ANALYSIS OF THE EFFECT OF INTELLECTUAL FUNCTIONING ON SCORES OF A STATE ASSESSMENT

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JULIE KATHRYN HARRISON, B.S., M.ED.

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ABSTRACT

JULIE KATHRYN HARRISON

ANALYSIS OF THE EFFECT OF INTELLECTUAL FUNCTIONING
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Across the nation, more than five million students, or approximately 10% of the school age population, are eligible for special education services. These students vary in disability, in programming, and in the severity of the disability. It is possible this variation alone may account for meaningful differences in student performance on state assessments.

The purpose of the study was to determine if there is a relationship between the intellectual functioning and the percentage correct on the State of Texas Assessment of Academic Readiness (STAAR) or STAAR Modified for students receiving services in special education. This study examined 6th, 7th, and 8th grade students in a suburban district in the Dallas/Fort Worth Metroplex who were eligible for special education services. Data from the school district included IQ scores obtained from their most current Full and Individualized Evaluation and 2012-2013 STAAR reporting results in the areas of reading and math.

Results suggested that students with a disability tend to present with lower overall intellectual levels than their peers. It would seem unfair to expect that this subgroup of students should meet the same standard with no allowances for disability-based

modifications. The study further demonstrates that students with disabilities are better able to demonstrate grade level mastery when given a modified test. As state assessment tests become increasingly rigorous and cognitively complex, it may become more difficult for students with disabilities to meet an absolute standard.

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INTRODUCTION

A preliminary study of state assessment results at both the state and national levels indicates that students with disabilities have significant difficulties passing state exams. Indeed, research suggests that the most common reason for a school's lack of academic success was the performance of students receiving special education services. While some students with disabilities are successful on state examinations, the majority of these students are not successful (Eckes & Swando, 2009).

In Texas, 8.6% of all students are currently identified as having a disability requiring special education (Texas Education Agency-Department of Assessment and Accountability, 2011). For a student to be eligible for special education services they must demonstrate underachievement in one or more academic subject area (Wanzek, Al Otaiba, & Petscher, 2014). It is important to note that students in special education vary in disability type and severity, as well as in the kind of services they receive. These students are also educated in varying environments, ranging from spending the entire day in a general education classroom to spending the entire day in a self-contained special education classroom. This variation alone could account for meaningful differences in academic performance.

The No Child Left Behind Law (NCLB) requires that all students with disabilities must participate in state assessments and must be tested on grade level standards either by

taking the same state assessment as their general education peers, by taking a modified state assessment, or by taking an alternate assessment (U. S. Department of Education, 2006). The Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 also requires that all students with a disability will participate in the state assessment. If the student is unable to participate in the general assessment the Individualized Education Program (IEP) team must document the reasons the student needs an alternate assessment (Individuals with Disabilities Education Act 300.320(a)(6)). Until the spring of 2008, Texas used the State Developed Alternate Assessment (SDAA) as its assessment for students in special education who did not take the standard state tests. Under the SDAA system, students with disabilities were tested on their IEP instructional level, rather than their enrolled grade level. In other words, a 7th grade student could take a 5th grade SDAA in reading and a 6th grade SDAA in math, if that is what his/her performance indicated. Additionally, under the SDAA there was no absolute passing standard and each Admission, Review, Dismissal (ARD) committee set both the grade level to be assessed and the passing standard for each subject.

In 2008, Texas began to require that all students with disabilities be tested using enrolled grade level standards. Students who had previously been tested on the SDAA now were tested on Texas Assessment of Knowledge and Skills-Modified (TAKS-Modified) or Texas Assessment of Knowledge and Skills-Alternate (TAKS-Alternate). The new requirements of TAKS-Modified made several significant changes to the education of students with disabilities. First, because it required that all students be tested on enrolled grade level standards, students could no longer be tested using below

grade level material. Second, the Texas Education Agency set absolute passing standards for each test. Similarly, the requirements of TAKS-Alternate significantly changed the assessment of students with significant cognitive delays. This test can only be given to students whose cognitive development is delayed to the point that the student can only access grade level skills through basic or pre-requisite skills.

ARD committees could no longer examine each child's individual needs and determine an appropriate passing score. These changes caused a significant dip in the scores of students with disabilities. Specifically, pass rates in reading dropped from 77% in 2007 to 62% in 2008. Math scores showed an even more serious decline with 74% passing in 2007 and 50% passing in 2008. At the same time, students in general education did not exhibit the same decline. In reading, the pass rate was 87% in 2007 and 88% in 2008. In math the pass rate remained the same with a 79% pass rate for both years (Texas Education Agency-Annual Yearly Progress Results, 2007, 2008).

There have been concurrent changes in curricular requirements in the past few years (Gosnell-Lamb, 2011). Many states have adopted the Common Core Curriculum, which emphasizes more rigor and higher-level thinking (Mathis, 2010). While Texas has not adopted the Common Core, it has adopted a new state test, The State of Texas Assessment of Academic Readiness Test (STAAR). The Texas Education Agency has stated that the STAAR test is more rigorous than previous state tests. It contains more questions and the questions are developed at a higher cognitive level (TEA, 2010). Texas students with disabilities are required to participate in the STAAR test either by taking the regular STAAR, STAAR-Modified, or STAAR-Alternate. Although there are few

differences between the STAAR-Alternate and TAKS-Alternate, there are significant differences between the STAAR-Modified and TAKS-Modified tests, with the new STAAR-Modified being a much more rigorous test. The Texas Education Agency document, Difference Between TAKS-Modified and STAAR-Modified (2012), states that the overall test difficulty is increased by including more rigorous items that assess skills at a greater depth and complexity. Additionally, student performance standards were set at higher levels.

Preliminary STAAR results indicate that only about 10% of students with disabilities would be successful at the recommended standards, and less than 40% of students taking a modified exam would meet the passing level at the recommended levels (TEA-Student Assessment Division, 2012). The United States Department of Special Education has informed states that any assessments based on modified standards cannot be used for to meet the state and federal accountability standards after the 2013-2014 school year (Eckes & Swando, 2009). Thus, students will only have the option of completing the regular STAAR or STAAR-Alternate exam.

Statement of the Problem

The implementation of these new rigorous tests warrants an analysis of the test and its effects on Texas students enrolled in special education. Researchers have questioned the validity of testing students with disabilities on grade level standards (McGrew & Evans, 2004). Additional research indicates that a student's intelligence plays a factor in their achievement. Students with disabilities tend to learn at slower rates than their peers and are more likely to experience difficulty with reading (Reschly & Grimes, 1992). Thus,

there appears to be a need to determine if students' intellectual functioning affects their performance on a state assessment test. This research is important in making policy decisions regarding state assessments for students with disabilities. Based on the definition of special education in IDEIA 2004, one of the basic tenets of special education is "to address the unique needs of the child that result from the child's disability (IDEIA, 2004).

Statement of the Purpose

The purpose of this study is to determine if there is a relationship between a student's intellectual functioning and the student's percentage of correct items on the STAAR Reading and STAAR Math tests. Of particular interest will be (a) to determine if there is a relationship between intellectual functioning and STAAR Reading percentage correct when a student takes the regular STAAR test; (b) to determine if there is a relationship between intellectual functioning and STAAR Math percentage correct when a student takes the regular STAAR test; (c) to determine if there is a relationship between intellectual functioning and STAAR Reading percentage correct when a student takes the STAAR modified test; and (d) to determine if there is a relationship between intellectual functioning and STAAR Math percentage correct when a student takes the STAAR modified test.

Definition of Terms

Definitions of terms as they relate to the study are as follows:

Academic Excellence Indicator System (AEIS). AEIS is a report that is published annually that provides state, district, and school level information regarding student performance (TEA, 2012b).

Adequate Yearly Progress (AYP). The minimum level of performance standard established by the federal government that monitors the educational growth at the school and district level (TEA-Department of Assessment and Accountability, 2012).

No Child Left Behind Act of 2001 (NCLB). The revised version of the Elementary and Secondary Education Act of 1965 and 1994 that was signed into law on January 2, 2002 (U. S. Department of Education, 2006).

State of Texas Assessment of Academic Readiness (STAAR). The assessment system for the state of Texas that measures student academic performance in grades 3 through 11. It replaced Texas Assessment of Knowledge and Skills and was implemented in 2012 (TEA, 2010).

State of Texas Assessment of Academic Readiness Modified (STAAR-M). An alternate assessment system for the state of Texas that is based on modified academic achievement standards (TEA, 2010).

Special Education. Instruction that is specifically designed, at no cost to parents, to address the unique needs of a child with a disability to ensure access to and progress toward the general education curriculum ("Individuals With Disabilities Education Improvement Act," 2004).

Texas Education Agency (TEA). A state agency which provides leadership, guidance, and other resources to assist schools in meeting the needs of their students.

Texas Essential Knowledge and Skills (TEKS). The required minimum curriculum standards for all students to achieve grade level goals provided by the Board of Education in the State of Texas.

Research Questions

The intent of this study is study is to gain information about scoring process on statewide achievement tests for individuals with disabilities. The research questions are as follows:

1. What is the relationship between intellectual functioning and STAAR Reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
2. What is the relationship between intellectual functioning and STAAR-Modified Reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
3. What is the relationship between intellectual functioning and STAAR Math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
4. What is the relationship between intellectual functioning and STAAR-Modified Math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

Assumptions

The following assumptions were identified for this study:

1. All sixth, seventh, and eighth grade students performed at their best on the STAAR tests.
2. All students did their own work on all tests.
3. The STAAR and STAAR-Modified tests are accurate measures of reading and math knowledge and skills.
4. The testing data used is reliable.

Limitations

1. This study was limited to one suburban Texas district, so results may not generalize to other districts or other states that do not have similar state assessment systems.
2. This study is limited to eligible students in Special Education in grades 6, 7, and 8. Results may not be representative of all grades tested.
3. The study is ex post facto, so results are limited to the information captured within the suburban district used in the study. For instance, no data on intellectual functioning is available on students not enrolled in Special Education. Thus, comparisons cannot be made across students enrolled in Special Education and those not enrolled.
4. STAAR tests are undergoing changes in scoring and administration, so assessment results may not be representative of future years.

5. The STAAR-Modified test described in this study is ending with the 2013-14 school year. The new modified test, STAAR-A may or may not provide comparable results.

Significance of the Study

Parallel movements between a more rigorous standards-based assessment and increasing accountability for students with disabilities have created discord in the educational environment. It is important for students with disabilities to have a place in both assessment and access to the general education curriculum but the assessment of academic progress is a challenging topic.

CHAPTER II

REVIEW OF LITERATURE

A review of the current literature, both in Texas and at the national level, suggests that academic accountability has become a major focus in identifying successful schools. The most common reason for a schools' failure was due to the performance of the students with disabilities (Eckes & Swando, 2009). Many states, including Texas, report that over 70% of students with disabilities are unsuccessful on state accountability assessments (McGrew & Evans, 2004). Some students with disabilities can be successful on state assessments, many are unable to meet the required passing standards (Thurlow, Quenemoen & Lazarun, 2011). In many instances, the scores of students with disabilities on state assessments are the reason that a school fails to achieve Adequate Yearly Progress (AYP) as defined by the No Child Left Behind (NCLB) law.

Across the nation, there were 6.4 million students, or approximately 13% of the school age population, are eligible for special education services (National Center for Education Statistics, 2014). In 2011, 8.6% of students in Texas qualified for special education services (TEA-DAA, 2012). These students vary in disability, in programming, and in the severity of the disability. It is difficult to discuss the performance of this subgroup without acknowledging the varieties of disabilities in this group of students. This variation alone may account for meaningful differences in student performance on state assessments.

The No Child Left Behind Law recognizes the many variations in the abilities of students receiving services in special education and requires students with disabilities to participate in state assessments in three primary ways, (1) participation in the general assessment without accommodations, (2) participation in the general assessment with accommodations that would not affect the validity of the test, and (3) participation in an alternate assessment (NCLB, 2001). Each student's Individualized Education Program team must determine the type of assessment the student will take.

No Child Left Behind has limited the number of students with disabilities who may participate in an alternate assessment to 3%. Each state sets specific criteria for students who would be eligible to take an alternate assessment. Federal regulations require that all alternative assessments be based on the student's enrolled grade level standards (Pullin, 2005).

Texas implemented the State of Texas Assessment of Academic Readiness (STAAR) test in 2011. This new, more rigorous, test led to significant decreases in test scores. The scores of students with disabilities showed even greater declines (TEA STAAR Statewide Summary, 2013).

In recent years there has been significant discussion regarding the performance of students with disabilities on state assessments. Numerous educators and researchers have questioned the validity of testing students with disabilities on grade level standards (Fuchs & Fuchs, 1999; Hoxby, 2005). Research by McGrew and Evans questioned the validity of the performance of students with disabilities on state assessments.

> Considerable controversy surrounds the issue of what can and should be expected for these students. Some people argue that the vast majority of students with disabilities, when given appropriate access to high quality curriculum and instruction, can meet or exceed the levels of proficiency currently specified… Others argue that a student's disability will ultimately prevent the student from attaining grade level achievement standards, even when provided appropriate instruction and accommodations. (McGrew & Evans, 2004, p. 3).

The Individuals with Disabilities Education Improvement Act (IDEIA) states that intelligence must be considered as a part of the student's full and individual assessment, which includes an examination of a student's health, vision, social and emotional status, general intelligence, academic performance, communicative status, and motor abilities (IDEA 300.303 (c) (4)). Research indicates that IQ scores currently account for 40% to 70% of expected achievement (Reschly & Grimes, 1992).

The Role of Intelligence in the Assessment of Students with Disabilities

Intelligence is a critical part of the assessment of students with disabilities and is, in fact, used as one of the foundation scores in the eligibility determination of students with intellectual and learning disabilities. Intelligence is one of the areas that must be considered as a part of the student's Full and Individual Evaluation prior to their entry into special education. Although there continues to be much controversy regarding the use of intelligence tests, Neisser (1995) states that IQ tests "predict certain forms of achievement—especially school achievement—rather effectively" (p. 96). However, there are many examples when knowledge about a student's intellectual level has led to

negative consequences, particularly in students with an intellectual disability. Since the 1970s, numerous researchers have documented the "self-fulfilling prophecy," or the more current "expectancy effect" (Babad, 1993; Jussim, Madon, & Chatman, 1994; Spitz, 1999). On the one hand it has shown that teachers tend to lower their expectations for students with disabilities with lower cognitive levels. On the other hand, it is unfair to expect students with disabilities who have lower cognitive levels to meet the strenuous academic demand of grade level material. It is difficult to maintain a balance between these two viewpoints. The researcher must carefully use information about a student's intellectual level.

As a group, the intelligence of students with disabilities shows a wide variance with some students scoring near the top and others scoring near the bottom. Olson (2004) revealed that students with disabilities tend to score in the lower half of the normal curve distribution on intelligence tests. This study was a part of the Special Education Elementary Longitudinal Project that included a nationally representative sample of students with disabilities from 6 to 12 years of age. Over 12,000 U. S. students with disabilities participated in this study.

A second study by Watkins, Lei, and Canivez (2007) focused primarily on the link between intelligence and achievement. This study examined the intelligence and achievement scores of 289 students with disabilities in a test-retest design. Students were tested on the Wechsler Intelligence Scale for Children III (WISC-III) for the intelligence portion of the test and by a combination of tests (Woodcock Johnson Tests of Achievement, Wechsler Individualized Achievement Test, and Kaufman Test of

Educational Achievement) for the achievement portion. This work included the intelligence scores of the test sample with the average full scale IQ of the students being 89.6. Watkins noted that this score was lower than the WISC-III standardization sample but that these results were consistent with other samples of students with disabilities. His results indicated "psychometric intelligence is predictive of future achievement whereas achievement is not predictive of psychometric intelligence" (Watkins, et al, 2007, p. 67). Intelligence tests are primarily designed to predict future performance. Achievement tests are used to determine what a student has already learned.

As a group, students with disabilities learn at slower rates than their peers and more often experience difficulty with reading (McDonnel, McLaughlin, & Morrison, 1997). Researchers examined groups of young adults who were persistently poor readers, accuracy improved readers, and non-impaired readers. This study indicated that students who had "accuracy improved" reading skills tended to exhibit better cognitive skills than students who had difficulty improving reading although both groups had been provided similar instruction. His results found that students' cognitive levels were heavily tied to their abilities to progress in reading (Shaywitz et al, 2003).

Although it is important not to stereotype students with disabilities, it is also critical to understand the importance of students' intelligence in their abilities to achieve grade level standards, particularly those standards requiring higher level cognitive skills. The work of McGrew and Evans (2004) indicates that IQ scores account for 40% to 50% of expected achievement. Although other factors account for 50% to 60% of achievement, the importance of intelligence cannot be ignored.

A review of the Texas STAAR assessment data show some indications that there is a link between intelligence and achievement (TEA Assessment Data, 2013). Students with disabilities are the lowest subgroup in both Math and Reading (TEA-Student Assessment Division, 2013). Those scores appear to substantiate previously mentioned research of Neisser (1995), Watkins et al. (2007), and McDonnel, McLaughlin, and Morrison (1997).

These data present significant challenges for educators. Although it is always the goal that all students will achieve at high levels, it is also critical to find a method that provides useful information about students' progress. This becomes even more critical as Texas adopts tests with increasing rigor and cognitive demands. According to McDonnell, McLaughlin, and Morrison (1997): "The challenge is to design a scoring and reporting system that signals high expectations for performance but still provides useful information about students who may be scoring at the low end of the distribution but still making significant progress" (p. 7).

The preceding review of the literature identifies key issues and concerns regarding the performance of Texas students with disabilities on state assessments. First, students with a disability are, required to participate in state assessment programs. To meet accountability standards, public schools must show academic growth for this group of students. Second, Texas assessment standards have grown increasingly more difficult over time. The assessments for students with disabilities have correspondingly increased in difficulty. Third, the participation requirements for an alternate assessment require documentation that the grade level curriculum has been significantly modified. However, evaluations of the released STAAR-Modified questions show no evidence of curricular

modifications. Many of the questions on the STAAR-Modified are the same exact question as on the non-modified test. The only perceptible modification was a reduction in the number of answer choices from four to three. Finally, research shows that there is a possible link between intelligence and performance.

History of Sociopolitical Events Propelling the Assessments of Students with Disabilities

Educational legislation has always had a place in history, but the rights of students with disabilities were never the focal point in these legislative pieces. Students with disabilities were commonly excluded from attending the public schools in their neighborhood. The options that were available to students with disabilities were to remain home or become institutionalized. These practices remained in effect until the 1970s.

A pivotal piece of legislation for special education was the Education for All Handicapped Children Act in 1975, also known as P. L. 94-142. This legislation came in response to growing concerns on behalf of all students with disabilities. P. L. 94-142 (1975) provided access and protection for individuals with disabilities and their parents by ensuring (1) a right to a free and appropriate public education; (2) an individualized education program; (3) nondiscriminatory identification and evaluation; (4) related services; (5) due process procedures; (6) and the least restrictive environment in which to learn. Education for students with disabilities changed greatly due to P. L. 94-142 and the federal funding that accompanied this law (Education for All Handicapped Children Act, 1975).

P. L. 94-142 (1975) initiated the implementation of the Individualized Education Programs and students' rights to the Least Restrictive Environment. However the effect of P. L. 94-142 was to provide a separate educational system for students with disabilities. While students with disabilities were given access to the same building as their general education peers, they were provided with separate classes, separate teachers, and specific laws that were unique to their specific needs (Turnbull & Turnbull, 1998). Defur reported that the special education programming that was in place in the 1970s primarily focused on how students with disabilities accessed public education and overall equality for students with disabilities. The policies in place were to reform how students with disabilities were included. "In retrospect, a free, appropriate public education was defined as attendance in public schools." (Defur, 2002, p. 204).

Educational changes for students with disabilities continued to evolve as questions of the validity of a separate system of education for individuals with disabilities were raised. In 1990 the Education for All Handicapped Children Act was revised, reauthorized, and expanded and became known as the Individuals with Disabilities Education Act (IDEA). IDEA is widely known as the cornerstone of current special education policy (Vaughnm, Bos, & Schumm, 2006). Special Education is

> A free appropriate public education which emphasizes special education and the related services designed to meet their unique needs to assure that the rights of children with disabilities and their parents or guardians are protected, and to assist state and localities to provide for the education of all children with disabilities (IDEA, 20, U. S. C. § 1400(c)).

Providing educational services in the least restrictive environment for students with disabilities is mandated by IDEA, which states that students with disabilities shall be educated with their peers without disabilities to the maximum extent appropriate (IDEA, 34, C. F. R. § 300.550 (b) (1)). Students with disabilities could only be placed in separate classes or schools when the extent of their disabilities prevented them from receiving an appropriate education in a general education classroom with the provision that supplementary aides and services be provided when appropriate (IDEA, 34, C. F. R. § 300.550 (b) (2)). School districts were required to provide a continuum of services including regular classes, resource rooms, special education classes, special schools, homebound instruction, and instruction in hospitals and institutions to ensure the Least Restrictive Environment for all students with disabilities (IDEA, 34, C. F. R. § 300.551).

The 1997 reauthorization of IDEA made critical changes to the Education for All Handicapped Children Act. The primary focus of these amendments was to strengthen the educational outcomes for students with disabilities (Yell & Shriner, 1997). The United States Department of Education's Office of Special Education Ideas that Work, (2004) stated that "the 1997 Amendments shifted the focus of the IDEA to one of improving teaching and learning, with a specific focus on the Individualized Education Program (IEP) as the primary tool for enhancing the child's involvement and progress in the general education curriculum." (p. 1).

The focus of the IEP included defining long-term goals, further enhancing procedures for evaluation, and utilizing behavior management techniques for all students in special education. The IEP became the tool that measures the accountability of a student's

performance. Defur (2002) stated that such significant improvement in achievement as measured by a student's IEP had never been achieved throughout the history of special education legislation. Defur further stated that the overall progress for students with disabilities was limited due to lower academic expectations and limited access to the general education curriculum. It was the IDEA 1997 resolution that indicated that student participation in statewide accountability programs would increase the opportunity for participation in the general education curriculum, thus elevating the academic expectation for all students.

George W. Bush, in 2001, issued a reauthorization of the Elementary and Secondary Education Act of 1965 that is known as the No Child Left Behind Act (NCLB), P. L. 107-110. This legislation was created in response to low academic performance for all students in the United States and has a primary focus on accountability rather than providing assistance to schools (Yell & Katsiyannis, 2004). No Child Left Behind, Section 101, supported specific performance goals to be reached by 2005-2006, ensuring that highly qualified teachers would be responsible for instruction of all students, students would be educated in all learning environments, and that all students would be expected to graduate from high school. No Child Left Behind (P.L. 107-110) further stated that all students, including students with disabilities, would be expected to perform at grade level in the subject areas of Reading, Math, and Science by 2014 (NCLB, 2001). No Child Left Behind is regarded as the most aggressive high-stakes testing policy ever implemented in the United States (Guisbond, Nell, Schaeffer, 2012.

Following the NCLB law, the last amendment of Individuals with Disabilities Education Act occurred in 2004 and the reauthorized statue was called The Individuals with Disabilities Education Improvement Act of 2004, and is known as IDEIA 2004. This amendment worked to align Individuals with Disabilities Education Act with No Child Left Behind. The Individuals with Disabilities Education Improvement Act 2004 revision specifically addresses the individual rights of students with an emphasis on their right to access the general education curriculum and participate in state and district assessments. Students with disabilities were no longer allowed to be excluded from the general assessment system. Schools and states were now required to report the performance data for all students, including students with disabilities (Elliot & Thurlow, 2006). IDEA requires that the performance of students with disabilities be reported as a part of the accountability requirements for Adequate Yearly Progress (AYP). The No Child Left Behind requirements were much more rigorous and many states were forced to revise and reexamine the current assessment procedures in place (Linn, Baker, & Betenbenner, 2002).

No Child Left Behind's concept of AYP was to ensure "that every school is on a trajectory such that all of its students will reach proficient achievement in a finite and relatively short number of years" (Hoxby, 2005, p. 81). AYP requirements apply to all students and the performance of one subgroup can result in a school not meeting AYP requirements. Pullin (2005) reports that schools that are typically high performing can be determined to be low performing by missing AYP solely on the scores of students with disabilities on statewide assessments.

IDEIA 2004 has strict procedural requirements regarding state assessments. It asserts that the IEP must include a statement of the individualized accommodations that are needed to measure the overall academic achievement and the student's functional performance on all state and district-wide assessments. In addition, if an alternate assessment is to be used, a statement of why the student cannot participate must also be noted (Wright & Wright, 2007).

While IDEA ensures that every student with a disability must participate in state assessment, NCLB requires that the scores of students with disabilities be disaggregated as a single subgroup along with the four racial/ethnic subgroups, economically disadvantaged students, and students with limited English proficiency. For a campus or district to meet AYP academic standards, each subgroup must meet the absolute standards. Prior to NCLB, the performance of students with disabilities was not a standalone subgroup. One of the greatest concerns of educators is the constant struggle to raise the achievement levels of students with disabilities to proficiency. Academic improvement and the struggle to obtain grade level achievement for students with disabilities encompass many different student and educator needs. These are specific student challenges related to the disabilities, and grade level curriculum specific for the varying student levels (McGrew & Evans. 2004).

History of Assessment Choices for Texas Students

In 1984, the Texas legislature passed a comprehensive education reform law mandating sweeping changes in state education with House Bill 72. This movement mandated the testing of all students in odd numbered grades with the Texas Educational

Assessment of Minimum Skills (TEAMS) being implemented in 1985. Students were tested in English/Language Arts and Math. High school students were required to pass the "exit level" version of TEAMS in order to receive a diploma. Students with disabilities were not required to participate in this test and their scores were not reported to the state. This test was of basic skills only and had little academic rigor (Cruse & Twing, 2000).

1990 state law began requiring the implementation of a new criterion referenced test, the Texas Assessment of Academic Skills (TAAS). This test shifted the focus from basic skills to academic skills (TEA Technical Digest, 2010). The TAAS was developed to measure how students were performing on the Texas essential elements (Cruse & Twing, 2000)

1997 involved a major shift in Texas' education of students with disabilities with the passing of House Bill 1800 by the 75th Texas Legislature. Prior to the passage of this bill, Texas had allowed each individual student's Admission, Review, and Dismissal (ARD) committee to determine the appropriateness of taking the state assessment test, but the score of any student with disabilities who took the state test was automatically disaggregated from any public reporting. This bill now required that the scores of any student with disabilities who participated in the TAAS test be included in the school's accountability with all other students. This bill also set up provisions to develop an alternate assessment for students with disabilities who would not be participating in the TAAS test (House Bill 1800, 1997).

Although state reporting during the 1990s saw the inclusion of the performance of students with disabilities, most students receiving services in special education were exempted from taking the test based on their Admission, Review, Dismissal (ARD) team meeting. In 1994, 9.9% of Texas students were identified as receiving special education. The 1993-94 Academic Excellence Indicator System (AEIS) data revealed that 7.3% of Texas students were ARD exempted from taking the test. While special education scores from students receiving services in special education are indeed shown, the AEIS scores represent less than 30% of all students in special education. These scores represent less than 30% of all students receiving services in special education. Their scores were still far below their peers in general education. In all areas tested, less than half of the students receiving services in special education were successful on the test. The 1990's did not show any significant increase in the performance of students with disabilities who actually participated in the TAAS test (TEA, 2012b).

State Developed Alternate Assessment (SDAA) was introduced in 2001. The SDAA provided assessments that were administered to eligible students in special education. The SDAA was developed for students who the IEP team determined were likely not to be successful on the state test. A key tenet of the SDAA was that it allowed students with disabilities to be tested on performance level standards instead of assigned grade level standards. For example, a student in the 7th grade could be tested on 4th grade level standards. The IEP team would examine the grade level objectives in the student's IEP to determine the appropriate grade level for state assessment (Essortment, 2011). One other important factor regarding the SDAA was that it allowed the ARD committee the ability

to determine the passing standard for each individual student. The ARD committee had the authority to determine the level of achievement that a student would need to pass the test. The ARD committee could recommend one of three achievement levels. Students could demonstrate "beginning skills," "developing skills," or "proficient skills" on the SDAA. If the student met the level set by the ARD committee, the student was counted as proficient on the state assessment (TEA Technical Digest, 2010). If the ARD committee determined that neither the SDAA nor the TAKS was appropriate, the district had the option to give the student a Locally Developed Alternate Assessment (LDAA). The state gave no specific guidelines for the development of the LDAA, but districts were required to report student results.

Beginning in the 2002-2003 school year, students in Texas began taking a new test, the Texas Assessment of Knowledge and Skills (TAKS) test. The TAKS test measured the statewide curriculum and was designed to be a more comprehensive test than its predecessors. Students with disabilities were eligible to take the TAKS test, the SDAA, or an LDAA. As TAKS was a significantly more rigorous test than the TAAS test. Many students with disabilities continued to take the SDAA test (Patterson, 2002).

The SDAA results were included as a part of the state reporting and this inclusion caused a significant increase in scores. In previous years, less than half of Texas students with disabilities were proficient on the state exam. In the seven years that the SDAA was implemented, 70-80% of students with disabilities were shown as proficient on their state test with passing rates for students who only took the SDAA exceeding 80% in both

Reading and Math. However, over half of all students with disabilities took the SDAA and were not taking the same test as their peers (TEA, 2012b).

The final year for SDAA testing was 2007 as Texas was required to change its testing program to meet federal requirements at that time. Students with disabilities were now required to be assessed on grade level standards. Assessment choices for students with disabilities included the TAKS (standard state assessment), TAKS Accommodated, TAKS Modified, and TAKS Alternative.

TAKS Accommodated is a general assessment based on the same grade level academic achievement standards as TAKS, but includes format changes (larger font, fewer items per page) and contains no embedded field-test items. The TAKS Accommodated had no changes in rigor or cognitive complexity (TEA-TAKS Resources, 2013).

In 2008, the TAKS Modified assessment was administered for the first time to meet federal accountability requirements. TAKS Modified was an alternate assessment based on modified grade level academic achievement standards. TAKS Modified was designed for students receiving special education services who met certain participation requirements (TEA-Student Assessment, 2012).

TAKS-Alternate (TAKS-Alt) was administered for the first time in 2008. TAKS-Alt was an alternate assessment based on alternate grade level achievement standards and was designed for students with significant cognitive disabilities (TEA Technical Digest, 2010).

In the spring of 2012, Texas began using a new, even more rigorous assessment, the State of Texas Assessments of Academic Readiness (STAAR). For the STAAR test, students receiving services in special education would have three basic choices for state assessment that would be determined by their ARD committee. Students may take the regular STAAR with or without allowable accommodations. Accommodations for the regular STAAR test in no way invalidate the results. Students who meet certain participation requirements may take one of two alternate assessments. However, NCLB regulations limit the number of passers resulting from alternate assessments that can be included in the district AYP. This limit on proficient alternate assessment results is referred to as the AYP federal cap. The federal cap is applied to the two types of alternate assessments. Alternate assessments based on modified academic achievement standards are subject to a two percent cap (STAAR-Modified). Alternate assessments based on alternate achievement standards for students with the most significant cognitive disabilities are subject to a one percent cap (STAAR Alternate). These tests were given for the first time in the spring of 2012 (TEA, 2013).

Although the STAAR was a new test with no reliability or validity information, Texas was still required to report scores to NCLB. For AYP purposes, TEA created a method to "bridge" STAAR results to the previous TAKS test. These scores were not considered the actual passing scores but were computed solely to meet AYP requirements. Due to this method of bridging scores, an analysis of the AYP Bridge STAAR test results did not show a performance drop as would have been expected from a more rigorous test. In fact, the percentage of passers on the TAKS and the STAAR were almost identical. In

Reading, 88% of all students passed the TAKS in 2011; an identical 88% passed the STAAR in 2012. In Math, 84% of students passed the TAKS in 2011 and 83% passed the STAAR in 2012. For students with disabilities, scores also stayed the same for both years, with 67% of students passing Reading and 63% passing Math (TEA AYP Results, 2011-2012). While there was an expectation that the STAAR results would be much lower than TAKS, this expected disparity was ameliorated by a significant manipulation of the passing standard for the STAAR test. In many cases, students "passed" the test with less than 40% of items answered correctly. Clearly, the lowering of the passing standard created an artificial picture of student success on the test. This is particularly problematic for the STAAR-Modified results. With only three answer choices, it is statistically possible to score 33% correct just by guessing. When a passing standard is set at 38%, little knowledge is actually gained regarding students' knowledge of grade level curriculum. The passing standards for many STAAR-Modified subject tests were set so that students could correctly answer less than half the questions and still pass the test.

In January 2013, TEA released the actual performance standards and scores for the STAAR test. STAAR results were set at much lower "phase-in" standards for the 2011-2012 school year. Special education scores are especially problematic when STAAR results are examined at the more rigorous "recommended" standards that will be in place in 2016. As an example, on the 3rd grade Reading test, 36% of students with disabilities passed the test at the lower standard. If the actual recommended standard had been in place, only 10% of these students would have passed the test.

A Comparison of the TAKS Test and the STAAR Test

The implementation of the STAAR test caused significant curricular changes for students in Texas. While both the TAKS and STAAR are based on the same Texas Curriculum, the STAAR is a much more rigorous test and the tested concepts are at a deeper level than students have previously experienced. TEA reports the following differences between the TAKS Assessment Program and the STAAR Assessment Program:

- STAAR Assessments will increase in length at most grades and subjects.
- Overall test difficulty of the STAAR will be increased by including more rigorous items.
- The rigor of STAAR items will be increased by assessing skills at a greater depth and level of cognitive complexity than on the previously administered TAKS. In this way, the test will be better able to measure the growth of higher achieving students (TEA: A Comparison of Assessment Attributes Texas Assessment of Knowledge and Skills (TAKS) to State of Texas Assessment of Academic Readiness (STAAR), 2010).

Many of these same differences are seen when examining key differences between the TAKS-Modified and the STAAR-Modified. However, the changes made the STAAR-Modified test a much more rigorous test than TAKS-Modified. The TEA, lists the following changes from the TAKS-Modified to the STAAR-Modified:

- Overall test difficulty on the STAAR-Modified is increased by including more rigorous items, which assess skills at a greater depth and level of cognitive complexity.
- The number of items on each STAAR-Modified test has increased.
- The performance standards for each grade and subject on the STAAR-Modified test require a higher level of student performance.
- A new method for determining answer distractors was developed and less viable distractors are no longer used.
- Fewer modifications have been made that limit the number of steps and/or operations required for multi-step problems in mathematics and science.
- Complex numbers are retained in STAAR-Modified mathematics items when calculations are not required. (The TAKS-Modified test simplified the number of variables and the complexity of numbers.)
- In writing, students are now required to specifically respond to prompts. On TAKS-Modified, students were able to write generic responses.
- "Make no change" or "No revision needed" options are now included as answer choices.
- The complexity of sentence structure and vocabulary is only slightly modified. The TAKS-Modified test made significant changes to sentence structure and vocabulary (TEA Differences between TAKS-Modified and STAAR-Modified, 2011).

Perhaps the best analysis of the rigor and difficulty of the STAAR-Modified would be an examination of questions on the test. While TEA maintains absolute secrecy on the actual items on the tests, it does publish sample questions for each grade level and subject. In a side-by-side comparison, there are only slight differences between the STAAR and the STAAR-Modified, and in many questions there were no differences at all (TEA STAAR Released Test Questions; STAAR Modified Released Test Questions, 2012). It would appear that the primary difference between STAAR and STAAR-Modified test questions is in the number of answer choices. STAAR has four answer choices; STAAR-Modified continues to have only three answer choices. This modification alone can amount to a higher score as it improves a student's chances of guessing a correct answer.

An Analysis of Assessment Choices for Texas Students

It is the responsibility of each student's ARD committee to determine the appropriate assessment for students with disabilities. This decision must be based on the student's IEP. The basic choices are STAAR, STAAR with accommodations, STAAR Modified, and STAAR Alternate. The first choice must always be the regular STAAR and it is the assumption that most students will complete that version of the test.

The STAAR-Alternate test is for students with the most significant cognitive disabilities. These students are unable to participate in other statewide assessments even with substantial accommodations. Unlike the other statewide assessments in Texas, STAAR Alternate is not a traditional paper or multiple-choice test. Instead, this assessment involves test administrators observing as students complete state-developed

assessment tasks that link to the grade level or high school course Texas Essential Knowledge and Skills (TEKS) curriculum. TEA Criteria for participation in STAAR Alternate is very specific and includes the following:

- The student must have a significant cognitive disability that is affecting the ability to reach grade level expectations. Students with a learning disability are not eligible to take STAAR Alternate. Additionally the student primarily demonstrates knowledge and skills through performance tasks. The student may be able to perform some literacy skills (e.g., tracing words, copying spelling words, completing simple worksheets, writing simple phrases or sentences). However, the student is typically evaluated by methods other than paper and pencil, such as observation of student performance while the student manipulates items, verbalizes responses, eye gazes, or activates an augmentative communication device.
- The student must require support to access grade level curriculum. To access the state-mandated grade level or course curriculum, the TEKS, a student with a significant cognitive disability needs specialized academic instruction as well as support throughout the day in areas such as expressing his or her needs, getting from place to place, eating lunch, negotiating social situations, and/or taking care of personal needs.
- The student requires intensive, individualized instruction in a variety of instructional settings. The student needs specialized academic instruction and techniques over a period of time to ensure that he or she can learn, retain

information, and transfer skills to other settings. The student can only access and participate in the grade level TEKS through prerequisite skills and primarily demonstrates knowledge and skills through performance tasks. The student may be able to perform some literacy skills (e.g., tracing words, copying spelling words, completing simple worksheets, writing simple phrases or sentences). However, the student is typically evaluated by methods other than paper and pencil, such as observations, eye gazes, or activates an augmentative communication device (TEA STAAR Alternate Participation Requirements, 2013).

AYP regulations limit the number of students who can participate in STAAR-alternate to one percent of the total population. Indeed, TEA data indicate that the number of students who participate in STAAR-Alternate is slightly less than one percent. Students who take the STAAR-Alternate are usually very successful and over 96% demonstrate proficiency in both Reading and Math (TEA-Student Assessment Division, 2013).

If the ARD committee indicates that a student is to take a modified state assessment, TEA again stipulates strict standards for eligibility. TEA has set the following criteria for the STAAR Modified assessment:

- The student's Present Level of Academic Achievement and Functional Performance statements indicate that the student is multiple years below his grade level peers and is unable to progress at the same rate or rigor of his peers.

- The student's standards based IEP indicates that the student accesses grade level curriculum through modifications that change, lower, or reduce grade level expectations.
- In order for the student to progress in the grade level or course curriculum, instruction must be direct (small group or individualized) and intensive (continuous and focused). The student needs specialized instruction and techniques over a period of time to acquire and apply academic knowledge and skills. In addition, the student needs frequent reminders to transfer knowledge and skills to other contexts (TEA, 2013b).

While the number of STAAR-Modified tests administered is subject to the student's ARD committee, the number of eligible passers for AYP purposes is limited to two percent of the total population. In grades 6, 7, and 8 (the grades of interest in this study), approximately 3.5% of all students take the STAAR Modified test in Reading. This accounts for approximately 41.5% of all students in special education in these grade levels (TEA-Student Assessment Division, 2013). In Math, the number of STAAR-Modified test takers is more than 3.8% of all test takers, with approximately 43% of all students in special education taking the modified test.

TEA STAAR-Modified results indicate that only 31.8% of all STAAR-Modified testers passed the Reading test in grades 6, 7, and 8 at the 2016 recommended level. STAAR-Modified Math testers scored slightly lower with 30.3% of students being successful on this test at the recommended passing rate. It is speculated that these

percentages would be lower if the overall percentage of students was closer to the Federal two percent guideline (TEA-Student Assessment Division, 2013).

The third and final choice for Texas students in special education is to take the regular STAAR test or the STAAR test with accommodations. Slightly more than half of students in special education in grades 6, 7, and 8 take the regular test. However, their scores indicate the struggle these students are facing. Only 9.5% of students with disabilities who took the regular STAAR test were successful in Reading at the recommended level. The passing rate of their peers was more than four times this level with a Reading pass rate of approximately 40.1%. Students with disabilities also struggled on STAAR Math. They achieved a passing rate of 9.6% as compared to an approximate 35.5% Reading pass rate of students without a disability (TEA-Student Assessment Division, 2013).

CHAPTER III

METHODOLOGY

Data collected for this research will answer the research questions regarding the relationship between the intellectual functioning and percent correct on the STAAR Reading and Math test for students in the 6th, 7th, and 8th grades for the 2012-2013 academic year. In addition, information will be used to determine if IQ can be used as a predictor for percentage correct.

Purpose of the Study

The purpose of this study is to determine whether students with low IQ scores and receiving services in special education. Of particular interest is (a) if there is a relationship between intellectual functioning and STAAR Reading percentage correct when a student takes the regular STAAR test; (b) if there is a relationship between intellectual functioning and STAAR Math percentage correct when a student takes the regular STAAR test; (c) if there is a relationship between intellectual functioning and STAAR Reading percentage correct when a student takes the STAAR modified test; and (d) if there is a relationship between intellectual functioning and STAAR Math percentage correct when a student takes the STAAR modified test.

Research Questions

The intent of this study is to gain information about scoring outcomes on statewide achievement tests for individuals with disabilities. The research questions for the study are as follows:

1. What is the relationship between intellectual functioning and STAAR Reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
2. What is the relationship between intellectual functioning and STAAR-Modified Reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
3. What is the relationship between intellectual functioning and STAAR Math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
4. What is the relationship between intellectual functioning and STAAR-Modified Math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

Procedure

A request for permission to review district STAAR result data and student IQ's was submitted to the Deputy Superintendent with the school district. Approval was granted from the Deputy Superintendent and was approved by the Texas Woman's University Institutional Review Board (IRB) and the dissertation committee. Upon approval of the IRB, data collection in the district commenced. To maintain confidentially, the district used for the purpose of this study will be known as "a suburban district located in the Dallas/Fort Worth Metroplex." The approval letter granted by the district is a part of the file in the IRB office of Texas Woman's University.

Data was collected from 6th, 7th, and 8th grade students receiving services special education services in a suburban district located in the Dallas/Fort Worth Metroplex. The study used archival data for the 2012-2013 academic year. Scores were retrieved from the 2013 STAAR results and the student's most current IQ score on record obtained as a part of their Full and Individual Evaluation (FIE) report. Student STAAR scores were accessed from a secure, password protected, electronic file system that stores all assessment scores for students in the school district. Student FIE reports were accessed from a secure, password protected, electronic file system that is utilized to maintain special education records for the school district.

The STAAR data set was pulled from the electronic file system in an Excel spreadsheet. In order to maintain the privacy of all students and to remove any identifiers that might single out individual students, names were removed to maintain an anonymous procedure for examining the data. Student cases were selected based on students receiving services in special education. All students not eligible for special education were removed and deleted from the data set. Local student identification numbers were used to obtain IQ scores through the districts online special education record system. A small group of students did not have an IQ on electronic file. Names were provided through the student ID and IQ's were obtained through their hard copy FIE that is located at a secured records location for special education students in the district. All student names and ID numbers were then hidden for further use.

The STAAR data and IQs were extracted from the reports and entered into an excel spreadsheet and formatted to be run through the Statistical Package for Social Sciences

(SPSS) version 21.0 program, which would carry out the data analysis procedures. The data was saved and stored on a password protected external hard drive. The archival data represented formal assessment information that was collected during the 2012-2013 testing session.

The archival data collected provided student demographics that included a student's status for Economically Disadvantage, Limited English Proficiency, Special Education, Bilingual, English as a Second Language, Gifted and Talented, and At Risk. Student grade at time of testing, race, scaled score, raw score, and percent correct were also included in the data set. While gender information would have been interesting, it was not included in the data set.

Research Design

This quantitative study examined Reading and Math test scores of 6th, 7th, and 8th grade students in two different testing groups. The first group includes students who took the STAAR Reading or Math test. The second group includes students that took the Modified STAAR Reading or Math test. The scope of this research was limited to the Reading and Math test for students in the 6th, 7th, and 8th grades. Students in grades 6, 7, and 8 were chosen because they had prior experience with the administration of state tests. High school students were not selected because End of Course results are not as compatible since these are tests of enrolled high school courses and not specific to a certain grade.

This research produced 12 sets of data:

- STAAR Reading Grade 6
- STAAR Reading Grade 7
- STAAR Reading Grade 8
- STAAR-Modified Reading Grade 6
- STAAR-Modified Reading Grade 7
- STAAR-Modified Reading Grade 8
- STAAR Math Grade 6
- STAAR Math Grade 7
- STAAR Math Grade 8
- STAAR-Modified Math Grade 6
- STAAR-Modified Math Grade 7
- STAAR-Modified Math Grade 8

Before the data sets were analyzed the descriptive statistics for each variable were run to check for any errors. This information was used to provide comparison data between the grades, testing varieties, and subject areas.

Demographics of the suburban district in the Dallas/Fort Worth Metroplex were obtained from the office of the Deputy Superintendent that reflected the enrollment information for the 2012-2013 school year. Information provided details on the number of campuses in the district at each level, total district population, TEA accountability

ratings, ethnic distribution data, and TEA subgroup data. This information provided an overview of the district being used in the research.

Preliminary analysis was done on individual data sets. Ethnic distribution for each data set was determined and compared to district level and other grade levels in the research group. Analysis on each data set provided information on the number of students that took each test, STAAR or STAAR-Modified. For each data set the mean, range, and standard deviation was determined for both STAAR percent correct and IQ scores and were used for grade level comparisons.

To answer the research question in the study an ex-post facto, correlation and linear regression design was used. There was one independent variable, intellectual functioning (IQ). The dependent variables were the students' percent correct on the STAAR or STAAR-Modified reading or math test. Data sets were individually analyzed and the Pearson product-moment correlation, also known as the Pearson *r*, was examined to provide the statistical means to evaluate the strength of the relationship between a student's IQ and percent correct on the STAAR. The correlation data suggested that there appeared to be some type of relationship between the two variables. A linear regress was then calculated to determine the predictive value of a student's IQ for STAAR percent correct.

Statistical reports for each data set were examined to check for errors and were used to answer the research questions. The research questions were answered and statistical support was provided to support the findings. To support correlation analysis correlation coefficient, effect size, and level of significance was provided for each data set in the

research question. In addition, a table of this information was provided for each data set. To summarize the regression the variance in the in the independence variable, IQ, was provided for each data set. Predictor results for each data set were explained and provided in a table.

Information from the data analysis was reviewed and summarized. The results of the analysis provided the evidence to answer the research questions and support those findings. Further, the information was used to discuss the educational implications the results could have and recommendations for further studies.

CHAPTER IV

RESULTS

The No Child Left Behind law requires that the academic progress of students be measured annual. There appears to be a need to determine if a student's intellectual functioning affects the performance of students with disabilities on the State of Texas Assessment of Academic Readiness test. This study evaluated a student's intellectual functioning and the percentage of items correct on the 2012-2013 STAAR Reading and Math tests. This chapter will examine and summarize the research sample, preliminary analysis, descriptive findings and the statistical results obtained by the analysis of the data sets using the Statistical Package for Social Sciences (SPSS) program. The findings of this study answer the following research questions:

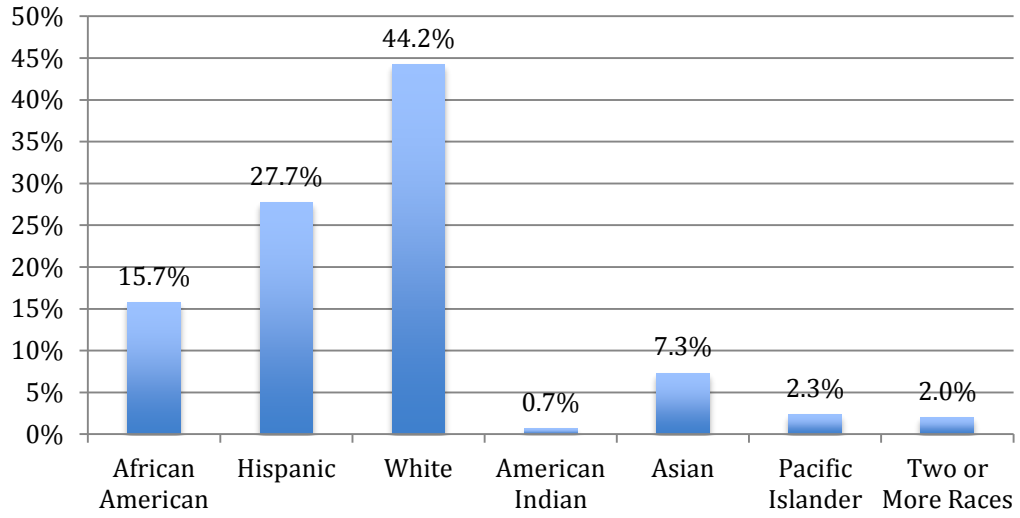
1. What is the relationship between intellectual functioning and STAAR reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
2. What is the relationship between intellectual functioning and STAAR-Modified reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

3. What is the relationship between intellectual functioning and STAAR math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?
4. What is the relationship between intellectual functioning and STAAR-Modified math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

School Demographics

The suburban district in the Dallas/Fort Worth Metroplex consists of 19 elementary schools, 5 junior high schools, and 3 high schools. The total district population for the 2012-2013 school year was 21,814 students. As of 2013, this district met the standard for student achievement, student progress, closing performance gaps, and post secondary readiness for the Texas Education Agency (TEA Accountability Standard, 2013). This district is rich with diversity, with more than 60 different languages spoken in students' homes. The ethnic distribution data provided by the state's Academic Excellence Indicator System (AEIS) report is illustrated in Figure 1. The students included in this research were sixth, seventh, and eighth grade students enrolled in a suburban district in the Dallas/Fort Worth Metroplex.

Figure 1



Ethnic distribution data

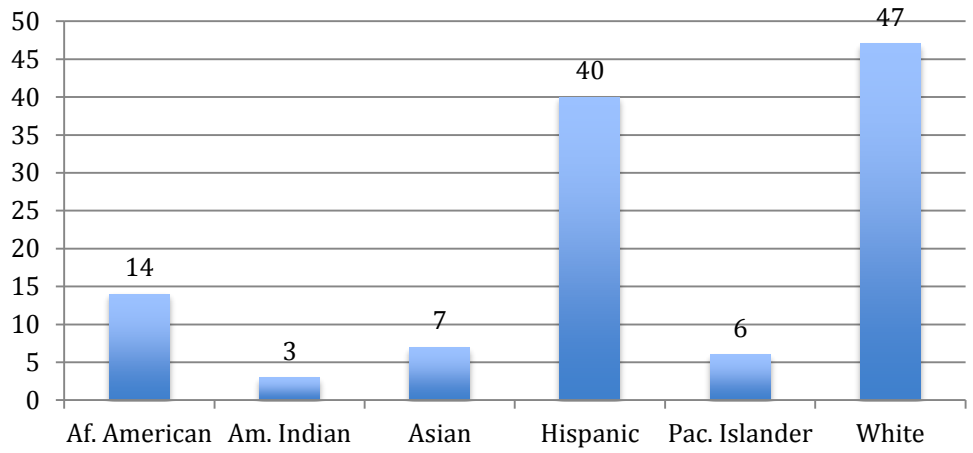
The district is populated by a diverse demographic of subgroups that are acknowledged by TEA with regards to the subgroup data that is used for AEIS reporting for each school and district. AEIS reports 52.0 percent of the students are economically disadvantaged, 48.0 percent non-educationally disadvantaged, 11.8 percent limited English proficient, 1.0 percent with disciplinary placements, and 36.3 percent at risk.

Preliminary Analysis

Sixth Grade

A total of 1,489 students were enrolled in the sixth grade for the testing administration. The sixth grade sample (*N*=117) was identified as students who receive services in special education who took the STAAR or STAAR-Modified test in reading or math. The ethnic distribution data of the sixth grade sample group was comparable to the overall campus distribution from Figure 1 and is illustrated in Figure 2.

Figure 2



Sixth grade sample ethnic distribution

The STAAR and STAAR-Modified percent correct results were analyzed descriptively and shown in Table 1. In the sixth grade sample group of students in special education, 59 students were administered the STAAR Reading, 62 students were administered the STAAR Math, 58 students were administered the STAAR-Modified Reading, and 55 students were administered the STAAR-Modified Math. The STAAR Reading scores ranged from 28 to 93. The mean scores and standard deviation (*M*=59, *SD*=17.34) were calculated using 2012-2013 STAAR results. The STAAR Reading-Modified scores ranged from 28 to 92, with mean scores and standard deviation (*M*=66, *SD*=14.24). The STAAR Math scores ranged from 15 to 100, with mean scores and standard deviation (*M*=49, *SD*=20.61). The STAAR Math-Modified scores ranged from 28 to 88, with mean scores and standard deviation (*M*=58, *SD*=16.01).

Table 1

Analysis of Sixth Grade STAAR and STAAR-Modified

	N	Min	Max	Mean	SD
STAAR Reading	59	28	93	59	17.34
STAAR-Modified Reading	58	28	92	66	14.24
STAAR Math	62	15	100	49	20.61
STAAR-Modified Math	55	28	88	58	16.01

An analysis of sixth grade data indicates that the number of students in special education who took the regular STAAR test was slightly greater than the number of students who took the Modified test in both reading and math. It is noted that the mean scores for reading were higher in both the STAAR reading and the STAAR-Modified reading than were their comparable scores in STAAR math and STAAR-Modified math. Additionally, students who took a modified test, whether in reading or in math tended to score higher than their peers who took the regular STAAR.

IQ scores were analyzed descriptively as shown in Table 2. Student IQ scores for all 117 students ranged from 62 to 133. The mean scores and standard deviation (*M*=89, *SD*=12.04) were calculated using the student's most current IQ as reported in their Full and Individual Evaluation report. IQ scores for students who took the STAAR Reading ranged from 73 to 133, with mean and standard deviation (*M*=93, *SD*=12.95). IQ scores for students who took the STAAR-Modified Reading ranged from 62 to 111, with mean and standard deviation (*M*=85, *SD*=9.46). IQ scores for students who took the STAAR Math ranged from 64 to 133, with mean and standard deviation (*M*=93, *SD*=13.10). IQ

scores for students who took the STAAR-Modified Math ranged from 62 to 109, with mean and standard deviation (*M*=85, *SD*=9.25).

Table 2

Analysis of Sixth Grade IQ

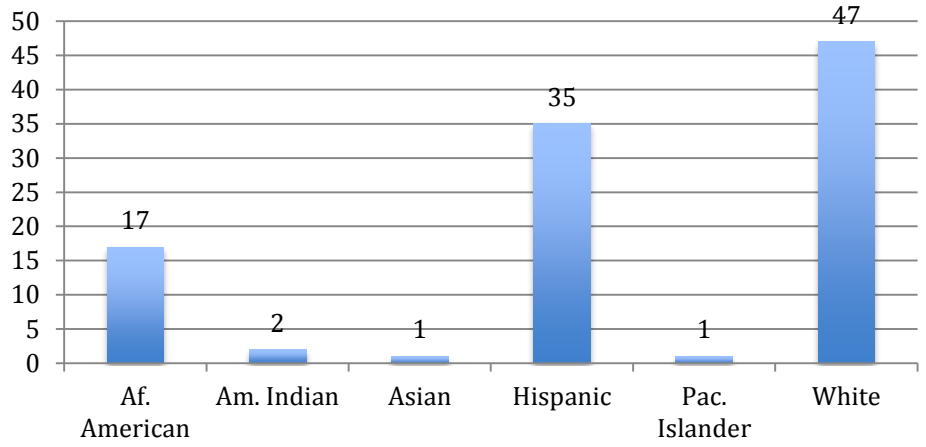
	N	Min	Max	Mean	SD
STAAR Reading	59	73	133	93	12.95
STAAR-Modified Reading	58	62	111	85	9.46
STAAR Math	62	64	133	93	13.10
STAAR-Modified Math	55	62	109	85	9.25

Results from intelligence testing indicated that students who took the regular STAAR test tended to have an overall higher mean IQ than students who took the STAAR-Modified with the mean IQ for STAAR being 93 as opposed to a mean IQ of 85 for the STAAR-Modified group. These differences would be expected as the STAAR-Modified test is intended for students with more cognitive difficulties.

Seventh Grade

A total of 1,466 students were enrolled in the seventh grade for the testing administration. The seventh grade sample (*N*=103) were identified as students who receive services in special education who took the STAAR or STAAR-Modified. The ethnic distribution data of the seventh grade sample group is presented in Figure 3 and was comparable to prior district ethnicity results.

Figure 3



Seventh grade sample ethnic distribution

The STAAR and STAAR-Modified percent correct results were analyzed descriptively and shown in Table 3. In the seventh grade sample group 34 students were administered the STAAR Reading, 35 students were administered the STAAR Math, 69 students were administered the STAAR-Modified Reading, and 68 students were administered the STAAR-Modified Math. The STAAR Reading scores ranged from 8 to 98. The mean scores and standard deviation (*M*=62, *SD*=18.51) were calculated using 2012-2013 STAAR results. The STAAR Reading-Modified scores ranged from 35 to 95, with mean scores and standard deviation (*M*=66, *SD*=15.00). The STAAR Math scores ranged from 22 to 98, with mean scores and standard deviation (*M*=52, *SD*=19.84). The STAAR Math-Modified scores ranged from 23 to 93, with mean scores and standard deviation (*M*=53, *SD*=15.41).

Table 3

Analysis of Seventh Grade STAAR and STAAR-Modified

	N	Min	Max	Mean	SD
STAAR Reading	34	35	95	62	18.51
STAAR-Modified Reading	69	8	98	66	15.00
STAAR Math	35	22	98	52	19.84
STAAR-Modified Math	68	23	93	53	15.41

An analysis of seventh grade STAAR data reveal that twice as many students took the modified test as took the regular test (STAAR Reading N = 34, STAAR Reading Modified N = 69; STAAR Math N = 35, STAAR Math Modified N = 68). These data contrast with sixth grade data where approximately the same number of students took each test (STAAR Reading N = 59, STAAR Reading Modified N = 58; STAAR Math N = 62, STAAR Math Modified N = 55). As with the sixth grade, the mean scores for reading were higher in both the STAAR reading and the STAAR-Modified reading than were their comparable scores in STAAR math and STAAR-Modified math.

IQ scores were analyzed descriptively as shown in Table 4. Student IQ scores for all 103 students ranged from 61 to 130. The mean scores and standard deviation (*M*=87, *SD*=12.80) were calculated using the student's most current IQ as reported in their Full and Individual Evaluation report. IQ scores for students who took the STAAR Reading ranged from 69 to 130, with mean and standard deviation (*M*=95, *SD*=13.52). IQ scores for students who took the STAAR-Modified Reading ranged from 61 to 114, with mean and standard deviation (*M*=83, *SD*=10.43). IQ scores for students who took the STAAR Math ranged from 76 to 130, with mean and standard deviation (*M*=94, *SD*=13.46). IQ

scores for students who took the STAAR-Modified Math ranged from 61 to 114, with mean and standard deviation (*M*=83, *SD*=10.43).

Table 4

Analysis of Seventh Grade IQ

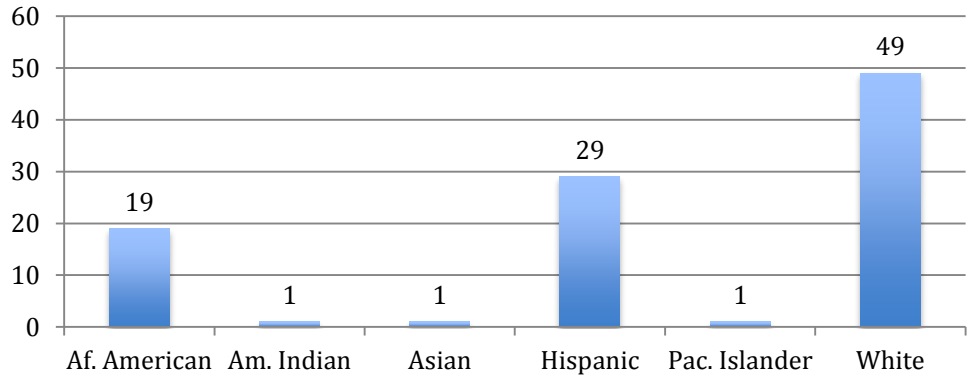
	N	Min	Max	Mean	SD
STAAR Reading	34	69	130	95	13.52
STAAR-Modified Reading	69	61	114	83	10.43
STAAR Math	35	76	130	94	13.46
STAAR-Modified Math	68	61	114	83	10.43

Results from seventh grade intelligence testing indicated that students who took the regular STAAR test tended to have an overall higher mean IQ than students who took the STAAR-Modified with the mean IQ for STAAR being 95 as opposed to a mean IQ of 85 for the STAAR-Modified group. These differences are comparable to sixth grade results and would be expected as the STAAR-Modified test is intended for students with more cognitive difficulties.

Eighth Grade

A total of 1,414 students were enrolled in the eighth grade for the testing administration. The eighth grade sample (*N*=100) are identified as students who receive services in special education who took the STAAR or STAAR-Modified. The ethnic distribution data of the eighth grade sample group is presented in Figure 4. and did not significantly differ from previous campus data.

Figure 4



Eighth grade sample ethnic distribution

The STAAR and STAAR-Modified percent correct results were analyzed descriptively and shown in Table 5. In the eighth grade sample group 43 students were administered the STAAR Reading, 43 students were administered the STAAR Math, 57 students were administered the STAAR-Modified Reading, and 57 students were administered the STAAR-Modified Math. The STAAR Reading scores ranged from 21 to 94. The mean scores and standard deviation (*M*=58, *SD*=17.34) were calculated using 2012-2013 STAAR results. The STAAR Reading-Modified scores ranged from 30 to 97, with mean scores and standard deviation (*M*=62, *SD*=17.83). The STAAR Math scores ranged from 21 to 85, with mean scores and standard deviation (*M*=47, *SD*=15.20). The STAAR Math-Modified scores ranged from 24 to 93, with mean scores and standard deviation (*M*=51, *SD*=14.96).

Table 5

Analysis of Eighth Grade STAAR and STAAR-Modified

	N	Min	Max	Mean	SD
STAAR Reading	43	21	94	58	17.34
STAAR-Modified Reading	57	30	97	62	17.83
STAAR Math	43	21	85	47	15.20
STAAR-Modified Math	57	24	93	51	14.96

While the number of eighth grade students receiving services in special education who took the regular STAAR test is less than the number of students who took the Modified test, the disparity is not as strong as in the seventh grade. As with the sixth and seventh grades, the mean scores for reading were higher in both the STAAR reading and the STAAR-Modified reading than were their comparable scores in STAAR math and STAAR-Modified math.

IQ scores were analyzed descriptively as shown in Table 6. Student IQ scores for all 100 students ranged from 56 to 121. The mean scores and standard deviation (*M*=87, *SD*=11.54) were calculated using the student's most current IQ as reported in their Full and Individual Evaluation report. IQ scores for students who took the STAAR Reading ranged from 67 to 121, with mean and standard deviation (*M*=93, *SD*=11.63). IQ scores for students who took the STAAR-Modified Reading ranged from 56 to 103, with mean and standard deviation (*M*=84, *SD*=10.15). IQ scores for students who took the STAAR Math ranged from 67 to 121, with mean and standard deviation (*M*=92, *SD*=11.39). IQ scores for students who took the STAAR-Modified Math ranged from 56 to 103, with mean and standard deviation (*M*=84, *SD*=10.47).

Table 6

Analysis of Eighth Grade IQ

	N	Min	Max	Mean	SD
STAAR Reading	43	67	121	93	11.63
STAAR-Modified Reading	57	56	103	84	10.15
STAAR Math	43	67	121	92	11.39
STAAR-Modified Math	57	56	103	84	10.47

Results from eighth grade intelligence testing indicated that students who took the regular STAAR test tended to have an overall higher mean IQ than students who took the STAAR-Modified with the mean IQ for STAAR being 93 as opposed to a mean IQ of 84 for the STAAR-Modified group. These differences are comparable to sixth and seventh grade results and would be expected as the STAAR-Modified test is intended for students with more cognitive difficulties,

Descriptive Analysis

Research Question 1

The first question in this research asked what is the relationship between intellectual functioning and STAAR Reading percent correct for students receiving services in special education in the sixth, seventh, and eighth grade. Data for each grade was analyzed separately. A Pearson product-moment correlation was conducted to evaluate if there was a significant correlation between intellectual functioning and STAAR Reading percent correct for special education students. A linear regression was calculated to determine the predictive value of a student's IQ for STAAR Reading performance.

Sixth grade reading results found a relatively strong, positive correlation coefficient of r = .541, and an effect size of p = .001 with a sample group of 59. The level of significance was set at the 0.01 level. Table 7 summarizes the strength of the correlation between IQ and STAAR Reading. The percent correct on the STAAR Reading can be explained by the variance in the independent variable, IQ. A .292 (29.2%) of variation in the percent correct on the STAAR Reading (dependent variable) can be explained by the IQ. The regression model, as seen on Table 8, predicting the percent correct on the STAAR Reading from a student's IQ was significant $F(1, 53) = 21.891$, $p < .001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR Reading (*Beta* = .541, $p = .001$), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 7

Correlation Between IQ and Percent Correct on STAAR Reading-6th Grade

	Reading Percentage Correct	IQ
Reading Pearson Correlation	1	.541
Sig. (2-tailed)		.001
N	59	55
IQ Pearson Correlation	.541	1
Sig. (2-tailed)	.001	
N	55	55

**Correlation is significant at the 0.01 level (2-tailed).

Table 8

STAAR Reading Regression Summary-6th Grade

Variable	B	Std. Error B	Beta	T	P
(Constant)	-10.817	14.874		-.727	.470
IQ	.738	.158	.541	4.679	.001

R = .541, R^2 = .292, Adj-R^2 = .279, SE = 15.019, F (1, 53) = 21.891, p<.001

Seventh grade reading results found a relatively strong, positive correlation coefficient of r = .677, and an effect size of p = .001 with a sample group of 34. The level of significance was set at the 0.01 level. Table 9 summarizes the strength of the correlation between IQ and STAAR Reading. The percent correct on the STAAR Reading can be explained by the variance in the independent variable, IQ. A .459 (45.9%) of variation in the percent correct on the STAAR Reading (dependent variable) can be explained by the IQ. The regression model, as seen on Table 10, predicting the percent correct on the STAAR Reading from a student's IQ was significant $F(1, 32) = 27.143$, $p < .001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR Reading (*Beta* = .677, $p = .001$), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 9

Correlation Between IQ and Percent Correct on STAAR Reading-7th Grade

	Reading Percentage Correct	IQ
Reading Pearson Correlation	1	.677
Sig. (2-tailed)		.001
N	34	34
IQ Pearson Correlation	.677	1
Sig. (2-tailed)	.001	
N	34	34

**Correlation is significant at the 0.01 level (2-tailed).

Table 10

STAAR Reading Regression Summary-7th Grade

Variable	B	Std. Error B	Beta	T	P
(Constant)	-25.209	16.996		-1.483	.148
IQ	.927	.178	.677	5.210	.001

R = .677, R^2 = .459, Adj-R^2 = .442, SE = 13.830, F (1, 33) = 27.143, p<.001

Eighth grade reading results found a relatively strong, positive correlation coefficient of r = .518, and an effect size of p = .001 with a sample group of 42. The level of significance was set at the 0.01 level. Table 11 summarizes the strength of the correlation between IQ and STAAR Reading. The percent correct on the STAAR Reading can be explained by the variance in the independent variable, IQ. A .268 (26.8%) of variation in the percent correct on the STAAR Reading (dependent variable) can be explained by the IQ. The regression model, as seen on Table 12, predicting the percent correct on the STAAR Reading from a student's IQ was significant $F(1, 34) = 12.461$, $p < 0.01$. Predictor results indicate that IQ scores are a significant predictor of

percent correct on the STAAR Reading (*Beta* = .518, *p* = .001), which indicated that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 11

Correlation Between IQ and Percent Correct on STAAR Reading-8th Grade

	Reading Percentage Correct	IQ
Reading Pearson Correlation	1	.518
Sig. (2-tailed)		.001
N	36	36
IQ Pearson Correlation	.518	1
Sig. (2-tailed)	.001	
N	36	36

**Correlation is significant at the 0.01 level (2-tailed).

Table 12

STAAR Reading Regression Summary-8th Grade

Variable	B	Std. Error B	Beta	T	P
(Constant)	-14.661	20.694		-.708	.483
IQ	.783	.222	.518	3.530	.001

R = .518, R^2 = .268, Adj-R^2 = .247, SE = 15.270, F(1, 35) = 12.461, p<.001

Research Question 2

The second question in this research asked what is the relationship between intellectual functioning and STAAR-Modified Reading percent correct for students receiving services in special education in the sixth, seventh, and eighth grade. Data for each grade was analyzed separately. A Pearson product-moment correlation was conducted to evaluate if there was a significant correlation between intellectual

functioning and STAAR-Modified Reading percent correct for special education students. A linear regression was calculated to determine the predictive value of a student's IQ for STAAR-Modified Reading performance.

Sixth grade modified reading results found a relatively weak, positive correlation coefficient of r = .257, and an effect size of p = .058 with a sample group of 58. The level of significance was set at the 0.01 level. Table 13 summarizes the strength of the correlation between IQ and STAAR-Modified Reading. The percent correct on the STAAR-Modified Reading can be explained by the variance in the independent variable, IQ. A .066 (6.6%) of variation in the percent correct on the STAAR-Modified Reading (dependent variable) can be explained by the IQ. The regression model, as seen on Table 14, predicting the percent correct on the STAAR-Modified Reading from a student's IQ was not significant $F(1, 53) = 3.754$, $p = .058$. Predictor results indicate that IQ scores are a marginally significant predictor of percent correct on the STAAR-Modified Reading (*Beta* = .257, $p = .058$), which indicates that students with a higher IQ were marginally more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 13

Correlation Between IQ and Percent Correct on STAAR-Modified Reading-6th Grade

	Reading Percentage Correct	IQ
M Reading Pearson Correlation	1	.257
Sig. (2-tailed)		.058
N	58	59
IQ Pearson Correlation	.257	1
Sig. (2-tailed)	.058	
N	55	55

Table 14

STAAR-Modified Reading Regression Summary-6th Grade

Variable	B	Std. Error B	Beta	T	P
(Constant)	26.142	20.355		1.284	.205
IQ	.461	.238	.257	1.938	.058

R = .257, R^2 = .066, Adj-R^2 = .049, SE = 16.546, F (1, 53) = 3.754, p =.058

Seventh grade modified reading results found a relatively weak, positive correlation coefficient of r = .276, and an effect size of p = .025 with a sample group of 69. The level of significance was set at the 0.05 level. Table 15 summarizes the strength of the correlation between IQ and STAAR-Modified Reading. The percent correct on the STAAR-Modified Reading can be explained by the variance in the independent variable, IQ. A .076 (7.6%) of variation in the percent correct on the STAAR-Modified Reading (dependent variable) can be explained by the IQ. The regression model, as seen on Table 16, predicting the percent correct on the STAAR-Modified Reading from a student's IQ was significant $F(1, 64) = 5.286$, $p = .025$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR-Modified Reading (*Beta* = .276 ,

p = .025), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 15

Correlation Between IQ and Percent Correct on STAAR-Modified Reading-7th Grade

	Reading Percentage Correct	IQ
M Reading Pearson Correlation	1	.276
Sig. (2-tailed)		.025
N	66	66
IQ Pearson Correlation	..276	1
Sig. (2-tailed)	.025	
N	66	69

**Correlation is significant at the 0.05 level (2-tailed).

Table 16

STAAR-Modified Reading Regression Summary-7th Grade

Variable	B	Std. Error B	Beta	T	P
(Constant)	33.757	14.319		2.358	.021
IQ	.395	.172	.276	2.299	.025

R = .276, R^2 = .076, Adj-R^2 = .062, SE = 14.433, F (1, 64) = 5.286, p = .025

Eighth grade modified reading results found a relatively strong, positive correlation coefficient of r = .470, and an effect size of p = .001 with a sample group of 57. The level of significance was set at the 0.01 level. Table 17 summarizes the strength of the correlation between IQ and STAAR-Modified Reading. The percent correct on the STAAR-Modified Reading can be explained by the variance in the independent variable, IQ. A .221 (22.1%) of variation in the percent correct on the STAAR-Modified Reading (dependent variable) can be explained by the IQ. The regression model, as seen on Table 18, predicting the percent correct on the STAAR-Modified Reading from a student's IQ

was significant $F(1, 51) = 14.458$, $p < 0.001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR-Modified Reading (*Beta* = .470, $p = .001$), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 17

Correlation Between IQ and Percent Correct on STAAR Modified Reading-8th Grade

	Reading Percentage Correct	IQ
M Reading Pearson Correlation	1	.470
Sig. (1-tailed)		.001
N	53	53
IQ Pearson Correlation	.470	1
Sig. (2-tailed)	.001	
N	53	58

**Correlation is significant at the 0.01 level (2-tailed).

Table 18

STAAR-Modified Reading Regression Summary-8th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-9.420	18.613		-.506	.615
IQ	.838	.220	.470	3.802	.001

$R = .470$, $R^2 = .221$, Adj-$R^2 = .206$, SE = 16.123, $F(1, 51) = 14.458$, $p<.001$

Research Question 3

The third question in this research asked what is the relationship between intellectual functioning and STAAR Math percent correct for students receiving services in special education in the sixth, seventh, and eighth grade. Data for each grade was analyzed separately. A Pearson product-moment correlation was conducted to evaluate if there

was a significant correlation between intellectual functioning and STAAR Math percent correct for special education students. A linear regression was calculated to determine the predictive value of a student's IQ for STAAR Math performance.

Sixth grade math results found a relatively strong, positive correlation coefficient of r = .645, and an effect size of p = .001 with a sample group of 58. The level of significance was set at the 0.01 level. Table 19 summarizes the strength of the correlation between IQ and STAAR Math. The percent correct on the STAAR Math can be explained by the variance in the independent variable, IQ. A .292 (29.2%) of variation in the percent correct on the STAAR Math (dependent variable) can be explained by the IQ. The regression model, as seen on Table 20, predicting the percent correct on the STAAR Math from a student's IQ was significant $F(1, 56) = 39.849$, $p < .001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR Math (*Beta* = .645, $p = .001$), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 19

Correlation Between IQ and Percent Correct on STAAR Math-6th Grade

	Math Percentage Correct	IQ
Math Pearson Correlation	1	.645
Sig. (2-tailed)		.001
N	62	58
IQ Pearson Correlation	.645	1
Sig. (2-tailed)	.001	
N	58	58

**Correlation is significant at the 0.01 level (2-tailed).

Table 20

STAAR Math Regression Summary-6th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-51.421	15.668		-3.282	.002
IQ	1.055	.167	.645	6.313	.001

R = .645, R^2 = .416, Adj-R^2 = .405, SE = 16.525, F (1, 56) = 39.849, p<.001

Seventh grade math results found a very strong, positive correlation coefficient of r = .726, and an effect size of p = .001 with a sample group of 35. The level of significance was set at the 0.01 level. Table 21 summarizes the strength of the correlation between IQ and STAAR Math. The percent correct on the STAAR Math can be explained by the variance in the independent variable, IQ. A .528 (52.8%) of variation in the percent correct on the STAAR Math (dependent variable) can be explained by the IQ. The regression model, as seen on Table 22, predicting the percent correct on the STAAR Math from a student's IQ was significant $F(1, 33) = 36.851$, $p < .001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR Math (*Beta* = .726, $p = .001$), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 21

Correlation Between IQ and Percent Correct on STAAR Math-7th Grade

	Math Percentage Correct	IQ
Math Pearson Correlation	1	.726
Sig. (2-tailed)		.001
N	35	35
IQ Pearson Correlation	.726	1
Sig. (2-tailed)	.001	
N	35	35

**Correlation is significant at the 0.01 level (2-tailed).

Table 22

STAAR Math Regression Summary-7th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-49.369	16.801		-2.398	.006
IQ	1.070	.176	.726	6.071	.001

R = .726, R^2 = .528, Adj-R^2 = .513, SE = 13.839, F (1, 33) = 36.851, p < .001

Eighth grade math results found a relatively strong, positive correlation coefficient of r = .618, and an effect size of p = .001 with a sample group of 43. The level of significance was set at the 0.01 level. Table 23 summarizes the strength of the correlation between IQ and STAAR Math. The percent correct on the STAAR Math can be explained by the variance in the independent variable, IQ. A .382 (38.2%) of variation in the percent correct on the STAAR Math (dependent variable) can be explained by the IQ. The regression model, as seen on Table 24, predicting the percent correct on the STAAR Math from a student's IQ was significant $F(1, 34) = 20.977$, $p < 0.001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on

the STAAR Math (*Beta* = .618, *p* = .001), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 23

Correlation Between IQ and Percent Correct on STAAR Math-8th Grade

	Math Percentage Correct	IQ
Math Pearson Correlation	1	.618
Sig. (1-tailed)		.001
N	37	36
IQ Pearson Correlation	.618	1
Sig. (2-tailed)	.001	
N	36	42

**Correlation is significant at the 0.01 level (1-tailed).

Table 24

STAAR Math Regression Summary-8th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-40.330	19.023		-2.120	.041
IQ	.947	.207	.618	4.580	.001

R = .618, R^2 = .382, Adj-R^2 = .363, SE = 12.785, F(1, 34) = 20.977, p<.001

Research Question 4

The fourth question in this research asked what is the relationship between intellectual functioning and STAAR-Modified Math percent correct for students receiving services in special education in the sixth, seventh, and eighth grade. Data for each grade was analyzed separately. A Pearson product-moment correlation was conducted to evaluate if there was a significant correlation between intellectual functioning and STAAR-Modified Math percent correct for special education students.

A linear regression was calculated to determine the predictive value of a student's IQ for STAAR-Modified Math performance.

Sixth grade modified math results found a relatively strong, positive correlation coefficient of r = .432, and an effect size of p = .001 with a sample group of 55. The level of significance was set at the 0.01 level. Table 25 summarizes the strength of the correlation between IQ and STAAR-Modified Math. The percent correct on the STAAR-Modified Math can be explained by the variance in the independent variable, IQ. A .186 (18.6%) of variation in the percent correct on the STAAR-Modified Math (dependent variable) can be explained by the IQ. The regression model, as seen on Table 26, predicting the percent correct on the STAAR-Modified Math from a student's IQ was significant $F(1, 50) = 11.462$, $p < .001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR-Modified Math (*Beta* = .432, p = .001), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 25

Correlation Between IQ and Percent Correct on STAAR-Modified Math-6th Grade

	Math Percentage Correct	IQ
M Math Pearson Correlation	1	.432
Sig. (2-tailed)		.001
N	52	52
IQ Pearson Correlation	.432	1
Sig. (2-tailed)	.001	
N	52	55

**Correlation is significant at the 0.01 level (2-tailed).

Table 26

STAAR-Modified Math Regression Summary-6th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-4.199	18.844		-.223	.825
IQ	.746	.220	.432	3.386	.001

R = .432, R^2 = .186, Adj-R^2 = .170, SE = 14.558, F (1, 50) = 11.462, p<.001

Seventh grade modified math results found a relatively strong, positive correlation coefficient of r = .541, and an effect size of p = .001 with a sample group of 68. The level of significance was set at the 0.01 level. Table 27 summarizes the strength of the correlation between IQ and STAAR-Modified Math. The percent correct on the STAAR-Modified Math can be explained by the variance in the independent variable, IQ. A .293 (29.3%) of variation in the percent correct on the STAAR-Modified Math (dependent variable) can be explained by the IQ. The regression model, as seen on Table 28, predicting the percent correct on the STAAR-Modified Math from a student's IQ was significant $F(1, 63) = 26.107$, $p < .001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR-Modified Math (*Beta* = .541, p = .001), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 27

Correlation Between IQ and Percent Correct on STAAR-Modified Math-7th Grade

	Math Percentage Correct	IQ
M Math Pearson Correlation	1	.541
Sig. (2-tailed)		.001
N	65	64
IQ Pearson Correlation	.541	1
Sig. (2-tailed)	.001	
N	65	68

**Correlation is significant at the 0.01 level (2-tailed).

Table 28

STAAR-Modified Math Regression Summary-7th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-13.976	13.280		-1.052	.297
IQ	.814	.159	.541	5.109	.001

R = .541, R^2 = .293, Adj-R^2 = .282, SE = 13.295, F (1, 63) = 26.107, p<.001

Eighth grade modified math results found a relatively strong, positive correlation coefficient of r = .447, and an effect size of p = .001 with a sample group of 57. The level of significance was set at the 0.01 level. Table 29 summarizes the strength of the correlation between IQ and STAAR-Modified Math. The percent correct on the STAAR-Modified Math can be explained by the variance in the independent variable, IQ. A .200 (20.0%) of variation in the percent correct on the STAAR-Modified Math (dependent variable) can be explained by the IQ. The regression model, as seen on Table 30, predicting the percent correct on the STAAR-Modified Math from a student's IQ was significant $F(1, 50) = 12.510$, $p < 0.001$. Predictor results indicate that IQ scores are a significant predictor of percent correct on the STAAR-Modified Math (*Beta* = .447, *p* =

.001), which indicates that students with a higher IQ were more likely to have higher percentage mastery scores, compared to those with lower IQ scores.

Table 29

Correlation Between IQ and Percent Correct on STAAR Modified Math-8th Grade

	Math Percentage Correct	IQ
M Math Pearson Correlation	1	.447
Sig. (1-tailed)		.001
N	52	52
IQ Pearson Correlation	.447	1
Sig. (2-tailed)	.001	
N	52	57

**Correlation is significant at the 0.01 level (1-tailed).

Table 30

STAAR-Modified Math Regression Summary-8th Grade

Variable	B	Std. Error B	Beta	T	p
(Constant)	-1.151	15.005		-.077	.939
IQ	.627	.17	.447	3.537	.001

$R = .447$, $R^2 = .200$, Adj-$R^2 = .184$, $SE = 13.259$, $F(1, 50) = 12.510$, $p<.001$

Summary

This chapter presented and analyzed the relationship between IQ and the percent correct on the STAAR for students receiving services in special education for the 2012-2013 assessment year. Based on the results presented in this chapter it can generally be concluded that students in special education with higher IQ's receive a higher percent correct on the STAAR or STAAR-Modified than students in special education with lower IQ's. These results were obtained in both reading and math and were observed regardless

of whether the student took a regular STAAR or a STAAR-Modified test. Chapter 5 will provide more detailed descriptions with conclusions and findings of the study. These findings will also include further research suggestions in the areas of effective and valid testing for students in special education.

CHAPTER V

DISCUSSION

The purpose of this study was to determine if there was a relationship between a student's intellectual functioning and the percent correct on reading or math STAAR or STAAR-Modified for students receiving services in special education in a suburban district in the Dallas/Fort Worth Metroplex. The analysis included the 2012-2013 academic year STAAR scores and the IQ for special education students in the sixth, seventh, and eighth grades.

Research Questions

The research questions focused upon the relationship between the IQ of students in special education and the percent of correct items on the reading or math STAAR tests. The data were further aggregated by grade, by subject (reading or math), and by the type of test (STAAR or STAAR-Modified). The following section presents the significant findings based upon the research questions.

1. What is the relationship between intellectual functioning and STAAR Reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

The mean STAAR Reading scores for all three grades hovered around 60 (6th grade 59, 7th grade 62, 8th grade 58) with a wide range between highest and lowest scores (6th grade 28-93, 7th grade 35-95, 8th grade 21-94) for all three grades. In a similar manner, the IQ scores for all three grades clustered around 94 (6th grade 93, 7th grade 95, 8th grade

93) with a similar range between lowest and highest scores (6th grade 73-133, 7th grade 69-130, 8th grade 67-121). An overall analysis of regression data for this question revealed that the student's IQ was a strong predictor of the student's STAAR reading performance for each and every grade tested. These data revealed that students with higher IQs tended to score higher on the STAAR reading test and students with lower IQs tended to score lower on the same test.

2. What is the relationship between intellectual functioning and STAAR-Modified Reading percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

Students who took the STAAR-Modified reading test scored higher than their peers in special education that took the non-modified STAAR reading test. Students in the 6th grade who took the STAAR-Modified test received a mean score of 66 compared to the mean score of 59 for those taking the non-modified STAAR. Seventh grade mean scores were 66 for the Modified test and 62 for the non-modified STAAR with eighth grade scores being respectively 62 and 58. These results would indicate that students in special education do indeed benefit from a modified test.

While the students taking a modified score of the STAAR reading test scored higher than their peers on the same test, their intelligence test results reveal an opposite finding. The mean results of the intelligence test for the students taking a modified reading test showed an overall lower intelligence level than their peers who took the regular STAAR in all three grades. The mean IQ for sixth grade students taking the STAAR-Modified was 85 as compared to 93 for the regular STAAR. Seventh grade mean IQ was 83 for

STAAR-Modified as compared to 95 for STAAR. Eighth grade scores showed a similar pattern with an 84 for STAAR-Modified and 93 for STAAR. These results are not surprising and would be expected results as the STAAR-Modified test is the test intended for students with more cognitive difficulties.

Regression data for all three grades revealed that the students' IQ was a predictor of the student's STAAR-Modified reading performance, however the results were not as significant as found in the previous question. However, there is ample evidence to indicate the role of the student's intelligence upon their STAAR mastery score.

3. What is the relationship between intellectual functioning and STAAR Math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

The mean STAAR mastery scores in math were significantly lower in all three grades than the scores in reading with mean scores of 49 in sixth grade math (reading 59), 52 in seventh grade math (reading 62), and 47 in the eighth grade math (reading 58). These scores indicate that students with disabilities are significantly struggling in math. Regression data showed a strong positive correlation between IQ and STAAR math results and indicated that students with higher intelligence scores will score higher on STAAR math tests. The correlation data for this research question was higher than any of the other research questions tested.

4. What is the relationship between intellectual functioning and STAAR-Modified math percent correct for students enrolled in Special Education in the 6th, 7th, and 8th grade?

As in reading, students who took the STAAR-Modified math test scored higher than their peers in special education that did not take the modified test. Students in the 6th grade who took the STAAR-Modified math test received a mean score of 58 as compared to the mean math score of 49 for those taking the regular STAAR. Seventh grade mean math scores were 53 for the Modified test and 52 for the STAAR. Eighth grade math scores being respectively 51 and 47. These results also indicate that students in special education do indeed benefit from a modified math test.

An examination of the relationship of intellectual functioning and STAAR-Modified math results indicate findings similar to the reading results. While there is a positive relationship between the student's IQ and the results of the modified test, the results for STAAR-M math are not as strong as those obtained on the non-modified test.

Support from the Literature

The national movement continues to require that all students must be tested on an annual basis and that those results must be disaggregated to include the special education subset. Current standards both in Texas and at the national level require that students with disabilities must meet the same rigorous standards as their non-disabled peers regardless of their disability status. The purpose of this study was to determine if the overall intelligence of students in special education will affect their performance on Texas's state assessment test. Reschly and Grimes (1992) positioned that a student's

intelligence plays a factor in their achievement. Nesser (1995) stated that IQ tests "predict certain forms of achievement—especially school achievement—rather effectively" (p. 96). McGrew and Evans (2004) indicated that IQ scores account for 40 to 50% of expected achievement. The findings from this study appear to validate and to provide additional evidence and support that intelligence does indeed affect the student's academic performance in both reading and math.

There were other salient findings in this study that provide additional support from prior research. Olson (2004) noted that while students with disabilities showed a wide variance in intellectual abilities, their mean performance tended to fall in the bottom half of the normal curve distribution. Watkins, Lei, and Canivez (2007) also focused on the link between intelligence and achievement. In their test of 286 students with disabilities, the average IQ was 89.6. Watkins noted that these scores were consistent with other samples of students with disabilities. He further postulated "psychometric intelligence is predictive of future achievement whereas achievement is not predictive of psychometric intelligence" (Watkins, et al, 2007, p.67). These results were replicated in this study. While there was indeed a wide variance in intellectual functioning of the students in this study with the highest IQ score being 133 and 56 being the lowest IQ score, the mean IQ scores for all groups in this study was 87.8.

It is interesting to further compare the results of the STAAR-Modified test with the results of the non-modified STAAR test with regard to intellectual functioning. While the overall intellectual functioning of the students taking the modified test was lower, the overall intellectual functioning of students taking the non-modified test was higher. One

would posit from these results that the academic results for STAAR-Modified would be lower. In this study, the reverse was true in all grades and all subjects. While the exact cause for this phenomenon requires further research, it would appear that students with disabilities do indeed perform better on a modified test of grade level standards.

One other interesting finding highlighted the students' performance on the reading and math tests. While numerous researchers, (McDonnel, McLaughlin, & Morrison, 1997; Shaywitz, 2003) have focused on the poor reading skills of students with disabilities, this study revealed that math presented more difficulties than reading. In all grades and tests, math scores were significantly lower than reading scores.

Assumptions

1. All sixth, seventh, and eighth grade students performed at their best on the STAAR tests.
2. All students did their own work on all tests.
3. The STAAR and STAAR-Modified tests are accurate measures of reading and math knowledge and skills.
4. The testing data used is reliable.

Limitations

1. This study was limited to one suburban Texas district, so results may not generalize to other districts or other states that do not have similar state assessment systems.

2. This study is limited to eligible students in special education in grades 6, 7, and 8. Results may not be representative of all grades tested.
3. The study is ex post facto, so results are limited to the information captured within the suburban district used in the study. For instance, no data on intellectual functioning is available on students not enrolled in Special Education. Thus, comparisons cannot be made across students enrolled in Special Education and those not enrolled.
4. STAAR tests are undergoing changes in scoring and administration, so assessment results may not be representative of future years.
5. The STAAR-Modified test described in this study is ending with the 2013-14 school year. The new modified test, STAAR-A may or may not provide comparable results.

Educational Implications

This study highlighted the performance of this district's students in special education on the reading and math tests as compared to their intellectual abilities. While most findings are consistent with previous research, this study highlights a growing concern about the performance of students with disabilities on high stakes assessments. Current policy requires that students with disabilities be expected to meet the same rigorous passing standards as their non-disabled peers. However, this research, coupled with previous findings, seems to suggest otherwise. Students with a disability tend to present with lower overall intellectual levels than their peers (Olsen, 2004). It would seem unfair to expect that this subgroup of students should meet the same standard with no

allowances for disability-based modifications. Current results from this study indicate that students with disabilities are better able to demonstrate grade level mastery when given a modified test, which is only slightly different than the state test. These findings would provide substantive support for the continuance of a modified test.

Recommendations for Further Studies

1. A follow-up study should be conducted using the new state test, the STAAR-A to determine the consistency of current findings.
2. More research should be conducted to determine what specific modifications enabled students with disabilities to perform at a higher level than their peers who took the non-modified test.
3. Research should also be conducted to determine why math scores were significantly lower than reading scores on this test.

Conclusion

This study analyzed the overall impact of intellectual functioning of students in special education upon the student's mastery scores on the Texas state assessment test the STAAR. Comparisons were made using both the STAAR-Modified and non-modified STAAR tests in reading and math. There were two unexpected findings in this study. It was expected that the students who took the non-modified test would score higher than their peers who took the modified test, as their overall intellectual functioning was higher than the students who took the modified test. Students who took the modified test showed higher mastery scores in both reading and math than their peers who took the

non-modified STAAR test. These results appear to indicate that these students are benefiting from the modifications available on that test.

The second unexpected finding dealt with the performance of the students in math. Reading has long been identified as an area of great concern for students with disabilities. In this study, students with disabilities tended to struggle far more with math than with reading.

Salient findings revealed that there was indeed a significant positive relationship between the student's intellectual functioning and their ability to demonstrate mastery on the STAAR test. These findings were found in all grades and all subjects, with highest predictive correlations found in STAAR math. This information should provide a strong basis in socio-political and educational decisions regarding the use of high stakes assessments for students with disabilities.

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APPENDIX A

IRB Approval Letter

Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378
email: IRB@twu.edu
http://www.twu.edu/irb.html

DATE: April 9, 2014

TO: Ms. Julie Kathryn Harrison
Department of Teacher Education

FROM: Institutional Review Board - Denton

Re: Exemption for Analysis of the Effect of Intellectual Functioning on Scores of a State Assessment (Protocol #: 17666)

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because a signed consent form is not required for exempt studies, the filing of signatures of participants with the TWU IRB is not necessary.

Although your protocol has been exempted from further IRB review and your protocol file has been closed, any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

cc. Dr. Jane Pemberton, Department of Teacher Education
Dr. Michael Wiebe, Department of Teacher Education
Graduate School