

## **Review of Literature on Accommodations for Students with Disabilities in Statewide Tests**

The District of Columbia’s Office of the State Superintendent of Schools (OSSE) requested a review of the literature regarding accommodations for students with disabilities on statewide assessments by Mid-South Regional Resource Center (MSRRC). This review was conducted to support OSSE’s response to feedback on accommodations for students with disabilities given during the U.S. Department of Education peer review of their state assessment system; and determine where there was evidence that specific accommodations were meaningful and had the intended effect when used by students with disabilities participating in assessments.

The purpose of allowing accommodations for students with disabilities when participating on statewide assessment is “to level the playing field” so that the student’s disability does not impact demonstration of their “true” knowledge, skills and abilities as measured by an assessment (Sireci, Li and Scarpati 2003). Allowing accommodations on state assessments ensures equity, allowing all students to be assessed and their progress or achievement compared. However, the practice of allowing accommodations on a standardized assessment does create many questions or concerns. The most common question found in the literature for study purposes tends to be: do test scores of students taking the assessment with accommodations have the same meaning as test scores of students using no accommodations ? Another common question is how do we know this specific accommodation is effective for students with disabilities? In other words, does the accommodation remove the barriers caused by the disability without giving the student an unfair advantage over peers who do not receive the accommodation?

These two questions have been the focus of many studies, literature reviews and reports. There have been a series of studies focused on effectiveness using a hypothesis known as the Interaction Hypothesis (Sireci et al., 2003; Zenisky & Sireci, 2007). This hypothesis proposes that students with disabilities will benefit to a greater degree from accommodations than students without disabilities. Over the years, in attempting to verify this hypothesis, it has evolved to demonstrating that students with disabilities who need the accommodation benefit to a greater degree than those who do not need the accommodation (Sireci et al., 2003). Proving this effect, that is proving that the interaction hypothesis is accurate, is one standard for determining that the accommodation is effective for the right group of students and not providing an unfair advantage.

The second question about valid scores resulting from using accommodations leads into many other questions, with the real focus being what accommodations work for what type of student? Answering this question will assist test developers, test administrators and educators in selecting appropriate accommodations for students.

Overall, research on most accommodations is sparse and not necessarily empirically sound. There are many challenges to studying test accommodations for students with disabilities. First, there is the wide range of student characteristics of those needing or receiving accommodations. Although it is a relatively small population compared to all students, the diversity within the group of students with disabilities is wide. The Individuals with Disabilities Education Act (IDEA) identifies 13 different disability types, each of which has their own set of characteristics and commonalities. The diversity in the student populations presents many challenges to conducting and replicating empirical studies. Second, experimental studies with control groups are difficult to achieve when testing is high stakes and required by law. In addition, issues such as sample size, and consistency in the implementation of accommodations complicate the methodology for conducting these studies. The studies or research on accommodations include experimental studies, quasi-experimental and non-experimental (Zenisky & Sireci, 2007). Zenisky and Sireci (2007) state that experimental studies are characterized by random assignments of participants to at least one experimental condition. In contrast, the quasi-experimental studies do not involve random assignment to any condition; instead are predicated on analyses of intact groups. The non-experimental studies do not entail group comparisons or experimental manipulations of accommodations use.

With all that being said, there is evidence that certain accommodations are effective for students with disabilities, result in comparable results, and do not provide an unfair advantage to students with disabilities. The rest of this paper will discuss the specific accommodations the OSSE allows on their assessments and the research that supports the accommodation usage.

### **Braille Materials**

Johnson, Kimball, Brown and Anderson (2001) found that students with disabilities benefited from accommodations and that using accommodations did not create an unfair advantage. They studied multiple accommodations for students with disabilities including the use of braille in the content areas of listening reading, writing and math on a state assessment. Their review showed that students with disabilities who received the identified accommodation scored better than students with disabilities who did not receive the accommodation; however students without disabilities outperformed all students with disabilities. This supports the hypothesis that the

accommodation will allow the student to more accurately demonstrate what he or she knows and can do thereby supporting the Interaction Hypothesis.

### **Magnifying glass**

Karmer-Hannan (2008) noted that magnification, while effective, was always paired with extended time; therefore, the use of one or the effectiveness could not be separated. The study also noted that as the magnification increased, so did the amount of extended time required to complete the exam.

### **Place markers to maintain place**

Elliott, Kratchowill and McKeivitt (2001) evaluated the effects of IEP defined accommodations on the performance of students with disabilities on constructed response items for math and science. Marking the task book to maintain place was one of the accommodations studied. Results indicated that students with disabilities scored better on the accommodation condition relative to their performance on the standard condition. All students (with and without disabilities) did better on the accommodated versions of the tests, but students with disabilities exhibited greater gains than students without disabilities, again supporting the Interaction Hypothesis.

### **Reading Test Questions**

The most extensive bodies of literature exists on this accommodation, therefore this discussion will be divided into several sections to ensure clear understanding. First, the accommodation of reading aloud the reading comprehension items is considered by most to be a modification that constitutes a nonstandard administration impacting the construct validity of the assessment, studies related to this accommodation are not included in this review. However, there are many studies that look at oral presentation of material in content areas such as math, science, social studies, writing, as well as reading of questions in the reading section of an assessment. Oral presentation formats include a human reader, computer readers, audiocassette and even video using the computer. Many of these studies noted that the oral presentation accommodation was accompanied by extended time (and in one study, over multiple sessions) and that the effect of the accommodations could not be separated.

#### *Oral Presentation of Reading Tests*

Bolt and Belinski (as cited in Zenisky & Sireci, 2007), Bolt and Ysseldyke (2006), Huynh and Barton (2006), Harris (as cited in Cormier, Altman, Shyyan, & Thurlow 2010), and McKeivitt and Elliott (2003) all studied the read-aloud accommodation for students with disabilities in the

reading section of the assessment (reading test questions, directions, or items other than comprehension passages) and found no statistical support of its effectiveness as an accommodation or that it resulted in comparable results. However, Fletcher et al. (2006), DiRosa (as cited in Cormier, Altman, Shyyan, & Thurlow 2010), and Johnson, Kimball, Brown and Anderson (2001) did find that students with disabilities benefited from the read-aloud accommodation on the reading test. DiRosa (2007) found the audio cassette helped some students some of the time, leading to more questions about determining who really needs the accommodation. Helwig's study (2002) demonstrated mixed results. The study found that students with disabilities in elementary school performed better with a read-aloud than their nondisabled peers, supporting the interaction hypothesis, however no difference was found with students in middle school. In one study, by Fuchs et al. (2000), students read aloud the reading section and the effect was positive. However, due to the nature of this accommodation, having the student read aloud, the test was individually administered and again, the results of the two accommodations cannot be separated. In general there were very mixed results for oral presentation of the reading tests even without reading the content. It should be noted that no study found negative effects for students with disabilities.

#### *Oral Presentation of Math Tests*

Sireci et al. (2005), through a meta-analysis of many studies, concluded that oral accommodations tend to have a positive effect on the scores of students with disabilities in mathematics and that the use of this accommodation may lead to more valid interpretation of the math achievement of students with disabilities. Janson (as cited in in Zenisky & Sireci, 2007) reviewed test results for students who took an un-accommodated assessment and then, once identified as a student with a disability, took an accommodated version and noted positive effects. Weston (2002) noted that the read-aloud accommodation for math improved performance on word problems more than on calculation problems; and that the accommodation of read-aloud helped those with poor reading efficiency the most. Ketterin-Geller, Yovanoff and Tindal (2007) found that students with lower reading skills received a differential benefit from read-aloud accommodations on items with high math difficulty and high linguistic complexity, but did not benefit from a simplified language accommodation. Other studies also found positive effects for the use of read-aloud in math including Weston (2003), Huynh, Meyer and Gallant (2004), Calhoon, Fuchs and Hamlett (2000), Bolt and Thurlow (2007), and Johnson (2000). Huynh et al. (2004) concluded that the read-aloud for math helped level the playing field for students with disabilities. Calhoon et al (2000) studied three read-aloud accommodations (read-aloud by teacher, read-aloud by computer and video on computer) and found all three to have statistically significant effects on the performance of students with disabilities. They also noted that students preferred one of the computer administrations over the teacher read-aloud.

Hansen, Lee and Forer (2002) studied a computer based administration that read the test to students with a small group of students with visual impairments and found it had potential for creating more independence in the testing situation than dependence on a human reader.

#### *Other content areas*

Most studies of oral accommodations looked at either math or reading, however, a few also explored other content areas. Janson (as cited in in Zenisky & Sireci, 2007) found positive effects for a read-aloud accommodation in science and social studies as well as math. Huynh, Meyer and Gallant-Taylor (as cited in Johnstone, Altman, Thurlow, & Thompson 2006) found that oral accommodations for students with visual or hearing disabilities positively impacted all content areas. Huynh, Meyer and Gallant (2004) also found positive effects for read-aloud in writing tests. On a science test, Dolan et al. (as cited in in Zenisky & Sireci, 2007) found that computerized oral testing demonstrated increased results over paper tests when passages were no longer than 100 words. Brown (as cited in Cormier, Altman, Shyyan, & Thurlow 2010) noted on a science test that oral accommodations provided a differential boost for those with reading difficulties as compared to those who read at or above teacher expectations.

Several studies were noted in the reading section that did not have positive or desired effects [Bolt and Belinski (as cited in in Zenisky & Sireci, 2007), Bolt and Ysseldyke (2006), Huynh and Barton (2006), Harris (as cited in Cormier, Altman, Shyyan, & Thurlow 2010), and McKevitt and Elliott (2003)]; and several other studies that found no support for the read-aloud accommodation. Meloy, Deville, and Frisbie (2002) found that the read-aloud, although effective for students with disabilities, also affected students without disabilities in a similar manner, therefore not supporting the Interaction Hypothesis. Schnirman (as cited in in Zenisky & Sireci, 2007), on a math test, found the same effect as Meloy et al. No studies found the read-aloud accommodation to have harmful effects, even when the studies did not support the Interaction Hypothesis.

#### **Simplification of Oral Directions**

Wolf (as cited in Cormier, Altman, Shyyan, & Thurlow 2010) found that when students who are deaf or hard of hearing received accommodations including the clarification of directions, the type or degree of hearing loss impacted the results, however the accommodation was effective for some of the students. Elliott et al. (2001) evaluated the effects of a variety of IEP defined accommodations, including the simplification of oral directions, on the performance of students with disabilities on constructed response items for math and science and found that students with disabilities scored better with accommodated condition as compared to their performance with

non-accommodated conditions. Although all students (those with and without disabilities) did better with accommodated conditions, there were greater gains for students with disabilities.

### **Translation of Words and Phrases**

Idstein (as cited in Johnstone, Altman, Thurlow, & Thompson 2006) found the use of dictionaries slowed down weaker students and they became dependent on the dictionary. The study also found dictionary use did not affect the scores of stronger students and had negative effects on the scores of weaker students. However, Johnson et al. (2001) found that students with disabilities benefited from a variety of accommodations, including the translation of words or phrases and that use did not create an unfair advantage.

### **Large Print**

One study by Fuchs et al. (2000) looked at multiple accommodations including large print. They found that on the reading test, large print did not have an impact on students with disabilities more than it did for students without disabilities, thus not supporting its usage. However both Huynh et al. (2002) and Johnson et al. (2001) found that students with disabilities did benefit from large print, and that the use of large print did not create an unfair advantage for students with disabilities.

### **Writing in Test Book**

Wolf (as cited in Cormier, Altman, Shyyan, & Thurlow 2010) found that for students who are deaf or hard of hearing, the type of hearing loss impacted the effectiveness of the accommodation, but concluded writing answers in the test booklet may have a positive impact. Tindal et al. (1998) found no effect on writing in the test booklet for students with or without disabilities.

### **Dictating Response**

Macarthur (2004) found that both using a scribe and using speech recognition software produced higher quality essays for students with disabilities than when handwritten. The use of the scribe was higher quality than the speech recognition software. Johnson et al. (2001) found the use of a scribe to have a positive effect and it did not create an unfair advantage for students with disabilities.

### **Calculators**

Landau, Russell, Gourgey, Erin, & Cowan (2003) found talking tactile tablets for math effective for students with visual impairments. Scheuneman et al. (2002) found that calculators were used

differently by different types of students and effects for students with disabilities were found, but were small.

### **Individual Testing**

Elliott et al. (2001) studied the effects of the IEP defined accommodations, including individual administration, and found positive effects for students with disabilities. Fuchs et al. (2000) also studied multiple accommodations, including individual administration, and found a positive effect for individual administration; however, it was paired with the accommodation of the student reading aloud to himself or herself. As previously found, the effect of one accommodation could not be separated from the other.

### **Test Administration Over Several Days**

Fletcher et al. (2006) found that students with disabilities benefitted from oral accommodations bundles with multiple sessions; however, these accommodations were not separated to study the effect. Walz, Albus, Thompson and Thurlow (2000) found that the multiple day accommodation did not support improved performance for students with disabilities. Neither students with or without disabilities had meaningful gains in performance when taking a test, designed to be administered in one day, over two days. .

### **Extended Time on Subtests**

The research on extended time is extensive, with somewhat mixed results. Sireci et al. (2005) did conclude that extended time tends to have a positive effect on scores of students with disabilities. They also noted that extended time was often accompanied with other accommodations such as Braille, oral administration, or separate testing location. There are a number of studies that demonstrated all students benefitted from extended time (Elliott and Marquat (2004), Mandinach et al. (as cited in Zenisky & Sireci 2007), Lewandowski (2007 and 2008), Fuchs et al. (2000), and Elliott et al. (2001). Zenisky and Sireci (2007) noted there is somewhat of a movement toward untimed tests for all students as part of a larger strategy of integrating universal test design therefore, there might not be a need for studies in this area in the future. The summary of research in 2007 by Cornier, Altman, Shyyan and Thurlow (2007) found that research does not support the use of extended time when looking at the differential boost to support the accommodation for students with disabilities. Lindstrom and Gregg (2007) did find that the scores from extended time assessment are comparable to those taken under standard time. They concluded that the results from both conditions can be interpreted in the same way. The overall general conclusion of the research summaries is that extended time benefits all students, that it is

comparable to administration without extended time, and that it should be considered for all students.

### **Breaks During Subtest**

Wolf (as cited in Cormier, Altman, Shyyan, & Thurlow 2010) found that for students who are deaf or hard of hearing, the degree and type of hearing loss impacts the effectiveness of some accommodations. However, the study did conclude that test breaks were effective for some students.

### **Computer administration**

There is a body of literature studying the administration of high stakes assessments on the computer. Some of these have been discussed in the oral administration section. A series of studies found that the results from computer based tests are comparable to paper tests [Kim and Huynh (2007 and 2008), Lee et al. (2008), Wang et al. (2008) and Puhan et al. (2007)]. In addition, Burch (as cited in Johnstone, Altman, Thurlow, & Thompson 2006), Dolan et al. (as cited in Zenisky & Sireci, 2007) and Calhoun et al (2000) found that computerized assessments increased the performance of students with disabilities. In contrast, Higgins et al. (2005), and Horkey et al. (2006), found no significant benefits of computer-based administration. Burch (as cited in Johnstone, Altman, Thurlow, & Thompson 2006) noted that students with both reading and math disabilities benefit from computer-based administration more than those with only reading disabilities. Hansen, Lee and Forer (2002) studied a computer based administration that read the test to students with a small group of students with visual impairments and found it had potential for creating more independence in the testing situation than dependence on a human reader. In addition, Calhoun et al. (2000) noted that students preferred the computer administration.

### **Conclusion**

The research varies depending on the particular accommodation. In many cases, multiple accommodations were examined, making it impossible to separate the effects for each accommodation. More research is needed in the area of effectiveness of accommodations for students with disabilities on state assessments; however with the emphasis on universal design of assessments what the focus of such research is yet to be determined. The information from this review of the literature should be used in conjunction with other data including the use of accommodations by other states to inform the use of accommodations on the DC CAS.



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