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AN ANALYSIS OF PSYCHO-EDUCATIONAL PROFILES OF ELEMENTARY
STUDENTS REFERRED FOR SPECIAL EDUCATION CONSIDERATION DUE TO
LITERACY DIFFICULTIES

A Dissertation Presented for

the Doctor of Education

Degree

The University of Tennessee at Chattanooga

Amy M. Bowers

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DEDICATION

This dissertation is dedicated to my family, the inspiration for all I have done and hope to do: husband Ted, daughter Lillian, parents Elden and Wanda Moates, sister Laura Moates Stanley, and brother John Moates.

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ABSTRACT

This study examined the results of a uniquely constructed literacy assessment technique, combining Dehn's (2006) interpretation of psychological processing assessment and the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) interpretation of academic achievement. The study employed a quantitative descriptive research design using *ex post facto* data. The population was selected from one northwest Georgia school district and consisted of 54 elementary school students (first through fifth grades). Participants in the population met the following criteria: 1) received three tiers of reading intervention in the RTI process, 2) were referred for initial special education consideration, 3) were from either a primarily English or Spanish-speaking home, and 4) received a psycho-educational evaluation using the combined literacy assessment technique during the 2007-2008 school year and first semester of the 2008-2009 school year. The presence of a processing deficit was determined for each participant in each of the eight areas assessed: phonemic awareness, auditory processing, working memory, long-term retrieval, fluid reasoning, executive processing, processing speed, and visual-motor integration. Decisional statistics were performed, and the results showed that working memory and long-term retrieval deficits were most prevalent. Participants' mean academic achievement scores were collected in eight areas, and a one-way ANOVA technique was performed to analyze the population's mean achievement scores by three factors: primary language in the home, gender, and years of instruction. Results indicated that the students who primarily speak English in the home exhibited significantly higher mean achievement scores in the Letter and Word Recognition, Word Reading Fluency, Reading Comprehension, Listening Comprehension, and Oral

Expression subtests. Female students exhibited significantly higher mean achievement scores in Oral Expression and Written Expression, and students with the least amount of school instruction exhibited significantly higher mean achievement scores in the areas of Letter and Word Recognition and Written Expression. Factors such as breadth of vocabulary, environmental language exposure, and the district's first grade intervention programming were considered to account for the differences in the population's combined literacy assessment outcomes. Implications for the school district's intervention and assessment design processes were provided.

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CHAPTER ONE: OVERVIEW OF THE STUDY

Introduction and Background to the Problem

Response to Intervention (RTI) became an educational reform issue in 1997, during the process of the reauthorization of the Individuals with Disabilities Education Act (IDEA) (Bradley, Danielson, & Doolittle, 2007). RTI was developed to assist in the identification of students exhibiting a learning disability. Eventually, the 2004 reauthorization of IDEA included language that greatly enforced, but did not require, RTI as an appropriate approach to the identification of students with a Specific Learning Disability (SLD). The regulations now suggest that states must not require the use of a severe discrepancy between intellectual ability and academic achievement, must allow for a process of identification based on a student's response to research-based instruction, and may allow for the use of other research-based processes to help determine eligibility for special education services in public education (United States Department of Education, 2004).

In response to IDEA 2004, states reauthorized their own regulations. Georgia's revised special education regulations were adopted June 14, 2007, and eligibility criteria for SLD services changed dramatically (Georgia Department of Education, 2007). Consistent with federal law, the definition shifted from a severe discrepancy formula advocating a difference of either 15 or 20 standard score points between psychological processing/intellectual ability scores and academic achievement scores, to a dual discrepancy formula. The dual discrepancy formula emphasizes a demonstrated inadequate response to intervention and a discrepancy between psychological processing skills and academic achievement (with no severe discrepancy or "cut-off" scores

provided in the determination of eligibility for services).

As a result of these changes to Georgia's special education regulations, local school districts have more control than ever before over eligibility determinations and an opportunity to exert greater professional judgment in the interpretation of student data presented for special education eligibility. Currently, all districts are expected to simultaneously implement a research-based process for intervention delivery and the use of alternative research-based procedures to determine special education eligibility (Georgia Department of Education, 2008). In Georgia, these research-based processes and procedures are implemented within the state's Pyramid of Interventions.

The Georgia Pyramid of Interventions was developed by the Georgia Department of Education as a process for RTI. It is a four-tiered approach to providing student interventions, based upon strong instruction using the Georgia Performance Standards (GPS) (the state's curriculum), formative assessment practices, and evidence-based instruction (Georgia Department of Education, 2008). Within the Pyramid of Interventions, the Georgia Department of Education has not required the implementation of specific programs or interventions with students. Further, there are no specific guidelines for the interpretation of psycho-educational evaluations conducted with students for the purposes of an SLD eligibility determination. There is also no designated method to help determine if a discrepancy exists between psychological processing and academic achievement test results. As a result, local districts are, at this time, making these determinations independently, according to their own interpretations of the revised regulations and beliefs about psycho-educational assessment techniques and practices. Such ambiguity in the interpretation of students' test results allows for little consistency

in how students are qualified for special education services in school districts across the state.

In one northwest Georgia public school district, the site of this study and hereinafter referred to as Northwest Georgia Area Schools, the school psychologists researched the state's revised special education regulations and the newest test interpretation techniques to best determine how to consistently identify psychological processing deficits. The psychologists' research revealed that in both IDEA 2004 (United States Department of Education, 2004) and Georgia's revised special education rules pertaining to SLD eligibility (Georgia Department of Education, 2007), the definition of the term *psychological processing* was not operationalized. Psychological processing was discussed in terms of the skills associated with using spoken or written language that impacts the ability to listen, think, speak, read, write, spell, or do mathematical calculations. An assessment technique was needed to consistently measure psychological processing skills, and the psychological processing skills needed to be identified. Dehn's (2006) approach to the interpretation of psychological processing assessment was chosen as a technique. Using Dehn's approach, phonemic awareness, auditory processing, working memory, and long-term retrieval are the psychological processes considered to impact basic reading skills. Next, the psychological processes of working memory, fluid reasoning, executive processing/planning, and long-term retrieval are considered to impact the academic skill of reading comprehension. Finally, auditory processing, executive processing/planning, visual-motor integration, and processing speed are considered to impact writing skills.

To conduct Dehn's (2006) interpretation of psychological processing assessment

results, four steps are required. First, a mean processing score is calculated from the standard scores obtained in all psychological processing areas administered. Second, the mean processing score is compared to each psychological processing standard score, which is termed an ipsative determination. Standard scores that are more than 15 points discrepant are termed an *ipsative difference*. Third, a normative determination is also made for each processing score, and standard scores that are below 90 are labeled as normative weaknesses while scores above 109 are labeled as normative strengths. Finally, processing scores that show both a normative weakness and a negative ipsative difference are labeled as processing deficits. Scores that show both a normative strength and a positive ipsative difference are labeled as processing assets. Using this approach objectifies the determination of processing deficits and assets within each student's psycho-educational evaluation, and is determined, by the district's school psychologists, to encourage consistency in the interpretation of processing skills in all schools across the district.

In order to measure the psychological processing skills using Dehn's (2006) interpretation technique, the psychologists chose to administer subtests from the *Woodcock-Johnson Tests of Cognitive Abilities- Third Edition Form A (WJCOG-III)* (Woodcock, McGrew, & Mather, 2001) and *Beery-Buktenica Test of Visual-Motor Integration- Fifth Edition (VMI-5)* (Beery, Buktenica, & Beery, 2004). A summary of the clusters administered from the *WJCOG-III* (Woodcock, McGrew, & Mather, 2001) and the skills they measure are provided below.

- Phonemic Awareness- The student is administered two subtests that require listening to phonemic blends that create words. The subtests measure the

student's knowledge and skills pertaining to analysis and synthesis of speech sounds.

- **Auditory Processing-** The student is administered two subtests (one of which also contributes to the Phonemic Awareness cluster score) that require two skills: 1) identifying words from phonetic blends or 2) identifying words with increasing background noise. Overall, the subtests measure the student's ability to analyze, synthesize, and discriminate auditory stimuli, including the ability to process and discriminate speech sounds presented under distorted conditions.
- **Working Memory-** The student is administered two subtests that require listening to a series of numbers and words. The student is asked to manipulate the series to provide a specific response. This cluster measures the ability to hold information in immediate awareness while performing a mental operation on the information.
- **Long-Term Retrieval-** Two subtests are administered to the student, which require the retrieval of vocabulary words from long-term memory within a specific amount of time. The cluster measures the ability to store and retrieve information.
- **Fluid Reasoning-** The student is administered two subtests involving the manipulation of pictures based upon newly established rules. The cluster measures the ability to reason, form concepts, and solve problems using unfamiliar information or novel procedures.

- Executive Processing- The student is administered three subtests (one of which is also used to measure skills within the Fluid Reasoning cluster) that require the ability to plan, monitor performance, and arrive at solutions to problems.
- Processing Speed- Two subtests are administered that require the student to match and circle pictures within a specific amount of time. The cluster measures the ability to perform simple and automatic cognitive tasks rapidly, particularly when under pressure to maintain focused attention.

The subtest administered from the *VMI-5* (Beery, Buktenica, & Beery, 2004) and the skill the instrument measures are provided below.

- Visual-Motor Integration- The student is asked to copy geometric designs with increasing difficulty. The subtest measures hand-eye coordination.

In addition to the use of Dehn's (2006) approach to psychological processing interpretation, the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) approach was used to assist in the interpretation of academic achievement scores related to literacy. Using this approach, the academic achievement assessment is divided into five key areas: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Eight achievement subtests from the *Kaufman Test of Educational Achievement- Second Edition (KTEA-II)* (Kaufman & Kaufman, 2004) were chosen to assess the five areas of literacy. The subtests administered and a description of their administration are provided below:

- Phonological Awareness- The student responds orally to items that require the manipulation of sounds. Tasks include rhyming, matching sounds, blending

sounds, segmenting sounds, and deleting sounds.

- Nonsense Word Decoding- The student decodes invented words of increasing difficulty, applying phonics skills and structural analysis skills.
- Letter and Word Recognition- The student identifies letters and pronounces words of gradually increasing difficulty; the words are irregular to ensure that reading vocabulary, and not decoding ability, is measured.
- Reading Comprehension- For its easiest items, the student reads a word and points to its corresponding picture. In following items, the student reads simple instructions and responds by performing the actions. Later in the subtest, the student reads passages of increasing difficulty and answers literal and inferential questions about what was read.
- Word Recognition Fluency- The student reads as many isolated words as possible within one minute.
- Oral Expression- The student performs specific speaking tasks in a real-life scenario, involving pragmatics, syntax, semantics, and grammar.
- Listening Comprehension- The student listens to passages and then responds orally to literal and inferential comprehension questions posed by the examiner.
- Written Expression- The student performs sentence-length tasks, which involve editing passages for errors in capitalization and punctuation and writing summaries. Scoring of the story is based on length, content, sentence structure, and organization.

By combining the techniques provided by Dehn (2006) and the Reading Rockets

program (Greater Washington Educational Telecommunications Association, Inc., 2005), as summarized in Appendix A, the district's school psychologists intended to provide objectivity and ensure consistency in the interpretation of psychological processing and academic achievement scores in students' psycho-educational evaluations in each of the schools' eligibility meetings for special education services throughout the district.

Statement of the Problem

Within the RTI framework in Georgia's public schools, all students must receive three tiers of research-based interventions prior to initial consideration for special education services. In Georgia, RTI is illustrated as occurring within the Georgia Pyramid of Interventions, which is a four-tiered approach to providing student interventions. In the first tier, all students receive differentiated instruction and flexible grouping as they access the state's curriculum. Those students who fail to show adequate progress in response to tier-one techniques also receive small-group, evidence-based interventions at tier-two. Students' progress is monitored bi-weekly using formative assessments. Those students who fail to show adequate progress in response to the intervention receive support at tier-three, which is individualized, evidence-based instruction, and receive weekly formative assessments to measure their progress. Those students who fail to show adequate progress in response to three tiers of intervention can be referred for special education consideration (Georgia Department of Education, 2008). Upon referral for special education consideration in the Specific Learning Disability (SLD) category in Georgia, all students must be formally evaluated and results must demonstrate evidence of at least one processing deficit associated with academic underachievement to support eligibility.

In a school district with a high rate of bilingual students, English language exposure outside the school setting is likely minimal for those students whose families choose to primarily speak a language other than English. Such limited English exposure must be considered in psycho-educational evaluations in order to avoid the risk of over-identifying culturally and linguistically diverse students for special education services. To address this risk, the state of Georgia mandated strict guidelines suggesting that all instruments must be administered in the students' native language and must not be culturally biased. There are, however, no specific guidelines in Georgia that determine how psycho-educational evaluation results should be interpreted in order to determine eligibility for special education services in the SLD category. Therefore, a technically, culturally, and linguistically sound psycho-educational evaluation process is needed to avoid the over-identification of culturally and linguistically diverse students for special education eligibility in the SLD category.

Purpose of the Study

This study investigated the psycho-educational evaluation profile in English- and/or Spanish-speaking elementary school students upon referral for special education consideration due to literacy difficulties. The purpose of this investigation was to determine if the psycho-educational evaluation profile that emerged disproportionately identified groups of students as exhibiting significant differences in performance based upon differences in culture and language. In particular, the psycho-educational evaluation profile was analyzed using a unique literacy assessment technique combining Dehn's (2006) approach to psychological processing assessment and the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) approach

to academic achievement assessment.

Research Questions and Hypotheses

This study investigated the following research questions.

Research Question 1. After receiving three tiers of intervention for a reading difficulty, what is the overall processing assessment profile that emerges in the school district using Dehn's (2006) approach, and how does it differ in terms of cultural and demographical characteristics?

Research Hypothesis 1. There is a significant difference in the distribution of processing deficits among the eight areas assessed as analyzed by primary language in the home (English or Spanish).

Research Hypothesis 2. There is a significant difference in the distribution of processing deficits among the eight areas assessed as analyzed by gender (male or female).

Research Hypothesis 3. There is a significant difference in the distribution of processing deficits among the eight areas assessed as analyzed by (two, three, four, five, six, or seven) years of instruction.

Research Question 2. After receiving three tiers of intervention for a reading difficulty, what is the overall academic achievement profile that emerges in the school district using the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) approach, and how does it differ in terms of cultural and demographical characteristics?

Research Hypothesis 4. There is a significant difference in the mean standardized academic achievement scores of students as analyzed by primary home language (English

or Spanish).

Research Hypothesis 5. There is a significant difference in the mean standardized academic achievement scores of students as analyzed by gender (male or female).

Research Hypothesis 6. There is a significant difference in the mean standardized academic achievement scores of students as analyzed by (two, three, four, five, six, or seven) years of instruction.

Conceptual Framework

This investigation was predicated upon what is known about children's language development and how language impacts reading achievement within the context of the RTI approach to the identification of students with learning disabilities. Research has shown that student language development is impacted by language exposure in the home (Hart & Risley, 1995; Hood, Conlon, & Andrews, 2008). Further, research conducted by Hart and Risley (1995) demonstrates the longitudinal gap in language development that occurs across income levels, favoring the language growth of students from more affluent families. Within the current study, the population included English- and/or Spanish-speaking students from a Title I school district, which implied that the students lived in low-income homes. As suggested in Hart and Risley's (1995) research, it was presumed that these students had limited language exposure due to the school district's high poverty level, with a particular deficit ascribed to those students whose parents spoke Spanish as a primary language in the home.

Rationale for the Study

The rationale for this study focused on the needs of the population's school district. The present study investigated the psycho-educational profile that emerged using

a unique approach to literacy assessment. Knowing what the psycho-educational evaluation results revealed about the population could help the school district understand more about their intervention selection and design processes in the schools. It could also help the school's special education department determine the appropriateness of their special education eligibility determinations. With this in mind, the intent of the study was to minimize the over-identification of culturally and linguistically diverse students.

Significance of the Study

This study was the first to offer a cultural analysis of the psycho-educational evaluation profiles that emerged using a unique test interpretation technique combining the work of Dehn (2006) and the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005). The cultural analysis helped the population's school district determine best practices for psycho-educational evaluation test selection and effectiveness of current assessment interpretation techniques in their goal to minimize over-identification of culturally and linguistically diverse students receiving special education services. This study also provided information to the school district that may help in its future intervention design and delivery processes.

Definitions of Terms

- 1) *Georgia Performance Standards (GPS)*. The Georgia Performance Standards define the curriculum expectations for students in Georgia's public schools. The Georgia Department of Education created the GPS from a revision of previous curriculum standards in 2002. The GPS was considered an improvement over previous content standards because they described the content standard, suggested tasks, and provided samples of student work, and teacher commentary on the work (Georgia Department

- of Education, 2008).
- 2) *Georgia Pyramid of Interventions*. The Georgia Pyramid of Interventions was developed by the Georgia Department of Education as a process for (RTI). It is a four-tiered approach to providing student interventions, based upon strong instruction using the GPS, formative assessment practices, and evidence-based instruction (Georgia Department of Education, 2008).
 - 3) *Individuals with Disabilities Education Act (IDEA)*. The Individuals with Disabilities Education Act is a federal law that ensures services to children with disabilities from birth to 21 nationwide. This law is the result of 25 years of revisions to what began as Public Law 94-142 (United States Department of Education, 2004).
 - 4) *Literacy Collaborative Framework (LC)*. The Literacy Collaborative (LC) Framework is a research-based balanced literacy approach to reading instruction developed by Fountas and Pinnell (1996), which includes the activities of read-alouds, guided reading, independent reading, and independent writing. This framework uses reading and writing instruction in multiple environments employing various approaches that differ by level of teacher support and child readiness. Implementation practices include community and home involvement that complement the structured classroom-based approach. The LC Framework also includes an extensive coaching component that features building-level literacy coaches who work with teachers to ensure that student achievement is continuously monitored and developmentally appropriate.
 - 5) *National Reading Panel (NRP)*. The National Reading Panel was organized in 1997 as the result of a congressional request. At that time, Congress wished to obtain a

national report addressing reading instruction based upon research-based knowledge. The NRP's emphasis was the readiness for classroom application of the results of the research, along with a rapid dissemination of their findings to encourage effective reading instruction in the schools (United States Department of Health and Human Services, 2000).

- 6) *Response to Intervention (RTI)*. Response to Intervention is an approach to ensuring that all students obtain the instructional support they need. In Georgia, RTI is illustrated as occurring within the Georgia Pyramid of Interventions, which is a four-tiered approach to providing student interventions. Georgia's implementation of RTI requires strong, evidence-based instruction using the GPS and formative assessment at all tiers. Students begin in the first tier and receive differentiated instruction and flexible grouping as they access the state's curriculum. Those students who fail to show adequate progress in response to tier-one techniques also receive small-group, evidence-based interventions at tier-two. Students' progress is monitored bi-weekly using formative assessments. Those students who fail to show adequate progress in response to the intervention receive support at the third tier of intervention, which is individualized, evidence-based instruction, and receive weekly formative assessments to gauge their progress. Those students who fail to show adequate progress in response to three tiers of intervention can be referred for special education consideration, which almost always includes a psycho-educational evaluation (Georgia Department of Education, 2008).
- 7) *Specific Learning Disability (SLD)*. A Specific Learning Disability is a category of disability in which a student can be determined eligible for special education services.

According to Georgia regulations, a student who qualifies for SLD special education services exhibits a primary deficit in basic psychological processes, supported by secondary underachievement in one or more of the following areas: Basic Reading Skills, Reading Comprehension, Reading Fluency, Oral Expression, Listening Comprehension, Written Expression, Math Calculation, and Math Reasoning. In addition, a lack of response to instructional intervention as supported by formative assessments must be documented (Georgia Department of Education, 2007).

Delimitations of the Study

The current study was delimited for population, treatment, and instrumentation in order to achieve its intended purpose of research. First, the population for this study was limited to students from a low-income, English and/or Spanish-speaking background, receiving instructional support in a public school system employing a four-tiered approach to RTI. The population was limited to those students in the school district known as “Northwest Georgia Area Schools” that were referred for special education consideration after receiving three tiers of reading intervention. Further, only those students who spoke English or a combination of English and Spanish were selected to help determine the impact of language acquisition on the outcomes of psycho-educational evaluations. Student background was determined by parent report. For the purposes of this study, students were categorized as being from a Spanish-speaking background based upon their parents’ report at the time of initial referral.

A second delimitation is that the population was drawn from one single school district to address two concerns pertaining to instructional treatment. As Reynolds and Shaywitz (2009) note, there is concern that the implementation of RTI in a large-scale

setting, such as a school district, may result in different outcomes than seen in a small-scale research study. Essentially, this study could have been implemented within a highly controlled setting in which groups of students were systematically exposed to particular interventions from highly trained personnel. Such an approach, however, is not currently the norm in public school districts, to which this study was intended to apply.

Finally, data investigated in this study were delimited to the psycho-educational evaluation results of students within the population who were referred for special education consideration during the first and second semesters of the 2007-2008 school year and first semester of the 2008-2009 school year. The analyzed data included psychological processing and academic achievement results obtained from standardized assessments administered during individual psycho-educational evaluations. The evaluations were completed to assist in special education eligibility determinations; students were not evaluated solely for the purpose of this study.

Limitations of the Study

This study was limited by two factors: population size and intervention information. First, because the combined literacy assessment approach was uniquely designed and implemented by one school district for a short amount of time, the resulting population size was small. The small population size inhibited the statistical testing that could be performed on Research Question 1. The researcher had hoped to perform the chi-square test to determine if there was a statistically significant difference in the frequency of processing deficits in each of the eight psychological processing areas assessed. In order to perform such a test, however, the population should have included at least five cases of deficits within each of the eight areas. Because one would not

expect every student to exhibit a processing deficit in every area, many more students would be needed in the population in order to have the distribution of processing deficits needed to perform the chi-square test.

The second limitation of this study involved information about the interventions delivered at the schools during the process of RTI. First, the researcher was unable to obtain a listing of the specific interventions that were used in the population during the intervention delivery phases. Prior to the administration of the psycho-educational evaluation, interventions were selected and designed by intervention teams in each student's school at all tiers of RTI. Whereas the Northwest Georgia Area Schools district maintained adherence to literacy instruction within the Literacy Collaborative balanced literacy framework at all tiers of RTI, it was known that such instruction could be provided using a myriad of strategies. A list of the specific strategies employed with this population throughout the tiers of intervention could help to determine how the interventions led to special education consideration and impacted the students' assessment profiles.

Second, the researcher could not verify the integrity and fidelity of the interventions used with each participant at each tier of intervention. Because this was an *ex post facto* study, the researcher could not verify that the interventions were appropriately designed and delivered to each of the students in the population. The absence of such verification is a serious concern for the implication of the results in this study. However, verifying the integrity and fidelity of the interventions was not deemed a necessary component to accomplish the purpose of this study. The intervention design and delivery details were not considered essential components; the *process* of referral for

special education consideration and the outcome of the combined literacy assessment technique were the key components. The researcher sought to determine what strengths and weaknesses would emerge in the population's literacy assessment profile as a result of RTI teams determining that general education interventions were no longer reasonable for a student and special education consideration was necessary.

Assumptions

The following assumptions were critical for the data interpretation, discussion, and conclusion for this study.

- 1) The instruments selected for and administered to the population exhibited adequate reliability and validity.
- 2) Standardization was followed in the administration of all tests.
- 3) All instruments were administered in English.
- 4) English is the primary language for all participants.
- 5) The population, by virtue of being selected from a Title I school district, is considered to exhibit the poor language characteristics of a low-income population.

Summary and Dissertation Outline

In this study, Chapter One provides a brief introduction to the background of the problem regarding the decision to study the psycho-educational evaluation profiles that could emerge in linguistically different groups of students during the process of determining eligibility for special education services. In addition, the chapter reviews the study's purpose, rationale, significance, conceptual framework, research questions and hypotheses, definition of terms, delimitations, limitations, and assumptions. Chapter

Two provides a review of the literature pertaining to what is known about the acquisition of language and literacy skills and how those skills relate. Chapter Two also discusses the role of RTI as a diagnostic and intervention procedure, and how that process impacts SLD eligibility for special education services. In Chapter Three, the researcher describes the methodology that was followed to address the specific research questions. Chapter Four provides the results of the research, and Chapter Five includes a summary of the study and a discussion of the results. Chapter Five also provides implications for practice and recommendations for future research.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This chapter presents a review of the literature summarizing what is known about literacy skills and the role of emergent literacy. In addition, the chapter discusses how primary and secondary languages are acquired including the major theories pertaining to the development of both literacy and language from a maturational and experiential view. Criticisms of both are provided. Finally, the chapter concludes with a review of RTI as a diagnostic concept in Georgia and how SLD eligibility determinations are impacted by language development. A discussion of special education disproportionality, in terms of state and federal requirements and as it pertains to the Northwest Georgia Area Schools district, is also provided.

The Importance of Literacy and Its Emphasis in Early Childhood

Literacy is a broad communication skill that involves the activities of reading, writing, and processing of oral information (Calfee, 1988; National Academy of Education, 1985). Reading instruction has long been a topic of interest to educators and policymakers, garnering much attention through research and recommendations. Some of the earliest reading research was conducted in the late 1800s by European psychologist James McKeen Cattell, a student of psychologist Wilhelm Wundt. Cattell's research focused on reading and perception, psychophysics, individual differences, and individuals' reaction times to various stimuli (Pearson, 2002). Since that time, reading has increasingly become regarded as a complex skill that involves the synthesis of interrelated information (National Academy of Education, 1985).

Recently, a best practices approach to reading instruction was emphasized and

encouraged by the National Reading Panel's (NRP) meta-analysis and resulting recommendations (Kamps et al., 2007; United States Department of Health and Human Services, 2000; VanDerHeyden & Jimerson, 2005). In the late 1990s, the NRP, composed of 14 reading experts, was developed to survey the knowledge-base of early reading development and disseminate a summary of their research to schools across the nation (United States Department of Health and Human Services, 2000). The NRP's involvement was beckoned by Congress to address a concern about literacy performance and instruction in the nation's schools. The NRP's description of the five areas of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension—led to an early discussion outlining how student progress could be targeted and measured during the implementation of a reading intervention, and it also outlined the role of written and expressive language skills in the instruction, assessment, and use of literacy. In addition to its contribution to the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005), the NRP's research is also the origin of Reading First, the academic cornerstone of President George W. Bush's No Child Left Behind Act (United States Department of Education, 2008).

According to the National Academy of Education (NAE, 1985), children tend to acquire reading skills during early childhood experiences that encourage both motivation to read and the use of literacy. The NAE asserts that an introduction to books, and being read to at home prior to beginning school, were the most significant factors influencing a child's early educational success. As is evident from this conclusion, early childhood is widely regarded as a critical time in the development of literacy skills, with many researchers suggesting that the skills developed in early childhood are strongly linked to

future reading success (Muter & Snowling, 1998; Torgesen, Wagner, & Rashotte, 1994; Whitehurst & Lonigan, 1998). The knowledge of letters, ability to distinguish syllables, rhymes, and phonemes, and understanding of phoneme-grapheme correspondence are all variables that influence the acquisition of language skills. In the presence of these language variables, researchers argue that phonological awareness is the skill most closely related to reading success, and the ability to segment phonemes predicts reading and spelling abilities in early childhood (Nation & Hulme, 1997). Thus, the importance of building a strong phonological foundation is quite evident.

Delayed phonological awareness skills in young children are also associated with future reading problems. Children who have difficulties developing phonological sensitivity may be at risk for reading difficulties or failure to learn how to read (Burgess, 1999). Further, there is evidence that phonological awareness difficulties can lead to difficulties in other activities that involve literacy skills (Jerger, 1996). There is a large body of research to suggest that early literacy skills are significantly impacted by early intervention in phonological awareness that is both consistent and accurate in delivery (Bos, Mather, Dickson, Podhajski, & Chard, 2001; Crim et al., 2008; Mather, Bos, & Babur, 2001; Torgesen et al., 1994).

Balanced Literacy Instruction

Proper reading instruction has long been a topic of debate. For decades, two separate instructional techniques dominated: the skills-based approach and meaning-based approach. The skills-based approach emphasizes the use of phonics and phonemics with basal readers, while the meaning-based approach emphasizes language experience, reading, writing, and critical thinking (Frey, Lee, Tollefson, Pass, &

Massengill, 2005; Wilson, 1998). The skills-based approach focuses on reading instruction from the perspective of decoding from the smallest point of the language (letters/phonemes) to larger components (sounds, words, and sentences). Language decoding leads to reading mastery (Diegmueller, 1996).

The meaning-based approach, also known as the whole language approach, is based upon the theory that children learn to read the way they learn to speak—naturally (Fisher, 2008; Frey et al., 2005). Whole language proponents argue that children identify words better in context rather than in isolation. In addition, learners emphasize comprehension and meaning in text, encouraging children to look for semantic and syntactical clues to decode unfamiliar words. Reading and writing are connected through writing and editing activities in order to form meaning. Mini-lessons are also provided to address phonics, although that instruction is provided in context to individual students on an as-needed basis.

The skills-based approach and the whole language approach were long considered incompatible and were the subject of a debate regarding which one was most appropriate and effective in the teaching of reading. Snow, Burns, and Griffin (1998) suggested that successful reading instruction should fuse the systematic phonics and phonemic instruction with engaging reading and writing experiences, an approach currently regarded as balanced literacy. In this approach, children are explicitly and systematically taught the relationship between letters and sounds while they are being read to, reading interesting stories, and writing (Diegmueller, 1996). The combination of reading and writing instruction is a necessary component of a balanced literacy program. This perspective meshes with a growing realization that reading instruction should be part of

an integrated language program encompassing oral language development and writing.

One example of a balanced literacy reading approach is Fountas and Pinnell's (1996) Literacy Collaborative framework. This framework is a research-based instructional model that employs reading and writing instruction in multiple environments using various approaches that differ by level of teacher support and child readiness. Fountas and Pinnell's approach includes community and home involvement in addition to a structured classroom-based approach, employing the activities of read alouds, guided reading, independent reading, and independent writing. The Literacy Collaborative framework includes an extensive coaching component that features building-level literacy coaches who work with teachers to ensure that student achievement is continuously monitored and developmentally appropriate.

Theories of Early Language Development

As previously noted, phonological awareness/sensitivity is a critical skill in the development of reading. Building upon this concept, researchers also argue that phonological sensitivity is strongly related to children's early language development, which intertwine to impact future reading and spelling performance (Hay, Elias, Fielding-Barnsley, Homel, & Freiberg, 2007). The impact of language on literacy skills is evident in the process of emergent literacy, which is described as the "...skills, knowledge, and attitudes that are the developmental precursors to reading and writing" (Whitehurst & Lonigan, 1998, p. 848). During this stage, children use pictures, general knowledge, and oral language skills to communicate a story to others. Later, as reading and writing skills develop, children begin to view text as meaningful language. Language becomes critical in the process of reading when children begin to make the shift from reading to read

(decoding) to reading for meaning (understanding). Language difficulties have been shown to significantly impact children's academic outcomes, social skills, and cognitive abilities. The impact of language development on cognitive and academic outcomes is of great interest in the current study; most notably in the fact that early language development is considered a precursor and good predictor of children's early literacy skills (Hay et al., 2007).

The process by which children learn to understand and speak a language has been a topic of great interest to researchers during the past 80 years. Several theories have been proposed to account for language development, primarily designated as the behaviorist, innateness, cognitivist, and interactionist perspectives (Chapman, 2000; Dale, Roche, & Duran, 2008; Morgan, 1990; Overskeid, 1995). Although each set of theorists seeks to account for language development on their own theoretical terms, the theories have expanded our general understanding of the process of language development and are now largely considered to contribute to an overall understanding of language acquisition in children.

Behaviorist theories have their roots in behavioral psychology, largely made famous by psychologists Ivan Pavlov, Edward Thorndike, John B. Watson, and B. F. Skinner. These researchers conducted experiments with animals and adults, suggesting that their thoughts, actions, and feelings are simply behaviors. Behaviorists seek to teach behavior using a schedule of reinforcements and punishments. Skinner, specifically, expanded the concept of behaviorism to language acquisition in humans, describing it primarily as a learned behavior (Dale, Roche, & Duran, 2008). His theory suggested that children imitate the language of their caregivers, and their own language is reinforced

when the spoken word is recognized and they are praised or they are given what they have requested. The act of reinforcing the behavior results in the successful development of oral language.

While Skinner's theory is simplistic and elicits observable results in children, it is certainly not considered a complete theory of language acquisition (Morgan, 1990). One of the arguments against the behaviorist approach is that language is governed by a set of rules that must be learned. These rules must be continually worked out and applied. For example, when children inappropriately use verb tenses such as "maked" for "made," they engage in what is known as over-applying a rule. In addition, researchers note that children go through the stages of language acquisition in a linear pattern. A definitive series of steps is evident in what are known as developmental milestones; children are expected to meet first word, first two-word, and first 50-word milestones at known age ranges (Kovelman, Baker, & Petitto, 2008). It appears that these age ranges cannot be adjusted even with significant levels of instruction; they are biologically determined. Finally, there is arguable evidence of a critical or sensitive period in language acquisition. Gathered through observations over the last 40 years, research suggests that young children, in the course of their development, are better speech and language learners than adults, a conclusion that has implications in second language learning to be discussed in this study (Kuhl, Conboy, Padden, Nelson, & Pruitt, 2005; Tomblin, Barker, & Hubbs, 2007). However, this finding is not evident for vocabulary learning. In Wartenburger et al.'s (2003) research involving brain-imaging methods, the data supported an age effect for the acquisition of grammatical judgments, but the age effect could not be extended to vocabulary development. No sensitive or critical period for vocabulary development is

evident based upon the brain-imaging data.

Critical of the behaviorist approach to language acquisition, Noam Chomsky focused his studies on the process of grammar and mechanics to argue for what is considered an innateness approach to language acquisition (Behme & Deacon, 2008; Birdsong, 2006; Chapman, 2000). Chomsky argued that adults do not typically speak in grammatically complete sentences, and what children hear is only a small portion of what is possible using language. He suggested that children are born with biologically determined skills for language acquisition. In Chomsky's view, children's brains include neural circuits, which he deems a Language Acquisition Device (LAD), that contain linguistic information without benefit of training. Children are able to hear speech and interpret from that some meaning according to what is built in their LAD (Behme & Deacon, 2008).

One criticism of Chomsky's work is its theoretical nature. Chomsky's research focused on grammatical rules and biological disposition, failing to study children in his research. Critics argued that his theory does not account for the interaction between children and their caregivers or the function of the children's language (Chapman, 2000).

The most recent contribution to the theory of language acquisition is the interactionist approach, which focuses on the language input children receive from their caregivers (Chapman, 2000). This theory argues that children learn language in the context of interacting with others during communication. Jerome Bruner (1983) argued that child-directed speech is used by adults to support children's acquisition of language, which is also known as scaffolding. In response to Chomsky's theory involving LAD, Bruner argues that a Language Acquisition Support System (LASS) exists, addressing the

need for interaction between children and adults (Bruner, 1983). Arguments against the interactionist approach focus again on what is known about developmental milestones. It is widely agreed that children in various cultures pass through the same stages of language acquisition. In addition, child-directed speech is not considered essential for children's language acquisition, but it appears to be useful.

Finally, building upon the biological predisposition promoted by Chomsky, cognitivists argue that children are unable to acquire language until they can first understand a concept for which to give expression. This theory is most prominently based upon Jean Piaget's work, which suggests that intelligence emerges on a developmental timeline. According to Piaget, there are four stages of cognitive development: Sensori-Motor (birth to two years), Pre-Operational (two to seven years), Concrete Operational (seven to 11 years), and Formal Operational (11 years and older) (Piaget, 1971). Piaget argued that language emerges in the Pre-Operational stage, when children learn to use images and words to represent objects. Cognitivist critics argue that as development progresses, however, the relationship between language and intelligence becomes less clear. Aspects of language, such as syntax, appear to develop regardless of intellectual growth (Dale, Roche, & Duran, 2008).

As noted, these four theories of language acquisition are generally considered useful in examining language development in children. Each theory, perhaps, offers a partial explanation of the process of children's language acquisition. Taken together, they address the physiological and environmental aspects of language learning that are believed to work together to impact children's language acquisition.

Factors Impacting Language and Literacy Performance

As previously noted, language is considered an important aspect of children's emergent literacy skills, quite possibly rivaling the impact of phonological sensitivity. In Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, and Poe's (2003) research, phonological awareness and language skills were both researched to help determine their interrelationships with print knowledge in young children from low-income homes. Dickinson et al.'s results included a correlational analysis in which all three skills were significantly interrelated and mutually reinforcing. Further, their research demonstrated a double-deficit impact; children with poor phonological sensitivity showed poor vocabulary skills, while children with poor vocabulary skills showed poor phonological sensitivity skills.

The NRP also addressed language development in terms of comprehension and vocabulary development as components of reading (United States Department of Health and Human Services, 2000). The NRP's analysis suggested that comprehension and vocabulary skills are indeed intertwined in the process of reading, and vocabulary instruction can increase reading achievement if the strategies are appropriate for a child's age and ability level (United States Department of Health and Human Services, 2000). Vocabulary is a defining factor influencing reading comprehension; if spoken or written words are in the learner's vocabulary, meaning can readily be ascribed to the text. Therefore, as supported by language acquisition models, language mastery is a biological issue that combines with environmental language exposure and instructional techniques to impact reading development. It is important to note, however, that the NRP's meta-analysis pertaining to vocabulary skills failed to include research pertaining to the

populations of special education students and second-language learners (United States Department of Health and Human Services, 2000). Eliminating these populations from the research base leads one to question how vocabulary development impacts the process of reading in these groups of students, an important issue in an increasingly culturally diverse nation. This issue is reinforced in the 2000 Census report pertaining to language use and English-speaking ability (United States Census Bureau, 2003). Acknowledging that the ability to communicate with government and private sector workers is necessary and that the United States public relies upon English-speaking skills, the 2000 Census Bureau asked respondents over the age of five if they spoke a language other than English in their home. The results showed that 18% speak a language other than English in the home, with 8% of respondents reporting that they speak English less than “very well.” The Census Bureau noted that the number of people who spoke a language other than English in the home grew by 47% in the 1990s.

In response to the need to address literacy techniques for English language learners (ELLs), the United States Department of Education funded the National Literacy Panel on Language Minority and Youth in 2002 to survey, select, and synthesize research on teaching language-minority students to read and write. Their report, published in 2007, suggests that literacy instruction in the home language can facilitate literacy in English. The government panel reports that students receiving bilingual instruction (compared to English-only instruction) performed better on measures of English reading proficiency than students instructed only in English. In addition, they address the role of vocabulary in reading instruction, suggesting that reading programs for ELLs should

include intensive language development as well as instruction in literacy strategies and skills.

Bilingual Language Acquisition

At this point, the impact of both monolingual and bilingual language acquisition appears to be a critical component in understanding the relationship between language and literacy skills. As suggested in Scarborough's (2001) research, there is a demonstrable link between language and reading skills, supporting the double-deficit impact evident in Dickinson et al.'s (2003) research. Scarborough's (2001) research demonstrates that monolingual children who exhibit poor reading skills tend to earn lower scores on language competence tests. This result, however, is not necessarily supported in the research involving bilingual readers. Proctor, Carlo, August, and Snow's (2005) research shows a strong relationship between bilinguals' language competence and bilingual reading skills, while Durgunoglu, Nagy, and Hancin-Bhatt's (1993) research shows only a minimal relationship. Kovelman, Baker, and Petitto's (2008) research investigated this discrepancy, and their study revealed that the age of first intensive, systematic, and maintained bilingual language exposure exhibited a strong positive impact on reading and language development. They assert that an important implication of their findings is that "...when evaluating whether a bilingual child has normal reading development in a language, the age of the child's first exposure to that language should be considered" (p. 216). Early bilingual exposure had such a powerful, positive impact on reading and language development that the authors contend that this factor alone may ameliorate the negative effect of low socio-economic status on literacy.

The relationship between early bilingual exposure and the development of literacy

skills is also supported in the literature pertaining to the developmental impact of bilingual language acquisition. Throughout the literature, three aspects of bilingual language acquisition are evident: sound system processing, vocabulary processing, and grammatical processing. First, research conducted by Kuhl et al. (2005) analyzed the relationship between speech perception in infancy and later language development and discussed the impact of a critical period in phonetic learning. Their study measured infants' native-language and nonnative-language speech perception by head turning at the age of seven months. The results suggested that better native-language speech discrimination in infancy predicts accelerated language abilities as a toddler, whereas better nonnative-language speech discrimination in infancy predicts reduced language abilities as a toddler. Kuhl et al. hypothesize that native-language speech discrimination encourages language development because it supports word recognition skills for toddlers in their native languages.

As previously discussed, a critical period in language development is also evident in the literature. Emerging from Lenneberg's (1967) critical period hypothesis, first language acquisition is theorized to rely upon the plasticity of both hemispheres of the brain; a critical period of language acquisition that is thought to begin at about age two. Hemispheric specialization is complete by puberty and, if language acquisition has not occurred by that time, full mastery of language will never be attained. This hypothesis has been extended to sign language development (Mayberry & Lock, 2003) and speech perception in students who receive a cochlear implant (Tomblin, Barker, & Hubbs, 2007). Collectively, these researchers have demonstrated that the later the age at which exposure to sign language or speech sounds occur, the more prevalent a decline in language

becomes as children age. Kuhl et al. (2005) extended the critical period hypothesis to speech perception results. The authors argue that the later the age at which children are exposed to nonnative speech sounds, the more likely their nonnative language skills are to decline as they grow. The critical period of speech perception is opened by maturation (particularly between the ages of 6 and 12 months), and if experience does not occur during that time, future language performance declines.

Vocabulary development is a second issue of importance in bilingual language acquisition. McLaughlin (1977) suggests that a bilingual child's lexicon in a given language occurs at a slower rate than that of a monolingual child. This result is attributed to the multiple meanings of some words in alternate languages. As an example, McLaughlin demonstrates that the English word *brush* can be used to describe a brush for clothes, shoes, or paints. However, the German word *Biirste* does not extend to a paint brush; the word *Pinsel* must be used. The fact that for bilingual children every object in the environment has two names is accepted as the child experiences the vocabulary in different contexts—both linguistic and nonlinguistic.

In addition to the relationship between speech perception and vocabulary development, researchers have investigated the impact of age of bilingual language acquisition and mastery of grammar skills. There is evidence that individuals who acquire a language beyond the critical period, and who have many years of experience with a second language, do not typically acquire the subtle aspects of grammar that early bilinguals reach. This result holds true even when years of experience is controlled. As a result, adults who learn a second language after puberty are more likely to make grammatical errors than those who learned the second language during childhood, even

when the length of time speaking the second language is controlled (Kuhl et al., 2005; McLaughlin, 1977).

Finally, research has addressed the psychological processing skills, the cognitive component of language learning, considered to affect bilinguals (Birdsong, 2006).

Although these findings are predominantly the result of adult research, working memory and processing speed components of language production appear to be steadily compromised by age. These declines appear to be linear, beginning in early adulthood and continuing throughout the life span. These cognitive deficits predict that bilingual language acquisition becomes maturationally more difficult in and beyond adulthood.

Throughout the discussion of the developmental approach to bilingual language skills, an adherence to the critical period hypothesis has been preserved. The research presented has provided evidence that the sound system processing, vocabulary processing, and grammatical processing that develops in a second language from the ages of two to approximately 12 leads to increased language development as children mature. This research has supported what is typically known about monolingual language development, as well.

At this point, it is important to note that there is evidence to suggest that the critical period hypothesis does not conclusively support bilingual language acquisition throughout the literature. Snow and Hoefnagel-Hohle (1978) conducted a longitudinal study of the natural acquisition of Dutch by English speakers from ages three to adult. Each participant was assessed three times to measure improvement in language acquisition. In the results, age groups were compared, and participants in the age groups of 12 to 15 and adults made the fastest progress during the first few months of learning

their second language. At the end of the first year, however, the eight to ten and 12 to 15 year-old participants achieved the best control of the second language. The youngest participants (ages three to five) scored lowest on all of the tests administered. The authors argued that these results failed to support the critical period hypothesis for bilingual language acquisition.

Further support that the critical period hypothesis fails to exist in bilingual language acquisition may be found in accounts of learners (beyond the age of puberty) who achieve native-like competence in a second language (Birdsong, 1992; Birdsong & Molis, 2001). McLaughlin (1977) also argues that situational differences exist in the overall language learning of children and adults (whether in the first or second language). McLaughlin suggests that adults typically learn a second language in a classroom setting, whereas a child learns the first language in the natural environment. Children's language development is ultimately affected by their cognitive development and maturation, and they typically lack the efficiency in information processing that adults have, which includes their use of mnemonic devices. These situational and cognitive factors are argued to make the learning of a first and second language qualitatively different from childhood to adulthood.

The Influence of Demographics on Literacy Skills

As noted earlier, the impact of socio-economic status on literacy skills may be most substantiated in the literature pertaining to emergent literacy, which is defined as the skills, knowledge, and attitudes of preschoolers that are precursors to the development of reading and writing skills (Whitehurst & Lonigan, 1998). Children's emergent literacy skills begin in the home with exposure to both text and print and parents engaging in both

oral language and reading activities with their children. Research has shown that mothers' literacy levels predict children's literacy development (United States Department of Education, 1999). This is a critical issue in the field of education because there appears to be a relationship between parents' educational level and children's achievement; children whose parents have less than a high school education tend to have the poorest reading success (Kogut, 2004). Children's future performance on reading achievement tests is also linked to socioeconomic status (SES). Research has shown that children from homes of higher SES perform better on later reading achievement tests (Raz & Bryant, 1990; Wassik & Bond, 2001; White, 1982) and are more successful at making the transition from "learning to read" to "reading to learn" (Campbell, Kelly, Mullis, Martin, & Sainsbury, 2001).

As previously noted, however, SES may not truly account for reading outcomes. As an example, White (1982) performed a meta-analysis of the research pertaining to SES and children's reading achievement and the results suggested that SES, taken alone, was a poor predictor of reading achievement when analyzed separately from specific home factors. Measures such as parental occupation and family income were not the main factors impacting children's reading achievement. Instead, the social, language, and literacy activities that encourage children's development and are typically associated with higher SES homes were the major influences on children's literacy development. Therefore, this study suggests that when common correlates of SES emerge and are analyzed as an SES effect, the productivity of SES as a predictor of children's reading achievement increases. In an instance where these common correlates fail to emerge as an SES effect, the productivity of SES as a predictor of children's reading achievement

greatly diminishes.

Race and ethnicity also play a part in literacy development. According to the United States Department of Education (1996), the minority student population increased from 24 to 33 percent between 1976 and 1991, with the proportion of Hispanic students doubling during that time period. Educational disadvantage in the form of lower high school completion rates and lower levels of college entry are evident in most minority groups (United States Department of Education, 1996). Specifically, text comprehension in fourth graders was analyzed, and results showed that white students, on average, scored 15 points above the mean for all fourth grade students. Black students scored 50 points below the national average, and Hispanic students scored 27 points below.

Explanations for this pattern of scores included differences in motivation, aspirations, and expectations or differences in child-rearing practices. Other factors such as a difference between the language practices of the home and school (which include conversational patterns, nonverbal communication, and social interactions) and educational practices (such as isolating Hispanic students in separate classes or providing them a lower level of instruction that result in a self-fulfilling prophesy of low performance expectations) were also theorized (United States Department of Education, 1996).

In summary, there is evidence in the literature that language acquisition impacts literacy skills, which takes into consideration three factors: 1) the age at which a second language is acquired, 2) the correlated variables of social, language, and literacy activities typically associated with higher SES homes, and 3) race and ethnicity. First, current research (Hay, Elias, Fielding-Barnsley, Homel, & Freiberg, 2007) shows a strong relationship between language and phonological awareness, a factor considered strongly

related to reading achievement. When language is analyzed as a correlate to both phonological awareness and writing skills, the results are considered equally as significant and mutually reinforcing (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003). Further, vocabulary and comprehension, as language skills, are considered strong predictors of reading (United States Department of Health and Human Services, 2000). These studies set the foundation for the importance of language in the acquisition of literacy skills in children.

Expanding the concept of language acquisition as a contributor to literacy skills, the concept of bilingual language acquisition is explored. Research (Birdsong, 2006; Kovelman, Baker, & Petitto, 2008; Kuhl et al., 2005; Lenneberg, 1967) suggests that there are developmental and maturational factors that determine the success of language and literacy acquisition, providing evidence for the support of a critical period during the early stages of childhood development (ages two to 12) in which these skills can and must be obtained. Supporting these conclusions, research (Birdsong, 2006) studying the impact of processing skills on adult learners' second language acquisition suggests that deficits in both working memory and processing speed impact language processing skills and steadily decline with age, beginning in early childhood. However, there is conflicting research (Birdsong, 1992; Birdsong & Molis, 2001) that suggests that a critical period does not exist in the acquisition of a second language. There is evidence to suggest that adolescent and adult learners are more successful at acquiring a second language than children (Snow & Hoefnagel-Hohle, 1978).

Finally, SES, race, and ethnicity are considered correlates of language and reading achievement. Mother's literacy level, parent's educational attainment, and exposure to

emergent literacy skills in the home are factors associated with SES that emerge to impact children's reading achievement (Kogut, 2004; Raz & Bryant, 1990; United States Department of Education, 1999; Wassik & Bond, 2001; White, 1982). In addition, factors such as communication patterns, social interaction, and educational practices of culturally diverse students are considered qualitative issues that negatively impact reading achievement (United States Department of Education, 1996).

The Process of RTI in Georgia's Public Schools

To understand the place and purpose of reading instruction and intervention in Georgia's public schools, a discussion of the state's Response to Intervention (RTI) process is necessary. RTI became an expected instructional component in Georgia's schools in 2007. At that time, the Georgia Department of Education proposed that all districts should employ a four-tier approach to providing interventions, known as the Georgia Pyramid of Interventions (Georgia Department of Education, 2008). This pyramid is considered a mechanism to describe the supports available to all students at all ability levels; services for underachievers and overachievers are incorporated into the model. For the purposes of this study, however, RTI will be discussed as a function of special education identification.

According to the Georgia Department of Education (2008) all students participate in the general education curriculum in the lowest tier of intervention (tier-one), which includes access to the Georgia Performance Standards (GPS), differentiated instruction, flexible grouping, universal screenings, and progress monitoring using formative assessment. Those students who perform within the lowest 15% of their grade level are targeted for tier-two interventions. At the second tier of intervention, students maintain

access to tier-one instruction, but they also receive research-based interventions in their area of need, with at least bi-weekly formative assessment to measure their response to the intervention and guide the decision-making of school personnel. For those students who fail to make adequate progress in response to this level of support, tier-three intervention is available. In addition to having access to tier-one and tier-two supports, the student receives intensive, research-based instruction in the area of need. Weekly formative assessment is performed to measure the student's response to the intervention and guide the decision-making of school personnel. For those students who fail to make adequate progress after all three tiers of support are provided, consideration for special education services can be requested and a full, individual psycho-educational evaluation is conducted to help determine the specific area(s) of difficulty evident in the student's learning profile to help determine eligibility for special education services.

According to both federal and Georgia state agencies, full, individual psycho-educational evaluations must include a variety of assessment tools and techniques in order to gather relevant functional, developmental, and academic information about the student of interest (Georgia Department of Education, 2007; United States Department of Education, 2004). Information from the student, the student's parent(s), and the student's instructor(s) or educational agency is recommended for analysis. The assessment process must also include the use of technically adequate instruments that are not culturally biased. These instruments must be administered by trained personnel, who are knowledgeable in the student's native language. Finally, the student must be assessed in all areas related to the suspected disability, including, as appropriate, health, vision, hearing, social and emotional status, general intelligence, academic performance,

communicative status, and motor abilities (Georgia Department of Education, 2007; United States Department of Education, 2004).

Ultimately, the RTI process is considered a diagnostic procedure for identifying not only learning difficulties but also interventions that could be effective with a target student. It is a problem-solving process at each of the four tiers of the Georgia Pyramid of Interventions and is viewed as an integration tool between the state's general and special education programs, due to its emphasis on coordinated decision-making and resource-sharing (Georgia Department of Education, 2008). However, the role of special education staff is most evident at the fourth tier of intervention, in which special education and/or related services are provided to students via an Individualized Education Program (IEP).

In summary, the RTI process seeks to enhance student learning. Although it was arguably identified as an approach to help determine special education eligibility in the schools, it is also an opportunity for school personnel to systematically measure and increase student performance (United States Department of Education, 2004). RTI's focus on assessment-driven decision-making, as a process for identifying effective instructional interventions, is intended to help special education eligibility teams determine whether specialized instruction at the highest level of intervention (tier-four) is necessary. In Georgia's schools, there are no required formative assessment or intervention techniques. School systems, at the local level, must determine how they will measure student progress and design interventions.

The Specific Learning Disability Program: Definition and the Impact of Language

The definition for a Specific Learning Disability (SLD) was originally proposed by the National Advisory Committee on Handicapped Children (United States Department of Health, Education, and Welfare, 1968) and incorporated in Public Law 94-142 (The Education for All Handicapped Children Act in 1975) now known as IDEA.

The committee proposed the following definition:

Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage.

(United States Department of Health, Education, and Welfare, 1968, p. 34)

This definition of SLD has remained in place over 40 years through four revisions to IDEA. This outcome is stunning because the category of SLD is the only special education category to remain unchanged in its definition, despite the fact that the operational definition changed in response to what research suggested about identification practices (Kavale, Spaulding, & Beam, 2009).

The current federal (and state of Georgia) regulations defining SLD include wording that requires a deficit in at least one area of basic psychological processing in using spoken or written language, which manifests in disorders related to reading,

writing, math, spelling, listening, speaking, and thinking. The definition further includes exclusionary factors such as hearing or vision impairments, motor handicaps, mental retardation/cognitive disabilities, and environmental disadvantage (Georgia Department of Education, 2007; United States Department of Education, 2004). These criteria are identical to the National Advisory Committee on Handicapped Children's 1968 definition.

For years, the determination of processing deficits and their relationship to academic disorders was based upon a discrepancy model, which compares general intelligence and academic achievement for eligibility purposes. Most states chose to specify how that discrepancy would be determined at the local level, generally offering a mathematical formula to operationalize a significant discrepancy. In Georgia, the formula consisted of obtaining an intellectual ability score and subtracting 20 points in the case of an initial eligibility meeting (or 15 points in a re-evaluation meeting) to obtain a cut-off score signifying the presence or absence of the SLD. If a student's academic achievement score met or fell below the cut-off score based upon the intellectual ability score, SLD eligibility criteria could be met. The 2004 revision to IDEA effectively removed the requirement for a discrepancy model and currently allows for a process to determine students' responses to scientifically, research-based intervention as a part of the evaluation procedure. This change was initiated by researchers and policymakers who argued that RTI was a more proactive approach to remediating student performance, citing two prominent arguments: 1) it typically takes two years of schooling to demonstrate a performance discrepancy and 2) delaying identification of SLD until a

child falls below a predicted level of performance can result in at least two years of academic failure (Donovan & Cross, 2002).

In addition to these issues, data (Turnbull, 2009) also showed that the discrepancy formula led to over-identification of students in special education, arguing that over-identification arguably caused two problems: 1) greater educational spending and 2) misidentified students received unneeded special education services and supports, resulting in a sense of entitlement and dependency perceived as problematic to these individuals in adulthood. Turnbull (2009) argued that the discrepancy formula allowed Local Education Agencies (LEAs) too much discretion in the process of SLD identification. As a result, students who demonstrated different intellectual ability and performance levels were made eligible for special education services, and the percentage of students receiving SLD support increased annually (United States Department of Education, 2007). Donovan and Cross (2002) also argued that culturally and linguistically diverse students are over-identified as eligible for special education services due to reading difficulties.

Revisions to the state of Georgia's SLD eligibility criteria addressed the issue of over-identification by stipulating that students receive a full, individual evaluation that includes a measurement of communication status (Georgia Department of Education, 2007). Further, a language processing assessment must be considered in the evaluation process, and instruments must be administered in the students' native language and must not be culturally biased. A strong rationale must also be afforded when students considered as Limited English Proficient (LEP) qualify for special education services. In

Georgia, properly designed intervention programs and evaluation processes are considered key to ensuring that students are accurately identified for SLD eligibility.

Disproportionality in Georgia’s Public Schools and in the Northwest Georgia Area Schools District

As required by IDEA 2004, the Georgia Department of Education developed and maintains a State Performance Plan (SPP) that evaluates the state’s efforts to implement the requirements and purposes of IDEA 2004, and describes how the state will improve such implementation (Georgia Department of Education, 2010). The Georgia Department of Education established measurable targets for the performance of special education students on 20 performance indicators, and they must report progress toward achieving those targets in an annual report. Federal law states:

(I) PUBLIC REPORT- the State shall report annually to the public regarding the performance of each Local Educational Agency (LEA) within the State Targets segment of the SPP. The State shall make the SPP available through public means, including posting on the SEA website, distribution to the media, and distribution through public agencies. (United States Department of Education, 2004, 616(b)(2)(C)(ii)(I))

The Georgia Department of Education provides these data as a planning tool to assist local school districts with program evaluation for the purpose of improving the performance of students.

One of the Georgia Department of Education’s 20 performance indicators focuses on disproportionality by disability type. To address this target, the state uses a weighted risk ratio. The weighted risk ratio answers the question: “What is a specific racial/ethnic

group's risk of receiving special education and related services for a particular disability as compared to the risk for all other students?" (Georgia Department of Education, 2010, Representation by Disability Type section, para. 2). The Georgia Department of Education provides the following interpretation for the ratios: between 1.20 and 1.99 is considered "At-Risk," between 2.00 and 3.99 is considered "Disproportionate," and above 4.00 is considered "Significant Disproportionality" (Georgia Department of Education, 2009). Weighted risk ratios are not comparable across districts; they adjust for school district variability in racial/ethnic composition.

In the Northwest Georgia Area Schools district, the weighted risk ratios for disproportionality in the area of SLD for students identified as Hispanic were reported as 1.79 in 2007, 1.75 in 2008, and 1.32 in 2009 (Georgia Department of Education, 2009). All ratios suggest that the school district's Hispanic students were at-risk for receiving special education and related services, when compared to the risk for all other students, due to eligibility in the SLD category.

Summary

Throughout this chapter, the researcher compiled concepts related to literacy, language, the process of diagnosis and intervention in Georgia's schools, the role of SLD eligibility determinations, particularly as they are impacted by language, and disproportionality in categories of special education in Georgia's schools and the Northwest Georgia Area Schools district. These are all perceived as important issues to the current study. From the literature review, it appears that literacy skills emerge in early childhood and are acquired through explicit instructional techniques, behavioral modeling techniques, and exposure to oral and written language resources. Similarly,

language is thought to be acquired both explicitly and through experiential means. There is evidence to suggest that the acquisition of a second language may be fundamentally different from acquiring a first language, due in large part to the setting in which it is acquired and to the learner's current command of the primary language. These issues emerge in the process of learning to read in school, and those students who exhibit language and/or reading acquisition difficulties are typically referred for additional support in the RTI process. Students who fail to respond to appropriate interventions can receive a full, individual psycho-educational evaluation and are considered for special education support, typically in the SLD category. Evidence suggests that students who are improperly placed in special education programs are negatively impacted in adulthood, and Georgia has recommended evaluation practices to ensure that an appropriate, full, and individual evaluation is performed to help drive special education determinations. The suggestion that misidentified special education students are negatively impacted even beyond the school setting provides support for the assertion that language and literacy must be carefully addressed in all diagnostic and intervention settings.

CHAPTER THREE: METHODOLOGY

Introduction

This chapter describes the methods and procedures that were used to analyze the psycho-educational evaluation results of students referred for special education consideration after receiving three tiers of literacy interventions. This chapter presents a description of the research design, research questions and null hypotheses, population, instrumentation and data collection procedures, and data analysis. The purpose of this study was to determine if a profile emerged in the psycho-educational evaluation results of students using a combination of the assessment approaches designed by Dehn (2006) and the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005). The present study evaluated the distribution of psychological processing deficits and significance of mean standardized academic achievement scores that emerged in students' psycho-educational evaluations.

Description of the Research Design

This study is representative of a quantitative descriptive research design (Patten, 2005). The study investigated a population of students who, after receiving three tiers of reading interventions and being subsequently referred for special education consideration, received a psycho-educational evaluation that included the integration of assessment techniques proposed by Dehn (2006) and the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005). A quantitative approach was selected to help determine the distribution and significance of those scores in this population of students. *Ex post facto* data were collected for the purpose of describing the existing conditions of the population (McMillan & Schumacher, 2006).

Research Questions and Null Hypotheses

This study investigated the following research questions.

Research Question 1. After receiving three tiers of intervention for a reading difficulty, what is the overall processing assessment profile that emerges in the school district using Dehn's (2006) approach, and how does it differ in terms of cultural and demographical characteristics?

Null Hypothesis 1. There is no difference in the distribution of processing deficits among the eight areas assessed as analyzed by primary language in the home (English or Spanish).

Null Hypothesis 2. There is no difference in the distribution of processing deficits among the eight areas assessed as analyzed by gender (male or female).

Null Hypothesis 3. There is no difference in the distribution of processing deficits among the eight areas assessed as analyzed by (two, three, four, five, six, or seven) years of instruction.

Research Question 2. After receiving three tiers of intervention for a reading difficulty, what is the overall academic achievement profile that emerges in the school district using the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) approach, and how does it differ in terms of cultural and demographical characteristics?

Null Hypothesis 4. There is no difference in the mean standardized academic achievement scores of students as analyzed by primary home language (English or Spanish).

Null Hypothesis 5. There is no difference in the mean standardized academic

achievement scores of students as analyzed by gender (male or female).

Null Hypothesis 6. There is no difference in the mean standardized academic achievement scores of students as analyzed by (two, three, four, five, six, or seven) years of instruction.

Institutional Review Board Approval

Before proceeding with the data collection process, the researcher sought Institutional Review Board (IRB) approval from the IRB of the University of Tennessee at Chattanooga (UTC IRB) and the Northwest Georgia Area Schools superintendent. Based on the guidelines of the UTC IRB, the research qualified for and received expedited status (see Appendix B). Once UTC IRB approval was granted, the researcher sought and was granted approval from the Northwest Georgia Area Schools superintendent to use the district's available data (see Appendix C). No data were collated or manipulated until approval had been obtained from both institutions.

All data used in the study were compiled from two existing databases available in the Northwest Georgia Area Schools psychological services office. The first database was developed and maintained by the district's three school psychologists in order to compile testing and demographic information for state and local reporting purposes. The second database was a district database used not only for data collection but also *ad hoc* reporting for state and local reporting purposes. The researcher only used databases containing information collected for legitimate and routine reporting purposes. All student data were accessible in both databases by a unique identification number. Aside from this number, no identifying information was tied to any of the subjects in this study, and confidentiality of all participants was strictly maintained.

Description of the Population and Sample

The participant population for this study was obtained from a database in the Northwest Georgia Area Schools from six elementary schools (kindergarten through fifth grade) containing referral and testing information for 130 students who had received a psycho-educational evaluation within two school years: fall and spring semesters of the 2007-2008 school year and fall semester of the 2008-2009 school year. The database was maintained by the district's school psychologists annually and was readily available to the researcher, a system school psychologist, for legitimate purposes. Of the 130 students in the database covering this time period, only the individuals who met explicit criteria for this study were selected for data analysis. The criteria for inclusion in the study were that the student: 1) received three tiers of reading intervention in the RTI process; 2) was referred for initial special education consideration; 3) received a psycho-educational evaluation using the combined literacy assessment approach comprised of Dehn's (2006) psychological processing assessment approach and the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) academic achievement approach; and 4) was from a primarily English- or Spanish-speaking home. There was no sampling in this defined population; all students who met the criteria during the targeted years were included in the study. In all, 54 students met the criteria and were included in the study. It is important to note that because this study employed secondary data, the researcher had no direct contact with any of the study's participants or their families in its completion. The population's data was simply accessed and compiled for analysis.

Instruments and Data Collection

Demographic Data

Demographic information pertaining to each student's school name, sex, home language, and grade placement at referral was collected from the Northwest Georgia Area Schools database on file in the psychological services office. In addition, each student's history of grade retentions, age upon starting school, school moves, and number of absences since enrollment in kindergarten was collected from a central office district database.

Psycho-educational Evaluation Data

In addition to the above data, psycho-educational evaluation results were compiled from each student's existing first or second semester 2007-2008 school year or first semester 2008-2009 psycho-educational evaluation report. Each psycho-educational evaluation was conducted using the combined literacy assessment approach provided in Appendix A. The academic achievement assessment of literacy was taken from the Reading Rockets approach (Greater Washington Educational Telecommunications Association, Inc., 2005), using the administration of the following eight subtests from the *Kaufman Test of Educational Achievement- Second Edition (KTEA-II)* (Kaufman & Kaufman, 2004): Phonological Awareness, Nonsense Word Decoding, Letter and Word Recognition, Reading Comprehension, Word Recognition Fluency, Oral Expression, Listening Comprehension, and Written Expression. The psychological processing assessment of literacy was taken from Dehn's (2006) approach, using the administration of two processing instruments. Subtests from the *Woodcock-Johnson Tests of Cognitive Abilities- Third Edition Form A (WJCOG-III)* (Woodcock, McGrew, & Mather, 2001)

were administered to provide standard scores for the following clusters: Phonemic Awareness, Auditory Processing, Working Memory, Long-Term Retrieval, Fluid Reasoning, Executive Processing, and Processing Speed. In addition, the Visual-Motor Integration subtest from the *Beery-Buktenica Test of Visual-Motor Integration- Fifth Edition (VMI-5)* (Beery, Buktenica, & Beery, 2004) was administered.

Data Analysis

Demographics

Descriptive statistics were used to describe the population. Frequency and percentages were calculated for data pertaining to race, sex, school building enrollment, grade, and primary home language. In addition, means, modes, and standard deviations were also reported for students' age upon starting school, number of grade retentions, number of school days missed since enrolling in kindergarten, and number of school moves.

Inferential statistics were also performed to provide further interpretation to the study's results pertaining to students' absenteeism and school moves. First, a one-way ANOVA was conducted to investigate the dependent variable of students' absences since initial school enrollment by the independent variable of grade at referral for testing. This information was provided to help determine if students' school absences were reasonable or beyond the school district's expectations. It was also useful to help determine if and where a significant difference in attendance patterns existed between grade levels.

Second, a one-way ANOVA was also performed to analyze the number of school moves by race. This information was important because it helped to provide some

cultural interpretation, identifying if one racial group exhibited more school moves than the others.

Research Questions

Inferential statistics were performed to address the study's research questions and hypotheses. First, the processing assessment data was analyzed to determine if a difference in the frequency of processing deficits was evident in groups of students as divided by primary language in the home (English and Spanish), gender (male and female), and (two, three, four, five, six, or seven) years of instruction.

First, in order to determine the presence of a processing deficit, each student's individual psychological processing scores were compared to his or her mean processing score. Those scores that were below 90 (a normative weakness) and at least 15 points less than the mean processing score (ipsative difference) were coded as a processing deficit (Dehn, 2006). Those scores that did not meet these criteria were not coded as a processing deficit.

To investigate processing deficits by language in the home, the data was analyzed with eight one by two chi-square tests using the Test of Homogeneity, comparing each of the psychological processing areas to primary language in the home (English or Spanish). The investigation of processing deficits by gender was also analyzed with eight one by two chi-square tests using the Test of Homogeneity. However, psychological processing scores were compared to gender (male or female). Finally, the investigation of processing deficits by years of instruction was performed using eight one by six chi-square tests employing the Test of Homogeneity. Psychological processing scores were compared to (two, three, four, five, six, or seven) years of instruction. Essentially, these

analyses sought to identify if the processing deficits were evenly dispersed or if a particular deficit area tended to be most prevalent for the students referred.

The data pertaining to students' academic achievement levels, the subject of Research Question 2, were also analyzed and inferential statistics were performed to address Null Hypotheses 4, 5, and 6. A one-way ANOVA was conducted to investigate the dependent variable of mean achievement scores in each of the eight areas assessed (Phonological Awareness, Nonsense Word Decoding, Letter and Word Identification, Reading Comprehension, Word Recognition Fluency, Oral Expression, Listening Comprehension, and Written Expression) as grouped by the following three independent variables: primary language in the home, gender, and years of instruction.

CHAPTER FOUR: RESULTS

This chapter is organized in terms of the two research questions and the six null hypotheses posed in Chapter Three. The chapter first reports the study's demographic data as divided by home characteristics (gender, evaluation year, race, and primary home language) and school characteristics (school building, grade, years of instruction, absences since initial enrollment in school, age in months in which the initial school enrollment occurred, and number of school moves). The chapter concludes with the data analysis pertaining to the research questions.

Demographics

Home Characteristics

The population consisted of 54 participants comprised of more males than females: in all there were 33 (61.1%) males and 21 (38.9%) females in the population. The majority of the population was referred and evaluated during the 2008-2009 school year, with 46 (85.2%) participants referred and evaluated in 2008-2009 and 8 (14.8%) participants referred and evaluated in 2007-2008.

The population was analyzed for race and primary home language, as identified by the students' parents and reported to school officials. There were 35 (64.8%) Hispanic participants, 15 (27.8%) white participants, two (3.7%) black participants, and two (3.7%) multi-racial participants. Spanish was the most prevalent primary home language with 33 (61.1%) participants primarily speaking Spanish in their homes and 21 (38.9%) participants primarily speaking English in their homes.

School Characteristics

The population was comprised of students in six elementary schools, with over

half of the population enrolled in one of two schools. School B had 14 (25.9%) participants and School D had 13 (24.1%) participants. Schools A, E, and F had seven (13.0%) participants each, while school C had six (11.1%) participants. The majority of the participants were in first grade with proportions generally declining with each successive grade advancement. There were 18 (33.3%) participants in first grade, eight (14.8%) in second grade, 14 (25.9%) in third grade, 10 (18.5%) in fourth grade, and four (7.4%) in fifth grade.

Retention data were collected for the participants, and the number of years of instruction they had received since kindergarten was analyzed. Over two-thirds of the students received four years of instruction or less. The data showed that 17 (31.5%) participants received two years of instruction, eight (14.8%) received three years of instruction, 14 (25.9%) received four years of instruction, four (7.4%) received five years of instruction, nine (16.7%) received six years of instruction, and two (3.7%) received seven years of instruction.

The researcher collected the number of absences recorded for each of the participants since their enrollment in school. The results show that 14 (25.9%) of the students had 10 or fewer absences, 22 (40.8%) had between 10 and 24 absences, and 18 (33.3%) had more than 24 absences. The population included a minimum of three absences and a maximum of 83 absences, with a mean of 22.39 ($SD = 16.26$).

The researcher also collected the age (in months) at which each of the participants began school. The data show that the youngest age of enrollment was four years, three months and the oldest age of enrollment was seven years, three months. Three (5.6%) participants enrolled in school younger than the age of five, 40 (74.1%) enrolled between

the ages of five and six, 10 (18.8%) enrolled between the ages of six and seven, and one (1.9%) enrolled above the age of seven. The mean age at enrollment was 67.24 months ($SD = 6.59$) (approximately five years, seven months).

Finally, the number of school moves was calculated for the population of students. The data were derived from the number of times the students transferred schools after their initial school enrollment. The data suggested that over 80% of the students had one school move or less. Thirty one (57.4%) students in the population had zero school moves, 15 (27.8%) had one school move, four (7.4%) had two school moves, two (3.7%) had three school moves, and two (3.7%) students had four school moves.

A one-way ANOVA was performed to analyze number of school moves by race. This analysis was performed to assist in the interpretation of the data pertaining to school moves. The one-way ANOVA results suggested that there was not a significant difference between the students' number of school moves and race, $F(3, 50) = .54, p = .658$. As seen in Table 1, all races represented in the population had a mean at or between one and zero school moves.

Table 1

Means and Standard Deviations for Total Number of School Moves by Student Race

Race	<i>N</i>	<i>M</i>	<i>SD</i>
Black	2	0.00	0.00
Hispanic	35	0.77	0.17
White	15	0.53	0.27
Multi-Racial	2	1.00	1.00
Total	54	0.69	0.14

Results of Research Questions and Data Analysis

In order to carry out the purpose of this study, data were sought to determine how

students' psycho-educational evaluation results for literacy skills compare, as measured by Dehn's (2006) psychological processing approach and the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) academic achievement approach, when referred for special education consideration after receiving three tiers of intervention for a reading difficulty. Two research questions, with corresponding hypotheses, were tested. The first research question focused on the assessment results pertaining to the psychological processing approach while the second research question focused on the assessment results pertaining to the academic achievement approach. The research questions and findings were as follows:

Research Question 1

Research Question 1. After receiving three tiers of intervention for a reading difficulty, what is the overall processing assessment profile that emerges in the school district using Dehn's (2006) approach, and how does it differ in terms of cultural and demographical characteristics?

Null Hypothesis 1. There is no difference in the distribution of processing deficits among the eight areas assessed as analyzed by primary language in the home (English or Spanish).

Null Hypothesis 2. There is no difference in the distribution of processing deficits among the eight areas assessed as analyzed by gender (male or female).

Null Hypothesis 3. There is no difference in the distribution of processing deficits among the eight areas assessed as analyzed by (two, three, four, five, six, or seven) years of instruction.

The null hypotheses were neither accepted nor rejected. The chi-square technique

was performed to answer Research Question 1, but the results suggested that the population was too small to provide at least five cases of processing deficits in each of the areas analyzed. Therefore, the chi-square statistic was not provided and the null hypotheses were neither accepted nor rejected.

To address Research Question 1, descriptive statistics were performed. As seen in Table 1, 63.0% of the processing deficits evident in the psychological processing assessment were found in two areas: Long-Term Retrieval and Working Memory. The remaining six areas assessed generally show an even distribution of the remaining 37.0% of the processing deficits. Therefore, Long-Term Retrieval and Working Memory occur more frequently than the other psychological processing skills assessed.

Table 2

Frequencies and Percentages for the Presence of Psychological Processing Deficits

Psychological Processing Skill	Frequency	Percent
Long-Term Retrieval	21	38.9%
Auditory Processing	1	1.9%
Fluid Reasoning	3	5.6%
Processing Speed	3	5.6%
Phonemic Awareness	2	3.7%
Working Memory	13	24.1%
Executive Processing	1	1.9%
Visual-Motor Integration	2	3.7%

Research Question 2

Research Question 2. After receiving three tiers of intervention for a reading difficulty, what is the overall academic achievement profile that emerges in the school district using the Reading Rockets (Greater Washington Educational

Telecommunications Association, Inc., 2005) approach, and how does it differ in terms of cultural and demographical characteristics?

Null hypothesis 4. There is no difference in the mean standardized academic achievement scores of students as analyzed by primary home language (English or Spanish).

The null hypothesis was rejected. There was a difference in academic achievement scores as analyzed by primary language in the home. To address this hypothesis, a one-way ANOVA was conducted. This analysis compared the independent variable of primary home language with two levels (English and Spanish) to the dependent variable of mean achievement scores in each of the eight areas assessed (Phonological Awareness, Nonsense Word Decoding, Letter and Word Identification, Reading Comprehension, Word Recognition Fluency, Oral Expression, Listening Comprehension, and Written Expression). Post hoc tests were not performed because there were fewer than three independent variable groups.

The data showed that there was a significant difference in five of the eight areas assessed: Letter and Word Recognition, $F(1, 52) = 5.16, p = .027$, Reading Comprehension, $F(1, 52) = 4.98, p = .030$, Word Reading Fluency, $F(1, 29) = 6.12, p = .019$, Oral Expression, $F(1, 52) = 8.31, p = .006$, and Listening Comprehension, $F(1, 52) = 18.21, p < .001$. There was no significant difference in the areas of Phonological Awareness, $F(1, 49) = 2.99, p = .090$, Nonword Decoding, $F(1, 50) = .01, p = .935$, and Written Expression, $F(1, 52) = 1.35, p = .249$.

As evident in Table 2, mean achievement scores were consistently higher for the group of students who primarily speak English in the home. As a result, there was a

significant difference between mean achievement scores favoring the performance of students who primarily speak English in the home.

Table 3

Means and Standard Deviations for Academic Achievement Scores by Primary Home Language

Academic Achievement Area		<i>N</i>	<i>M</i>	<i>SD</i>
Phonological Awareness	English	21	83.57	7.84
	Spanish	30	79.50	8.54
	Total	51	81.18	8.43
Nonword Decoding	English	21	83.52	10.87
	Spanish	31	83.29	9.38
	Total	52	83.38	9.90
Letter and Word Recognition*	English	21	86.38	10.31
	Spanish	33	80.82	7.63
	Total	54	82.98	9.10
Reading Comprehension*	English	21	83.00	11.20
	Spanish	33	77.45	7.08
	Total	54	79.61	9.22
Word Reading Fluency*	English	10	86.60	11.33
	Spanish	21	76.95	9.56
	Total	31	80.06	10.98
Oral Expression**	English	21	82.57	14.23
	Spanish	33	72.70	10.85
	Total	54	76.54	13.08
Listening Comprehension**	English	21	94.29	11.06
	Spanish	33	81.70	10.24
	Total	54	86.59	12.16
Written Expression	English	21	78.05	9.27
	Spanish	33	75.33	7.70

Academic Achievement Area	<i>N</i>	<i>M</i>	<i>SD</i>
Total	54	76.39	8.37

* $p < .05$

** $p < .01$

Null Hypothesis 5. There is no difference in the mean standardized academic achievement scores of students as analyzed by gender (male or female).

The null hypothesis was rejected. There was a difference in academic achievement scores as analyzed by gender. To address this hypothesis, a one-way ANOVA was conducted, which compared the independent variable of gender with two levels (male and female) to the dependent variable of mean achievement scores in each of the eight areas assessed (Phonological Awareness, Nonsense Word Decoding, Letter and Word Identification, Reading Comprehension, Word Recognition Fluency, Oral Expression, Listening Comprehension, and Written Expression). Post hoc tests were not performed because there were fewer than three independent variable groups.

The data showed that there was a significant difference in two of the eight areas assessed: Oral Expression, $F(1, 52) = 4.75, p = .034$, and Written Expression, $F(1, 52) = 6.31, p = .015$. There was not a significant difference in the areas of Phonological Awareness, $F(1, 49) = .03, p = .860$, Nonword Decoding, $F(1, 50) = .01, p = .925$, Letter and Word Recognition, $F(1, 52) = .35, p = .557$, Reading Comprehension, $F(1, 52) = 1.90, p = .174$, Word Reading Fluency, $F(1, 29) = .14, p = .713$, and Listening Comprehension, $F(1, 52) = .45, p = .504$.

As evident in Table 3, mean achievement scores were higher for females in all areas except Listening Comprehension. However, in both areas in which a significant difference existed, mean achievement scores favored the performance of the females.

Table 4

Means and Standard Deviations for Academic Achievement Scores by Gender

Academic Achievement Area		<i>N</i>	<i>M</i>	<i>SD</i>
Phonological Awareness	Male	30	81.00	9.01
	Female	21	81.43	7.73
	Total	51	81.18	8.43
Nonword Decoding	Male	32	83.28	10.82
	Female	20	83.55	8.51
	Total	52	83.38	9.91
Letter and Word Recognition	Male	33	82.39	8.42
	Female	21	83.90	10.24
	Total	54	82.98	9.10
Reading Comprehension	Male	33	78.24	8.27
	Female	21	81.76	10.40
	Total	54	79.61	9.23
Word Reading Fluency	Male	19	79.47	12.09
	Female	12	81.00	9.39
	Total	31	80.06	10.98
Oral Expression*	Male	33	73.55	12.89
	Female	21	81.24	12.25
	Total	54	76.54	13.08
Listening Comprehension	Male	33	87.48	12.48
	Female	21	85.19	11.81
	Total	54	86.59	12.16
Written Expression*	Male	33	74.21	7.94
	Female	21	79.81	8.05
	Total	54	76.39	8.37

* $p < .05$

Null Hypothesis 6. There is no difference in the mean standardized academic achievement scores of students as analyzed by years of instruction (two, three, four, five,

six, or seven).

The null hypothesis was rejected. There was a difference in academic achievement scores as analyzed by years of instruction, as shown in Appendix D. To address this hypothesis, a one-way ANOVA was conducted, which compared the independent variable of years of instruction with six levels (two, three, four, five, six, and seven) to the dependent variable of mean achievement scores in each of the eight areas assessed (Phonological Awareness, Nonsense Word Decoding, Letter and Word Identification, Reading Comprehension, Word Recognition Fluency, Oral Expression, Listening Comprehension, and Written Expression). Post hoc tests were performed in the areas of significance using the Dunnett's *C* procedure to control for Type I error across the multiple pairwise comparisons. Dunnett's *C* does not assume equal variances. This procedure was selected because there may be a lack of power associated with the test due to the small population size.

The data showed that there was a significant difference in two of the eight areas assessed: Letter and Word Recognition, $F(5, 48) = 2.64, p = .034$, and Written Expression, $F(5, 48) = 4.74, p = .001$. There is not a significant difference in the areas of Phonological Awareness, $F(5, 45) = .27, p = .929$, Nonword Decoding, $F(5, 46) = .97, p = .447$, Reading Comprehension, $F(5, 48) = 1.22, p = .315$, Word Reading Fluency, $F(4, 25) = .45, p = .809$, Oral Expression, $F(5, 48) = 1.65, p = .165$, and Listening Comprehension, $F(5, 48) = .152, p = .201$.

The effect size in the form of eta squared (η^2) was calculated to provide the strength of the relationship between years of instruction and the Letter and Word Recognition subtest score. The result showed that the relationship was small, with years

of instruction accounting for 22% of the variance of the mean Letter and Word Recognition subtest score. There was a significant difference in the means between the group that had two years of instruction and the group that had six years of instruction, but there were no significant differences between any of the other pairwise comparisons. As a result, the group that had two years of instruction had higher mean Letter and Word Recognition subtest scores than the group that had six years of instruction. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the six years of instruction groups, are reported in Appendix D.

Eta squared was also calculated to provide the strength of the relationship between years of instruction and the mean Written Expression subtest score. The result showed that the relationship was small, with years of instruction accounting for 33% of the variance of the mean Written Expression subtest score. There was a significant difference in the means between the group that had two years of instruction and the group that had four years of instruction, but there were no significant differences between any of the other pairwise comparisons. As a result, the group that had two years of instruction had higher mean Written Expression subtest scores than the group that had four years of instruction. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the six years of instruction groups, are reported in Appendix E.

CHAPTER FIVE: SUMMARY, FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Chapter Five presents a summary of this study. The chapter will revisit the study's problem statement, purpose, significance, literature overview, and methodology. Chapter Five will conclude with a summary of the limitations, assumptions, discussion of results, implications for practice, and recommendations for future research.

Statement of the Problem

In Georgia's public schools, the RTI process mandates that all students must receive three tiers of research-based interventions prior to initial consideration for special education services. Upon referral for special education consideration in the Specific Learning Disability (SLD) category in Georgia, all students must be formally evaluated and results must demonstrate evidence of at least one processing deficit associated with academic underachievement to support eligibility.

In the state of Georgia, there are strict guidelines for the selection of tests used in psycho-educational evaluations. Such guidelines were designed to address issues such as limited language exposure due to environmental disadvantage or second language acquisition. There are, however, no specific guidelines in Georgia that determine how psycho-educational evaluation results should be interpreted in order to determine eligibility for special education services in the SLD category. Therefore, a technically, culturally, and linguistically sound psycho-educational evaluation process is needed to avoid over-identification of special education students in the SLD category.

Purpose of the Study

This study investigated the psycho-educational evaluation profile in English-

and/or Spanish-speaking elementary school students upon referral for special education consideration due to literacy difficulties. The purpose of this investigation was to determine if the psycho-educational evaluation profile that emerged disproportionately identified groups of students as exhibiting significant differences in performance based upon differences in culture and language. In particular, the psycho-educational evaluation profile was analyzed using a unique literacy assessment technique combining Dehn's (2006) approach to psychological processing assessment and the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) approach to academic achievement assessment.

Significance of the Study

This study was the first to offer a cultural analysis of the psycho-educational evaluation profiles that emerged using a unique test interpretation technique combining the work of Dehn (2006) and the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005). The cultural analysis helped the population's school district determine best practices for psycho-educational evaluation test selection and effectiveness of current interpretation techniques in their goal to minimize over-identification of culturally and linguistically diverse students receiving special education services. This study also provided information to the school district that may help in its future intervention design and delivery processes.

Literature Overview

The literature review traced the latest recommendations for literacy assessment and the balanced literacy instructional approach. It discussed theories of language development and how language is considered to impact literacy development, both in

bilingual and monolingual learners. The literature review concluded with a discussion of intervention delivery within the process of RTI in Georgia's public schools, how language skills impact decision-making for special education consideration in the SLD category, and how disproportionality is reported and interpreted as it pertains to Georgia's public schools and the Northwest Georgia Area Schools district.

Literacy is a broad communication skill that involves the activities of reading, writing, and processing oral information (Calfee, 1988; National Academy of Education, 1985). A best practices approach to reading instruction was emphasized and encouraged by the NRP's meta-analysis and resulting recommendations (Kamps et al., 2007; United States Department of Health and Human Services, 2000; VanDerHeyden & Jimerson, 2005). The NRP's description of the five areas of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension—led to a discussion of how student progress could be targeted and measured during the implementation of a reading intervention, which was the basis for the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005). It also outlined the role of written and expressive language skills in the instruction, assessment, and use of literacy.

The literature suggests that literacy skills emerge in early childhood and are acquired through explicit instructional techniques, behavioral modeling techniques, and exposure to oral and written language resources. A portion of the literature pertaining to reading research is devoted to a discussion of the meaning-based approach and the skills-based approach. The meaning-based approach focuses on the theory that children learn to read the way they learn to speak—naturally (Fisher, 2008; Frey et al., 2005). The skills-based approach focuses on reading instruction from the perspective of decoding

from the smallest point of the language (letters/phonemes) to larger components (sounds, words, and sentences). A merger of these two approaches was brought forth and termed balanced literacy. Balanced literacy seeks to fuse the systematic phonics and phonemic instruction with engaging reading and writing experiences.

Further supporting the concept of balanced literacy as a successful approach to literacy instruction, research suggests that phonological awareness skills are a critical component of reading (Bos Mather, Dickson, Podhajski, & Chard, 2001; Crim et al., 2008; Jerger, 1996; Mather, Bos, & Babur, 2001; Nation & Hulme, 1997; Torgeson et al., 1994). In addition, there is research to suggest that phonological sensitivity is strongly related to children's early language development, which is considered a factor that impacts emergent literacy (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003). A melding of phonological awareness and language skills is considered to impact literacy development.

Like the development of literacy skills, language is thought to be acquired both explicitly and through experiential means. There are essentially four theories of language development that are considered to account for the physiological and environmental aspects of language acquisition in young children: behaviorist, innateness, cognitivist, and interactionist (Chapman, 2000; Dale, Roche, & Duran, 2008; Morgan, 1990; Overskeid, 1995). They are considered useful in the examination of language development in children, and each offers a partial explanation of the process of children's language acquisition.

Language development, as a factor that impacts literacy, was also addressed by the NRP's meta-analysis and recommendations (United States Department of Health and

Human Services, 2000). Their analysis indicates that comprehension and vocabulary skills intertwine in the process of reading. In addition, vocabulary instruction can increase reading achievement if the strategies are appropriate for a child's age and ability level. Vocabulary is also considered a defining factor that impacts reading comprehension; if spoken or written words are in the learner's vocabulary, meaning can be readily ascribed to the text.

In consideration of the increasingly diverse culture in which we now live, factors impacting bilingual language development were also researched. The research indicates that three aspects of bilingual language acquisition are evident: sound system processing, vocabulary processing, and grammatical processing. In discussions of each of these skills, themes of successful performance with early exposure are evident in the literature (Kuhl et al., 2005), supporting the idea of a Critical Period hypothesized by Lenneberg (1967). This concept, however, is not fully supported in the literature, particularly as it applies to bilingual language acquisition (Birdsong, 1992; Birdsong & Molis, 2001; McLaughlin, 1977; Snow & Hoefnagel-Hohle, 1978).

The cognitive component of language learning was also researched. Birdsong (2006) suggests the psychological processing skills of working memory and the processing speed of language processing production are steadily compromised by age. The declines are linear, beginning in early adulthood and continuing throughout the life span. These cognitive deficits are considered to predict that bilingual language acquisition becomes maturationally more difficult in and beyond adulthood.

As a final factor that is considered to influence literacy, the demographic variables of SES, race, and ethnicity are considered correlates of language and reading

achievement. Mothers' literacy levels, parents' educational attainment, and exposure to emergent literacy skills in the home are factors associated with SES that emerge to impact children's reading achievement. Factors such as communication patterns, social interaction, and educational practices of culturally diverse students are considered qualitative issues that negatively impact reading achievement.

The nation's public schools are expected to encourage children's literacy performance, and the process of RTI is designed to meet all students' needs. In Georgia, students who fail to respond to appropriate interventions within the RTI process can receive a full, individual psycho-educational evaluation and be considered for special education support in the SLD category. There is evidence to suggest that students who are improperly placed in special education programs are negatively impacted in adulthood (Turnbull, 2009), and Georgia has recommended evaluation practices to ensure that an appropriate, full, and individual evaluation is performed to help drive special education determinations. The suggestion that misidentified special education students are negatively impacted even beyond the school setting provides support for the assertion that language and literacy must be carefully addressed in all diagnostic, intervention, and special education settings. Ultimately, data provided by the Georgia Department of Education suggested that Hispanic students enrolled in the Northwest Georgia Area Schools district in the 2007-2008 and 2008-2009 school years were at-risk for being eligible for special education services when compared to their peers of other races (Georgia Department of Education, 2009).

Methodology

This study was representative of a quantitative descriptive research design. It

described a population of English- and/or Spanish-speaking elementary school students that received a psycho-educational evaluation which included a unique literacy assessment approach, integrating techniques proposed by Dehn (2006) and the Reading Rockets program (Greater Washington Educational Telecommunications Association, Inc., 2005). The population was referred for special education consideration after receiving three tiers of reading interventions.

Limitations

This study was limited by two factors: population size and intervention information. First, because the combined literacy assessment approach was uniquely designed and implemented by one school district for a short amount of time, the resulting population size was small. The small population size inhibited the statistical testing that could be performed on Research Question 1. The researcher had hoped to perform the chi-square test to determine if there was a statistically significant difference in the frequency of processing deficits in each of the eight psychological processing areas assessed. In order to perform such a test, however, the population should have included at least five cases of deficits within each of the eight areas. Because one would not expect every student to exhibit a processing deficit in every area, many more students would be needed in the population in order to have the distribution of processing deficits needed to perform the chi-square test.

The second limitation of this study involved information about the interventions delivered at the schools during the process of RTI. First, the researcher was unable to obtain a listing of the specific interventions that were used in the population during the intervention delivery phases. Prior to the administration of the psycho-educational

evaluation, interventions were selected and designed by intervention teams in each student's school at all tiers of RTI. Whereas the Northwest Georgia Area Schools district maintained adherence to literacy instruction within the Literacy Collaborative balanced literacy framework at all tiers of RTI, it was known that such instruction could be provided using a myriad of strategies. A list of the specific strategies employed with this population throughout the tiers of intervention could help to determine how the interventions led to special education consideration and impacted the students' assessment profiles. Second, the researcher could not verify the integrity and fidelity of the interventions used with each participant at each tier of intervention. Because this was an *ex post facto* study, the researcher could not verify that the interventions were appropriately designed and delivered to each of the students in the population. The absence of such verification is a serious concern for the implication of the results in this study, but the integrity and fidelity of the RTI interventions was not deemed a necessary component for this study. The *process* of referral for special education consideration and the outcome of the combined literacy assessment technique were the key components of interest pertaining to RTI. The researcher sought to determine what strengths and weaknesses would emerge in the population's literacy assessment profile as a result of RTI teams determining that general education interventions were no longer reasonable for a student and special education consideration was necessary.

Assumptions

The following assumptions were critical for the data interpretation, discussion, and conclusion included in this chapter.

- 1) The instruments selected for and administered to the population exhibited

adequate reliability and validity.

- 2) Standardization was followed in the administration of all tests.
- 3) All instruments were administered in English.
- 4) English is the primary language for all participants.
- 5) The population, by virtue of being selected from a Title I school district, is considered to exhibit the poor language characteristics of a low-income population.

Findings and Discussion

Demographics

The demographic data in this study were gathered to provide a description of the population's educational history and school enrollment upon receipt of the psycho-educational evaluation. Both inferential and descriptive data were offered to impart information about the population's cultures.

First, the data suggested that the majority (85%) of the population was referred for special education consideration and evaluated during the first semester of the 2008-2009 school year, the third of three semesters of data collected for the present study. In turn, only 15% of the population was evaluated during both semesters of the 2007-2008 school year. One would expect to see a pattern in special education referrals, either in terms of an even proportion referred during each semester or a larger proportion referred in the first or second semesters. The discrepancy in the referral rates by school year is likely a function of the schools' adjustment to the implementation of the RTI process. Special education referrals were likely very low during the 2007-2008 school year because the district had just started implementing the RTI process. In the district's RTI process,

students were required to receive 12 weeks of tiered interventions prior to referral for special education consideration. The schools were slow to implement the RTI process, in initial implementation and/or decision-making after six weeks of interventions, and many students received interventions throughout the school year. Therefore, it appears reasonable to assume that many of the students that received interventions in the RTI process during the 2007-2008 school year were referred for special education consideration at the beginning of the 2008-2009 school year. This result skewed the referral rates for those school years.

Second, the data suggested that over half of the students in the population were enrolled in two of six elementary schools in the district, with the remaining percentage evenly distributed among the remaining four schools. This result provides little more information than the referral rates for special education consideration among the schools. It is possible that the two highest referring schools were quickest to implement the RTI process and were most efficient in their intervention follow-up and decision-making. The discrepancy may speak to the leadership qualities in those schools, particularly as they pertain to communication processes and perceived value of the RTI process.

Third, the population's absenteeism was examined to help determine if the students referred for special education consideration and a psycho-educational evaluation had a history of adequate access to the general curriculum. A one-way ANOVA was performed to analyze the total number of absences since initial school enrollment by grade at referral for evaluation. The analysis was performed to provide some perspective to the students' school absenteeism beyond descriptive statistics. Within the Northwest Georgia Area Schools district, attendance is a concern when students reach 10 absences.

The results of this study's attendance analysis suggest that the students' mean absences were well within 10 absences for each school year in all grades. When applying the standard deviation of those means, all absences were within district expectations in all grade levels except third and fourth. Students in third grade, who typically have four years of school experience (including kindergarten), had a mean of 24.79 absences, with 95% of the students exhibiting between 7.76 and 41.82 absences. Students with over 40 absences would be, at some point, targeted for attendance intervention. Students in fourth grade, who typically have five years of school experience, had a mean of 31.00 absences, with 95% of the students exhibiting between 17.28 and 55.73 absences. Students with over 50 absences would be, at some point, targeted for attendance intervention.

The one-way ANOVA results suggested that there was a significant difference between the grade levels' attendance patterns, and a post-hoc test suggested that the difference was evident in the comparison of first and fourth grades. A review of the students' mean absences since enrollment at all grades suggested that first grade students had the least amount of absences ($M = 11.56$) and fourth grade students had the most absences ($M = 36.50$).

Research (National Center for Education Statistics, 2006) pertaining to school attendance and special education status suggests that elevated absenteeism is prevalent. The results of the current study do not fully support such an assertion. Although the current study consisted of students not yet designated as eligible for special education services, they were in the process of special education consideration, and many of the students likely qualified for special education services. Therefore, it appears that the

students in the current study's population were typically present to receive the district's general education instruction. If they qualified for special education services, their attendance was typically within district expectations.

A one-way ANOVA was also performed to analyze the number of school moves by race. The data suggested that there was no significant difference between any of the analyses. Frequent moves can negatively impact students' academic performance, and school mobility and absenteeism are often associated with poor school performance (Alexander, Entwisle, & Dauber, 1996). Highly mobile students are children of migrant workers (Gouwens, 2001), military personnel, homeless families, and other unstable work/home situations related to high poverty (Popp, Stronge, & Hindman, 2003). It appears that all races and cultures represented in the population have a similar background in respect to school mobility.

To provide more information about the population's school moves, it would have been beneficial to have a matched sample of students who received three tiers of interventions for reading but were not ultimately referred for special education consideration and a psycho-educational evaluation. The present study's population could have been compared to the matched sample to help determine if the students who were ultimately referred for special education consideration were more mobile than students who were not referred for special education consideration.

Research Question 1

Research Question 1. After receiving three tiers of intervention for a reading difficulty, what is the overall processing assessment profile that emerges in the school district using Dehn's (2006) approach, and how does it differ in terms of cultural and

demographical characteristics?

Null Hypothesis 1. There is no difference in the distribution of processing deficits among the eight areas assessed.

The results of the data analysis for Research Question 1 suggested that over half (63%) of the processing deficits evident in the psychological processing assessment were found in two areas: Long-Term Retrieval and Working Memory, representing the only two memory assessments in the psychological processing approach. The remaining six areas assessed generally showed an even distribution of the remaining 37% of the processing deficits. Therefore, Long-Term Retrieval and Working Memory occurred more frequently than the other psychological processing skills assessed.

As is evident in the combined literacy assessment approach summary (see Appendix A), the eight psychological processing skills used in the assessment of literacy fall in one of three cognitive processing groups: basic reading skills, reading comprehension, and/or written expression. Notably, auditory processing, working memory, long-term retrieval, and executive processing skills overlap and are evident in two of the three areas. The two most prominent areas of deficit within this study (working memory and long-term retrieval) are considered components of both areas of reading: basic reading skills and reading comprehension.

Two subtests were administered in the areas of long-term retrieval and working memory to arrive at a cluster score. Both sets of subtests required the recall of vocabulary words. However, the long-term retrieval subtests consist of a timed element while the working memory subtests consist of a manipulation of vocabulary words with no timed element. These subtests rely upon spoken vocabulary, which is what

differentiates them from the other areas of psychological processing assessed.

The psychological processing outcome associated with the present study appears to extend Birdsong's (2006) research, which investigated the processing skills associated with bilingual language acquisition in adults. Birdsong's (2006) study demonstrated that language processing speed (which corresponds to long-term retrieval, in the present study) and working memory show a linear decline in early adulthood, continuing throughout the life span. Before discussing how the present study extends Birdsong's (2006) research, one clarification of the population's characteristics must be afforded. In the determination of which participants would be coded as primarily speaking English or Spanish in the home, those students that were reported by parents to primarily speak English in the home were expected to spend nearly 100% of their day using the language if they spoke another language. The group of students who were reported as primarily speaking Spanish in the home was thought to use the language during 50% or more of their day. Therefore, the English-speaking group is largely considered monolingual while the Spanish-speaking group is largely considered bilingual. This rationale is important because it suggests that processing deficits in working memory and long-term retrieval are evident in both monolingual and bilingual children, extending the finding from bilingual adults, as found in Birdsong's (2006) study.

Overall, the present study suggested that processing deficits were not evenly distributed among the eight areas assessed and were most prevalent in the areas of working memory and long-term retrieval. Because inferential statistics could not be performed to provide the statistical significance of the frequency of the deficits, it is unknown how language and cultural factors interact. Therefore, the original question

pertaining to the relationship between students' processing deficits and culture remains: What is the relationship between processing deficits and students' primary language? In addition, the following questions remain unanswered. What processing deficits, if any, are evident in the psychological processing assessments of students who demonstrate adequate progress within the tiers of intervention? How do their psychological processing profiles compare to those of students who fail to make adequate progress within the tiers of intervention? What are the long-term implications of a processing deficit? How often do students completely overcome their processing deficit(s) and no longer require special education services? Is there a psychological processing outcome that appears to offer most promise in the efficiency with which students overcome their academic difficulties and begin to make adequate progress? Further study is needed to address these questions.

Research Question 2

Research Question 2. After receiving three tiers of intervention for a reading difficulty, what is the overall academic achievement profile that emerges in the school district using the Reading Rockets (Greater Washington Educational Telecommunications Association, Inc., 2005) approach, and how does it differ in terms of cultural and demographical characteristics?

Null Hypothesis 4. There is no difference in the mean standardized academic achievement scores of students as analyzed by primary home language (English or Spanish).

The results of the data analysis for Null Hypothesis 2 were significant; there was a difference in academic achievement scores by language in the Letter and Word

Recognition, Reading Comprehension, Word Reading Fluency, Oral Expression, and Listening Comprehension subtests, favoring the performance of the English-speaking group. As evident in Appendix A, the academic achievement areas in which differences were noted fall within the literacy areas of phonics, fluency, vocabulary, and comprehension. The null hypothesis was rejected.

First, in the areas of phonics and fluency, the population exhibited a significant difference between mean academic achievement scores in the Letter and Word Recognition and Word Reading Fluency subtests as grouped by primary language in the home, favoring the performance of the English-speaking group. The English-speaking students were more adept at accurately identifying letters and words than the Spanish-speaking students. As a result, the English-speaking group identified words better and faster than the Spanish-speaking group.

The Spanish-speaking group's significantly lower scores on the Letter and Word Recognition and Word Reading Fluency subtests were likely impacted by the vocabulary demands of the tests. As noted in McLaughlin's (1977) research, bilingual students' vocabulary development occurs at a slower rate than that of a monolingual child. Therefore, the reliance on vocabulary in sight word recognition may have negatively impacted the performance of the Spanish-speaking group.

The next areas in which mean academic achievement scores differ are in the literacy areas of vocabulary and comprehension. First, both areas (Listening Comprehension and Oral Expression) associated with the literacy area of vocabulary showed that significant differences between mean achievement scores exist, and those scores are consistently associated with a higher level of performance in the group of

students that primarily spoke English in the home. A significant difference between mean achievement scores was also evident in the Reading Comprehension subtest, favoring the performance of the English-speaking students. McLaughlin's (1977) research suggesting that bilingual students' lexicon develops at a slower rate than monolingual students is again expected to account for the difference in these scores. The English-speaking/monolingual group likely has a larger vocabulary that would have greatly enhanced their performance on the Oral Expression and Listening Comprehension subtests, encouraging significantly stronger scores when compared to the Spanish-speaking/bilingual group.

The present study adds to the literature of bilingual reading and language results. Students who primarily speak Spanish in the home appeared to exhibit significantly lower reading (word recognition and fluency), language (listening and speaking), and reading comprehension performances than their peers who were reported to primarily speak English in the home. In the present study's population of students, the data suggested that the majority of the participants had no school moves and began kindergarten at the typical age of five. Very few students had been retained in a grade and all students received three tiers of reading interventions. As noted in the literature review, language acquisition models suggest that language mastery is a biological issue that combines with environmental language exposure and instructional techniques to impact reading development.

In consideration of these factors, the demographic data associated with the present study's population suggest that the biological factors associated with the construct of school (age at enrollment and number of retentions, in particular) appear generally typical

and would not support a difference in the assessment results of the study's participants. Next, although both the English- and Spanish-speaking groups received the same types of instructional techniques (which were within the Literacy Collaborative balanced literacy framework), it is possible that the groups benefitted from that instruction differently. The English-speaking (and arguably monolingual) group may have benefitted from the instruction more than the Spanish-speaking group because they are more adept with the language of instruction. This result would lead to a difference in the literacy performance of the two groups.

Finally, the issue of environmental language exposure may have contributed to the difference between the English- and Spanish-speaking groups' performances. It is expected that the English-speaking group's environmental language exposure in English outside of the school environment encouraged their performance on the assessments. Once again, facility with the English-language would support the finding for a significantly higher level of performance in the English-speaking group.

In summary, the present study found that English-speaking students outperformed their Spanish-speaking peers in the literacy areas of phonics, fluency, vocabulary, and comprehension. The issue of environmental language exposure was discussed using assumptions. Therefore, more information is needed about the population's environmental language exposure. This weakness within the study points to a broader issue of concern: socio-economic status (SES). The present study's results appear to underestimate the impact of factors related to SES in the population. As noted in the literature review, a meta-analysis (White, 1982) was performed that investigated reading achievement and SES. The study suggested that the social, language, and literacy

activities in a child's home serve as the best SES predictor of reading achievement. Therefore, future research pertaining to students' environmental language exposure, language models, and literacy exposure in the home would provide greater interpretative value to the present study's results. The following questions remain. Who are the English- and Spanish-speaking groups' language models? What are those models' levels of academic language proficiency? How much language do the students hear each day? How much language do they speak each day? What types of written language are available in the students' environment outside of school, and how often do they engage in reading alone and with a language model?

Null Hypothesis 5. There is no difference in the mean standardized academic achievement scores of students as analyzed by gender (male or female).

The results of the data analysis for Null Hypothesis 3 were significant; there was a difference in academic achievement scores by gender, and the data suggested that a significant difference was evident in two subtests (Oral Expression and Written Expression), favoring the performance of the females. The null hypothesis was rejected.

The analyses for Null Hypotheses 5 and 6 (and Null Hypotheses 2 and 3) were performed to provide a cultural description of the population. Throughout the presentation of the present study, the primary issue of investigation has been the cultural and linguistic relationship to the outcomes of the combined literacy assessment approach. Upon analyzing those relationships, the researcher intended to determine if the combined literacy assessment technique appeared to offer a profile of scores that favored groups of students based upon culture and/or language.

Null Hypothesis 5 intended to provide information about the population's culture

as it pertained to gender. As evident in Appendix A, the academic achievement areas in which gender differences were noted fall within the literacy areas of vocabulary and comprehension. As noted in the subtests' names, both of the areas of significance measured aspects of expressive language, with one focused on speaking skills and the other focused on writing skills. The significant finding in the area of expressive language is interesting in this study because the analyses were performed without the consideration of primary home language; the population included a portion of bilingual students. In particular, 13 (62.0%) of the 21 females in the study were coded as primarily Spanish-speaking in the home. In comparison, 20 (61.0%) of the 33 males in the study were coded as primarily Spanish-speaking. Therefore, the majority of the females was bilingual and was coded as bilingual at the same frequency as the males, and they significantly outperformed the males.

The results of the present study support the findings of the Educational Testing Service (ETS) gender study (Cole, 1997). The ETS study focused on the results of students' performances on nationally represented samples of tests at fourth, eighth, and twelfth grades and self-selected samples in college and graduate/professional school (such as students who chose to take the SAT or GRE). The results suggested that the top two areas in which the females outperformed the males were writing and verbal language use, which parallels the significant findings in the present study showing that females outperformed males in written and oral expression. As previously noted, language acquisition models suggest that language mastery is a biological issue that combines with environmental language exposure and instructional techniques to impact reading development. Upon analyzing the issues that could account for the significant difference

between the males and females' expressive language scores, in terms of how language mastery is achieved through language acquisition models, it appears that biological issues best explain the difference. Consistent with Halpern's (1997) argument pertaining to gender differences and biological bases of verbal intelligence, it is possible that the females' brain development predisposed them to higher levels of expressive language ability and/or there are social issues pertaining to biological development that impacted the females' achievement. Otherwise, the males and females were exposed to the same types of interventions throughout all tiers of RTI.

Null Hypothesis 6. There is no difference in the mean standardized academic achievement scores of students as analyzed by (two, three, four, five, six, or seven) years of instruction.

The results of the data analysis for Null Hypothesis 6 were significant; there was a difference in academic achievement scores by years of instruction. The null hypothesis was rejected. The data suggested that a significant difference was evident in the Letter and Word Recognition and Written Expression subtests.

Post hoc tests showed that the statistical significance associated with the Letter and Word Recognition mean subtest score was evident in the pairwise comparison of students with two years of instruction and students with six years of instruction. In the analysis of Written Expression by years of instruction, the statistical significance was evident in the pairwise comparison of students with two and four years of instruction. The effect size associated with the strength of the relationship between years of instruction and the subtest areas of significance (Letter and Word Recognition and Written Expression) was small. Therefore, there is arguably little practical significance

in these findings. The results suggested that students with two years of school instruction scored significantly higher than students with more years of school instruction in both areas of significance. Student performance in letter and word recognition and writing skills appeared to decline as years of instruction increased.

To begin the discussion of the findings pertaining to Null Hypothesis 6, it is important to note that subtest standard scores were standardized by age. Therefore, the comparison of mean academic achievement standard scores across age and grade levels is acceptable.

One argument for the difference in Letter and Word Recognition and Written Expression subtest means by years of instruction involves the effectiveness of the tiered interventions prior to the students' referral for testing. In the Northwest Georgia Area Schools district, a specific individual and frequent literacy intervention is available to the district's lowest performing first graders. It is possible that this specific intervention delivered better letter and word recognition and written expression support than what was afforded to the students in the later grades.

In reviewing the population's data as grouped by years of instruction, it is important to note that the most highly represented group of students was students with two years of instruction, regarded as the first graders. There were 17 students in the population coded as having two years of school instruction and 18 students coded as first graders. Linking this information to what is known about the school district's intervention programs, it is possible that the specific first grade intervention program employed by the Northwest Georgia Area Schools district encouraged a more efficient referral process when compared to the interventions at the other grade levels in the

elementary schools. Those first grade students who failed to make adequate progress in response to the district's specific intervention program may have been referred more quickly and in higher numbers than the students in the later grades. This rationale may help to explain why, in the present study, it appears that special education referrals decreased as grade levels increased.

Overall, the present study found that students with two years of instruction, which are typically first graders, outperformed their older peers in measures of phonics and comprehension skills. A longitudinal study appears warranted and questions pertaining to this result remain. Do all students tend to exhibit declines in literacy performance as they advance in years of school instruction? How does the district's specific, programmed first grade intervention teach phonics and comprehension skills? Would students with more years of instruction benefit from the same types of instructional techniques provided to the students with two years of instruction? How do the intervention techniques compare and contrast as delivered at different grade levels?

Disproportionality

As previously discussed, the purpose of this study was to investigate the Northwest Georgia Area Schools' combined literacy assessment approach in order to address disproportionality from a cultural and linguistic approach. In the Georgia Department of Education reports, disproportionality is determined based upon racial/ethnic categories. Such information may not adequately address the complexity of a school district's demographics. According to The Governor's Office for School Achievement (2010), the Northwest Georgia Area Schools district has reported enrollment numbers of 65% and 64% Hispanics in the 2007-2008 and 2008-2009 school

years, respectively, while the overall state rate was consistently 10%. In the Northwest Georgia Area Schools district, some of the Hispanic students have reported to the researcher that they identify more closely with the local white culture and English language than with the Hispanic culture and Spanish language. Therefore, an analysis of additional information appears warranted to ensure that all aspects of culture and language are investigated in the district's program evaluation of disproportionality, and the profile from the combined literacy assessment approach sought to provide that information.

What Do These Results Imply for Bilingual Students?

As the United States becomes increasingly diverse in both cultures and languages, it is likely that the prevalence of bilingual students will continue. Although the results of the present study imply that the population's bilingual students underperformed when compared to their monolingual peers, such results should not be readily expected from all bilingual students.

Contrary to the results of the present study, research (August & Shanahan, 2007; California Tomorrow, 2010; Lambert, Genesse, Holobowand, & Chartrand, 1993) suggests that bilingual students exhibit greater mental flexibility and higher achievement than their monolingual peers. The contributing factor that was consistent in all of these studies was bilingual instruction. It was noted that bilingual students' achievement was higher than their monolingual peers when they were provided instruction in their primary language, facilitating their performance in the second language. This finding is an important implication for the present study. The students in the present study's bilingual population received literacy instruction exclusively in English, their second language.

Literacy instruction was not provided in Spanish, the students' home language.

Therefore, the language of instruction could be investigated as an additional instructional issue of importance.

Expanding upon the issue of instructional language, one may also question the decision to conduct the population's evaluations in English. As noted in the present study, all students were assumed to have been administered the psychological processing and academic achievement tests in English, which was based upon the fact that data available to the researcher in the database of test results housed only the results of tests administered in English. Arguably, the assumption that all tests were administered in English raises questions about the population's significantly different results pertaining to primary home language. It is reasonable to expect that monolingual, English-speaking students would perform best on tests administered in English when compared to the performance of bilingual students administered tests in English. Such an argument is addressed in the state of Georgia's rules and regulations pertaining to special education. Georgia's state rules and regulations pertaining to psycho-educational evaluations state that all students must receive an evaluation in their primary language (Georgia Department of Education, 2010). In the Northwest Georgia Area Schools district, experience with the population has led the district's school psychologists to test bilingual students in English, if the students have had a traditional school experience in the United States. Typically, the population's bilingual students perform best on tests administered in English instead of their primary home language, presumably because English is their language of instruction. Therefore, the significantly different results, favoring the performance of the monolingual, English-speaking students, are not fully explained by

and associated with the language of test administration. The students were evaluated in English because, in all cases, English was considered their instructional language, strongest academic language, and, ultimately, primary language that would lead to valid test results.

Supporting the results of the present study, there is research to suggest that bilingual students may exhibit a lower performance on verbal intelligence tests and reading tests through third grade (Kittell, 1963). Kittell's study indicated that students in third grade exhibit lower verbal intelligence and reading test performances when compared to their fifth grade peers. It was noted that the students' increasing bilingual vocabulary may account for the improvement seen in the middle grades.

Implications for Practice

Based on the findings of this research, the following recommendations are offered:

1. The Northwest Georgia Area Schools district could begin to investigate the types of intervention programs that address the following: A) phonics, fluency, vocabulary, and comprehension skills for bilingual students that primarily speak Spanish in the home and B) expressive language skills for males. New interventions or improvements to interventions in these areas may be warranted.
2. Further analysis of psycho-educational evaluation instruments may be necessary to determine if there are more culturally and linguistically appropriate ways to measure psychological processing and academic achievement skills in students referred for special education consideration.
3. The phonics and comprehension techniques offered in first grade could be analyzed and compared to those provided in the later grades. Identifying

similarities and differences between the intervention approaches may help the school district design more effective interventions for students in all grades.

4. Begin to assess environmental language exposure across the Northwest Georgia Area Schools district. Obtaining baseline assessment data could help in the district's design of student instruction and assessment.
5. The Northwest Georgia Area Schools should begin to collect data pertaining to the efficiency of their RTI process in each of the schools. Such data could provide information about the design qualities of their effective interventions. It could also include data pertaining to student demographics to determine if particular groups of students tend to exhibit trends in their progress in response to the implementation of particular interventions.
6. The Northwest Georgia Area Schools should also investigate the English Language Learner (ELL) program's role as it pertains to the outcomes of the present study. The district's ELL program could help bilingual students' families encourage their children's academic and conversational vocabulary in order to facilitate not only school and work performance but also maintain students' conversational skills within their families.

Recommendations for Future Research

As a result of this study, the following recommendations are suggested for future research:

1. Conduct the study with a larger population size. A larger population size would provide the ability to analyze psychological processing skills using the chi square technique, thus providing an account of statistical significance in

the results. In addition, it may provide more diversity in the population of students when described by years of school instruction.

2. Employ more than one school district in the study. Conducting the research with more than one school district with a high number of English language learners could potentially provide the information needed to determine if the profile that emerged is indeed related to the types of interventions that are typically afforded in the daily practice of public school instructional delivery.
3. Use different instruments in the combined literacy assessment approach. Using different instruments in the combined literacy assessment approach could help to determine how instrument selection impacted the profiles that emerged.
4. Include a measure of environmental language exposure as it pertains to exposure to both language and literacy outside the school environment. Identify students' primary language models, the models' academic language proficiency, amount of time engaged in language interactions with the models, and amount of exposure to and engagement with print media.
5. Investigate the relationship between language processing speed (long-term retrieval in this study) and bilingual language facility. Is it possible that the prevalent long-term retrieval deficits associated with the study's outcome are largely a measure of students' efficiency managing two languages?
6. The combined literacy assessment approach used in this study provides a reasoned conceptual framework, both for future research and for practice. The model demonstrated considerable utility, and, thus, could offer future

studies a conceptual basis for the continued evolution of practices in the field. At this time, the model also represents a useful approach for addressing existing requirements of identification within the field of special education.

Conclusion

Overall, the results of this study implied that the Northwest Georgia Area Schools district was at-risk for over-identifying culturally and linguistically diverse students for special education services. First, the Georgia Department of Education published disproportionality weighted risk ratios suggesting that Hispanic students were at-risk for over-identification in the SLD eligibility category. The results of the present study showed that students that primarily speak English at home tended to outperform their peers that primarily speak Spanish at home in all but one literacy area assessed (phonemic awareness); the results are considered significant in five of the eight academic areas analyzed. Therefore, students that primarily speak Spanish in the home tend to significantly underperform academically when compared to their English-speaking peers. Providing a cultural perspective, in the form of school experience and gender, females tend to perform significantly higher on oral and written expression tests, and student achievement tends to decline in word reading and written expression tests after first grade. In circumstances where the population's Spanish-speaking students exhibit a processing deficit that can be tied to academic underachievement, they are likely to qualify for special education services in the SLD category at a disproportionate rate when compared to their English-speaking peers.

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APPENDICES

Appendix A

Combined Literacy Assessment Approach

Academic Achievement Assessment

*Represents the
Reading Rockets Approach
to Literacy Assessment*

Basic Reading Academic Achievement Skills	
Phonemic Awareness	
KTEA-II	Phonological Awareness
Phonics	
KTEA-II	Nonsense Word Decoding
KTEA-II	Letter and Word Recognition

Psychological Processing Assessment

*Represents
Dehn's Approach
to Literacy Assessment*

Basic Reading Psychological Processing Skills	
WJCOG-III	Phonemic Awareness
WJCOG-III	Auditory Processing
WJCOG-III	Working Memory
WJCOG-III	Long-Term Retrieval

Comprehension: Reading & Writing Academic Achievement Skills	
Fluency	
KTEA-II	Word Recognition Fluency
Vocabulary	
KTEA-II	Listening Comprehension
KTEA-II	Oral Expression
Comprehension	
KTEA-II	Reading Comprehension
KTEA-II	Written Expression

Reading Comprehension Psychological Processing Skills	
WJCOG-III	Working Memory
WJCOG-III	Fluid Reasoning
WJCOG-III	Executive Processing
WJCOG-III	Long-Term Retrieval

Writing Psychological Processing Skills	
WJCOG-III	Auditory Processing
WJCOG-III	Executive Processing
Beery VMI	Visual-Motor Integration
WJCOG-III	Processing Speed

Appendix B

Institutional Review Board Approval to Conduct Research



Institutional Review Board
Dept. 4905
615 McCabe Annex
Chattanooga, TN 37403-2598
Phone: (423) 425-4443

MEMORANDUM

TO: Amy Bowers
Dr. Ted Miller **IRB # 10-054**

FROM: Lindsay Pardue, Director of Research Integrity
M. D. Roblyer, IRB Committee Chair

DATE: March 18, 2010

SUBJECT: IRB Application # 10-052: An Analysis of Psycho-educational Profiles of Elementary Students Referred for Special Education Consideration Due to Literacy Difficulties

The IRB Committee Chair has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004148) has approved this research project # 10-054.

Since your project has been deemed exempt, there is no further action needed on this proposal unless there is a significant change in the project that would require a new review. Changes that affect risk to human subjects would necessitate a new application to the IRB committee immediately.

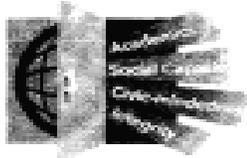
Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page <http://www.utc.edu/irb> or email us at: instrb@utc.edu.

Best wishes for a successful research project.

Appendix C

Approval to Conduct Research



Dalton Public Schools
Including students in learning
and addressing individual differences

March 26, 2010

Dear Amy,

I received your request to study an analysis of psycho-educational profiles of elementary students referred for special education considerations due to literacy difficulties and enjoyed talking with you and learning more about your plans. Permission has been granted for you to collect the necessary data for your study. My only request is that you share your findings upon completion of the study. If I can be of further assistance in this process, please let me know.

Sincerely,

A handwritten signature in black ink that reads "Rhonda Hayes". The signature is written in a cursive, flowing style.

Rhonda Hayes
Assistant Superintendent
Dalton Public Schools

cc: Jim Hawkins

Appendix D

95% Confidence Intervals of Pairwise Differences in Letter and Word Recognition Scores as Analyzed by Years of Instruction

Years of Instruction	<i>M</i>	<i>SD</i>	2	3	4	5	6
2	86.00	7.15					
3	84.00	8.11	-10.18 to 14.18				
4	82.57	11.18	-7.95 to 14.80	-13.24 to 16.10			
5	89.50	11.03	-35.08 to 28.08	-38.32 to 27.32	-39.21 to 25.35		
6	76.56	4.59	1.56 to 17.33*	-4.77 to 19.66	-5.35 to 17.38	-18.75 to 44.64	
7	72.00	2.83	-32.84 to 60.84	-29.61 to 53.61	-29.45 to 50.59	-31.45 to 66.45	-44.24 to 53.35

Note: An asterisk indicates that the 95% confidence interval does not contain zero, and therefore the difference in means is significant at the .05 significance using the Dunnett's *C* procedure.

Appendix E

**95% Confidence Intervals of Pairwise Differences in Written Expression Scores
as Analyzed by Years of Instruction**

Years of Instruction	<i>M</i>	<i>SD</i>	2	3	4	5	6
2	80.76	6.02					
3	74.13	5.57	-2.15 to 15.43				
4	71.29	6.98	1.71 to 17.25*	-6.83 to 12.51			
5	82.00	14.02	-41.21 to 38.74	-48.26 to 32.51	-50.81 to 29.39		
6	78.44	7.55	-7.99 to 12.64	-16.16 to 7.52	-18.23 to 3.91	-37.06 to 44.17	
7	63.50	3.54	-46.80 to 81.33	-50.12 to 71.37	-53.17 to 68.74	-43.02 to 80.02	-44.24 to 63.35

Note: An asterisk indicates that the 95% confidence interval does not contain zero, and therefore the difference in means is significant at the .05 significance using the Dunnett's *C* procedure.

LIST OF ABBREVIATIONS

GPS	Georgia Performance Standards
IDEA	Individuals with Disabilities Education Act
KTEA-II	Kaufman Test of Educational Achievement- Second Edition
LEA	Local Education Agency
LEP	Limited English Proficient
NRP	National Reading Panel
RTI	Response to Intervention
SES	Socioeconomic Status
SLD	Specific Learning Disability
VMI-5	Beery-Buktenica Test of Visual-Motor Integration- Fifth Edition
WJCOG-III	Woodcock-Johnson Tests of Cognitive Ability- Third Edition

VITA

Amy M. Bowers is the eldest daughter of Elden and Wanda Moates and sister of Laura Moates Stanley and John Moates. Mrs. Bowers graduated from Fannin County High School in Blue Ridge, GA in 1995 and obtained a B. S. degree in Psychology from the University of Georgia (UGA) in 1999. While a student at UGA, Mrs. Bowers was a music scholarship recipient and performed with the marching band, basketball band, pep band, concert band, symphonic band, and horn choir. In addition, she volunteered in cognitive, industrial/organizational, and school psychology clinics on campus.

Mrs. Bowers earned her M. Ed. and Ed. S. degrees in School Psychology from Georgia Southern University by 2002. She was a graduate assistant in the Georgia Southern Museum. After graduation, Mrs. Bowers worked as a certified school psychologist in the Richmond County, Georgia; Elbert County, Georgia; and Greenwood District #50, South Carolina public school districts. She is currently a school psychologist in the Dalton Public Schools system in Georgia.

Mrs. Bowers is presently an Ed. D. candidate in Learning and Leadership at the University of Tennessee at Chattanooga and is preparing to graduate in December 2010. She looks forward to spending more time with her family, especially her infant daughter, Lillian, and husband, Ted, and friends while enjoying additional opportunities to read, travel, and spend time outdoors.