



Smarter Balanced Assessment Consortium:

Accommodations for English Language Learners and Students with Disabilities: A Research-Based Decision Algorithm

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Perspective

Smarter-Balanced Assessment Consortium (SBAC) is charged with the development, field testing, and implementation of systems that provide fair assessment opportunities to every student taking the assessments, including English language learners (ELLs) and students with disabilities (SWDs). In accordance with the current legislation, and in an attempt to level the playing field for all students, SBAC plans to develop a common accommodation system to reduce or eliminate variations across states. These accommodations include changes in the test process, in the test itself, or in the test response format. Given the computer-based nature of the SBAC assessment system, the discussion of accommodations is complex, multidimensional, and challenging.

The goal of an accommodation is to make an assessment more accessible for English language learners and students with disabilities and to produce results that are valid for these students. The intent is **NOT** to give them an unfair advantage over those who are not receiving that accommodation. Therefore, to serve the purpose, for its assessments, SBAC should consider accommodations with characteristics that satisfy certain assumptions and conditions toward a reliable and valid assessment system. The purpose of this document is to provide research-based evidence and recommendations to those involved in the assessment of ELL students and students with disabilities particularly to SBAC to inform its accommodation decisions.

The following five major conditions are important to consider in selecting accommodations for ELLs and students with disabilities (see, for a more detailed discussion of these conditions see Abedi, 2012):

(1) Effectiveness: an accommodation must be effective in making an assessment more accessible to the recipients.

(2) Validity: an accommodation should not alter the focal construct, i.e., the outcomes of accommodated and non-accommodated assessments should be comparable.

(3) Differential Impact: an accommodation should be sensitive to student's background characteristics, and their academic standing, i.e., one size may not fit all.

(4) Relevance: an accommodation should be appropriate for the recipients.

(5) Feasibility: an accommodation must be logistically feasible to implement in the assessment setting.

Evidence Needed

Accommodations that meet all the five conditions (particularly effectiveness and validity) will make assessments more accessible for ELLs and SWDs without compromising the validity of assessments. As such, they may also be considered for all students as *accessibility features* because they control for sources of construct-irrelevant variance. The most convincing approach for examining the effectiveness, validity and differential impact of accommodations is through a randomized controlled trial (RCT) experiment in which accommodations (except those such as Braille, created for a particular subgroup of students) are randomly assigned to students and sources of threats to internal and external validity of the experiment are controlled. Table 1 below illustrates a RCT model for ELL students. The identical design with the same underlying concept can be applied for students with disabilities. ELL and non-ELL students are randomly assigned to the accommodated and non-accommodated conditions that allows for the examination of different hypotheses regarding effectiveness and validity.

Table 1.

Examining Effectiveness and Validity of Accommodations for ELL Students

Student Status	Accommodation Status	
	Accommodated	Non-Accommodated
ELL	Group 1	Group 2
Non-ELL	Group 3	Group 4

Comparing the performance of students in Group 1 (ELL students who receive accommodations) with those in Group 2 (ELL students receiving no accommodations) provides evidence of the effectiveness of accommodations. For example, under a given accommodation, if Group 1 performs significantly better than group 2 and higher than the gain made by group 3 over group 4 (differential boost), then the accommodation is considered effective in improving the performance of ELL students. Similarly, comparing the performance of students in Group 3 (non-ELL students receiving accommodations) with students in Group 4 (non-ELL students tested under the standard condition with no accommodation) provides evidence on the validity of that accommodation. If students in Group 3 perform significantly better than students in Group 4, then the accommodation may have done more than what it was supposed to do; it may have altered the

focal construct. However, improved performance of students in group 3 over students in group 4 may be an indication of “Accessibility”. That is, accommodations that improve performance of all students and do not alter the focal construct can make assessments more accessible for all students by controlling for sources of construct-irrelevant variance.

There are many sources of threat to the internal validity of the experiments detailed in Table 1, the most important of which is *selection*, i.e. initial differences between subjects in the treatment and control groups due to the lack of randomization or problems due to small sample size. Other sources of threats to internal validity of the accommodation experiment such as *history*, *testing*, *instrumentation*, *diffusion of treatment*, and *mortality* can also be controlled by randomly assigning students to the four cells of Table 1 (Wiersma & Jurs, 2009).

Research on the effectiveness and validity of accommodations using a RCT approach is scarce. Many of the studies on the effectiveness and validity of accommodations that are reported in the literature are conducted on existing assessment data from annual state assessments. While the numbers of students in accommodated and non-accommodated groups are substantially large in these datasets, there is a major concern about the lack of random assignment of students to either the treatment group, in which students receive accommodations, or to the control group, in which students are tested under the standard testing conditions with no accommodations provided. More importantly, the accommodation policies in place in many of these states require that accommodations be provided to students that are in need of such intervention and so, ideally, have the benefit of being assigned to meet students’ needs. Therefore, the accommodated students are typically from lower performing student groups. Results of these studies are not always conclusive due the issues discussed above.

System for Classifying Accommodations Based on Evidence of Their Effectiveness and Validity

While due to the lack of enough studies, it would be difficult to make a research-based judgment about the validity and effectiveness of all the accommodations that are currently being used in the nation particularly for the SBAC’s member states, we have sufficient research-based evidence to make a judgment about some of these accommodations. For providing evidence-based recommendations for selecting effective and valid accommodations, we have developed a notational system that includes the following notations applied to individual accommodations:



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Use: An accommodation labeled under this category is supported by existing research as being effective in making assessments more accessible and/or valid (i.e., does not alter the focal construct) for ELLs/SWDs. The literature shows multiple studies that provide consistent results supporting the effectiveness and validity of the accommodations used for ELLs and SWDs.

Use/Low Evidence: This label is used mainly for accommodations for students with disabilities that require additional research-based evidence on their effectiveness and validity. However, given a minimal level of research, supporting these accommodations combined with expert opinion and direction for use in federal disability laws, use of the accommodation is recommended when indicated in a student's individualized education program (IEP).

Not Use: An accommodation is labeled as "Not Use" when there is enough consistent evidence suggesting the accommodation is not effective and alters the focal construct; thus, the validity of assessments under this accommodation is questionable.

Unsure: The research-based evidence is inconclusive or there is not enough evidence to make a judgment about effectiveness and/or validity of this accommodation. However, neither is there enough evidence to completely reject this accommodation as ineffective or invalid. Accommodations under this label can be further categorized into the following:

Unsure/Low Evidence Needed: Existing research-based evidence is supportive of the accommodation but not sufficient consistent evidence to make a firm judgment about its effectiveness and validity; therefore, only minor additional research-based evidence is needed.

Unsure/Moderate Evidence Needed: Existing research-based evidence is not quite sufficient to make a judgment about the effectiveness and validity of the accommodation; therefore, more consistent research-based evidence is needed. The evidence should include results of studies that have used RCT design to examine both validity and effectiveness of the accommodations used.

Unsure/High Evidence Needed: Existing research-based evidence neither supports nor rejects the effectiveness and validity of the accommodation; therefore, substantial research-based evidence (based on the RCT design) is needed to justify the use of this accommodation.

Process for Decision on Classifying Accommodations

Based on the results of accommodation studies for English language learners and students with disabilities, we first made a decision on the validity and effectiveness of each accommodation using the above notational system of Use, Use/Low Evidence, Not Use, Unsure, Unsure/Low



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Evidence Needed, Unsure/Moderate Evidence Needed, and Unsure/High Evidence Needed. Five experts in the area of accommodations for students with disabilities and ELL students were asked to independently label existing accommodations based on the literature and their professional views using the notational system discussed above. Decisions from the five experts were listed in four separate tables: (1) “Effectiveness” for ELLs, (2) “Validity” for ELLs, (3) “Effectiveness” for SWDs, and (4) “Validity” for SWDs. The independent judgments were then recorded and shared with the five experts as a group and several meetings were scheduled to review individual decisions and to reach to collective decisions. The level of consistency between experts was quite high; therefore, reaching to a “collective decision” by the experts was quite straightforward.

Decisions on the effectiveness and validity of accommodations were made independently. For example, an accommodation could be marked as *effective* in making assessments more accessible for ELLs/SWDs (indicated by a decision of “Use”) but at the same time marked as “invalid” (indicated by a decision of “Not Use” or “Unsure/High Evidence”) because it may alter the focal construct.

However, while classification of accommodations into categories with different levels of accessibility and validity provides useful information, the overall decision on what accommodations can be used is not straightforward. Therefore, to assist SBAC’s member states in their accommodation decisions we provide guidelines. Table 2 presents the rubric used to arrive at the overall decision for the use of each accommodation. The principle underlying the “Overall Decision” in Table 2 is the impact of the accommodation on the focal construct and its consequences, i.e., the level of risk involved in the decision. If an accommodation alters the focal construct (based on the existing literature) then no matter how effective it is in making assessments more accessible to the recipients, there will be high risk associated with the provision of that accommodation. Consequently, the outcomes of the accommodated assessments may not be compared (or aggregated) with the outcomes of the assessments under standard condition with no accommodation provided.

Based on this principle, our main criterion for recommending an accommodation for use in Table 2 is the evidence strongly suggesting the accommodation does not alter the focal construct. We recommended “Use” when an accommodation has been labeled as “Use” in term of validity even if the evidence does not support the effectiveness of accommodation, since these accommodations regardless of how effective they are will have no impact on the focal construct and the comparability



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of the accommodated and non-accommodated outcomes is not compromised. Therefore, the level of risk in Table 2 is assessed based on level of impact of accommodation on the focal construct. The higher the level of impact of an accommodation on the focal construct, the higher the level of risk associated with the use of that accommodation. For example, for accommodations that are labeled as “Use/Low Evidence”, the level of risk is low (Minor) as compared with the accommodations labeled as “Unsure/High Evidence” for which high level of risk is involved.

Table 2.

Overall Decisions on Accommodation Use

Validity Decision	Effectiveness Decision	Overall Decision
Use	Use	Use
Use	Use/Low evidence	Use
Use	Unsure/Low evidence	Use
Use	Unsure/Moderate evidence	Use
Use	Unsure/High evidence	Use
Use/Low evidence	Use	Use/Minor risk
Use/Low evidence	Use/Low evidence	Use/Minor risk
Use/Low evidence	Unsure/Low evidence	Use/Minor risk
Use/Low evidence	Unsure/Moderate evidence	Use/Minor risk
Use/Low evidence	Unsure/High evidence	Use/Minor risk
Unsure/Low evidence	Use	Use/Minor risk
Unsure/Low evidence	Use/Low evidence	Use/Minor risk
Unsure/Low evidence	Unsure/Low evidence	Use/Minor risk
Unsure/Low evidence	Unsure/Moderate evidence	Use/Minor risk
Unsure/Low evidence	Unsure/High evidence	Use/Minor risk
Unsure/Moderate evidence	Use	Use/Moderate risk
Unsure/Moderate evidence	Use/Low evidence	Use/Moderate risk
Unsure/Moderate evidence	Unsure/Low evidence	Use/Moderate risk
Unsure/Moderate evidence	Unsure/Moderate evidence	Use/Moderate risk
Unsure/Moderate evidence	Unsure/High evidence	Use/Moderate risk
Unsure/High evidence	Use	Use/High risk
Unsure/High evidence	Use/Low evidence	Use/High risk
Unsure/High evidence	Unsure/Low evidence	Use/High risk
Unsure/High evidence	Unsure/Moderate evidence	Use/High risk
Unsure/High evidence	Unsure/High evidence	Use/High risk

The “Overall Usage Decision” labels are indicated for accommodations for English language learners in Table 3 below. Appendix A lists the individual accommodations and the overall usage decision labels along with the research on validity and effectiveness decisions for all accommodations considered for ELL students.

Table 3.

Overall Decisions for Accommodation Use for English Language Learners

Accommodation	Overall Usage Decision
Read aloud of test directions in student’s native language	Use/Minor Risk
Read aloud of test questions (Math, Science, History/Social Science) to student by teacher or electronic media	Use/Minor Risk Access
Read aloud of test questions (ELA) to student by teacher or electronic media	Use/High Risk
Picture Dictionary (alone, combined with oral reading of test items in English, and combined with bilingual glossary)	Use/Minor Risk
Test Break	Use/Minor Risk Access
Extra time within the testing day (not combined with another accommodation)	Use Access
Test in a familiar environment with other ELLs	Use/ Minor Risk
Small group setting	Use/ Minor Risk Access
Commercial Dictionary/Glossary in English	Use/High Risk
Customized Dictionary/glossary in English (content-related terms removed)	Use Access
Customized Dictionary in English (content-related terms removed) and <u>extra time</u>	Use Access
Traditional glossary with Spanish translations (content-related terms removed)	Use
Traditional glossary with Spanish translations and <u>extra time</u> (content-related terms removed)	Use
Bilingual Dictionary	Use/ Minor Risk
Computer-based test (CBT)	Use Access
Pop-up Glossary (CBT) (content related terms excluded)	Use Access (only for English- English)
Modified English (also called simplified English and linguistic modification in the literature)	Use Access
Spanish Translation of Test	Use/Moderate Risk
Dual Language Translation of Test	Use/Moderate Risk

The “Overall Usage Decision” labels are indicated for accommodations for students with disabilities in Table 4 below. Appendix B lists the individual accommodations and the overall usage decision labels along with the research on the validity and effectiveness decisions for all accommodations considered for students with disabilities.



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Table 4.

Overall Decisions for Accommodation Use for Students with Disabilities

Accommodation	Overall Usage Decision
Test administration <u>directions</u> that are simplified or clarified (does not apply to test questions)	Use Access
Test <u>questions read aloud</u> to student or use audio, not visual CD presentation (Math, Science, History/Social Science only, <u>not ELA</u>)	Use/ Minor Risk
Test <u>questions</u> read aloud to student by teacher or electronic media-ELA	Use/ Minor Risk Access
Manually Coded English or American Sign Language to present <u>directions</u> for administration	Use/ Minor Risk
Manually Coded English or American Sign Language to present <u>test questions</u> (Math, Science, History/Social Science)	Use/ Minor Risk
Manually Coded English or American Sign Language to present <u>test questions</u> -ELA	Use/ Minor Risk
Large-print versions/ Test items enlarged if font larger than required on large-print versions	Use Access
Braille transcriptions provided by the test contractor	Use/ Minor Risk
Calculator on mathematics tests (if not part of the focal construct)	Use Access
Calculator on the science tests (if not part of the focal construct)	Use/ Minor Risk Access
Arithmetic table or formulas (not provided) on the mathematics tests if not part of the focal construct	Use/ Minor Risk Access
Arithmetic table or formulas (not provided) on science tests if not part of the focal construct	Use/High Risk
Math manipulatives on mathematics tests (if they don't interact with intended construct)	Use/Moderate Risk
Math manipulatives on science tests (if they don't interact with intended construct)	Use/Moderate Risk
Commercial Dictionary	Not Use
Customized Dictionary/glossary (content-related terms removed)	Use Access
Pop-up Glossary (CBT) (content related terms excluded)	Use Access
Computer Use (including word processing software with spell and grammar check tools turned off for essay responses to writing portion of a test)	Use Access
Audio amplification equipment	Use/ Minor Risk, Access
Colored overlay, mask, or other means to maintain visual attention	Use/ Minor
Special lighting or acoustics; special or adaptive furniture such as keyboards, larger/anti-glare screens	Use/ Minor Risk
Visual magnifying equipment	Use/ Minor Risk Access
Assistive device that does not interfere with the independent work of the student on the multiple-choice and/or essay responses (writing portion of the test) (i.e. handheld optical magnifiers, screen readers, magnification software, speech recognition system, physical supports or assists)	Use/ Minor Risk



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Accommodation	Overall Usage Decision
Essay responses dictated to a scribe, audio recorder, or speech-to-text converter and the student provides all spelling and language conventions	Use/ Minor Risk (for Human Scribes and Speech to Text)
Responses dictated in Manually Coded English or American Sign Language to a scribe for selected-response items (multiple-choice questions)	Use/ Minor Risk
Responses dictated orally, to a scribe for selected-response items (multiple-choice questions)	Use/ Minor Risk
Word processing software with spell and grammar check tools <u>enabled</u> on the essay responses writing portion of test (if grammar, spelling, or language conventions is not the intended construct)	Use/High Risk
Noise buffers (e.g., individual carrel or study enclosure, ambient noise/music)	Use/ Minor Risk
Test individual student separately, provided that a test examiner directly supervises the student	Use/ Minor Risk Access
Test students in a small group setting	Use/ Minor Risk Access
Test administered at home or in hospital by a test examiner (when documented need is provided)	Use/ Minor Risk
Administration of the test at the most beneficial time of day to the student	Use/ Minor Risk Access
Supervised breaks (no more than 20 minutes) within a section of the test	Use/ Minor Risk Access
Extra time on a test within a testing day	Use Access
Test over <u>more than one day</u> for a test or test part typically administered in a single sitting (provided student cannot access questions/answers from previous sitting)	Use/ Minor Risk Access

The status of the accommodations using the above decision guidelines can change over time as more research evidence becomes available; therefore, the categorization provided in these two tables is flexible and time-sensitive. However, the methodology presented in this paper can be followed to incorporate new research findings into the system. Thus, the purpose of this paper is twofold: First is to present a snapshot of the accommodation that can be used based on the existing research and experts' views and second to introduce a methodology for selecting accommodations that is logistically reasonable and conceptually justifiable and also to incorporate research findings into the process of decisions for selecting accommodations. It is important that at the time of implementation of this system, SBAC revise the list of evidence cited in this paper and decide about the use of accommodations accordingly.



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Limitations of the System

We acknowledge several major limitations in this system. First and foremost is the subjectivity involved in assigning accommodations to the different categories discussed above. Different reviewers of the literature may make different judgments particularly with the studies that provide inconsistent results. Second, there are not enough studies in the field to shed light and help with decisions on many of the accommodations currently used by the SBAC's member states. There is a need for and a current trend toward research that assigns accommodations based on individual student need so that some students with specific needs would receive the accommodation and others would not. Third, this system needs to be constantly revised as new studies are added to the accommodation literature. Lastly, accommodations that are identified by the system to be effective and valid may not be consistent with the policies of some SBAC's member states.

The Utility of the System in Spite of All the Limitations

As indicated earlier, the most important aspect of accommodations is their interaction with the focal construct. Accommodations are supposed to help recipients deal with any construct-irrelevant variance in an assessment without providing unfair advantage to them. The most effective accommodations with the highest effect sizes cannot serve the purpose if they alter the focal construct. Therefore, this system brings validity issues strongly into consideration. The decision-making process currently in practice is partly based on state policies, which may have little to do with the nature and performance of accommodations. More importantly, while the field of accommodations for ELLs and SWDs have benefited tremendously from many studies including meta analyses of existing results, the attention of these studies are mainly focused more on effectiveness (effect sizes) than on the comprehensive picture including all accommodation characteristics (discussed above,) most importantly the validity aspect of accommodations.

Accessibility and Accommodation

Along with the work of the two Race to the Top Consortia and their quest for more accessible assessments, this research-based decision process gives more attention to the concept of "accommodation" and "accessibility". While some view these two concepts differently, studies on the effectiveness and validity of accommodations bring these two concepts closely together. Accommodations that are effective in making assessments more accessible for ELLs and SWDs and



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can help other students as well can be used as “accessibility” features and can become part of a standardized test administration process. These accommodations can be grouped under two categories: (1) accommodations that may have no conceivable impact on the focal construct (e.g., “test administration directions that are simplified or clarified”, or “extra time”), and (2) accommodations that may have some direct or indirect influence on the focal construct (e.g., “commercial dictionary”,). Accommodations under the first category can be used for ELLs and SWDs as appropriate accommodations (since they are not providing an unfair advantage to the recipients); or as “accessibility” features for all because everyone may benefit from these features. However, accommodations under the second category can be considered as “accessibility” features when used for all students since using them for a certain group of students may not be a good practice as they may provide unfair advantage to the recipients.

A major consideration in the application of the accessibility feature is “feasibility”. Only features that are logistically feasible to implement can be considered as accessibility features. For example, “one-on-one testing” may help many students, not only ELLs and SWDs, but may not be feasible in large-scale assessments.

Summary and Conclusion

SBAC plans to use accommodations that make assessments more accessible for English language learners and students with disabilities in order to provide valid, reliable and fair assessments for all students. Many accommodations are currently used by the SBAC’s member states but there may not be enough research-based evidence to justify their use. Accommodations must have certain characteristics, the most important of which are effectiveness and validity, in order to be useful for ELLs and SWDs. An accommodation is effective if it makes assessments more accessible for the recipients. However, an effective accommodation may not necessarily provide valid assessment outcomes if the accommodation alters the focal construct (i.e. a validity concern). When an accommodation does more than what is intended to do (i.e., provides unfair advantage to the recipients), then the accommodated and non-accommodated assessment outcomes may not be comparable and may not be aggregated.

In recent years, there has been substantial attention to the issues of accommodations by researchers and policy makers. Researchers have carefully examined some of the currently used accommodations and have provided research-based recommendations on which accommodations



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to use. However, in many cases, attention has been focused mainly on the effectiveness of accommodations by considering effect sizes with less attention to the validity aspect of accommodations. For example, a commonly used accommodation for ELL students which has been recommended as effective is “commercial dictionary”. Studies show that this accommodation improves the performance of ELL students but at the same time improves the performance of non-ELLs by providing content-based terminologies and definitions. If this accommodation is useful for both ELL and non-ELLs, then it should be offered to all students as an “accessibility” feature.

In this paper we discussed five major characteristics that an accommodation should have in order to be considered in the assessment of ELLs and SWDs: (1) Effectiveness, it must be effective in making assessments more accessible to the recipients; (2) Validity, it should not alter the focal construct; (3) Differential impact, it must be sensitive to individual student’s background; (4) Relevance, it must be relevant to the intended audience; and (5) Feasibility, it must be logistically feasible to administer.

While all five characteristics are essential for selecting appropriate accommodations for ELLs and SWDs, effectiveness and validity deserve a greater level of attention. This paper presents a summary of research for some of the most commonly used accommodations and based on the findings of the studies provides recommendations to help SBAC’s member states in their decisions for selecting appropriate accommodations and accessibility features for ELLs and SWDs. The paper recommends the “Use” of an accommodation if there is substantial and consistent evidence on the validity of the accommodation and some indication its effectiveness. Otherwise, the paper suggests the level of risks involved and the need for more studies to be done before the accommodation be implemented into the assessment system.

The paper also discusses the common notions underlying accommodation and accessibility. Accommodations that are effective and do not alter the focal construct can be considered as accessibility features and can be used for all students. Similarly, accommodations that improve measurement of a construct and are beneficial to and affect performance of everyone should be used as accessibility features for all.

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Appendix A.

Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Read aloud of test directions in student's native language	<p>Accommodated results shared some psychometric characteristics with non-accommodated results for ELL providing some construct validity evidence. Significant DIF rarely observed for ELLs (Young, Cho, Ling, Cline, Steinberg, & Stone, 2008).</p> <p>Appears to be responsive to the likely needs of English language learners (Francis, Rivera, Lesaux, Kieffer, & Rivera, H., 2006).</p>	Unsure / Low Evidence	Use / Low Evidence	Use/Minor Risk
Read aloud of test questions (Math, Science, History/Social Science) to student by teacher or electronic media	<p>Zero effect in a meta-analysis (Pennock-Roman and Rivera, 2011, 2012).</p> <p>Mixed results on a grade 8 math assessment comprised of released test items: a significant positive effect for students in state where students are experienced with a read aloud on standardized math assessments. There was no effect on students in state where read-aloud is not practiced on standardized math assessments (Wolf, Kim, Kao, & Rivera, N., 2009).</p> <p>This is the only accommodation deemed helpful for the lowest level of English proficient students-math only, not ELA</p>	Unsure/Low Evidence	Use / Low Evidence	Use/Minor Risk Access



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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>(Acosta, Rivera, & Shafer Willner, 2008).</p> <p>Effective in math when selected for students according to language proficiency (i.e. English vs. L1), cultural proximity (i.e. time in US school, native country schooling, and testing experience) and US schooling (i.e. needs, classroom experiences) (Kopriva, Emick, Hipolito-Delgado, & Cameron, 2007).</p> <p>Not effective for grade 7 ELL students on a social studies test (Castellon-Wellington, 2000; Sato, Rabinowitz, Worth, Gallagher, Lagunoff, & McKeag, 2007).</p>			
Read aloud of test questions (ELA) to student by teacher or electronic media	<p>Passages read aloud threaten construct validity, but reading of test questions may be appropriate (study did not address validity by content areas) (Acosta et al., 2008).</p> <p>The authors refer to this as an oral accommodation and find that previous studies do not provide clear results on the effectiveness of this accommodation (Sireci, Li, & Scarpati, 2003).</p>	Unsure/High Evidence	Unsure/High Evidence	Use/High Risk

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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Picture Dictionary (alone, combined with oral reading of test items in English, and combined with bilingual glossary)	Effective in all variations when selected for ELL students according to their specific needs (i.e. language proficiency, time in US schools, native country schooling, testing experience, and US schooling needs and classroom experiences).	Unsure/Low Evidence	Unsure/Low Evidence	Use/Minor Risk
Test Break	<p>An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test directions rather than listed as possible accommodations (Acosta et al., 2008).</p> <p>Appears likely to be responsive to the needs of English language learners (Francis et al., 2006).</p>	Unsure/Low Evidence	Unsure/Moderate Evidence	Use/Minor Risk Access
Extra time within the testing day (not combined with another accommodation)	<p>Based on 3 samples from 3 studies this meta-analysis indicated a statistically significant effect size for the extra time accommodation. (Kieffer, Rivera, M., & Francis, in press).</p> <p>Considered Indirect Linguistic Support (Pennock-Roman & Rivera, 2011).</p>	Use	Unsure/Moderate Evidence	Use Access



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Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>Highly rated by a team of experts as helpful for the lowest English proficient students and important to include when providing dictionaries/glossaries, scripted oral accommodations, sight translations, and response accommodations (Acosta et al., 2008).</p> <p>This study indicated that extra time is both effective and valid for students in grade 4 (Abedi, Courtney, & Leon, 2003b).</p> <p>This accommodation was too often bundled with others, making the effect of extra time indiscernible (Sireci et al., 2003).</p> <p>Both ELL and non-ELL students in grade 8 are helped by this accommodation on a math assessment of 35 released NAEP items. ELL student scores increased with this accommodation but not as substantially as when it was combined with a glossary (Abedi, Hofstetter, Baker, & Lord, 2001a).</p> <p>Not effective for grade 7 ELL students on a social studies test (Castellon-Wellington, 2000).</p>			

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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Test in a familiar environment with other ELLs	An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should be part of test directions rather than listed as possible accommodations; however, not considered ELL responsive (Acosta et al., 2008).	Unsure / Low Evidence	Unsure/High Evidence	Use/Minor Risk
Small group setting	Not ELL responsive (Acosta et al., 2008) and considered Indirect Linguistic Support (Pennock-Roman & Rivera, 2011). No indication of effectiveness or validity on grade 4 math in a small group setting (Abedi et al., 2003b)	Unsure/LowEvidence	Unsure/High Evidence	Use/Minor Risk Access
Commercial Dictionary/Glossary in English	A meta-analysis of 18 samples from 9 studies indicated a statistically significant gain for ELLs who used an English dictionary or glossary regardless of whether the test was computer-based or paper and pencil. Meta-analysis combined paper and pencil studies that used a mix of commercial and customized dictionaries (Kieffer et al., in press). English language dictionaries and glossaries was the only one of seven empirically tested accommodations that produced an average though small effect size that is positive and significant.	Unsure/High Evidence	Unsure / Low Evidence	Use/High Risk

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Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>Studies included the use of both commercial and customized dictionaries (Francis, et al., 2006).</p> <p>Accommodation was not effective for grade 8 ELL students although effective for ELL students in grade 4. Additionally accommodation did not affect validity of the science assessment (Abedi, Courtney, Mirocha, Leon, & Goldberg, 2005).</p>			
Customized Dictionary/glossary in English (content-related terms removed)	<p>Effective for grade 4 but not grade 8 science assessments and evidence on both for validity (Abedi et al., 2005).</p> <p>A simplified English dictionary for use with Hmong students on a reading assessment was moderately significant for ELLs who reported using the accommodation (Albus, Bielinski, Thurlow, & Liu, 2005).</p> <p>Not effective for ELL students on a grade 8 math assessment (Abedi et al., 2001a), on grades 4 and 8 math assessment (Abedi et al., 2003b) nor on grades 4 and 8 science assessments (Abedi, Courtney, & Leon, 2003a).</p> <p>Grade 8 ELL students with access to a</p>	Use	Unsure / Low Evidence	Use Access



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Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>customized dictionary (included at end of test, compiled of test words only, with dictionary excerpted entries) scored significantly higher on NAEP science items than LEP students under standard conditions (no dictionary or glossary). There were no significant differences in mean scores for non-LEP students; thus providing validity evidence. (Abedi, Lord, Boscardin, & Miyoshi, 2001b).</p>			
	<p>Future research should focus on English dictionary or glossary accommodation because of the robust evidence of their effectiveness and validity (Kieffer, Lesaux, Rivera, & Francis, 2009).</p> <p>No effect of accommodation on ELLs, however, students involved in a think aloud said that they did not use the glossary during the assessment, nor did they have experience using one during class instruction (Wolf, et al., 2009).</p>			

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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Customized Dictionary in English (content-related terms removed) and <u>extra time</u>	<p>In a meta-analysis, PPT dictionary was a significant accommodation only when combined with extra time. (Pennock-Roman & Rivera, 2011).</p> <p>Although often studied and reported as effective, this meta-analysis did not indicate significant effect sizes for dictionary with extra time accommodations. The authors caution that the number of studies were small, and limited to certain grades and content areas. They suggest further studies with a broader sample of states and tests (Francis et al., 2006).</p>	Use	Use / Low Evidence	Use Access
Traditional glossary with Spanish translations (content-related terms removed)	<p>This accommodation was more effective for grade 8 than for grade 5 students. Significant DIF rarely observed for ELLs (Young, et al., 2008).</p> <p>A bilingual/English glossary with translations did not significantly improve the science scores of students in grades 4 and 8. This may be used for ELL students in grades 4 and 8 without compromising validity, although it did not significantly improve scores. (Abedi et al., 2003a).</p>	Use	Unsure / Moderate Evidence	Use

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Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	ELL students scored slightly higher using a glossary (English glosses with Spanish translations) than did ELL students under standard conditions on a grade 8 science test; but difference did not reach significance. This accommodation had no significant effect on scores of non-LEP students providing evidence for construct validity. Students with higher English proficiency benefited more from the glossary accommodation (Abedi et al., 2001b).			
Traditional glossary with Spanish translations and <u>extra time</u> (content-related terms removed)	A bilingual/English glossary did no significantly improve the science scores of ELL students in grades 4 and 8 (Abedi et al., 2003a).	Use	Unsure / Moderate Evidence	Use
Bilingual Dictionary	May be effective when individual student characteristics such as language proficiency, time in US school, native country schooling, testing experience and classroom experiences are considered in accommodation assignment (Kopriva et al., 2007). Effective for grade 4 science but not grade 8 ELL students, and validity was not threatened (Abedi et al., 2005).	Unsure/Low Evidence	Unsure / High Evidence	Use/Minor Risk

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Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Computer-based test (CBT)	Several factors contribute to the effectiveness of this accommodation: the presentation of a single item at a time, a pop-up glossary, extra time, and a small and novel setting. Authors recommend this accommodation when testing large numbers of ELL students. Study also indicated validity evidence i.e. non-ELLs scored similarly on accommodated and non-accommodated test versions (Abedi et al., 2003b; Abedi, 2009).	Use	Use	Use Access
Pop-up Glossary (CBT) (content related terms excluded)	<p>A meta-analysis indicated effectiveness when ELL students were not disaggregated by proficiency levels (Pennock-Roman & Rivera, 2011).</p> <p>Effective when selected for students according to language proficiency, time in US school, native country schooling, testing experience, and US school needs, and classroom experiences. Also effective when combined with read aloud of test items when selected for students according to characteristics described above (Kopriva et al., 2007).</p> <p>Accommodations should be selected according to the unique needs of English</p>	Use	Use	Use Access (only for English-English)

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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>language students (Shafter Wilner, Rivera, Acosta, 2007).</p> <p>Effective and valid for grade 4 and 8 students on a math assessment (Abedi et al., 2003b).</p>			
<p>Modified English (also called simplified English and linguistic modification in the literature)</p>	<p>A meta-analysis of 24 samples from 12 studies yielded a small and significant effect size when ELLs used this accommodation (Kieffer et al., in press).</p> <p>This accommodation was the most effective for grade 7 students with low-intermediate and intermediate levels of English proficiency on a history assessment (Aguirre-Munoz, 2000; Pennock-Roman & Rivera, 2011).</p> <p>Study consisted of 25 matched pairs of original and linguistically modified math items for grades 7 and 8 taken from 256 NAEP items. The authors concluded that the construct was not altered by the accommodation as measured by ELL and EO student results. The overall effect size between original and modified items for ELL students was 0.16; without differentiating between students with high and low levels of English proficiency (Sato</p>	<p>Use</p>	<p>Unsure/Low Evidence</p>	<p>Use Access</p>



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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>et al., 2010).</p> <p>There was negligible difference in scores between ELLs and non-ELLs in this meta-analysis when test language was simplified. There was evidence of construct validity in non-ELLs similar performance on accommodated and non-accommodated versions (Kieffer et al., 2009).</p> <p>Not effective in improving performance of grade 4 ELL students on a science test although non-ELL students' scores were not impacted, thus providing evidence of validity. Effective for grade 8 ELL students; however, there were no non-ELL students to test for validity (Abedi et al., 2005).</p> <p>Evidence of validity when used with non-ELLs; however, not effective with a small number of grades 4 and 6 students on a state standardized science assessment (Rivera, C. & Stansfield, 2004).</p> <p>Effective for grade 8 science assessment in addition to appearing valid (non-ELL scores were not affected) and feasible. No</p>			

Appendix A.

Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>indications of effectiveness for students in grade 4 although non-ELL scores were not affected. Students whose primary language was neither English nor Spanish benefited the most from this accommodation. (Abedi et al., 2003a).</p> <p>Grade 8 ELL students scored higher than non-accommodated ELL students on a math assessment, but results did not reach significance (Hofstetter, 2003).</p> <p>This accommodation indicates potential to level the playing field for ELLs, and the researchers call it “an attractive accommodation.” However, they state that research findings on this accommodation are mixed (Sireci et al., 2003).</p> <p>Evidence of effectiveness and validity for grade 8 students on a math assessment of 35 released NAEP items. Students with lower English proficiency benefited from modified English and extra time (Abedi et al., 2001a).</p> <p>The results of a math assessment with NAEP items indicated that ELL and non-</p>			



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Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>ELL students might benefit from this accommodation. (Kiplinger, Haug, & Abedi, 2000).</p> <p>Not effective for multiple choice items for ELL students in grades 5 and 8 on a science assessment. However, the accommodation was effective on open-ended items (Brown, 1999).</p> <p>Not effective for ELL students in grades 5 and 8 on a math assessment with some positive effect on non-ELL students (Brown, 1999).</p> <p>Improved performance of grade 8 ELL and non-ELL students thereby indicating that accommodation on a secure NAEP math assessment is effective for ELLs but not valid (Abedi, Lord, & Hofstetter, 1998).</p> <p>Linguistic modification improved performance for lower level math students in grade 8; the more advanced the math class the less or no impact on student outcomes (Abedi, Lord, & Plummer, 1997).</p>			
Spanish Translation of Test	A Spanish translation accommodation on	Unsure/	Unsure/	Use/Moderate

Appendix A.

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Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>a grade 7 history assessment had the largest effect sizes for ELLs with low English proficiency and students instructed in Spanish but were not effective for intermediate Spanish speakers. The authors stated that levels of Spanish proficiency are important to obtain in order to precisely select appropriate accommodations (Aguirre-Munoz, 2000; Pennock-Roman & Rivera, 2011).</p> <p>A student's home language is a better indicator of the effectiveness of a translation accommodation than the language of instruction for students in grades K-1 (Robinson, 2010).</p> <p>There are 2 experiments of Spanish translations in the Hofstetter study in this meta-analysis; ELLs instructed in English but given a Spanish translation accommodation indicated a negative effect size. When ELLs were instructed in Spanish and given a Spanish translation accommodation, the effect size was positive. This study suggests that language of instruction may be a moderator in the effectiveness of this</p>	Moderate Evidence		Risk

Appendix A.

Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>accommodation (Hofstetter, 2003; Kieffer, et al., 2009)</p> <p>Empirical studies indicated significant variability across the estimates of the effects of a Spanish translation. Effectiveness may vary according to a student's language of instruction (Francis et al., 2006).</p> <p>Abedi, Hofstetter, and Lord (2004) found that when the language of instruction is not Spanish, then fluent Spanish speaking students perform lower than on non-accommodated versions of the assessment.</p> <p>Not effective on a grade 8 reading test with the passage in English but all other materials (i.e. directions, test questions and answers) presented side by side in 2 languages and aurally in L1 on a cassette (Anderson, Liu, Swierzbis, Thurlow, & Bielinski, 2000).</p> <p>Not effective for grade 8 students taking a NAEP math assessment (Abedi et al., 1998).</p>			

Appendix A.

Overall Decisions for Accommodation Use for English Language Learners

Accommodations For ELLs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Dual Language Translation of Test	<p>Only slightly effective when administered with extra time. Lacked validity evidence for non-ELLs under restricted time (Pennock-Roman & Rivera, 2011).</p> <p>The increased length of a dual language translation necessitates generous time limits. Effectiveness was unobserved for this Grade 8 assessment perhaps because of the test length and because the accommodation were offered to students who were neither fluent in Spanish (the language of the accommodation) nor who recently received math instruction in Spanish (Abedi, Courtney, Leon, Kao, & Azzam, 2006).</p> <p>Effective on a grade 8 math assessment in English and Spanish (Duncan et al., 2005).</p> <p>A dual-language test booklet doesn't appear to provide significant improvement in assessment results for students using this accommodation (Sireci et al., 2003).</p>	Unsure / Moderate Evidence	Unsure/ Moderate Evidence	Use/Moderate Risk

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Presentation Accommodations (e.g., repeat directions, read aloud, large print, braille, etc.)				
Test administration <u>directions</u> that are simplified or clarified (does not apply to test questions)	<p>Clear and understandable test directions are part of basic test administration and should not need accommodations. An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test directions rather than listed as accommodations (Acosta et al., 2008).</p> <p>Eight experts considered these accommodations both valid and fair but slightly more used those terms when the accommodations were indicated on students’ IEPs. The authors also referred to this accommodation as “paraphrase or simplify language in directions” or “clarify questions [in directions] by asking.” The study suggested that this accommodation (with others used as a package) affects performance of both students with disabilities (63.4%) and students without disabilities (42.9%); thus expressing concerns over the validity of these accommodations (Elliot, Kratochwill, & McKeivitt, 2001).</p> <p>Thurlow and Bolt (2001) recommend using this accommodation when the purpose of the test is not to test the ability to follow directions.</p>	Use	Use/Low Evidence	Use Access
Test <u>questions read aloud</u> to student or used audio, not visual CD presentation	Increased consensus across states to use this accommodation for content areas other than	Unsure/Low Evidence		Use/ Minor Risk

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Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
<p>(Math, Science, History/Social Science only, <u>not</u> ELA)</p>	<p>reading (Christiansen, Braam, Scullin, & Thurlow, 2011).</p> <p>Studies presented very mixed results. Report indicated that 3 studies showed SWD received benefit and 2 studies showed benefits for students who were low readers (including SWD). (Cormier, Altman, Shyyan, & Thurlow, 2010).</p> <p>Study indicated positive impact of read-aloud accommodation for grade 4 students (not grade 8) on hard to read math items controlling for performance on computation only problems. Impact of the read aloud accommodation on easy to work math problems was significant with a small effect size. There was no main effect of the read-aloud accommodation (Bolt & Thurlow, 2004).</p> <p>5th grade students with reading disabilities benefitted more from a read aloud accommodation on a science test than did general education students. The greatest benefit was gained with the read-aloud accommodation combined with graphics or pictures that replaced text response options (distracters and key) (Brown, 2007).</p>			

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>This study of 625 middle school students ($n = 388$ with LD) tested the impact of a read-aloud accommodation on a math assessment. Both SWD and general ed students had higher means on the accommodated version and those at a higher levels of math proficiency benefitted more. They suggested that all students should be given accommodations when it improves performance. Accommodations may be relevant for all students, not only SWDs (Elbaum, 2007).</p> <p>Students with disabilities benefited from a text-to-speech accommodation on a computer-based social studies test (Dolan, Hall, Banerjee, Chun, & Strangman, 2005).</p> <p>This study included students in grades 4, 5, 7, 8 on a math assessment with a read aloud accommodation from a video monitor. Scores on 4 or 5 difficult reading items were compared between 2 groups: SLD and general education students. Validity evidence for the accommodation was provided; general education students did not show improved performance with the accommodation. Elementary students with SLD benefitted from the read aloud accommodation; however, middle school students with SLD did not (Helwig, Rozek-</p>			



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Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>Tedesco, & Tindal, 2002).</p> <p>When math questions were read aloud to students with disabilities (Barton, 2002; Burch, 2002; Johnson, Kimball, Brown, & Anderson, 2001b).</p> <p>Read aloud by one of three methods (teacher, computer, computer with video) was effective for grade 9-12 students on a grade 3 math performance assessment; however, effect sizes were weak (teacher and computer versions) to moderate (video condition) (Calhoon, Fuchs, & Hamlett, 2000).</p> <p>Effective: On more innovative problem-solving math tests, students with specific learning disabilities scored statistically significantly higher than students without SLD with a read aloud accommodation (Fuchs, Fuchs, Eaton, Hamlett & Karns, 2000).</p> <p>In an experimental study, students with and without disabilities were randomly assigned to teacher test read-aloud and student silent-read conditions. SWD scores statistically significantly higher than non-SWD. Authors concluded there was evidence for validity of the read-aloud accommodation (Tindal, Heath,, Hollenbeck, Almond, & Harniss, 1998).</p>			

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Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Test <u>questions</u> read aloud to student by teacher or electronic media-ELA	<p>The study tested a read-aloud accommodation for students with dyslexia and general ed students. Students were orally read proper nouns and comprehension stems. Results indicated test validity; only the students with decoding problems benefitted significantly from the accommodation; and the accommodated students with reading disabilities had a 7 fold likelihood of passing the test over those who were not accommodated (Fletcher et al., 2006).</p> <p>The grade 4 and 5 students with disabilities in this study benefitted from the accommodation as did the students without disabilities indicating a lack of validity. Group results may have masked the effect of the accommodation on individual students. 12% of students with a SLD received a differential boost over GE peers (Crawford & Tindal, 2004).</p> <p>Construct validity was affected when read aloud recording was provided on test with text segments (McKevitt & Elliott, 2003; Meloy, Deville, & Frisbie, 2002)</p>	Unsure/Low Evidence	Use/Low Evidence	Use/ Minor Risk Access
Manually Coded English or American Sign Language to present <u>directions</u> for administration	<p>Implementation is standardized through computer administered assessment</p> <p>A computer based signing of a math test for</p>	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk



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Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>students who are deaf or hard of hearing may overcome limitations of DVD recordings (e.g., distance of student from TV screen, need for delay of all students participating in viewing each time one student needs to re-view question, frequent rewinding or fast-forwarding) (Russell, Kavanaugh, Masters, Higgins, & Hoffmann, 2009).</p> <p>Thurlow and Bolt (2001) recommend using an interpreter with hearing impaired students who may benefit from such accommodation, stating that visual and hearing impaired students need this accommodation to fully participate in assessments.</p> <p>36 of 48 states with statewide assessments allow an interpreter for instructions. This accommodation is recommended for students with hearing impairments.</p> <p>Ray (1982) found adaptations in the directions help deaf children score the same as other students (see also Sullivan, 1982).</p>			
Manually Coded English or American Sign Language to present <u>test questions</u> (Math, Science, History/Social Science)	Readers and sign language interpreters (access assistant) may not be uniformly qualified or trained, and they may not consistently interpret test items as is necessary in a standardized setting (Russell, et al., 2009).	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk



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	<p>A computer based signing of a math test for students who are deaf or hard of hearing may overcome limitations of DVD recordings (e.g., distance of student from TV screen, need for delay of all students participating in viewing each time one student needs to re-view question, frequent rewinding or fast-forwarding) (Russell et al., 2009).</p> <p>Signing a math assessment is an accommodation of an accommodation and the validity is difficult to ascertain. The inability of local interpreters to view the assessment in advance to prepare is a significant weakness, especially with less frequently used math and science content vocabulary (Johnson, Kimball, & Brown, 2001a).</p>			
Manually Coded English or American Sign Language to present <u>test questions</u> -ELA	<p>Readers and sign language interpreters (access assistant) may not be uniformly qualified or trained, and they may not consistently interpret test items as is necessary in a standardized setting (Russell et al., 2009).</p> <p>Used by 4% of teachers, administrators, or other educational professionals with at least 1 student as indicated in a survey of 444 educators of</p>	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk

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Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>students who are deaf or hard of hearing (Cawthon, 2007).</p> <p>On a listening portion of a standardized assessment, a standardized signed version is necessary to ensure that a high quality of interpretation is achieved; one that is comparable to a spoken version (Johnson et al., 2001a).</p>			
<p>Large-print versions/ Test items enlarged if font larger than required on large-print versions</p>	<p>Thurlow and Bolt (2001) recommend that the large-print accommodation be offered to any student who may benefit from it.</p> <p>Burk (1998) indicated no benefit for LD on computer.</p> <p>Brown (2007) indicated no benefits.</p> <p>Extra time may be needed when using this accommodation (Wright & Wendler, 1994).</p> <p>40 out of 48 states with standardized assessments allow this accommodation for students with visual impairments. Research indicates that this accommodation helps to reduce the achievement gap between students with visual impairments and those without</p>	<p>Use</p>	<p>Use/Low Evidence</p>	<p>Use Access</p>



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	<p>(Bennett, Rock, & Jirele, 1987).</p> <p>There are indications that this accommodation does not change the construct being tested (Bennett et al., 1987).</p> <p>Beattie, Grise, & Algozzine (1983) indicated benefits for LD.</p> <p>Grise, Beattie, & Algozzine (1982) indicated no benefit.</p> <p>Large print has also been used for students with learning disabilities, although several studies have shown no impact for SLD students. One study, however, indicated substantial impact for SLD students in 5 of 8 skills (Perez, 1980).</p>			
Braille transcriptions provided by the test contractor	<p>A Braille version of a test may increase the difficulty of some items such as those involving diagrams or special symbols (Bennett, Rock, & Kaplan, 1987; Bennett, Rock, & Novatkoski, 1989; Coleman, 1990; Bolt & Thurlow, 2004).</p> <p>This is an appropriate accommodation for students with blindness or significant visual impairments. 33 out of 48 states with statewide</p>	Use / Low Evidence	Use/ Low Evidence	Use/ Minor Risk



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	<p>assessments allow this accommodation (Thurlow, House, Boys, Scott, & Ysseldyke, 2000).</p> <p>Thurlow and Bolt (2001) recommend using Braille with extended time for students with severe visual impairments.</p>			
Equipment and Material Accommodations (e.g., calculator, amplification equipment, manipulatives, etc.)				
<p>Calculator on mathematics tests (if not part of the focal construct)</p>	<p>Both general education and special education grade 6 students benefited from the use of calculators on a math assessment (Bouck, E. & Bouck, M., 2008).</p> <p>Many testing programs allow students to use calculators during math tests with some stipulations on allowable arithmetic functions that the computer can perform (Russell, 2006). Calculator use had no significant effect on test scores for 244 general education students in intact classrooms assigned randomly to calculator/non-calculator test versions. Students with disabilities were only modestly helped with calculator availability. The calculator accommodation was bundled making individual effects difficult to discern (Shaftel, Belton-Kocher, Glasnapp, & Poggio, 2006).</p> <p>SWDs did not benefit more from this accommodation than did students without disabilities on a test with conventional math</p>	Use	Unsure/Low Evidence	Use Access



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Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	content. However, on more innovative problem-solving tests, students with specific learning disabilities scored marginally significantly higher than students without SLD (Fuchs et al., 2000b).			
Calculator on the science tests (if not part of the focal construct)	This accommodation has not been researched using experimental or quasi-experimental studies.	Use/Low Evidence	Unsure/Low Evidence	Use/ Minor Risk Access
Arithmetic table or formulas (not provided) on the mathematics tests if not part of the focal construct	This accommodation has not been researched using experimental or quasi-experimental studies. However, validity is likely threatened if the construct being tested comprises information on the arithmetic table or in provided formulas.	Unsure/Low Evidence	Unsure/ Moderate Evidence	Use/ Minor Risk Access
Arithmetic table or formulas (not provided) on science tests if not part of the focal construct	This accommodation has not been researched using experimental or quasi-experimental studies. Validity is only threatened if the test is measuring student knowledge of the arithmetic table or formulas. It is possible that because the focal construct is science, the use of an arithmetic table or formulas may be an acceptable accommodation	Unsure/High Evidence	Unsure/ Moderate Evidence	Use/High Risk



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Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Math manipulatives on mathematics tests (if they don't interact with intended construct)	Rated 2.57 out of 3 by a panel of eight experts when given as one in a packaged set of accommodations (2= fairness/validity questionable, 3 = fair/valid) (Elliott, Kratochwill, McKeivitt, & Malecki, 2009).	Unsure/ Moderate Evidence	Unsure/ Moderate Evidence	Use/Moderate Risk
Math manipulatives on science tests (if they don't interact with intended construct)	Considered fair and valid by a panel of eight experts on 4 science tasks when given as one in a packaged set of accommodations (Elliott et al., 2009).	Unsure/ Moderate Evidence	Unsure/ Moderate Evidence	Use/Moderate Risk
Commercial Dictionary	Commercial dictionaries may allow an unfair advantage to students not receiving the accommodation if definitions, explanations, pictures or examples are provided (Acosta et al., 2008).	Not Use	Use/Low Evidence	Not Use
Customized Dictionary/glossary (content-related terms removed)	Mixed conclusions on effectiveness in studies with English language learners (Abedi et al., 2001b, Abedi et al., 2003a, Abedi et al., 2005, Albus et al., 2005, Kieffer et al., 2009). No threats to validity (Abedi et al., 2001b, Abedi et al., 2005)	Use	Unsure / Low Evidence	Use Access
Pop-up Glossary (CBT) (content related terms excluded)	Considered effective for English language learners (Abedi et al., 2003b, Kopriva et al., 2007, Pennock-Roman & Rivera, 2011).	Use	Use	Use Access
Computer Use (including word processing software with spell and grammar check tools turned off for essay responses to	5 of 6 studies conducted in 2007 and 2008 indicated comparability between computer-based assessments and paper and pencil assessments	Content areas: Use (for constructed response items)	Use	Use

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Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>to be effective on a math assessment according to student ability and item difficulty; moderate to lower ability students performed better on easier items. Validity was not examined. (Scarpati, Wells, Lewis, and Jirka, 2011).</p> <p>No differential impact on performance of students with and without reading disabilities (Iovino, Fletcher, Breitmeyer, & Foorman, 1998).</p> <p>The use of Irlen filters for students identified with vision problems (e.g. scotopic sensitivity) did not lead to improved oral reading or reading comprehension. (Blaskey, Scheiman, Parisi, Ciner, Gallaway & Selznick, 1990).</p> <p>Students experienced improvement in raw reading scores and reading age over time when using Irlen lenses of their color choice. Several other variables not related to use of the lenses are mentioned that could have contributed to the reading improvements. (Robinson & Conway, 1990).</p>			
Special lighting or acoustics; special or adaptive furniture such as keyboards, larger/anti-glare screens	This accommodation has not been researched using experimental or quasi-experimental studies but there is no evidence that validity is impacted for students who have this accommodation noted	Unsure/ Low Evidence	Use/Low Evidence	Use/ Minor Risk



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	on their individual IEPs.			
Visual magnifying equipment	<p>This accommodation has not been researched using experimental or quasi-experimental studies but there is no evidence that validity is impacted for seeing impaired students.</p> <p>Students who need a magnification accommodation often require extra time (Cormier et al., 2010).</p>	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk Access
Assistive device that does not interfere with the independent work of the student on the multiple-choice and/or essay responses (writing portion of the test) (i.e. handheld optical magnifiers, screen readers, magnification software, speech recognition system, physical supports or assists)	<p>This accommodation has not been researched using experimental or quasi-experimental studies.</p> <p>Many examples of assistive devices to use as accommodations are provided by Salend, 2009.</p> <p>Students with disabilities who used an accommodation as allowed by Washington State (some of which were assistive devices) had higher test results than special education who did not use the accommodations (Johnson et al., 2001b).</p>	Use / Low Evidence	Use/Low Evidence	Use/ Minor Risk
Response Accommodations (e.g., mark answers in book, scribe records response, point, etc.)				
Essay responses dictated to a scribe, audio recorder, or speech-to-text converter and the student provides all	Students who are identified as D/HH may use this accommodation, and a scribe can translate the student's response into English from their	Unsure/low Evidence For Human Scribes	Use/Low Evidence For Human Scribes	Use/ Minor Risk



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<p>spelling and language conventions</p>	<p>primary language ASL. The study does not specify the degree to which the student is responsible for spelling, grammar, and language conventions (Cawthon, 2007).</p> <p>The least used accommodation in 2004-2005 according to 444 participants was the student signing the response-used by 17% of test administrators with at least 1 student (Cawthon, 2007).</p> <p>The dictated response accommodation is one of the more frequently offered by states although not one of the most frequently used by students. Test administrators may find it difficult to provide scribes, contributing to less frequent use. The studies analyzed in this meta-analysis indicated higher scores for SWDs when this accommodation was used. However, one study (Koretz & Hamilton, 2000) noted that the scores were unreasonably high. This accommodation has most frequently been tested with students with learning disabilities rather than students with physical impairments who may clearly need it (Bolt & Thurlow, 2004).</p> <p>Students who used a scribe to transcribe verbatim their responses (with no capitalization or punctuation) and then performed their own</p>	<p>Use/Low evidence For Speech to Text</p>	<p>Unsure/Low Evidence For Speech to Text</p>	<p>Use/ Minor Risk</p>



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	editing outperformed students with disabilities who did not use this scribe accommodation. The authors suggest the need for empirical studies on this accommodation (Johnson et al, 2001b).			
Responses dictated in Manually Coded English or American Sign Language to a scribe for selected-response items (multiple-choice questions)	Thurlow and Bolt, 2001) recommend the use of a computerized assessment over a scribe accommodation if students can effectively use a computer.	Use / Low Evidence	Unsure/Low Evidence	Use/Minor Risk
Responses dictated orally, to a scribe for selected-response items (multiple-choice questions)	<p>Thurlow and Bolt (2001) recommend the use of a computerized assessment over a scribe accommodation if students can effectively use a computer.</p> <p>On more innovative problem-solving math tests, students with specific learning disabilities scored significantly higher than students without SLD when given an encoding accommodation—a scribe writes responses for students upon request (Fuchs et al., 2000b).</p> <p>Limitations of current SWD research: accurate identification (i.e. whether a disability exists) and classification (i.e. which disability is present) of students; consensus on appropriateness of various accommodations; accommodations for SWD when the disability is related to the measured construct; and issues related to test design (i.e. item/test bias, test difficulty, and</p>	Use / Low Evidence	Unsure/ Low Evidence	Use/ Minor Risk



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	<p>optimal test format) (Koretz & Barton, 2003-2004).</p> <p>This accommodation was considered irrelevant on performance of MC items; while outcomes on open response items were implausibly high in a 1995 assessment though not on a 1997 test (Koretz & Hamilton, 1999).</p> <p>This accommodation may be especially effective for SWDs when used in combination with other accommodations such as read aloud and extended time. However, there are validity concerns with this accommodation (Tippets & Michaels, 1997).</p> <p>32 out 48 states with standardized assessment allow this accommodation. Several studies suggest that this accommodation impacts scores of SWDs (MacArthur & Graham, 1987).</p>			
<p>Word processing software with spell and grammar check tools <u>enabled</u> on the essay responses writing portion of test (if grammar, spelling, or language conventions is not the intended construct)</p>	<p>If future literature indicates safe to use, this should be made available to all students.</p> <p>Hollenbeck et al. found significant difference in scores on writing test (rating for Item/Content, Organization, Voice, Word Choice, Sentence Fluency, and Conventions), with students having spell/check scoring higher. When spelling was a</p>	<p>Unsure / High Evidence</p>	<p>Use/Low Evidence</p>	<p>Use/High Risk</p>

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	<p>criteria, ALL students demonstrated better performance with spell/check (Hollenbeck, Tindal, Harniss, & Almond, 1999).</p>			
<p>Setting Accommodations (e.g., study carrel, student's home, separate room, etc.)</p>				
<p>Noise buffers (e.g., individual carrel or study enclosure, ambient noise/music)</p>	<p>This accommodation has not been researched using experimental or quasi-experimental studies but this accommodation addresses test setting and can be addressed in test administration protocol.</p>	<p>Use/Low Evidence</p>	<p>Use/Low Evidence</p>	<p>Use/ Minor Risk</p>
<p>Test individual student separately, provided that a test examiner directly supervises the student</p>	<p>An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test directions rather than listed as possible accommodations (Acosta et al., 2008)</p>	<p>Use/Low Evidence</p>	<p>Use/Low Evidence</p>	<p>Use/Minor Risk Access</p>
<p>Test students in a small group setting</p>	<p>An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test directions rather than</p>	<p>Use/Low Evidence</p>	<p>Use/Low Evidence</p>	<p>Use/Minor Risk Access</p>

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>listed as possible accommodations (Acosta et al., 2008)</p> <p>One of three most widely used accommodations for SD/HH, along with interpreting test directions (3rd most commonly used), and extended time (2nd most used). These are used for both reading and math assessments. (Cawthon, 2007).</p>			
Test administered at home or in hospital by a test examiner (when documented need is provided)	An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test directions rather than listed as possible accommodations (Acosta et al., 2008)	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk
Timing/Scheduling Accommodations (e.g., extended time, frequent breaks, etc.)				
Administration of the test at the most beneficial time of day to the student	An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test directions rather than listed as possible accommodations (Acosta et al., 2008).	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk Access
Supervised breaks (no more than 20 minutes) within a section of the test	An expert panel concurred that accommodations that pertain to test administration (e.g. timing/scheduling and setting—except extra time) should become part of test administration practices rather than listed as possible	Use/Low Evidence	Use/Low Evidence	Use/ Minor Risk Access

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
Extra time on a test within a testing day	<p>accommodations (Acosta et al., 2008)</p> <p>Studies prior to 2007 indicated support for this accommodation, however studies in later years were mixed with one finding that scores were comparable between extended and no extended time studies, and two other studies indicating that students with disabilities did not score higher with extra time. Students who need a magnification accommodation often require extra time (Cormier et al., 2010).</p> <p>The “later years” in Cormier et al. (2010) were 2007-08. Since then 5 studies were published in 2009-2010. Two showed differential benefit to students with disabilities (Lindstrom, 2010; Ricketts, Brice, & Coombes, 2010) and 3 studies did not show differential benefit (Lee, Osborne, & Carpenter, 2010; Lovitt, 2010; Lovitt, Lewandowski, Berger, & Gathje, 2010).</p> <p>The authors suggest there is an interaction between student characteristics and accommodations indicating the need to consider accommodations on an individual basis. For example, the impact of extended time is influenced by a student’s math and reading proficiency. Students with low math ability did not benefit from extra time although higher achieving math students with low reading ability performed</p>	Use	Use/Low Evidence	Use Access

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>better with extended time (Cawthon, Ho, Patel, Potvin, & Trundt, 2009).</p> <p>Extra time often is provided in combination with other accommodations and according to expert consensus, a standard package of accommodation, including extended time was found to be valid and fair (Elliott et al, 2009).</p> <p>General education students benefited more than students with a learning disability in reading; however, the special education students under extended time attempted as many questions as the general education students under normal time (Lewandowski, Lovett, & Rogers, 2008).</p> <p>Second most frequently used accommodation for students identified as D/HH (Cawthon, 2007).</p> <p>Extra time had a greater effect on SWDs than on general education students. It was the most common accommodation Sireci et al. (2003) meta-analysis. Extra time benefits all students but the greatest gains are made by SWDs. (Sireci, Li, & Scarpati, 2003).</p> <p>Some studies found that extended time does not affect the validity of assessments. (Elliott, et al., 2001)</p>			



Accommodations for English Language Learners and Students with Disabilities: A Research-Based Decision Algorithm

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
	<p>Non-SWDs benefited more from this accommodation than did SWD on a test with conventional math content. However, on more innovative problem-solving tests, students with specific learning disabilities scored statistically significantly higher than students without SLD with extended time (Fuchs et al., 2000b).</p> <p>32 out of 48 states with standardized assessments allow this accommodation for many types of disabilities. There is a concern about test validity when using this accommodation (Thurlow et al., 2000).</p> <p>Chiu and Pearson (1999) found extended time to be an effective accommodation for students with disabilities particularly for those with specific learning disabilities.</p> <p>Some studies did not show an effect of extended time for students with disabilities, specifically on language arts assessments (Munger & Loyd, 1991; Fuchs, L., Fuchs, D., Eaton, Hamlett, Binkley, & Crouch, 2000a; Marquart, 2000).</p>			
Test over <u>more than one day</u> for a test or test part typically administered in a single sitting (provided student cannot access	Fletcher et al. (2009) supported benefits for students with limited sustained attention.	Use/Low Evidence	Unsure/Moderate	Use/ Minor Risk

Appendix B.

Overall Decisions for Accommodation Use for Students with Disabilities.

Accommodations For SWDs	Research	Validity Decision	Effectiveness Decision	Overall Decision
<p>questions/answers from previous sitting)</p>	<p>Of the 48 states with standardized assessments, 33 states allow this accommodation with/without certain conditions.</p> <p>5th grade SWDs benefited from multiple day testing, while 8th graders did not (Crawford & Tindal, 2004).</p> <p>DiCerbo, Stanley, Roberts, and Blanchard (2001) found that students tested under a divided-time administration obtained scores significantly higher than those under standard testing conditions and middle and low ability readers benefited more from this accommodation than high ability readers.</p> <p>Thurlow and Bolt (2001) recommend using this accommodation to those who can benefit from it, however, they indicted that this accommodation should be used only when absolutely necessary.</p> <p>Walz, Albus, Thompson, and Thurlow (2000) found that SWDs did not benefit from a multiple-day test administration while non-SWDs did benefit</p>		<p>Evidence</p>	<p>Access</p>



Accommodations for English Language Learners and Students with Disabilities: A Research-Based Decision Algorithm

The Smarter Balanced Assessment Consortium brings together states to create a common, innovative assessment system for Mathematics and English Language Arts that is aligned with the Common Core State Standards and helps prepare students for college and careers. The Consortium involves educators, researchers, policymakers, and community groups in a transparent and consensus-driven process to help all students thrive in a knowledge-driven global economy. The Consortium's projects are funded through a four-year, \$175 million grant from the U.S. Department of Education, comprising 99% of activity resources, with the remaining support provided through generous contributions of charitable foundations. Membership is open to any interested U.S. state. For more information, please visit www.k12.wa.us/smarter.