use a resource during the test?
 - Do they intentionally not use certain resources once they start a test or do they forget about them by the end of the test?
- Engage with students to understand the broader application of accessibility resources in their instruction and learning and how these resources can be best accessed during the test.
 - The [Individual Student Assessment Accessibility Profile \(ISAAP\) Tool](#) offers guidance to help align assigned accessibility resources with student needs to ensure a fair and valid testing experience. The ISAAP process reflects a systematic approach to ensure that students receive the supports necessary in both their learning and testing environments.

APPENDIX A: FIGURE DATA TABLES

Table A-1. Percentage of Tested Students in Each Subgroup (Figure 1)

Content Area and Grade Level	Disabled (%)	Economically Disadvantaged (EconD) (%)	English Learners (EL) (%)
ELA 3	12	62	22
Mathematics 3	11	62	22
ELA 5	13	62	19
Mathematics 5	12	62	19
ELA 8	11	60	12
Mathematics 8	11	60	12
ELA 11	9	57	9
Mathematics 11	9	57	9

Table A-2. Percentage of Students Assigned Any Accessibility Resource (Figure 2)

Grade Level	ELA (%)	Mathematics (%)
Grade 3	15.6	15.5
Grade 5	16.2	16.0
Grade 8	11.3	10.7
Grade 11	5.1	4.7

Table A-3. Percentage of Students Using an Assigned Accessibility Resource (Figure 3)

Content Area and Grade Level	ASL (%)	Audio Transcript (%)	Masking (%)	Print-on-Demand (%)	TTS (%)
ELA 3	57.8	2.8	24.4	35.1	63.2
Mathematics 3	68.1	N/A	12.6	15.5	60.0
ELA 5	52.5	5.6	25.9	31.4	65.6
Mathematics 5	67.8	N/A	16.7	11.6	55.2
ELA 8	58.5	5.9	22.2	18.0	51.8
Mathematics 8	67.2	N/A	22.4	4.6	29.6
ELA 11	53.6	9.5	12.2	4.9	26.6
Mathematics 11	58.3	2.8	14.6	1.0	9.9

Note: “N/A” indicates that the accessibility resource was not available for the given content area.

Table A-4. Percent Usage of TTS Among Students With and Without an IEP (Figure 4)

Content Area and Grade Level	IEP (%)	No IEP (%)
ELA 3	74.8	55.4
Mathematics 3	72.1	52.5
ELA 5	77.3	53.6
Mathematics 5	67.2	43.7
ELA 8	63.0	34.1
Mathematics 8	37.7	17.7
ELA 11	39.9	15.4
Mathematics 11	15.6	6.2

Table A-5. Usage Frequency per Test Portion by Accessibility Resource, Content area, and Grade level (Figure 5)

Content Area and Grade	TTS: Portion 1	TTS: Portion 2	TTS: Portion 3	Masking: Portion 1	Masking: Portion 2	Masking: Portion 3	ASL: Portion 1	ASL: Portion 2	ASL: Portion 3	Print-on-Demand: Portion 1	Print-on-Demand: Portion 2	Print-on-Demand: Portion 3
ELA 3	26.1	26.5	27.5	1.5	0.7	0.5	12.0	7.4	5.5	2.6	1.4	1.1
Mathematics 3	26.2	21.5	19.8	0.7	0.5	0.4	25.1	16.4	14.7	1.6	1.6	1.2
ELA 5	26.4	24.0	21.7	1.4	0.7	0.4	10.3	10.6	7.0	2.2	1.5	1.2
Mathematics 5	21.3	16.9	15.0	1.0	0.6	0.4	23.6	13.2	9.2	1.5	1.1	1.1
ELA 8	14.0	10.2	11.2	1.4	0.5	0.4	11.5	7.3	7.2	1.3	0.9	0.9
Mathematics 8	10.2	6.2	4.5	1.3	0.8	0.6	22.6	13.3	9.2	0.8	0.8	0.7
ELA 11	5.0	3.8	3.9	0.6	0.2	0.2	12.6	7.8	6.0	0.0	0.0	0.0
Mathematics 11	2.0	1.3	1.0	0.8	0.4	0.3	16.7	9.6	5.4	0.1	0.0	0.0