

A Comparative Analysis of the Relationships Among Language, Oral Vocabulary,  
Reading Vocabulary, and Reading Comprehension for Adolescent Students with  
Learning Disabilities and Emotional/Behavioral Disorders.

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

A COMPARATIVE ANALYSIS OF THE RELATIONSHIP AMONG LANGUAGE,  
ORAL VOCABULARY, READING VOCABULARY, AND READING  
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DISABILITIES AND EMOTIONAL/BEHAVIORAL DISORDERS

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and hereby certify that, in their opinion, it is worthy of acceptance.

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## **DEDICATION**

For Jason – my partner, best friend, and greatest motivator. We did it!

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## CHAPTER 1

### INTRODUCTION

#### Statement of the Problem

Literacy, specifically the ability to access and comprehend text on grade level, is a primary focus of education in the United States, which is highlighted by the stringent criteria for literacy written into law with No Child Left Behind (NCLB, 2001). Reading ability is recognized as an important predictor of achievement in other content areas, such as science and mathematics, and is a requirement for participation in the global information economy (Kamil et al., 2008). However, recent data indicate that 69 percent of students in the eighth grade in the United States are not proficient in their ability to read and comprehend text at grade level (Lee, Griggs, & Donahue, 2007). The ability to read and comprehend text is recognized as an essential life skill, and deficits in reading comprehension negatively impact academic success for all students, especially those at-risk or identified with disabilities (Benner, Nelson, Ralston, & Mooney, 2010; Denton, Vaughn, & Fletcher, 2003; Gersten, Fuchs, Williams, & Baker, 2001; Lane & Menzies, 2010; Lee et al., 2007; Mastropieri & Scruggs, 1997).

To comprehend text is to read for meaning (Kame'enui & Baumann, 2004) and the language-based skill of vocabulary knowledge is essential to this process (Beck, McKeown, & Kucan, 2002). The stated goal of NCLB regarding literacy is to ensure that all students can read at or above grade level by the end of grade 3 and this is a focus in educational decision-making. For students with disabilities, however, the relative importance ascribed to reading comprehension in their educational planning may vary according to the performance-related manifestations of their disability. For example, for

students with emotional disturbance (ED), the focus often is on social and behavioral deficits while, for students with learning disabilities (LD), the focus primarily is on academic skill deficits, such as reading comprehension (Kauffman & Brigham, 2009). In contrast to these differences in focus, recent research has highlighted similarities between students with ED and students with LD: low academic achievement across core content areas (Algozzine, Wang, & Violette, 2010; Kauffman & Brigham, 2009; Lane & Menzies, 2010) and increased rates of co-morbid language disorders (Benner, Nelson, & Epstein, 2002; Boyle, McCartney, O'Hare, & Law, 2010; Durkin & Conti-Ramsden, 2010). These similarities suggest that language-based reading skills should be an area of emphasis in the educational planning for both disability groups in order to help them reach this national literacy goal and increase academic success.

Even before the national focus on literacy, extensive research has been conducted on the various aspects of literacy, including the use of vocabulary interventions for literacy skill development (Anders & Bos, 1986; Beck et al., 2002; Beck, Perfetti, & McKeown, 1982; Blachowicz, 2005; Feldman & Kinsella, 2005; Harmon, Hedrick, & Wood, 2005; McKeown & Beck, 2004). While vocabulary knowledge has been linked to interventions in reading comprehension (Allen, 1999; Beck et al., 2002; Bryant, Goodwin, Bryant, & Higgins, 2003; National Reading Panel, 2000), the exact nature of this relationship has not been examined, specifically for adolescent students or students with disabilities. Exploration of vocabulary knowledge as a language-based skill that may predict literacy performance, such as reading comprehension, could lead to more efficient and effective interventions that are targeted to support students in their development of literacy.

The connection between language and literacy has been explored for both young children (Catts, 1993, 1997; Catts, Fey, Zhang, & Tomblin, 1999; McCardle, Scarborough, & Catts, 2001; Tomblin, Zhang, Buckwalter, & Catts, 2000) and older learners (Kamil et al., 2008; Roberts, Torgesen, Boardman, & Scammacca, 2008; Scammacca et al., 2007; Torgesen et al., 2007), but the specific language-literacy relationships that have been explored vary across these age groups. In addition, these connections have not been systematically evaluated across disability categories. As a result, the research currently provides evidence that language and literacy are connected, but a more focused examination is needed to identify the specific language skills, such as vocabulary knowledge, that are connected to achievement in literacy skills, particularly reading comprehension.

The same lack of specificity exists in the research on adolescents, both in regard to literacy and specific disability categories. For example, research in the area of adolescent or “older” struggling readers encompasses students in grades 4-12 (Scammacca et al., 2007). While this grouping addresses the change in reading skill that is required between the primary and later grades, specifically, learning to read versus reading to learn, it does not highlight the differences in the reading abilities and academic needs of students in the older elementary grades, who receive instruction primarily in one room with one teacher for a variety of subjects, and those in secondary schools who transition from classroom to classroom and teacher to teacher while tackling a greater variety of courses within the content areas. Information on adolescent struggling readers currently provides a broad view of literacy, but more specific information about the language-literacy relationship within the secondary grades, both middle and high school,

would be beneficial to researchers and teachers, in order to address specific needs and develop targeted interventions (Scammacca et al., 2007). While information is needed across all secondary grade levels, a logical first step in this exploration would focus on the early secondary experiences of students in Grades 6-8, with future research endeavors expanding into the later secondary grades. This focus on the early adolescent years would provide initial information regarding how the language-literacy relationship develops as students progress from elementary to secondary settings, thus informing intervention decisions for these students.

Similar to the breadth described in the literature on adolescent struggling readers, the literature on students with disabilities generally takes a broad view of language and its impact on literacy and academic performance. Research has identified both similarities and differences among students with LD and students with ED in terms of language skill and academic performance. However, while recent research has highlighted the similarities for these two groups regarding low academic achievement and increased rates of language disorders (Benner, Nelson, & Epstein, 2002; Denton, Vaughn, & Fletcher, 2003; Kauffman & Brigham, 2009; Lane & Menzies, 2010; Mann, 2003), this research involves either the broad categories for language (receptive and expressive) or the larger components of language; semantics, syntax, and pragmatics (Benner, Nelson, & Epstein, 2002; Goran & Gage, 2011; Scarborough, 2001). This literature does not delve into the specific language skills, such as vocabulary knowledge, that may impact literacy and academic performance. Specificity is needed in the examination of the relationship between language and literacy for students with LD and students with ED to provide a

clearer picture of what individual skills should be targeted to ensure interventions for each group are effective and efficient.

### **Review of Related Literature**

The purpose of the literature review is two-fold. First, it provides an overview of the related areas of research, which include: 1) language-literacy connections in young children, 2) vocabulary and reading comprehension connections in older students, 3) adolescent struggling readers, and 4) language-literacy connections for students with disabilities, specifically Learning Disabilities (LD) and Emotional Disturbance (ED). The fourth area of related research, which focuses on students with disabilities, includes information on the characteristics of students with LD and ED, the research on language and academics for these two groups, as well as a comparison and contrast of the literature concerning language-literacy connections for these two groups. Each area of the research that involves language-literacy connections is examined for overarching information on language, as well as addressing the available information on the specific language skill of oral vocabulary.

The second purpose of the literature review is to highlight the gap in the literature concerning the language-literacy relationship that exists for adolescent students with disabilities. This relationship should be addressed at two levels of specificity, overall language-literacy connections and examination of the specific skill of oral vocabulary as it relates to reading vocabulary and reading comprehension. For students with LD and students with ED, the relationship between language skill and reading ability should be examined to identify the similarities and differences in their language and learning needs.

## **Language and Literacy Connections – Young Children**

Young children, as defined in the reading and language literature, are children who are in the early years of schooling, from pre-kindergarten to second grade (Catts, 1997; McCardle, Scarborough, & Catts, 2001; Poe, Burchinal, & Roberts, 2004; Tomblin, Zhang, Buckwalter, & Catts, 2000). Research has shown that, by the time children enter school, they already demonstrate variance in their literacy-related knowledge and skills (McCardle et al., 2001). In a review of the literature, McCardle and colleagues questioned whether these differences in student knowledge of reading-related skills, such as oral language abilities and emergent literacy knowledge, could serve as predictive factors, or reliable indicators, of future reading ability. The results of this review indicated that, while emergent literacy and oral language abilities are among the best predictors of future reading skill in the primary grades, there is little longitudinal research available that examines these relationships throughout the elementary grades or into adolescence.

Studies have found that young children with language impairments are at risk for later reading difficulties (Catts, 1997; Tomblin et al., 2000) and that certain language skills are predictive of future reading achievement (Catts, 1997; Catts et al., 1999; Poe, Burchinal, & Roberts, 2004). Catts noted that many cases of reading disability are language-based disorders that are manifested in a variety of ways. Difficulties may occur in oral language development, syntax (the structure of language), or receptive understanding of information. These concerns with structure and understanding of language can significantly impact reading comprehension (Catts, 1997; Catts et al., 1999).

In 1999, Catts and his colleagues examined the relative impact of oral language abilities on reading abilities. The oral language abilities, assessed with five subtests of the Test of Language Development, Second Edition: Preschool (TOLD-2:P; Newcomer & Hammill, 1988) and a narrative story task (Culatta, Page, & Ellis, 1983), were combined to obtain vocabulary, grammar, and narrative composite scores. The participants, all kindergarten students, included 328 children diagnosed with impairments, either language, nonverbal, or both, and 276 children who were typically developing. The students were assessed in kindergarten and given a follow-up assessment two years later. Results indicated that both phonological processing and oral language skills, including vocabulary, were robust predictors of later reading achievement (Catts et al., 1999). The authors' discussion of clinical implications noted that longitudinal studies are needed to further examine these results. While this study examined the relationship from kindergarten to second grade, information is needed about the implications for older students, including adolescent learners with and without disabilities.

In another longitudinal study, Poe and colleagues (2004) examined the language and reading skills of 77 African-American students from pre-kindergarten to second grade. Language skills were assessed using the Clinical Evaluation of Language Fundamentals, Third Edition (CELF-3) (Semel, Wiig, & Secord, 1995) and reading skills were measured with the Letter–Word Identification Scale and Broad Reading score from the Woodcock–Johnson Psycho-Educational Battery–Revised (WJ-R) (Woodcock & Johnson, 1990). Results indicated that language skill was the best predictor of reading skills for students in second grade. However, the total language score from the CELF-3

was used and information regarding specific language skills (e.g. vocabulary) was not analyzed. Further research on the connection between language skill and reading comprehension needs to include an examination of the relationship between vocabulary knowledge and reading comprehension for younger children, as well as adolescent learners.

Scarborough (2009) conducted a review of the literature pertaining to early language-literacy connections, with attention on the use of early language and literacy skills as indicators for later reading performance. The early language comprehension skills identified include background knowledge, vocabulary, language structures (semantics and syntax), verbal reasoning, and literacy knowledge. Scarborough describes these as “strands” that are woven together, with the skills becoming increasingly more strategic and essential to skilled reading. When there are deficits in these “comprehension” strands, specifically when reading materials become more complex in the older elementary grades, reading comprehension deficits are “essentially *oral language* limitations” (Scarborough, 2009, p. 24). The results of the review suggest that, when children enter formal schooling with weaker verbal abilities and poorer literacy knowledge than their peers, they are much more likely to display reading difficulties in the early elementary grades. When examining the correlational research for the skills to target for intervention, Scarborough (2009) found oral language skills (especially expressive vocabulary) emerged as one of the best candidates. This statement was paired with a caution that the correlational nature of the findings cannot speak to causality, and a recommendation that further investigation of the impact of vocabulary interventions on reading performance be conducted.

**Oral Vocabulary and Reading for Young Children.** Research on the value of vocabulary knowledge for reading comprehension dates back to the 1920s (Lehr, Osborn, & Hiebert, 2004; National Reading Panel, 2000). The members of the National Reading Panel (NRP) examined over 20,000 studies conducted in this 75-year history that have involved vocabulary instruction in preparation for their report (National Reading Panel, 2000). Application of the following search criteria resulted in the identification of only 50 of the 20,000+ studies for further examination: (1) a report of research, (2) reporting experimental or quasi-experimental studies, (3) publication in English, (4) dealing with a broad population, not exclusively examining special populations such as learning disability or English language learners. The resulting examination provided evidence that the presence of a word in a child's vocabulary will foster the ability to read the word in print and aid in comprehension of the text (National Reading Panel, 2000). However, the NRP (2000) determined that there is little in the literature that addresses the best method, or combination of methods, for vocabulary instruction, and there is little research on the measurement of vocabulary skill as it pertains to intervention and instruction.

Lehr and colleagues (2004) examined research-based practices in early reading and discovered strong evidence to support the value of vocabulary knowledge in developing reading abilities. In their review of the literature, the authors defined vocabulary as “knowledge of words and word meanings in both oral and print language and in productive and receptive forms” (Lehr et al., 2004, p. 5). This definition encompassed all of the components of vocabulary knowledge and highlighted the importance of spoken/written as well as receptive/expressive distinctions. When evaluating reading research, Lehr et al. discovered the relationship between vocabulary

knowledge and reading comprehension to be one of the most “persistent” findings (Baumann, Edwards, Boland, Olejnik, & Kame’enui, 2003; Davis, 1942; Kame’enui & Baumann, 2004; Lehr et al., 2004). In fact, young students with limited vocabularies were found to struggle with reading comprehension, which can lead to a “cycle of frustration and failure” (Lehr et al., 2004, p. 6) where low vocabulary leads to low comprehension, resulting in limited reading experiences which further limits vocabulary growth (Hart & Risley, 2003; Lehr et al., 2004; White, Graves, & Slater, 1990).

The findings of the research on language and literacy for young children yield two important points: 1) emergent literacy and oral language abilities are among the best predictors of future reading skill in the primary grades, and 2) there is little longitudinal research available that examines these relationships throughout the elementary grades or into adolescence. Knowledge of the language skills that have predictive properties for reading for adolescent students could have significant implications for the effectiveness of interventions with this population, including adolescent students with disabilities.

### **Vocabulary and Reading Comprehension Connections – Older Students**

The early connections between language and literacy have been well documented for students in younger grades. Within this literature base, however, there continues to be a call for these connections to be examined further with respect to the predictive value of specific language-based skills, such as vocabulary, on reading abilities, and for these language-literacy connections to be examined into the school-age years, to include exploring the connections for adolescent students. The term “older students” is used to refer to this entire group, from the later elementary years through the secondary grades.

Hart and Risley (2003) examined the vocabulary-reading comprehension connection in a multi-year research effort that followed students from ages 7-9 months to 9-10 years. The original study involved providing language-intensive activities in a preschool setting to children from an impoverished community and using the measured language skills of a group of children of professors at a local university as a comparison group. By providing intervention that presented “everyday language” opportunities, the authors found that they increased the size of the children’s vocabulary, but had no impact on the developmental trajectory of vocabulary growth; the vocabulary increases were temporary (Hart & Risley, 2003). This result spawned a second study with an ambitious research plan to evaluate the vocabulary growth rate and developmental trajectory of children in their homes from 7-9 months of age (prior to evidence of expressive vocabulary) until the age of 3 years.

In the second study, the authors conducted 2-1/2 years of observations in the homes of 42 families. The families represented three author-defined levels socioeconomic status – professional, working-class, and welfare – and at least two ethnic groups (information is provided only on the African-American participants). Child vocabulary levels mirrored the vocabulary usage of the families, with the children of the professionals exhibiting a significantly higher vocabulary size than the children of the working-class families, and the children from families on welfare exhibiting less than half of the vocabulary size of the children of professionals. In addition, the developmental trajectory of vocabulary growth indicated that the children from families in welfare not only had smaller vocabularies, but also were adding words at a slower rate, resulting in an ever-widening gap between these children and the children from

professional families. This finding led to the third study in this research strand, which looked at the predictive power of these results on language and achievement testing at 9-10 years of age.

The authors were able to follow 29 of the children until they were ages 9-10 years. Academic and language testing results indicated that the rate of vocabulary growth at age 3 was correlated with receptive vocabulary ( $r=.58$ ), language skills such as listening, speaking, semantics and syntax ( $r=.72$ ), and reading comprehension scores ( $r=.56$ ) (Hart & Risley, 2003). While the research conducted by Hart and Risley (2003) and examined by Lehr and colleagues (2004) was limited to the examination of children in preschool and early elementary settings, it is reasonable to expect that further research with older students would yield similar findings about the relationship between vocabulary and reading comprehension.

### **Adolescent Struggling Readers**

Adolescent struggling readers have been a focus in education research for decades (Davis, 1942). They continue to receive attention today as achievement-related demands continue to increase (Kamil et al., 2008; Moore, Bean, Birdyshaw, & Rycik, 1999; Santa, 2006; Scammacca et al., 2007; Torgesen et al., 2007) and accountability for student success is under national scrutiny (Fuhrman & Elmore, 2004; Yell, Katsiyannas, & Shiner, 2006).

Scammacca et al. (2007) conducted a meta-analysis of interventions for adolescent struggling readers, reviewing 31 studies of reading interventions for secondary students. Their inclusion criteria were: (1) publication between 1980 and 2006, (2) include only English-speaking struggling readers in grades 4-12, (3) intervention focus on

one or more components of reading instruction, (4) used multiple-group experimental or quasi-experimental design, (5) report data for at least one dependent measure of reading or reading-related variables (including vocabulary), and (6) report sufficient data to compute effect size and a measure of standard error. The findings indicated that the overall estimate of effect size across all 31 studies was 0.95, and 0.42 across the 11 studies that used standardized, norm-referenced measures. The studies that used researcher-developed measures tended to show greater effects since the measures were more directly linked to the intervention tested. The authors acknowledged statistically significant variance across the studies, indicating that the effect sizes may be moderated by other factors such as the type of intervention, the grade level of students, and the intervention provider. Of the five types of intervention, vocabulary interventions had the largest overall effect size, 1.62. This result may appear inflated due to the limitation of the measurement, as these interventions were focused on direct word instruction related to the specific context, so measurement was of knowledge of the target words shortly after the intervention. No information was obtained on the long-term benefits of vocabulary instruction, the generalization of skills to other contexts, or the use of standardized assessments to measure vocabulary growth.

**Vocabulary and reading for adolescent struggling readers.** Scammacca et al. (2007) provided suggestions that future research should include generalization of vocabulary growth to other contexts and improvement on standardized measures. In addition, the authors provided implications for practice based on the research review. Of the nine identified implications for practice, three included explicit mention of the benefit of interventions that focus on vocabulary: (1) older students with reading difficulties

benefit from interventions focused both at the word level and at the text level (e.g. vocabulary), (2) older students with reading difficulties benefit from improved knowledge of word meanings and concepts, and (3) word-study interventions (including vocabulary) for older students with reading difficulties are associated with small-to-moderate gains, even on standardized outcome measures. Each of these implications for practice referenced word knowledge, word-study, and/or working at the word and text level, all of which are components of vocabulary instruction.

The topic of reading comprehension, covered in any discussion of adolescent struggling readers, consistently includes a review of the importance of vocabulary knowledge and instruction. With the national focus on improving reading achievement, there is a great deal of research on adolescent learners that is focused on individualized interventions. While this focus appears logical, there are many aspects of reading achievement that are excluded. The typical study of adolescent struggling readers involves instruction on a finite set of vocabulary words and assessment of those words with a researcher-made instrument within a short time of the instruction (Kamil et al., 2008; Moore, Bean, Birdyshaw, & Rycik, 1999). This approach does not address generalization of vocabulary skill to other contexts, long-term success of the intervention, or an understanding of the underlying vocabulary-comprehension relationship. Current researchers recognize the need for further examination of the vocabulary-comprehension connection, as well as the use of standardized assessments to measure vocabulary growth (National Reading Panel, 2000; Scammacca et al., 2007), however information about these areas can only be inferred from the intervention literature at this time.

Torgesen and colleagues conducted a literature review of literacy instruction for adolescents and developed a reference document for teachers identifying valuable practices for academic literacy instruction with adolescent students (Torgesen et al., 2007). Vocabulary was identified as one of the six critical factors underlying proficient reading. As a result of their review of the research, Torgesen et al. (2007) identified recommendations for improving academic literacy instruction for students in grades 4-12, improving literacy-related instruction in the content areas, and supporting the literacy development of both English Language Learners and students reading below grade level. Each of these recommendations highlighted the importance of vocabulary knowledge, with an encouragement for teachers to balance direct instruction in word knowledge with the development of word-learning strategies.

### **Language-Literacy Connections for Students with Learning Disabilities (LD)**

**Characteristics of LD.** A learning disability, as defined in the Individuals with Disabilities Education Act, is a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which may be manifested as an inability to listen, think, speak, read, write, spell, or do math (IDEA, 2004). In most cases, the cause of the learning disability is unknown and, given the variety of perceptual and cognitive processing skills involved, it is likely that there are multiple causes (Heward, 2009). According to the U.S. Department of Education (2011), 6.5 million students aged 3-21 years received special education services in the 2009-2010 school year, representing 13% of the public school population in the nation. Approximately 38% of those students were identified with a specific learning disability, the largest disability category (US. Department of Education & National Center for

Education Statistics, 2011). The demographic characteristics of students with LD show disproportionality for males, African Americans and Hispanics, and students living in poverty (Shifrer, Muller, & Callahan, 2011). Regarding ethnicity, students with LD include 55.83% Caucasian, 20.26 % African American, and 20.46% Hispanic (U.S. Department of Education, 2007). Students living in poverty make up 48% of the LD population (Shifrer et al., 2011), while the same group represents only 16.0% of the general population (Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). It should be noted that the disproportionality of African American and Hispanic students identified with LD can be accounted for by the lower average SES of these subgroups (Shifrer et al., 2011).

**Vocabulary and reading comprehension for students with LD.** It is estimated that 80-90% of all students identified with LD are referred for services due to reading concerns (Heward, 2013; Kavale & Forness, 2000). This vast majority of children with reading disabilities tend to fall further and further behind as they progress through the school-aged years, following the same “cycle of frustration and failure” (Lehr et al., 2004, p. 6) described in the literature on vocabulary and reading comprehension (Hart & Risley, 2003; Lehr, Osborn, & Hiebert, 2004; White, Graves, & Slater, 1990) that was examined in an earlier section of this review. For example, in a longitudinal study conducted with students diagnosed with LD, Stanovich and his colleague discovered that 74% of the students continued receiving services for reading problems into high school (Stanovich & Siegel, 1994).

Roberts, Torgesen, Boardman, and Scammacca (2008) reviewed existing evidence-based strategies for reading instruction for adolescent struggling readers with

LD. In keeping with the National Reading Panel report's five essential areas for effective early reading instruction (2000), the authors identified the five essential areas of effective reading instruction for older students and vocabulary is one of the five. Even with vocabulary being an essential area, Roberts and his colleagues (2008) echoed the findings of Scammacca et al (2007) by noting a scarcity of experimental research on effective vocabulary instruction for older students with LD. Concerns with vocabulary research are related to the nature of vocabulary learning (e.g. direct instruction or incidental learning) and the difficulty of reliably measuring improvement. The type of vocabulary measurement tool and the specific words targeted vary from study to study, along with the length of time between instruction and assessment. As a result, it is difficult to make statements about generalization of the findings to other situations or populations. Also, the authors note the paucity of using standardized measures to document vocabulary growth for adolescent learners. The aforementioned concerns play a role in the ongoing difficulty of identifying specific vocabulary-comprehension relationships for adolescent students, specifically students with disabilities.

Since the understanding or use of language is an integral component of the definition of LD, it is logical that language skill deficits frequently are noted in conjunction with deficits in reading and reasoning skill for students with LD (McArthur, Hogben, Edwards, Heath, & Mengler, 2000). However, since language skill deficits are viewed as a core causal component of LD, language skill is not a focus area in the literature on LD. Rather, the literature tends to focus on the manifestations of the disability, or the impact on a student's ability to perform tasks such as reading, and writing. The literature that does address the language-LD connection focuses on the

overlap of the disability categories of LD and Language Impairment (LI), rather than examining specific aspects of the interrelationship of language and learning skills, such as the vocabulary-comprehension connection for students with LD.

McArthur and colleagues conducted an examination of the similarities between students identified with LD and students identified with language impairments (LI) and determined that over half of each group met the eligibility requirements for the other category and could have easily been classified as such (McArthur et al., 2000). This overlap in disability categories can be attributed to the language skills that are embedded within the learning tasks of reading and reasoning. As further support for the common ground in identification categories, the researchers found that 55% of children with reading difficulties also have impairments in oral language and 51% of children with language deficits have a concomitant reading disability.

Scarborough (2001) highlighted the fact that, for students beyond 2<sup>nd</sup> grade, reading comprehension deficits are essentially oral language limitations. These limitations include the child's lack of knowledge of the word in spoken form, an inability to parse semantic and/or syntactic relationships among words, and a lack of crucial background knowledge to correctly interpret the text (Scarborough, 2001). In summary, researchers recognize that language and vocabulary skill deficits are components of a deficit in reading comprehension, but the exact nature of the relationship has not been examined.

### **Language-Literacy Connections for Students with Emotional Disturbance (ED)**

**Characteristics of ED.** An emotional disturbance (ED), as defined by IDEA, is an inability to learn, an inability to build or maintain satisfactory relationships, and

inappropriate behaviors under normal circumstances that adversely impact educational performance (2004). While it is rare to pinpoint a single cause, there are four categories of causal factors that have been identified and studied in relation to ED: biological, family, school, and cultural factors (Kauffman & Landrum, 2008). Biological factors include genetic factors, brain damage or dysfunction (e.g. Traumatic Brain Injury), and developmental disorders. Family factors include family structure, interaction and discipline styles, as well as external influences, such as poverty, unemployment, homelessness, community violence, etc., that add stress to the family dynamic. School factors include how within child variables, such as intelligence, academic achievement, and social skills, interact with the behavioral, academic, and situational expectations in a classroom and school setting. Cultural factors involve the differences between the cultures of home and school, as well as educator perspectives that may include bias and discrimination.

A meta-analysis conducted by Forness and his colleagues found that the mean prevalence for ED in school-aged children in the United States is 12.7% (Forness, Freeman, Paparella, Kauffman, & Walker, 2012). According to the U.S. Department of Education (2011), approximately 0.9% of the 6.5 million students in public school who receive special education services were identified with ED. It is important to note that identification rates are variable, ranging from 0.2% to just over 2.0% across states (U.S. Department of Education, 2007). The demographic characteristics of students with ED show disproportionality for males, African Americans, and students living in poverty (Wagner et al., 2005). Eight in ten (80%) of the students with ED are male, which is significantly more than the 51% represented in the general population. Regarding

ethnicity, students with ED include 56.9% Caucasian, 27.0% African American, and 12.1% Hispanic. A comparison of the demographic data for students with ED and LD indicates similarities concerning disproportionality for males (80% for ED and 73% for LD), African Americans (27% for ED and 20% for LD), and students living in poverty (33% for ED and 48% for LD). A contrast is noted for Hispanic students, however, with a higher number identified with LD (20%) and a lower number identified with ED (12%) (Shifrer et al., 2011; Forness et al., 2012; U.S. Department of Education, 2007). When compared to the general population, demographic data for students with ED indicate a significantly larger percentage of African-American students and a significantly lower percentage of Hispanic students. In addition, students living in poverty make up 33.2% of the ED population, while the same group represents only 16.0% of the general population.

The behavioral difficulties associated with ED can be categorized as internalizing (e.g. social withdrawal and depression) and externalizing (e.g. aggression and noncompliance) (Kauffman, 2005; Kauffman & Brigham, 2009; Kauffman & Landrum, 2008). Long-term and post-secondary outcomes for students with ED are troublesome, and include academic failure, an increased dropout rate, a high unemployment rate, low participation in post-secondary education or training, an increase in social isolation, and increased levels of crime (Bradley, Doolittle, & Bartolotta, 2008; Maag & Katsiyannis, 1998).

**Language-Literacy connections for students with ED.** Students with ED present with a variety of challenges, including behavioral, academic, and social difficulties that negatively impact their educational performance (Goran & Gage, 2011;

Kauffman & Landrum, 2008). Recent research has highlighted the existence of an interrelationship between behavior, academics, and language within the category of ED (Benner, Nelson, & Epstein, 2002; Goran & Gage, 2011). For example, Benner and colleagues conducted a review of 26 studies and found that, on average, 57% of students with language impairments also had social/behavioral deficits and an average of 71% of the students with ED had co-existing language deficits (Benner, Nelson, & Epstein, 2002). In addition, in a study comparing the social/behavioral skills of students with language impairments and their typically developing peers ( $n=71$ ), McCabe and colleague found that the students with language impairments were more likely to have deficits in social/behavioral skills (McCabe & Meller, 2004). These co-morbid language and social/behavioral deficits are manifested as academic and social difficulties in school (Kauffman, 2005; Kauffman & Brigham, 2009), but their etiological bases are still developing (Goran & Gage, 2011; Trout, Nordness, Pierce, & Epstein, 2003). Further examination is needed concerning the relationship of specific skill deficits to academic performance for students with ED, such as the vocabulary-reading comprehension connection.

For students with ED, while the specific information on literacy is limited, the academic deficits across the core content areas have been well documented in the literature (Algozzine et al., 2010; Benner et al., 2002; Benner et al., 2010; Reid et al., 2004). This has contributed to an increase in research addressing academic performance for students with ED over the past decade (Gresham, 2004; Kauffman, 2010; Lane et al., 2008; Lane & Menzies, 2010; McIntosh et al., 2008). In a meta-analysis of the academic performance of students with ED, Reid and colleagues (2004) found that most students

with ED performed at or below the 25<sup>th</sup> percentile in general academic functioning, which is a significantly lower performance level when compared to nondisabled peers. These findings are corroborated by recent research, including the study by Lane and colleagues of 42 students with ED educated in self-contained or segregated classroom settings (Lane et al., 2008). The authors found that the students performed below the 25<sup>th</sup> percentile on all reading, written expression, and mathematics measures. In addition, Nelson, Benner, Lane, and Smith's (2004) study of 155 K-12 grade students with ED found that 83% of the participants scored below the mean on the Total, Broad Reading, Broad Math, and Broad Written Language composites of the Woodcock Johnson III Test of Achievement (Woodcock et al., 2001).

Benner, Nelson, and Epstein (2002) conducted a literature review of 26 studies ( $n=2796$ ) investigating the language skills of students with ED. Their findings included information that 71% of students with ED had co-occurring language deficits and 57% of students with diagnosed language disorders also were identified as having ED. When the results were broken down by language category, the authors found that 71% of students with ED had pragmatic language deficits, 64% had expressive deficits, and 56% had receptive deficits. These findings, along with the findings of other studies (Gallagher, 1999; Hummel & Prizant, 1993; Nelson et al., 2005; Rogers-Adkinson, 2003; Ruhl et al., 1992) suggest that many students with ED exhibit language deficits. However, the results are organized by general language categories, and questions still remain as to the specific language skills that are impacted, as well as the nature of the interaction among language, behavior, and academic performance.

Researchers have found mixed results regarding the language and academic outcomes associated with behavioral manifestations (e.g., internalizing and externalizing) for students with ED. Gresham and colleagues (Gresham et al., 1999) found that students with internalizing behaviors were less academically competent than students with externalizing behavior and scored lower on reading and math assessments. However, students who exhibited both internalizing and externalizing behaviors performed significantly worse across all academic assessments than peers in either the internalizing or externalizing groups, or nondisabled peers. In a cross-sectional study of 166 students with ED, Nelson, Benner, and Cheney (2005) examined the relationship between internalizing and externalizing behaviors and language abilities, finding that although 90% of students with ED exhibit language deficits (Benner et al., 2002), those with externalizing behaviors were more likely to have language deficits than students with internalizing behaviors. As the research regarding academic and language deficits for students with ED increases (Hodge et al., 2006; Kostewicz & Kubina, 2008; Mattison, 2008), and as future research concerning the relationship between language and ED focuses less on broad categories of language (pragmatics or semantics) and more on specific language skills (vocabulary), interventions to target etiological bases, such as language deficits, will also increase (Nelson et al., 2006).

Nelson, Benner, Neill, and Stage (2006) conducted an examination of the interrelationships among language, behavior, and academics for students with ED. The participants in this study included 126 students in grades K-12 who received special education services for ED. The authors utilized three standardized measures to represent the constructs: the Child Behavior Checklist: Teacher Report Form (Achenbach, 1991)

for externalizing behavior, the Woodcock Johnson-III Tests of Achievement (WJ-III; Woodcock et al., 2001) for academic fluency and academic skills, and the CELF-3 (Semel & Secord, 1995) for language. Structural equation modeling (SEM) was used to examine the relationships that exist among these constructs. The authors found that externalizing behavior had little to no influence on the constructs of language and academics. However, language ability demonstrated a significant impact on both academic fluency and academic skills. In addition, academic fluency was determined to mediate the effect of language ability on academic skill. The authors concluded that students with ED would benefit from intervention targeting language abilities to develop academic skills. Limitations of this study include the small sample size for SEM analysis and the broad operational definition of the variables of language and academics.

Current research indicates that students with ED have both language (Benner et al., 2002) and academic (Reid et al., 2004) deficits and that language skill serves as a significant predictor of academic performance (Benner, Mattison, Nelson, & Ralston, 2009). Researchers have argued for the provision of language assessment and intervention for students with ED, as they may require the same level and extent of academic and language-based support as students with LD, in addition to the needed behavioral interventions, but this recommendation currently is not followed in common practice (Benner et al., 2009; Benner et al., 2002; Goran & Gage, 2011; Kauffman, 2010; Nelson et al., 2006). The examination of the language-reading comprehension relationship would provide important insight to inform language intervention decisions for students with ED.

## **Comparison of the Language-Literacy Relationship for Students with LD and ED**

While the research reviewed to this point demonstrates the existence of connections between language and literacy for students with disabilities, there is limited information concerning the specific nature of this relationship. In addition, there is little information on how this relationship differs for students with LD and ED. Recently, researchers have begun to explore the interrelationship between language, academics, and behavior in a comparative examination for these two groups. One study is described below, along with how the present study is designed to address the gap in the literature by building on this small body of work.

Goran and Gage (2011) built upon the work of Nelson and colleagues (2006) and expanded the examination of the interrelationship of cognition, language, academics, and behavior to identify similarities and differences between students with ED and LD. In this study, the authors used a similar SEM model to examine these relationships for 142 students in grades 3-8 ( $n=25$  with ED and  $n=117$  with LD). The measures used for each construct were as follows: the Cognitive Abilities Test (CogAT; Lohman & Hagen, 2001) for cognitive ability, the levels of the Missouri Assessment Program (MAP) performance for academic ability, the Clinical Evaluation of Language Fundamentals, Fourth Edition (CELF-4; Semel, Wiig, & Secord, 2003) for language ability, and a calculated measure of suspension severity and rate for behavior. Results indicated no significant differences between the two groups, except on the behavior measure. Implications of this study support the conclusion of Nelson and colleagues (2006) that students with ED would benefit from language interventions to assist in development of

academic skills, and advances this conclusion to include students with LD. Limitations of this study include the broad nature of the measures of language and academics.

The present study is designed to address the similarities and differences between students with LD and ED regarding the relationship between language and academic skills, but at a more focused level. This study will use broad language and reading measures to allow for comparison to the previous works, but will address the gap in this literature by also examining the relationship among the specific language and literacy skills of oral vocabulary, reading vocabulary, and reading comprehension.

### **Summary of Language-Literacy Connections for Students with LD and ED**

Students with LD and students with ED share a core characteristic of the absence of cognitive impairment (IDEA, 2004). Despite this commonality, the categories of LD and ED are associated with different performance-based manifestations: academic skill deficits for LD and social/behavioral deficits for ED (Goran & Gage, 2011). Recent research, however, has highlighted the similarities in the deficits for the two groups, specifically the commonality of increased rates of language disorders and low academic achievement (Algozzine et al., 2010; Goran & Gage, 2011; Kauffman & Brigham, 2009; Lane & Menzies, 2010). Even with the documentation of co-occurring academic, behavioral, and language deficits, current interventions and educational planning for students with ED continue to focus on behavior and frequently do not address language assessment or interventions (Gallagher, 1999; Goran & Gage, 2011; Nelson et al., 2006). Given the similarities between ED and LD in regard to language and academic skill deficits, further investigation into the specific connections between language and literacy would benefit the development of effective and efficient interventions for both groups of

students. Even if the over-arching language-literacy connections are similar across the two groups of students, there may be differences in the specific skill deficits or patterns of deficits.

### **Literature Review Summary**

The predictive value of language skill on reading comprehension has been explored extensively in the early elementary grades (Catts, 1993, 1997; Catts, Fey, Tomblin, & Zhang, 2002), but there is limited information on the predictive quality of this relationship for secondary students. The connection between vocabulary and reading comprehension has been explored for younger students (Baumann et al., 2003; Davis, 1942; Hart & Risley, 2003; Kame'enui & Baumann, 2004; Lehr et al., 2004; McCardle et al., 2001), and is listed as one of the critical factors underlying proficient reading for adolescents (National Reading Panel, 2000; Torgesen et al., 2007). While this connection has been described as strong and reciprocal, it is not fully understood (Beck et al., 2002; Gersten et al., 2001; McKeown & Beck, 2004) and has not been systematically studied across ages or disability categories. Although there is evidence that a relationship exists between language, academics, and behavior for students with LD and ED (Benner et al., 2002; Benner et al., 2010; Goran & Gage, 2011; McArthur et al., 2000; Nelson et al., 2005; Nelson et al., 2004; Nelson et al., 2006; Scarborough, 2001), a deeper exploration of this relationship is needed. Further investigation of the relationship between vocabulary and reading comprehension skills for secondary students, with a focus on the similarities and differences of this relationship across the disability groups of LD and ED, is needed.

## **Purpose of Study**

The purpose of this study is to explore the broad relationships between language and literacy, as well as the more specific relationships between oral vocabulary, reading vocabulary, and reading comprehension for adolescent students with LD and ED. To guide this exploration, three main research questions are posed:

1. Do students with LD and students with ED differ on language skills?
2. Do students with LD and students with ED differ on reading skills?
3. What is the relationship between language skills and reading skills for adolescent students with LD and ED?
  - 3a. What is the relationship between oral vocabulary and reading vocabulary for adolescent students with LD and ED?
  - 3b. What is the relationship between oral vocabulary and reading comprehension for adolescent students with LD and ED?

## **CHAPTER 2**

### **METHOD**

The first section of this chapter provides an overview of the research questions, conceptual framework, sample of adolescent students, and the procedure used to select participants. The second section describes the language and reading measures used in the study. The final section includes a discussion of the analysis procedures.

#### **Formal Research Questions**

In order to meet the goals of this study, the following research questions are examined:

1. Do students with LD and students with ED differ on language skills?
2. Do students with LD and students with ED differ on reading skills?
3. What is the relationship between language skills and reading skills for adolescent students with LD and ED?
  - 3a. What is the relationship between oral vocabulary and reading vocabulary for adolescent students with LD and ED?
  - 3b. What is the relationship between oral vocabulary and reading comprehension for adolescent students with LD and ED?

#### **Conceptual Framework**

This research examines the interrelationship between language skills and reading skills for adolescent students with LD or ED. To meet the objectives of this study, three relationships between language and reading have been examined. First, the language skills of students with LD and ED were evaluated and patterns of strengths and

weaknesses within and across the two groups of students were determined. Second, a similar examination of reading skills for the two groups was conducted, again examining the patterns of strengths and weaknesses within and across the groups. Finally, the interrelationship of language and reading skills was examined for the adolescent students with LD and ED. Within this examination, the specific relationships between oral vocabulary and both reading vocabulary and reading comprehension were studied.

### **Participants**

The participants for this study were selected from the sixth-, seventh-, and eighth-grade populations from two school districts in the Midwest, one in an urban public school system and one in a medium-sized public school system. Students in Grades 6-8 were chosen for this study for three reasons: (1) this study is an initial examination of adolescent students who experience the transitions involved in a secondary school setting (e.g. multiple classrooms and multiple teachers to cover the content subjects), (2) sixth, seventh, and eighth grades are the earliest academic years that involves a secondary school structure, and (3) obtaining a representative sample is more likely with younger secondary students given that the drop-out rate for students with ED is nearly twice that for all students with disabilities (Bradley et al., 2008; Maag & Katsiyannis, 1998).

Two groups of students participated in the study, with a total participant number of 25. The first group consists of 16 students enrolled in Grades 6-8 who have an educational diagnosis of Specific Learning Disability (LD) in the area of reading comprehension, though other concomitant learning disabilities (e.g. written expression, math reasoning, etc.) could also be present. The second group consists of 9 students enrolled in the same grades who have an educational diagnosis of Emotional Disturbance

(ED) and evidence of an emotional/behavioral disorder in their academic records as defined by scores in the “Clinically Significant” range on two or more of the scales on a standardized behavior assessment.

A prospective power analysis conducted for the statistical analyses proposed in this study using a total sample  $n=30$  and sub-group samples of  $n=15$  yielded power calculations ranging from .7529 to .8477. Once the sample reached  $n=25$ , a second power analysis was conducted using a total sample  $n=25$  and sub-group samples of  $n=9$  and  $n=16$ , and yielded power calculations of .6722 ( $n=9$ ), .9558 ( $n=16$ ), and .9975 ( $n=25$ ).

**Participant selection.** All participants were selected for this study based on the following criteria: (1) age between eleven and fifteen years, (2) enrolled in 6<sup>th</sup>, 7<sup>th</sup>, or 8<sup>th</sup> grade, (3) English as the primary language spoken by the student, (4) a current primary educational diagnosis of LD (with reading comprehension as an identified area) or ED, and (5) cognitive abilities, measured with an intelligence quotient (IQ) assessment, in the average range. For the purposes of this study, “average” was defined as 90-110, with the standard error of measurement (SEM) of 2.6 (Wechsler, 2003), resulting in a range of 87-113 used as an inclusionary criterion for potential participants.

The sample was drawn from two school districts. District A is an urban public school district in a large, Mid-western city. The district includes six buildings that house students in Grades 6-8, and the administrators at two buildings agreed to participate in the current study. According to district data available through the Department of Elementary and Secondary Education (DESE), the current enrollment data for this district include a total student population of 18,076 and 2,594 students (14.35%) receiving special

education services. Of the 2,594 students receiving special education services, 785 (30.26%) have an educational diagnosis of Learning Disability and 175 (6.75%) have an educational diagnosis of Emotional Disturbance. School district information indicates that the student population at middle school Building A is 825, with 111 students (13.45%) in Grades 6-8 receiving special education services, 61 (54.95%) with an educational diagnosis of LD and 13 (11.71%) with an educational diagnosis of ED. School district information indicates that the student population in Building B is 794, with 105 (13.22%) receiving special education services, 45 (42.86%) with an educational diagnosis of LD and 6 (5.71%) with an educational diagnosis of ED. Table 1 provides a breakdown of demographic characteristics by building and grade for District A.

Table 1  
*Demographic Characteristics of District A*

	Building		District
	A	B	
Total Population	825	794	18, 076
SpEd (% of Total)	111 (13.45)	105 (13.22)	2594 (14.35)
LD (% of SpEd)	61 (54.95)	45 (42.86)	785 (30.26)
ED (% of SpEd)	13 (11.71)	6 (5.71)	175 (6.75)

Note: SpEd = Special Education, LD = Learning Disabilities, ED = Emotional Disturbance

District B is a public school system in a medium-sized, Midwestern community. The district includes three building that house students in Grades 6-7 and three buildings that house students in Grades 8-9. The administrators at all six buildings agreed to participate in the current study. According to district data available through the

Department of Elementary and Secondary Education (DESE) and obtained from district personnel, the current enrollment data for this district include a total student population of 17,709 and 1868 students (10.55%) receiving special education services. Of the 1868 students receiving special education services, 495 (26.50%) have an educational diagnosis of Learning Disability and 150 (8.03%) have an educational diagnosis of Emotional Disturbance. Table 2 provides a breakdown of demographic characteristics by building and grade for District B.

Table 2  
*Demographic Characteristics of District B*

	Building						District
	A	B	C	D	E	F	
Total Population	775	855	932	753	826	936	17,709
SpEd (% of Total)	89 (11.48)	124 (14.50)	105 (11.27)	135 (17.93)	102 (12.35)	89 (9.51)	1,868 (10.55)
LD (% of SpEd)	34 (38.20)	38 (30.64)	34 (32.38)	48 (35.56)	31 (30.39)	25 (28.09)	495 (26.50)
ED (% of SpEd)	7 (7.86)	14 (11.29)	7 (6.67)	13 (9.63)	13 (12.74)	6 (6.74)	150 (8.03)

Note: SpEd = Special Education, LD = Learning Disabilities, ED = Emotional Disturbance

**Participant recruitment.** Permission to conduct this study was obtained at the district and building level for both districts. The author met with administrators in each building, described the study, and asked permission to distribute study information, parental consent, and student assent forms to potential participants. Since English is the language examined in this study, all forms were printed in English and all assessments were conducted in English. In both districts, the author was allowed to provide study information, parental consent forms, and student assent forms to the teachers, who then distributed them to the students they identified as potential participants. In order to

preserve student confidentiality, school personnel accessed the students' files to determine which students meet the inclusionary criteria for the study and obtained and retained the parental consent and student assent forms. All data collected for each student were de-identified to preserve confidentiality. Students who returned signed parental consent, gave signed student assent, and met the inclusion criteria were included as potential participants in the study. The number of participants in the groups totaled 9 for ED and 16 for LD. All potential participants were included in the study. See Table 3 for characteristics of the study participants.

Table 3  
*Participant Characteristics*

Participant	Age	Grade	Gender	Ethnicity	IQ
LD					
01	11	6	M	B	105
02	11	6	M	W	103
03	11	6	M	M	99
04	11	6	M	B	89
05	11	6	F	W	87
06	11	6	M	W	95
07	12	6	M	W	93
08	12	6	M	B	108
09	12	6	M	I	99
10	13	6	F	B	93
11	13	7	F	W	96
12	13	7	M	W	108
13	13	7	F	B	97
14	13	8	M	B	91
15	15	8	F	W	98
16	15	8	M	W	102

Table 3 (contd.)  
*Participant Characteristics*

Participant	Age	Grade	Gender	Ethnicity	IQ
ED					
17	12	6	M	W	108
18	12	6	F	W	108
19	13	7	F	B	102
20	13	7	F	B	92
21	13	7	F	B	99
22	14	8	F	W	113
23	14	8	M	W	107
24	14	8	M	W	97
25	15	8	M	W	89
Mean for	11.6	6.5			97.69
LD					
Mean for	12.2	7.2			101.67
ED					
Overall	11.8	6.7			99.12
Mean					

Note: Ethnicity, W=White, B=Black, M=Multi-racial, I=Indian(Asia)

To ensure the participants met the inclusionary criteria for this study, a follow-up file review was conducted by the author and a school psychologist to examine the assessments and eligibility criteria in the area of cognitive abilities and behavior for all participants from District B. District A did not allow the author access to the records. The author is a speech-language pathologist and special educator with 12 years of experience in the schools, working with students in grades K-12. She holds a Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP) from the American Speech-Language Hearing Association (ASHA), licensure from the Missouri State Board of Healing Arts in speech-language pathology, as well as teaching certification in the state of Missouri in speech-language and mild-moderate cross-categorical, both K-12. The author holds a Masters of Health Science in Speech-Language Pathology and is completing a PhD in Special Education, both with the University of Missouri. The

school psychologist who helped with the file review has over 15 years of experience as a school psychologist working with grades PreK-12 in the states of Missouri and Kansas. She earned a Masters of Education and Counseling from the University of Missouri.

For students with LD, the file review included examination of the IQ tests and scores, as well as a listing of the specific areas of LD in which the students qualified. For students with ED, the file review included examination of the IQ tests and scores, as well as the behavior measures administered, the raters who completed the assessment, and the scales on which the students were scored as at-risk or clinically significant. As mentioned previously, the inclusionary criteria for ED included two or more independent raters scoring the student in the at-risk or clinically significant range on at least two of the subscales of the behavior assessment.

The participants from District B included 11 students with LD and five with ED. For all of the student participants from this district, the IQ assessments on file were completed by a school psychologist or a supervised school psychology intern. None of the evaluations reviewed were initial eligibility determinations, so the students had been receiving special education services for at least two evaluation cycles, or six years. Fourteen of the sixteen students had IQ tests administered in the latest re-evaluation cycle (within the last three years), while two had reported IQ scores from assessments in a previous evaluation cycle (more than three years prior).

For the five students with ED, the additional inclusionary criterion was the rating of the student as at-risk or clinically significant on at least two subscales of a behavior assessment by at least two independent raters. All five had behavior testing completed within the context of the most recent re-evaluation cycle, and all of these re-evaluations

were conducted within 18 months of the current study assessments. Four of the five were rated using the BASC-2 and one was rated with the SSIS. The raters included self, parent/guardian, and classroom teachers. All five students were rated as clinically significant or at-risk on several of the subscales of the behavior assessment, surpassing the inclusionary criterion of two subscales. See Table 4 for the raters and scales for each student with ED.

Table 4  
*Behavior Ratings for Students with ED in District B*

Grade	Behavior Scale	Administered by	Behavior Rater(s)	Behavior Scales rated Clinically Significant or At-Risk
6	BASC	School Psychologist	Self, Mother, Classroom Teacher	Aggression Anxiety Atypicality Conduct Problems Depression Externalizing Problems Hyperactivity Internalizing Problems Somatization
7	SSIS	School Psychologist	Guardian, Two Classroom Teachers	Competing Behaviors Problem Behaviors Social Skills
7	BASC	Outside Agency	Parent	Anxiety Behavioral Symptoms Depression Somatization

Table 4 (contd.)  
*Behavior Ratings for Students with ED in District B*

Grade	Behavior Scale	Administered by	Behavior Rater(s)	Behavior Scales rated Clinically Significant or At-Risk
8	BASC	School Psychologist	Self, Mother, Two Classroom Teachers	Adaptability Adaptive Skills Anxiety Atypicality Behavioral Symptoms Depression Internalizing Problems Leadership School Problems Somatization Study Skills Withdrawal
8	BASC	School Psychologist	Self (previous evals included parent/teacher ratings)	Attention Problems Atypicality Depression Hyperactivity Internalizing Problems Locus of Control School Problems Somatization

Note: BASC = Behavior Assessment System for Children, Second Edition; SSIS = Social Skills Improvement System

Additional information that was collected for all participants included age, gender, and ethnicity. The author attempted to collect information on socio-economic status (SES) as measured by participation in the Free/Reduced Lunch program, but District B would not release this information. While none of the additional demographic variables were used as a criterion for inclusion in the study, they were included in the data analysis for the purpose of identifying groupings or sub-groupings of the results. Participants were free of vision and hearing impairments that would limit their ability to participate in the proposed study. Written parent/guardian consent and student assent were obtained for each participant (see Appendices A and B). Participant recruitment

occurred during the regular 2011-2012 school year and continued into the summer school session. As a result, the parent consent and student assent letters were modified for summer participants and are included as Appendices C and D.

### **Settings**

All assessments were administered in the school attended by the student participant. Each school provided a testing location that was furnished with a table and chairs, and free of distractions to allow for the tests to be administered according to standardization procedures.

### **Measures**

Student demographic data was obtained from their academic records. These data points include: age, grade, gender, ethnicity, and cognitive ability. Measures of cognitive ability were obtained and the results reported according to individual tests administered and the categories of performance as reported in the WISC-IV (Wechsler, 2003). It is recognized that cognitive ability is highly correlated with language skill (Clegg, Hollis, Mawhood, & Rutter, 2005; Gleason, 1993), but this is not a focus of the current study, so additional measures of cognition were not administered. Because this study is focused on students with either LD or ED they, by definition, are expected to have cognitive abilities that fall in the average range or above average range (Goran & Gage, 2011; Sabornie, Cullinan, Osborne, & Brock, 2005; IDEA, 2004) and measured cognitive ability in the range of 87-113 is one of the inclusionary criteria for participation in this study. This range was determined by examining the performance descriptors and standard error of measurement (SEM) for the WISC-IV (Wechsler, 2003). Student scores are considered “average” (neither low average nor high average) if they fall in the range of 90-110. This

range, coupled with the SEM of 2.6, was used to determine that a range of 87-113 represents an average score. Since district personnel were responsible for the file review to determine potential participants, information was not available on the number of students excluded based on this criterion.

Measures of reading comprehension, vocabulary skill, and language were administered in this study. The author, a certified speech-language pathologist whose experience and credentials are described above, administered all of the reading and language assessments. The standardized, normative assessments that were used in each area are listed in Table 5 and described below.

Table 5  
*Standardized Assessment Measures*

Assessment Area	Standardized Measure(s)
Reading Comprehension	Woodcock Reading Mastery Tests-Revised
Vocabulary	Peabody Picture Vocabulary Test, Fourth Edition Expressive Vocabulary Test, Second Edition
Language	Clinical Evaluation of Language Fundamentals, Fourth Edition
Behavior	Behavior Assessment System for Children, Second Edition Social Skills Improvement System

**Reading comprehension.** Reading comprehension was assessed using the Woodcock Reading Mastery Tests-Revised (WRMT-R) (Woodcock, 1998). The WRMT-R is a comprehensive assessment that measures several important aspects of reading ability, including basic skills and reading comprehension, which is further divided into word comprehension and passage comprehension. The subtests that comprise the basic skills portion are Word Identification and Word Attack. The reading

comprehension portion of the test is comprised of passage comprehension and the word comprehension tests, which include Antonyms, Synonyms, Analogies, and the content area reading tasks of General Reading, Science-Mathematics, Social Studies, and Humanities. This assessment provides norm-referenced scores for students in grade levels Kindergarten to college senior. The WRMT-R provides results in a variety of forms, including standard scores, percentile ranks, grade equivalents, age equivalents, and a Relative Performance Index (RPI). The option of different levels of interpretive data allows the examiner to choose the level of precision and information obtained from this assessment. In the current study, the scores will be reported at the highest level of precision in order to obtain the greatest detail available concerning student ability in reading. This level of reporting includes the Basic Skills Cluster, Reading Comprehension Cluster, and the Total Reading-Full Scale scores.

The normative information is based on a representative sample of 3,184 students in grades K-12 and 245 young adults aged 18-22 years who were tested across forty of the fifty states at 129 testing locations (Woodcock, 1998). To ensure a nationally representative sample, the authors used a stratified multistage sampling procedure. The stratification variables included age, grade, gender, socioeconomic status (as measured by parent education level), ethnicity, geographical region, and educational placement. By including educational placement as a variable, the authors ensured that the normative sample included a proportional number of students receiving special education and gifted services. Internal consistency reliability coefficients for the tests and clusters assessed at Grade 5 and Grade 8 (the reported results that were closest in age/grade to the sample in the current study) for Form G+H ranged from .84 to .99. Content validity measures of

the WRMT-R item development included contributions from outside experts, design that is comprehensive in content and difficulty, and open-ended item creation to eliminate guessing as a confounding factor in scoring. Concurrent validity correlations were calculated between the WRMT-R and the Woodcock Johnson (WJ) reading tests (Woodcock, 1978). For Grades 5 and 8, the correlations for Passage Comprehension ranged from .55 to .57 and Total Reading was .81. While the authors did not provide any explanation of these results, it should be noted that scores for the Total Reading Score of the WRMT-R and the WJ Reading Achievement showed correlations of .87 to .92 across the grade levels. Also, the authors of the WRMT-R highlight the comprehensive nature of the content and design of the test, with all items being open-ended. This is in comparison to the format of the reading section of the WJ, which includes a cloze procedure task, and may account for some of the variability in the correlations for Passage Comprehension.

**Vocabulary skill.** Vocabulary skill, both receptive and expressive, was assessed using standardized, normative assessment measures. These assessments are the Peabody Picture Vocabulary Test, Fourth Edition (PPVT-IV) and the Expressive Vocabulary Test, Second Edition (EVT-2), respectively.

The PPVT-IV is an individually administered, norm-referenced measure of receptive vocabulary skill (Dunn & Dunn, 2007). The student is asked to choose, from four, full-color pictures on one page, the picture that best represents the target word spoken by the examiner. The EVT-2 is an individually administered, norm-referenced measure of expressive vocabulary skill (Williams, 2007). The student is asked to provide the word that best represents the object/group/action represented in the full-color stimulus

picture. These two tests were co-normed (Dunn & Dunn, 2007; Williams, 2007) to provide a comprehensive evaluation of receptive and expressive vocabulary knowledge. The normative information is based on a representative sample of 3,540 people from across the United States, ranging in age from 2 years, six months through 90+ years. Grade norms for students in grades K-12 are also available. The raw score information for both tests can be converted to a standard score, percentile rank, normal curve equivalent, stanine, and age or grade equivalent. In addition, the co-norming of the PPVT-IV and EVT-2 allows for a growth scale value (GSV) to be calculated and used as a progress monitoring measure. Split-half reliability for the PPVT-IV ranged from .89 to .97 for standard scores across all age groups. Alternate-form reliability ranged from .87 to .93, and test-retest reliability ranged from .92 to .96. For the EVT-2, split-half reliability ranged from .88 to .97, alternate-form reliability ranged from .83 to .91, and test-retest reliability ranged from .94 to .97. Validity of the PPVT-IV and the EVT-2 was examined across the domains of construct validity, content validity, and correlations with other tests. Correlations between the PPVT-IV and the Clinical Evaluation of Language Fundamentals, Fourth Edition (CELF-4; Semel et al., 2003) ranged from .67 to .79, correlations between the EVT-2 and CELF-4 ranged from .68 to .80. Correlations between the PPVT-IV and the EVT-2 ranged from .80 to .84 across the age groups represented in the normative sample.

**Language skill.** Language skill refers to one's ability to understand and use words effectively, both orally and in writing (Nelson et al., 2006). This skill set was assessed with a standardized measure, the Clinical Evaluation of Language Fundamentals, Fourth Edition (CELF-4; Semel et al., 2003).

The CELF-4 is an individually administered test for use with children and youth between the ages of 5 and 21 years of age that takes approximately 30-60 minutes to complete. Composite scores are provided for core language, receptive language, expressive language, language structure, language content, and language memory. For students ages 11-14 years, the following subtests are administered to calculate the composite scores: Concepts & Following Directions, Recalling Sentences, Formulated Sentences, Word Classes, Word Definitions, Understanding Spoken Paragraphs, Sentence Assembly, and Semantic Relationships.

The normative sample included more than 4,500 children, adolescents, and young adults as a representative sample of people in the United States ages 5 through 21 years (Semel et al., 2003). The sample was stratified across the variables of age, gender, ethnicity, geographic region, and parent education level. The sample also included proportions of students receiving special education and gifted services. Test-retest reliability coefficients for the CELF-4 ranged .88 to .92 for composite scores and split-half reliability ranged from .87 to .95 for composite scores. The average reliability coefficients for the subtests ranged from .71 to .92 for the standardization sample. Evidence of validity of the CELF-4 was gathered for test content, response process, and internal structure (Semel et al., 2003). Content was reviewed to ensure it was appropriate to the language skills of the various stages of development and, to address potential bias, a group of experts was recruited for their knowledge of language use in diverse populations.

**Behavior.** Two behavior measures were used to provide information regarding inclusionary evidence for participants in the ED group. The Behavior Assessment

System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004) and the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008) are norm-referenced measures that provide comprehensive information on student behaviors that can affect interpersonal relationships and academic performance. Each measure is described below.

***Behavior Assessment System for Children, Second Edition (BASC-2).*** The Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004), Teacher, Parent, and Self-report, Adolescent version, is a comprehensive behavior rating scale that measures both internalizing and externalizing behaviors. A special education (SE) teacher, two general education (GE) teachers, and parent will complete this assessment. Forms require the individual to rate child/adolescent behaviors on two scales, adaptive and clinical, with subscales consisting of Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Learning Problems, Somatization, and Withdrawal. The Self-Report version subscales are Alcohol Abuse, Anxiety, Attention Problems, Attitude to School, Attitude to Teachers, Atypicality, Depression, Hyperactivity, Locus of Control, School Maladjustment, Sensation Seeking, Sense of Inadequacy, Social Stress, and Somatization.

The assessment is suitable and normed for secondary students. The normative sample includes more than 13,000 children from the ages of 2-18 years collected from over 375 sites in 257 cities across 40 states. The sample was designed to represent the national population with respect to gender, socioeconomic status (SES), ethnicity, geographic region, and receipt of special education services. Test reliability and scale intercorrelation validity are adequate across the teacher rating scales (ranging from .85 to .89), parent rating scales (ranging from .83 to .86), and self-report measures (ranging

from .67 to .95) across individual scales. Evidence of validity was obtained through four methods: (1) empirical review of the scales and composites, (2) correlations with other behavior measures, (3) profiles of groups of students with specific diagnoses, and (4) test development measures that compare the BASC-2 with standard diagnostic systems, expert opinions, and the perceptions of teachers, parents, and children. The BASC-2 provides scale and composite score classifications that range from Very High to Clinically Significant for the Adaptive Scales and Very Low to Clinically Significant for the Clinical Scales. Students who score in the At-Risk or Clinically Significant ranges on one or more of the scales will be considered for participation in this study.

***Social Skills Improvement System (SSIS)***. The Social Skills Improvement System (Gresham & Elliott, 2008) is a comprehensive behavior rating scale that assesses three domains of behavior: social skills, problem behaviors, and academic competence. Social skills are further divided into the subdomains of communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. Problem behaviors are broken down into the subgroups of externalizing, bullying, hyperactivity/inattention, internalizing, and autism spectrum. This assessment includes rating scales for parents, teachers, and a self-report from the student.

The normative sample included 4,700 children ages 3-18 years and assessments took place at 115 sites across 36 states. The sample was designed to represent the national population in regard to ethnicity, socioeconomic status (SES), and geographic region. The sample was balanced in terms of gender representation and controlled for receipt of special education services. Reliability was examined for internal consistency (median scale reliability range .94 - .96), test-retest reliability (median value of .80 - .81),

and inter-rater reliability across scales and subscales (median values of .58 - .59). Validity measures included empirical evidence of convergence and divergence (modest support), correlations with other behavior measures (moderate to high correlations with the BASC-2), and evidence based on clinical populations (statistically significant differences in measures of problem behaviors). The SSIS provides recommendations for identifying students who may need intervention and these guidelines will be used for consideration for inclusion in the current study. For the Social Skills and Academic Competence scales, standard scores below 85 suggest the need for behavioral intervention. For the Problem Behavior scale, a score greater than 100 indicates more than average problems with behavior.

### **Analysis Procedures**

The analysis procedures that were used in this study to examine the research questions are presented below. Each research question is listed, along with the variables that were examined, and the statistical procedures used to address the question. Prior to addressing the research questions, descriptive statistics were analyzed for the entire sample. The descriptive information that was collected for each participant includes age, gender, ethnicity, and cognitive ability. The mean, standard deviation, and skew were calculated for each demographic measure, for the entire sample and by subgroup (LD and ED). This information was used to compare the groups and determine if there are significant differences across any of the variables that need to be addressed in the later analyses. For example, if ethnicity is significantly different, this will be a covariate when examining the results for the research questions. The use of Pearson correlation coefficients was a part of the analysis for many of the research questions in this study.

When many correlations are conducted on a small sample, concerns could arise regarding an increased likelihood of a Type I error. The Pearson product-moment correlation coefficient,  $r$ , is frequently used as it is independent of both scale of measurement and sample size (Tabachnick & Fidell, 2007, p. 56). These characteristics of the Pearson  $r$ , coupled with the fact that the correlations used in the analyses will not focus on items that are repetitive in value or skills measured, allow for use of this statistic to report relationships between variables. All variables were examined to determine if they met in regard to the assumptions of normality (Keppel & Wickens, 2004).

**Research question 1.** The first research question asks, “Do students with LD and students with ED differ on language skills?” This question focuses only on the language measures and includes an examination of the scores for the PPVT-IV and EVT-2, as well as the composite scores of the CELF-4, which include the Core Language Scale, Receptive Language Index, and the Expressive Language Index. To assess group differences across the domain of language, the language scores obtained for both student groups were analyzed using a multivariate one-way analysis of variance (MANOVA) test (Tabachnick & Fidell, 2007). Group was entered as the independent variable (2 levels) and the PPVT-IV, EVT-2, Core Language Scale, Receptive Language Index, and Expressive Language Index were entered as the dependent variables. A series of individual one-way analyses of variance (ANOVAs) was conducted to explore group differences for specific dependent variables. Effect sizes were calculated using Cohen’s  $d$  for significant findings to determine the magnitude of differences.

**Research question 2.** The second research question states, “Do students with LD and students with ED differ on reading skills?” This question addresses reading skill and

the variables used include the Basic Skills Cluster, Reading Comprehension Cluster, and Total Reading Cluster of the WRMT-R. To assess group differences across the domain of reading, the scores obtained for both student groups were analyzed using a multivariate one-way analysis of variance (MANOVA) test (Tabachnick & Fidell, 2007). Group was entered as the independent variable (2 levels) and the Basic Skills Cluster, Reading Comprehension Cluster, and Total Reading Cluster scores were entered as the dependent variables. A series of individual one-way analyses of variance (ANOVAs) was conducted to explore group differences for specific dependent variables. Effect sizes were calculated using Cohen's *d* for significant findings to determine the magnitude of differences.

**Research question 3.** The third research question is, "What relationship exists between language skills and reading skills for adolescent students with LD and ED?" Two sub-questions are included to address the relationships between particular language and reading skills. Specifically,

- 3a. What is the relationship between oral vocabulary and reading vocabulary for adolescent students with LD and ED?
- 3b. What is the relationship between oral vocabulary and reading comprehension for adolescent students with LD and ED?

The oral vocabulary measures include the Standard Scores from the PPVT-IV and EVT-2, as well as the Word Definitions Subtest of the CELF-4. The reading vocabulary measure is the Word Comprehension Subtest and the reading comprehension measure is the Reading Comprehension Cluster, both of the WRMT-R. To assess the relationship between language and reading, two regression analyses were conducted, with reading

(either vocabulary or comprehension) as the dependent variable and the three oral vocabulary measures (PPVT-IV, EVT-2, and Word Definitions Subtest) as the independent variables.

## CHAPTER 3

### RESULTS

The purpose of this study was to explore the relationship between language and literacy for adolescent students with LD and ED at two levels of specificity. First, the relationship between overall language skill and reading was examined and group differences were explored. Second, the specific relationship between oral vocabulary and both reading vocabulary and reading comprehension was studied and group differences on these variables were also explored. The results are presented by research question.

Inter-scorer reliability was addressed for a random sampling of each assessment measure. A second rater randomly scored 11 of the total 25 protocols for each of the four assessment measures, representing 44% of the sample. The two raters matched 100% on the scoring of individual items and subtests. There were a total of three calculation errors across the 44 protocols that were identified and corrected.

**Research question 1:** Do students with LD and students with ED differ on language skills? The language measures used in this analysis include the PPVT-IV, EVT-2, and three composite scores from the CELF-4: Core Language Scale, Receptive Language Index, and Expressive Language Index. The five language variables were first analyzed to check assumptions of normality and all five variables met these assumptions. Descriptive information for the language variables is presented in Table 6. In addition, Box's Test of Equality of Covariance Matrices was used to check the equality of the covariance of the measures across groups (LD, ED). The Box's M test was  $F=1.249$ ,  $p=.228$ , verifying that the two groups are equal enough to continue the analysis.

Table 6  
*Descriptive Analyses of Language Variables*

	PPVT-IV	EVT-2	CELF-4 Rec	CELF-4 Exp	CELF-4 Core
Mean (Std. Error)	95.04 (2.411)	95.16 (2.625)	84.40 (3.379)	91.20 (3.546)	88.72 (3.677)
Lower Bound (95%)	90.06	89.74	77.43	83.88	81.13
Upper Bound (95%)	100.02	100.58	91.37	98.52	96.31
Variance	145.373	172.307	285.500	314.417	337.960
Std. Dev.	12.057	13.127	16.897	17.732	18.384
Minimum	69	77	52	57	50
Maximum	124	126	113	122	120
Range	55	49	61	65	70
Skewness (Std. Error)	.459 (.464)	.831 (.464)	-.239 (.464)	-.183 (.464)	-.364 (.464)
Kurtosis (Std. Error)	.501 (.902)	.184 (.902)	-.557 (.902)	-.551 (.902)	-.165 (.902)

Note: PPVT-IV = Peabody Picture Vocabulary Test, Fourth Edition; EVT-2 = Expressive Vocabulary Test, Second Edition; CELF-4 = Clinical Evaluation of Language Fundamentals, Fourth Edition; Rec = Receptive Language Index; Exp = Expressive Language Index and Core = Core Language Scale

The MANOVA results are presented in Table 7. A MANOVA was selected as the analysis method because it has more power to detect differences than univariate analyses and addresses problems associated Type 1 error (Tabachnick & Fidell, 2007). The MANOVA result of  $F=2.270$ ,  $p=.089$  indicates no significant difference ( $p<.05$ ) by group across the five language variables entered; however, given the small number of participants and exploratory nature of the study, this was interpreted as a trend.

Table 7  
*Multivariate Tests by Group for Language Variables*

Effect	Value	F	<i>p</i>
Pillai's Trace	.374	2.270	.089
Wilks' Lambda	.626	2.270	.089
Hotelling's Trace	.597	2.270	.089
Roy's Largest Root	.597	2.270	.089

Note: \**p* < .05

It should be noted that dependent variables that are even moderately correlated could diminish the power of a MANOVA (Tabachnick & Fidell, 2007). The language variables are all highly correlated (see Table 8), which may have impacted the power of the MANOVA. Therefore, a series of one-way ANOVAs was conducted to explore possible group differences for the individual language variables. Differences were detected on the vocabulary measures (PPVT-IV and EVT-2) with the students with ED scoring significantly higher on both, but no differences were detected on the composite language scores of the CELF-4. The results of the ANOVAs are presented in Table 9. In addition, the effect sizes for the PPVT-IV and EVT-2 were 0.0998 and 0.979, respectively, indicating a large effect (Cohen, 1992). However, the effect sizes for the CELF-4 measures were low. These results provide evidence that the students with LD and ED would appear similar on overall language skill assessments, but show differences in the sub-skills of language, specifically in the area of vocabulary.

Table 8  
Correlations Among Language Variables

	PPVT-IV	EVT-2	CELF-4 Rec	CELF-4 Exp	CELF-4 Core
PPVT-IV	1.00	.827**	.728**	.757**	.798**
EVT-2		1.00	.743**	.759**	.758**
CELF-4 Rec			1.00	.868**	.912**
CELF-4 Exp				1.00	.980**
CELF-4 Core					1.00

Note: \*\* $p < .01$

Table 9  
ANOVA Tests of Language Variables by Diagnosis

Language Variable	LD ( $n=16$ )	ED ( $n=9$ )	Total ( $n=25$ )	Overall Test Statistics			
	Mean (SD)	Mean (SD)	Mean (SD)	$df$	F	$p$	Cohen's $d$
PPVT-IV	90.94 (8.933)	102.33 (13.892)	95.04 (12.057)	1	6.277	.020*	0.998
EVT-2	90.75 (8.660)	103.00 (16.378)	95.16 (13.127)	1	6.078	.022*	0.979
CELF-4 Rec	82.69 (17.454)	87.44 (16.402)	84.40 (16.897)	1	.446	.511	0.281
CELF-4 Exp	88.06 (17.582)	96.78 (17.577)	91.20 (17.732)	1	1.416	.246	0.496
CELF-4 Core	85.75 (18.288)	94.00 (18.378)	88.72 (18.384)	1	1.168	.291	0.450

Note: \* $p < .05$

**Research question 2:** Do students with LD and students with ED differ on reading skills? The reading measures used in this analysis were the Basic Skills Cluster, Reading Comprehension Cluster, and Total Reading Cluster of the WRMT-R. The three

reading variables were checked to determine if they met the assumptions of normality and all three reading variables met these assumptions. The descriptive information for the reading variables is presented in Table 10. The Box's M test results of  $F=1.368$ ,  $p=.224$  verified the null hypothesis was met and the two disability groups were equal enough to pursue additional analyses.

Table 10  
*Descriptive Analyses of Reading Variables*

	Basic Skills	Reading Comprehension	Total Reading
Mean (Std. Error)	89.44 (2.310)	86.00 (2.184)	88.32 (2.015)
Lower Bound (95%)	84.67	81.49	84.16
Upper Bound (95%)	94.21	90.51	92.48
Variance	133.423	119.250	101.477
Std. Dev.	11.551	10.920	10.074
Minimum	71	54	67
Maximum	115	109	111
Range	44	54	44
Skewness (Std. Error)	.653 (.464)	-.802 (.464)	.075 (.464)
Kurtosis (Std. Error)	.211 (.902)	2.375 (.902)	.458 (.902)

Note: Reading Variables are the Cluster scores from the Woodcock Reading Mastery Test-Revised

The results of the MANOVA are presented in Table 11 and  $F=1.769, p=.184$  indicates the two disability groups did not differ in overall reading ability.

Table 11  
*Multivariate Tests by Group for Reading Variables*

Effect	Value	F	<i>p</i>
Pillai's Trace	.202	1.769	.184
Wilks' Lambda	.798	1.769	.184
Hotelling's Trace	.253	1.769	.184
Roy's Largest Root	.253	1.769	.184

Note: \* $p < .05$

Again, given the exploratory nature of the study, and the potential impact of correlation among the reading variables (see Table 12), ANOVAs were conducted to determine if groups differed on any specific variable. The series of one-way ANOVAs indicated significant differences between the two groups on the Reading Comprehension and Total Reading variables, and a result approaching significance between the two groups in regard to the Basic Skills Cluster. In addition, all three ANOVAs had effect sizes greater than 0.80, which represents a large effect (Cohen, 1992). See Table 13 for the results of the ANOVAs. These results indicate that the students with LD and ED would appear similar on overall reading scores, but differ on the components of reading related to comprehension. Students with ED demonstrated better basic reading skills (approaching significance), and statistically significantly better performance on reading comprehension and composite reading assessments.

Table 12  
*Correlations Among Reading Variables*

	Basic Skills	Reading Comprehension	Total Reading
Basic Skills	1.00	.727**	.945**
Reading Comprehension		1.00	.909**
Total Reading			1.00

Note: \*\* $p < .01$

Table 13  
*ANOVA Tests of Reading Variables by Diagnosis*

Reading Variable	LD ( $n=16$ )	ED ( $n=9$ )	Total ( $n=25$ )	Overall Test Statistics			
	Mean (SD)	Mean (SD)	Mean (SD)	$df$	F	$p$	Cohen's $d$
Basic Skills	86.13 (9.885)	95.33 (12.490)	89.44 (11.551)	1	4.139	.054	0.822
Reading Comprehension	82.50 (10.621)	92.22 (8.843)	86.00 (10.920)	1	5.403	.029*	0.999
Total Reading	85.06 (8.760)	94.11 (10.080)	88.32 (10.074)	1	5.523	.028*	0.961

Note: \* $p < .05$

Reading Variables are the Cluster scores from the Woodcock Reading Mastery Test-Revised

**Research question 3:** What is the relationship between language skill and reading skill for adolescent students with LD and ED? This question was addressed at two levels of specificity to examine the relationship between oral vocabulary and reading vocabulary, as well as the relationship between oral vocabulary and reading comprehension. The oral vocabulary measures used to address this research question included the PPVT-IV, EVT-2, and the Word Definitions subtest of the CELF-4 (see Table 14).

Table 14  
*Means (Standard Deviations) for Oral Vocabulary  
 Measures by Group*

	LD (n=16)	ED (n=9)	Total (n=25)
PPVT-IV	90.94 (8.933)	102.33 (13.892)	95.04 (12.057)
EVT-2	90.75 (8.660)	103.00 (16.378)	95.16 (13.127)
CELF-WdDef	8.56 (3.306)	10.89 (5.134)	9.40 (4.113)

Note: LD = Learning Disability; ED = Emotional Disturbance; PPVT-IV = Peabody Picture Vocabulary Test, Fourth Edition; EVT-2 = Expressive Vocabulary Test, Second Edition; CELF-WdDef = Word Definitions Subtest of the Clinical Evaluation of Language Fundamentals, Fourth Edition

The reading vocabulary measure was the Word Comprehension subtest score on the WRMT-R and the reading comprehension measure was the Reading Comprehension Cluster score from the WRMT-R. The reading vocabulary and reading comprehension measures met assumptions of normality and the descriptive information for these variables is presented in Table 15.

Table 15  
*Descriptive Analyses of Reading Measures*

	Reading Vocabulary	Reading Comprehension
Mean (Std. Error)	90.40 (2.063)	86.00 (2.184)
Lower Bound (95%)	86.14	81.49
Upper Bound (95%)	94.66	90.51

Table 15 (contd.)  
*Descriptive Analyses of Reading Measures*

	Reading Vocabulary	Reading Comprehension
Std. Dev.	10.316	10.920
Minimum	61	54
Maximum	107	109
Range	46	54
Skewness (Std. Error)	-.782 (.464)	-.802 (.464)
Kurtosis (Std. Error)	1.397 (.902)	2.375 (.902)

Note: Reading Vocabulary = Word Comprehension subtest; Reading Comprehension = Reading Comprehension Cluster score; both from the Woodcock Reading Mastery Test-Revised

A linear regression was conducted to examine the relationship between the oral vocabulary measures and the reading vocabulary measure. To account for the potential impact of interaction among the oral vocabulary measures, three models were used. The results are described below and Model 3 is summarized in Table 16, as it is the only model with significant results. The first model included the three-way interaction (PPVT\*EVT\*CELFWdDef) and all three possible two-way interactions (PPVT\*EVT, PPVT\*CELFWdDef, EVT\*CELFWdDef). The results of this model ( $R^2=.741$ ;  $F=8.595$ ,  $df(6,18)$ ,  $p=.000$ ) indicated that the oral vocabulary measures were highly predictive of reading vocabulary performance. However, none of the dependent variables was individually statistically significant, including the three-way interaction. Since the three-way interaction was not significant, it was eliminated and the model was rerun. The second model yielded similar results, demonstrating statistical significance ( $R^2=.743$ ;

F=8.695;  $df(6,18)$ ;  $p=.000$ ), with none of the individual dependent variables significant. When the two-way interactions were omitted and the model included only the three oral vocabulary measures, statistical significance again was achieved ( $R^2=.652$ ;  $F=13.112$ ;  $df(3,21)$ ;  $p=.000$ ), with the PPVT-IV yielding a significant result ( $p=.048$ ), the EVT-2 approaching significance ( $p=.053$ ) and the Word Definitions subtest of the CELF-4 not significant ( $p=.328$ ) (see Table 16).

Table 16  
*Significance of Oral Vocabulary on Reading Skills by Model*

	Reading Vocabulary					Reading Comprehension				
	<i>p</i>	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$	<i>p</i>	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$
PPVT-IV	.048*	.448	.214	.524	.602	.217	.300	.236	.331	.568
EVT-2	.053	.440	.215	.560	.602	.019*	.601	.237	.722	.568
CELF-4 WdDef	.328	-.683	.682	-.272	.602	.357	-.708	.752	-.267	.568

Note: \* $p < .05$

A second linear regression analysis was conducted to evaluate the relationship between oral vocabulary and reading comprehension. Again, to address potential interaction issues, three models were run that systematically addressed the three-way and two-way interactions. The first model included the three- and two-way interactions, and the results mirrored those of the previous analysis. The results of this model ( $R^2=.723$ ;  $F=7.822$ ,  $df(6,18)$ ,  $p=.000$ ) indicated that the oral vocabulary measures were highly predictive of reading comprehension. However, none of the dependent variables was individually statistically significant. The second model included the two-way interactions and the model demonstrated statistical significance ( $R^2=.720$ ;  $F=7.733$ ;  $df(6,18)$ ;  $p=.000$ ), but none of the individual dependent variables was significant. In the analysis of the third model, which included only the three original oral vocabulary

measures, the EVT-2 yielded a significant result ( $p=.019$ ), while the other two variables were non-significant (PPVT-IV,  $p=.217$  and Word Definitions,  $p=.357$ ) (see Table 16).

Additional regression analyses were run to address the potential impact of disability status on the results. For reading vocabulary as the dependent variable, the regression revealed that this model was highly predictive of the reading skill ( $R^2=.652$ ;  $F=9.383$ ;  $df(4,20)$ ;  $p=.000$ ), but none of the independent variables of oral vocabulary and disability category were significant. For reading comprehension, the overall model again was significant ( $R^2=.623$ ;  $F=8.267$ ;  $df(4,20)$ ;  $p=.000$ ), with only the EVT-2 as individually statistically significant (see Table 17). Inclusion of disability category in the regression did not provide any additional information regarding the relationship between oral vocabulary and the reading measures.

Table 17  
*Significance of Disability and Oral Vocabulary on Reading Skills*

	Reading Vocabulary	Reading Comprehension
Disability	.878	.815
PPVT-IV	.071	.279
EVT-2	.080	.035*
CELF-4WdDef	.399	.445

Note: \* $p<.05$

## CHAPTER 4

### DISCUSSION

The results of the current study provide support for examining the language-literacy connection for adolescent students with disabilities at both a broad and specific level. While students with LD and ED appear similar on composite assessments of language and reading, there are differences between the two groups in relation to vocabulary and reading comprehension. The results related to each research question are examined below.

The first question examined the similarities and differences between students with LD and ED in relation to language skills. Language skills were assessed using standardized measures that investigate oral vocabulary and composite language skills in the areas of receptive and expressive language, as well as an overall composite language index. These measures were chosen to address both levels of specificity targeted in this study; overall language skills and vocabulary knowledge. When all of the measures were included in the analysis, there was no difference between the two groups. The results held true when comparing the CELF-4 results for receptive, expressive, and core indices. When looking at language from a broad perspective, the current study provides support for the statement in the literature that there are no differences between students with LD and ED (Goran & Gage, 2011). This result also supports the findings in the literature that students with ED and LD who have reading/academic deficits often have co-morbid language difficulties (Benner et al., 2002; McCabe & Meller, 2004). It should be noted that, given the strongly correlated nature of the language variables, the power of the MANOVA could have been diminished (Tabachnick & Fidell, 2007). With correlated

variables, it is important also to examine the results at an individual level, through the use of ANOVA.

When using ANOVA to examine a specific language skill, in this case oral vocabulary, differences between the groups emerge. Students with ED performed significantly better than the students with LD on both the receptive (PPVT-IV) and expressive (EVT-2) measures of vocabulary knowledge, and the effect sizes of these results were both large. This finding is a new contribution to the literature, as previous studies have not examined vocabulary knowledge at this level of specificity with the use of standardized measures. It is interesting to note that the students with ED did as poorly on the CELF-4 as the students with LD, with small effect sizes for all three composite scores, but demonstrated significantly better performance on the measures of oral vocabulary.

The nature of the CELF-4 as a broad assessment of language skills, versus the specificity of the oral vocabulary measures, appears to influence the results. In addition, the response tasks for the assessments were different. The PPVT-IV required the student to identify a picture from a set of four and the EVT-2 required the student to answer a question about a picture stimulus, either providing the label of the item or category, or providing a synonym for the label of the item. The CELF-4 involved a variety of response tasks that include repeating sentences, generating descriptive information about a target word, identifying and explaining the relationship between two words, and formulating sentences using a target word and a picture stimulus. The difference in task demands may impact student performance.

While vocabulary knowledge is only one component of language skill, it did not appear to have a significant impact on the performance of students on overall language assessments. This raises questions about what language skills, and at what level of specificity, should be addressed in assessment and intervention. This finding, that oral vocabulary skills are significantly different across the two groups while overall language performance is not, supports the practice of identifying individual strengths and weaknesses at both the global and specific levels, so as to determine what skills should be targeted for intervention.

The second question addressed the similarities and differences between students with LD and ED in regard to reading skills. The results of this analysis were similar to those in the examination of language skills. When examining reading as a composite skill, there were no differences between the groups. Again, the correlated nature of the variable could have impacted the power of the MANOVA. When each reading variable was examined independently (through ANOVA), however, differences emerged. Students with ED out-performed their LD peers on every measure. The mean score for students with ED was in the average range and at least 9 points higher than the mean for students with LD on all three measures, and the effect sizes for all of differences were large. The difference on the Basic Skills cluster approached significance and the differences on Reading Comprehension and Total Reading were statistically significant, with large effect sizes for all three. These results suggest that students with ED demonstrate better skills in the area of reading comprehension than their peers with LD. Again, this finding is a new contribution to the literature. Previous studies have shown that students with ED and LD both demonstrate difficulty with reading, but those studies

looked at reading from a broad perspective. A more specific examination of the component skills of reading shows a difference across the two groups with a large effect size, which is beneficial information to have when considering interventions and instructional planning.

The students with ED demonstrated higher oral vocabulary skills and higher performance on the reading comprehension tasks than their LD peers. These results provide evidence to support the vocabulary-comprehension connection for adolescent students with disabilities. It is interesting to note that the results of the current study could be argued to contribute to the inconsistency in the literature for students with LD and ED regarding language and literacy. While some authors report that students with LD and ED show similar deficits in language and academics/reading (Benner et al., 2002; Benner et al., 2006; Goran & Gage, 2011; Kauffman & Brigham, 2009; Lane & Menzies, 2010), others note specific difficulties for students with LD (Algozzine et al., 2010; Boyle et al., 2010; Durkin & Conti-Ramsden, 2010). At the broad level of analysis, where composite language and literacy assessments were used, no differences were found between the two groups. However, when examining more specific components of language (vocabulary) and reading (comprehension), differences emerge, with students with ED scoring higher than their LD peers. When examining patterns of strengths and weaknesses for students, it is important to look at both overall performance and individual skill performance to obtain a more complete picture of ability and function.

The third research question examined the relationship between language and reading. The focus here was on identifying language skills that are related to reading skills. Developments in this area could inform both assessment and intervention

decisions for adolescent students with disabilities. The third research question again utilized the concept of looking at this relationship at two levels of specificity; how oral vocabulary relates to reading vocabulary and how oral vocabulary relates to reading comprehension.

Standardized assessment tools that measure oral vocabulary (PPVT-IV and EVT-2) were shown to be related to performance in both reading vocabulary and reading comprehension. However, the Word Definitions subtest of the CELF-4 was non-significant in both analyses. Both receptive and expressive measures of oral vocabulary were related to reading vocabulary, either at or approaching a level of statistical significance. For reading comprehension performance, only the expressive oral vocabulary measure was significantly related. Examination of interactions among the oral vocabulary measures indicated that there was no significant impact on the relationships with the reading variables. Also, when disability category was included, it did not have an impact on the results. Overall, these results indicate that standardized measures of receptive oral vocabulary may provide insight into reading vocabulary knowledge, while expressive oral vocabulary measures are correlated with reading comprehension performance. These findings contribute new information to the literature, as this is an initial examination of the use of standardized vocabulary measures when looking at the relationship between oral vocabulary and reading.

### **Limitations**

As an initial effort in this area, the current study has limitations. The main limitation was related to generalization of the findings, specifically related to the small sample size and the geographical limitations of the two districts in the Midwest. The

sample size was limited by the restricted range of IQ scores utilized to create a more homogenous sample, as well as the rate of returned consent, which is a common issue for studies that involve adolescent students with disabilities. In addition, sampling from districts in the same geographical region may reduce generalization to other locations. Although the sample size provided adequate power for the analyses, a larger sample of students with LD and ED is needed for broad implications. A second limitation involved the correlated nature of the variables, both for the language and reading analyses. When the independent variables are so strongly correlated, it may diminish the power of the MANOVA. While using a series of ANOVAs will account for the power difference, examination of the correlational nature of the variables is an important consideration.

The use of archival data to determine eligibility for LD and ED provides its own set of limitations. When using existing information from a school district, there is no way to control for factors such as when a test was administered or by whom, unknown environmental or situational influences on the test administration or student performance, or differences in diagnostic decision-making and identification processes across building-level teams and school districts. In addition, due to confidentiality concerns, one school district would not allow the author to conduct the file review, so the variation in that process across the two districts could be seen as a limitation as well.

Another potential limitation involves the consent process required to conduct individualized assessments. In the current study, the district personnel assumed the responsibility of contacting potential participants and obtaining written consent. Within this structure, there is no way to control for consistency in how the study information was presented to parents and students or returned to the school. If some building personnel

sent the letters home with students while others made personal contact with parents, this could impact the response rate. As with all research efforts, and as a result of the potential limitations, this study should be viewed as exploratory in nature and replicated further.

### **Implications**

The results of this study have implications for the language-literacy connection for adolescent students with disabilities. First, the oral vocabulary-reading comprehension connection for young children (Scarborough, 2009; National Reading Panel, 2000) is supported for adolescent students as well. Students with disabilities who demonstrate deficits in reading comprehension also demonstrate deficits in oral language, and would benefit from increases in both areas. While the current study does not provide information concerning a predictive relationship between language and reading, there is evidence to support the vocabulary-reading connection for adolescent students and this should be considered in assessment and intervention decisions for these students. Future research should continue to explore the language-literacy connection for adolescent students, with a focus on the predictive value of language skills on reading performance, as well as other relationships between specific language and reading skills.

In addition, the use of standardized measures for oral vocabulary knowledge and growth is feasible (Scammacca et al., 2007). As a result, the findings of investigations that utilize standardized measures will be more generalizable across settings and populations, thus informing intervention decisions. Also, the Growth Scale Value (GSV), which can be calculated from the PPVT-IV and EVT-2 results, shows promise as a tool to monitor vocabulary growth over time and should be explored. While the current

study provides initial data regarding these relationships and the use of standardized measures, future research is needed to further examine the oral vocabulary-reading comprehension connection, as well as the utility of a variety of standardized measures available to assess vocabulary knowledge and growth for adolescent students with disabilities.

The current study provides initial information on the importance of oral vocabulary knowledge to reading comprehension skills for adolescent students with disabilities. This link is important for assessment decisions concerning reading ability, as well as for informed intervention plans to address the underlying issues related to reading difficulties for students with LD and ED. This study provides further evidence that students with ED require the same type of language-based support as students with LD. As future research in this area develops, the potential of targeted vocabulary interventions that utilize standardized measures will expand and be generalizable to greater populations of students with disabilities.

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## APPENDIX A

### CONSENT FORM TO PARTICIPATE IN A RESEARCH STUDY

**Researcher's Name(s):** Lisa Goran

**Academic Advisor:** Dr. Rebecca McCathren

**Project Number:** 1201591

**Project Title:** A Comparative Analysis of the Relationships Among Language, Oral Vocabulary, Reading Vocabulary, and Reading Comprehension for Adolescent Students with Learning Disabilities and Emotional/Behavioral Disorders.

#### INTRODUCTION

**This consent may contain words that you do not understand. Please ask the investigator or the study staff to explain any words or information that you do not clearly understand.**

Your child is being asked to participate in a research study. This research is being conducted to examine the language-literacy connection for adolescent students with disabilities. When your child is invited to participate in research, you and your child have the right to be informed about the study procedures so that you can decide whether you want to consent to participation. This form may contain words that you do not know. Please ask the researcher to explain any words or information that you do not understand.

You and your child have the right to know what you will be asked to do so that you can decide whether or not to be in the study. Your participation is voluntary. You do not have to be in the study if you do not want to. You may refuse to be in the study and nothing will happen. If you do not want to continue to be in the study, you may stop at any time without penalty or loss of benefits to which you are otherwise entitled.

#### WHY IS THIS STUDY BEING DONE?

The purpose of this research is to examine how vocabulary knowledge and overall language skills are related to reading comprehension and overall reading success for students in Grades 6-8 who have either a Learning Disability or an Emotional/Behavioral Disorder.

#### HOW MANY PEOPLE WILL BE IN THE STUDY?

About 30 students in Grades 6-8 from Hazelwood School District will take part in this study.

#### WHAT AM I BEING ASKED TO DO?

You will be asked to give consent for your student to participate in individualized language and reading assessments. The student will attend two or three testing sessions with Lisa Goran, a speech-language pathologist and special educator, in which your student's vocabulary, language, and reading skills will be assessed. You will also be asked to give consent for Lisa Goran to review your child's educational records to obtain demographic information (e.g. age, gender, ethnicity, participation in the Free/Reduced Lunch program) and scores from standardized cognitive measures. If your student has an

emotional/behavioral disorder, but no current behavior measures exist in your student's file, you and your student also may be asked to complete a behavior rating scale.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **HOW LONG WILL I BE IN THE STUDY?**

This study will take approximately two or three testing sessions of 30-60 minutes each with your child. All assessments will be completed with your child during the school day and during the remainder of the 2011-2012 school year. Your child can stop participating at any time without penalty. If you are asked to complete a behavior rating scale, this will take approximately 20 minutes of your time.

### **WHAT ARE THE BENEFITS OF BEING IN THE STUDY?**

Your/your child's participation will benefit his/her educational opportunities since specific information will be gathered that can inform goal setting and instructional planning that will target your child's individual needs. In addition, an overview of the findings from the entire study will be shared with the teachers to provide them with the most current information available about how to best address the language and reading skills needs of students in middle school.

### **WHAT ARE THE RISKS OF BEING IN THE STUDY?**

While there are no foreseeable risks to you or your child as a result of participating in this study, your child may feel uncomfortable answering some of the questions on some of the assessments. Your child can ask to stop the assessment at any time he/she feels uncomfortable.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **WHAT ARE THE COSTS OF BEING IN THE STUDY?**

There is no cost to you or your child.

### **WHAT OTHER OPTIONS ARE THERE?**

You and your child have the option of not participating in this study, and will not be penalized for your decision.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **CONFIDENTIALITY**

Information produced by this study will be stored in the investigator's file and identified by a code number only. The code key connecting your child's name to specific information about you/your child will be kept in a separate, secure location. Information contained in your child's records may not be given to anyone unaffiliated with the study in a form that could identify you or your child without your written consent, except as required by law.

**WILL I BE COMPENSATED FOR PARTICIPATING IN THE STUDY?**

You and your child will receive no payment for taking part in this study.

**WHAT ARE MY RIGHTS AS A PARTICIPANT?**

Participation in this study is voluntary. You and your child do not have to participate in this study.

You will also be informed of any new information discovered during the course of this study that might influence your health, welfare, or willingness to be in this study.

**WHO DO I CONTACT IF I HAVE QUESTIONS, CONCERNS, OR COMPLAINTS?**

Please contact Lisa Goran at (573) 864-9821 if you have questions about the research. You may also contact Mrs. Goran’s academic advisor, Dr. Rebecca McCathren at (573) 882-5764. Additionally, you may ask questions, voice concerns or complaints to the research team.

**WHOM DO I CALL IF I HAVE QUESTIONS OR PROBLEMS?**

If you have any questions regarding your rights as a participant in this research and/or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the University of Missouri Campus Institutional Review Board (which is a group of people who review the research studies to protect participants’ rights) at (573) 882-9585 or [umcresearchcirb@missouri.edu](mailto:umcresearchcirb@missouri.edu).

You may ask more questions about the study at any time. For questions about the study or a research-related injury, contact Lisa Goran at (573) 864-9821 or Dr. Rebecca McCathren at (573) 882-5764. A copy of this Informed Consent form will be given to you before you participate in the research.

**SIGNATURES**

I have read this consent form and my questions have been answered. My signature below means that I do want my child to be in the study. I know that I can remove myself and my child from the study at any time without any problems.

\_\_\_\_\_

Student Name (please print)

\_\_\_\_\_

Date

\_\_\_\_\_

Legal Guardian (please sign)

\_\_\_\_\_

Date

## APPENDIX B

### CONSENT FORM TO PARTICIPATE IN A RESEARCH STUDY

**Researcher's Name(s):** Lisa Goran  
**Academic Advisor:** Dr. Rebecca McCathren  
**Project Number:** 1201591

**Project Title:** A Comparative Analysis of the Relationships Among Language, Oral Vocabulary, Reading Vocabulary, and Reading Comprehension for Adolescent Students with Learning Disabilities and Emotional/Behavioral Disorders.

#### INTRODUCTION

**This consent may contain words that you do not understand. Please ask the investigator or the study staff to explain any words or information that you do not clearly understand.**

Your child is being asked to participate in a research study. This research is being conducted to examine the language-literacy connection for adolescent students with disabilities. When your child is invited to participate in research, you and your child have the right to be informed about the study procedures so that you can decide whether you want to consent to participation. This form may contain words that you do not know. Please ask the researcher to explain any words or information that you do not understand.

You and your child have the right to know what you will be asked to do so that you can decide whether or not to be in the study. Your participation is voluntary. You do not have to be in the study if you do not want to. You may refuse to be in the study and nothing will happen. If you do not want to continue to be in the study, you may stop at any time without penalty or loss of benefits to which you are otherwise entitled.

#### WHY IS THIS STUDY BEING DONE?

The purpose of this research is to examine how vocabulary knowledge and overall language skills are related to reading comprehension and overall reading success for students in Grades 6-8 who have either a Learning Disability or an Emotional/Behavioral Disorder.

#### HOW MANY PEOPLE WILL BE IN THE STUDY?

About 30 students in Grades 6-8 from the Columbia Public School District and Hazelwood School District will take part in this study.

#### WHAT AM I BEING ASKED TO DO?

You will be asked to give consent for your student to participate in individualized language and reading assessments. The student will attend two or three testing sessions with Lisa Goran, a speech-language pathologist and special educator, in which your student's vocabulary, language, and reading skills will be assessed. You will also be

asked to give consent for Lisa Goran to review your child's educational records to obtain demographic information (e.g. age, gender, ethnicity, participation in the Free/Reduced Lunch program) and scores from standardized cognitive measures. If your student has an emotional/behavioral disorder, but no current behavior measures exist in your student's file, you and your student also may be asked to complete a behavior rating scale.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **HOW LONG WILL I BE IN THE STUDY?**

This study will take approximately two or three testing sessions of 30-60 minutes each with your child. All assessments will be completed with your child during the school day and during the 2012 summer school session. Your child can stop participating at any time without penalty. If you are asked to complete a behavior rating scale, this will take approximately 20 minutes of your time.

### **WHAT ARE THE BENEFITS OF BEING IN THE STUDY?**

Your/your child's participation will benefit his/her educational opportunities since specific information will be gathered that can inform goal setting and instructional planning that will target your child's individual needs. In addition, an overview of the findings from the entire study will be shared with the teachers to provide them with the most current information available about how to best address the language and reading skills needs of students in middle school.

### **WHAT ARE THE RISKS OF BEING IN THE STUDY?**

While there are no foreseeable risks to you or your child as a result of participating in this study, your child may feel uncomfortable answering some of the questions on some of the assessments. Your child can ask to stop the assessment at any time he/she feels uncomfortable.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **WHAT ARE THE COSTS OF BEING IN THE STUDY?**

There is no cost to you or your child.

### **WHAT OTHER OPTIONS ARE THERE?**

You and your child have the option of not participating in this study, and will not be penalized for your decision.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **CONFIDENTIALITY**

Information produced by this study will be stored in the investigator's file and identified by a code number only. The code key connecting your child's name to specific information about you/your child will be kept in a separate, secure location. Information

contained in your child's records may not be given to anyone unaffiliated with the study in a form that could identify you or your child without your written consent, except as required by law.

**WILL I BE COMPENSATED FOR PARTICIPATING IN THE STUDY?**

You and your child will receive no payment for taking part in this study.

**WHAT ARE MY RIGHTS AS A PARTICIPANT?**

Participation in this study is voluntary. You and your child do not have to participate in this study.

You will also be informed of any new information discovered during the course of this study that might influence your health, welfare, or willingness to be in this study.

**WHO DO I CONTACT IF I HAVE QUESTIONS, CONCERNS, OR COMPLAINTS?**

Please contact Lisa Goran at (573) 864-9821 if you have questions about the research. You may also contact Mrs. Goran's academic advisor, Dr. Rebecca McCathren at (573) 882-5764. Additionally, you may ask questions, voice concerns or complaints to the research team.

**WHOM DO I CALL IF I HAVE QUESTIONS OR PROBLEMS?**

If you have any questions regarding your rights as a participant in this research and/or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the University of Missouri Campus Institutional Review Board (which is a group of people who review the research studies to protect participants' rights) at (573) 882-9585 or [umcresearchcirb@missouri.edu](mailto:umcresearchcirb@missouri.edu).

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**SIGNATURES**

I have read this consent form and my questions have been answered. My signature below means that I do want my child to be in the study. I know that I can remove myself and my child from the study at any time without any problems.

\_\_\_\_\_  
Student Name (please print)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Legal Guardian (please sign)

\_\_\_\_\_  
Date

## APPENDIX C

### STUDENT ASSENT FORM TO PARTICIPATE IN A RESEARCH STUDY

**Researcher's Name(s):** Lisa Goran  
**Academic Advisor:** Dr. Rebecca McCathren  
**Project Number:** 1201591

**Project Title:** A Comparative Analysis of the Relationships Among Language, Oral Vocabulary, Reading Vocabulary, and Reading Comprehension for Adolescent Students with Learning Disabilities and Emotional/Behavioral Disorders.

#### INTRODUCTION

**This assent may contain words that you do not understand. Please ask the investigator or the study staff to explain any words or information that you do not clearly understand.**

You are being asked to participate in a research study. This research is being conducted to examine the language-literacy connection for adolescent students with disabilities. When you are invited to participate in research, you have the right to be informed about the study procedures so that you can decide whether you want to participate. This form may contain words that you do not know. Please ask the researcher to explain any words or information that you do not understand.

You have the right to know what you will be asked to do so that you can decide whether or not to be in the study. Your participation is voluntary. You do not have to be in the study if you do not want to. You may refuse to be in the study and nothing will happen. If you do not want to continue to be in the study, you may stop at any time without penalty or loss of benefits to which you are otherwise entitled.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

#### WHY IS THIS STUDY BEING DONE?

The purpose of this research is to examine how vocabulary knowledge and overall language skills are related to reading comprehension and overall reading success for students in Grades 6-8 who have either a Learning Disability or an Emotional/Behavioral Disorder.

#### HOW MANY PEOPLE WILL BE IN THE STUDY?

About 30 students in Grades 6-8 from Hazelwood School District will take part in this study.

#### WHAT AM I BEING ASKED TO DO?

You will be asked to participate in individualized language and reading assessments. You will attend two or three testing sessions with Lisa Goran, a speech-language

pathologist and special educator, in which your vocabulary, language, and reading skills will be assessed. If you have an emotional/behavioral disorder, but no current behavior measures exist in your file, you and your parent also may be asked to complete a behavior rating scale.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **HOW LONG WILL I BE IN THE STUDY?**

This study will take approximately two or three testing sessions of 30-60 minutes each. All assessments will be completed during the school day and during the remainder of the 2011-2012 school year. You can stop participating at any time without penalty. If you are asked to complete a behavior rating scale, this will take approximately 20 minutes of your time.

### **WHAT ARE THE BENEFITS OF BEING IN THE STUDY?**

Your participation will provide specific information about your individual strengths and weaknesses in language or reading that can help inform goal setting and instructional planning that will target your individual needs.

### **WHAT ARE THE RISKS OF BEING IN THE STUDY?**

While there are no foreseeable risks to you as a result of participating in this study, you may feel uncomfortable answering some of the questions on some of the assessments. You can ask to stop the assessment at any time you feel uncomfortable.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **WHAT ARE THE COSTS OF BEING IN THE STUDY?**

There is no cost to you.

### **WHAT OTHER OPTIONS ARE THERE?**

You have the option of not participating in this study, and will not be penalized for your decision.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

### **CONFIDENTIALITY**

Information produced by this study will be stored in the investigator's file and identified by a code number only. The code key connecting your name to specific information about you will be kept in a separate, secure location. Information contained in your records may not be given to anyone unaffiliated with the study in a form that could identify you without your parent's written consent, except as required by law.

**WILL I BE COMPENSATED FOR PARTICIPATING IN THE STUDY?**

You will receive no payment for taking part in this study.

**WHAT ARE MY RIGHTS AS A PARTICIPANT?**

Participation in this study is voluntary. You do not have to participate in this study.

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You may ask more questions about the study at any time. For questions about the study or a research-related injury, contact Lisa Goran at (573) 864-9821 or Dr. Rebecca McCathren at (573) 882-5764. A copy of this Informed Student Assent form will be given to you before you participate in the research.

**SIGNATURE**

I have read this student assent form and my questions have been answered. My signature below means that I do want to be in the study. I know that I can remove myself from the study at any time without any problems.

\_\_\_\_\_  
Student Name (please sign)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Student Name (please PRINT neatly)

## APPENDIX D

### STUDENT ASSENT FORM TO PARTICIPATE IN A RESEARCH STUDY

**Researcher's Name(s):** Lisa Goran  
**Academic Advisor:** Dr. Rebecca McCathren  
**Project Number:** 1201591

**Project Title:** A Comparative Analysis of the Relationships Among Language, Oral Vocabulary, Reading Vocabulary, and Reading Comprehension for Adolescent Students with Learning Disabilities and Emotional/Behavioral Disorders.

#### INTRODUCTION

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Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

#### WHY IS THIS STUDY BEING DONE?

The purpose of this research is to examine how vocabulary knowledge and overall language skills are related to reading comprehension and overall reading success for students in Grades 6-8 who have either a Learning Disability or an Emotional/Behavioral Disorder.

#### HOW MANY PEOPLE WILL BE IN THE STUDY?

About 30 students in Grades 6-8 from the Columbia Public School District and Hazelwood School District will take part in this study.

**WHAT AM I BEING ASKED TO DO?**

You will be asked to participate in individualized language and reading assessments. You will attend two or three testing sessions with Lisa Goran, a speech-language pathologist and special educator, in which your vocabulary, language, and reading skills will be assessed. If you have an emotional/behavioral disorder, but no current behavior measures exist in your file, you and your parent also may be asked to complete a behavior rating scale.

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**HOW LONG WILL I BE IN THE STUDY?**

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**WHAT ARE THE BENEFITS OF BEING IN THE STUDY?**

Your participation will provide specific information about your individual strengths and weaknesses in language or reading that can help inform goal setting and instructional planning that will target your individual needs.

**WHAT ARE THE RISKS OF BEING IN THE STUDY?**

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Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

**WHAT ARE THE COSTS OF BEING IN THE STUDY?**

There is no cost to you.

**WHAT OTHER OPTIONS ARE THERE?**

You have the option of not participating in this study, and will not be penalized for your decision.

Any services that are provided by the schools will not be affected by participation or lack of participation in this study.

**CONFIDENTIALITY**

Information produced by this study will be stored in the investigator's file and identified by a code number only. The code key connecting your name to specific information about you will be kept in a separate, secure location. Information contained in your records may not be given to anyone unaffiliated with the study in a form that could identify you without your parent's written consent, except as required by law.

**WILL I BE COMPENSATED FOR PARTICIPATING IN THE STUDY?**

You will receive no payment for taking part in this study.

**WHAT ARE MY RIGHTS AS A PARTICIPANT?**

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You may ask more questions about the study at any time. For questions about the study or a research-related injury, contact Lisa Goran at (573) 864-9821 or Dr. Rebecca McCathren at (573) 882-5764. A copy of this Informed Student Assent form will be given to you before you participate in the research.

**SIGNATURE**

I have read this student assent form and my questions have been answered. My signature below means that I do want to be in the study. I know that I can remove myself from the study at any time without any problems.

\_\_\_\_\_  
Student Name (please sign)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Student Name (please PRINT neatly)

## VITA

Lisa Goran is a speech-language pathologist and special educator. She has experience working in clinical, hospital, private therapy, and school settings. Her professional experiences in school settings include providing speech-language therapy and special education instruction to students PreK-12, as well as Special Education Department Chair at a secondary building. She received a Bachelors of Health Science in Communication Science & Disorders and a Masters of Health Science in Speech-Language Pathology, both from the University of Missouri. She holds a Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP) from the American Speech-Language Hearing Association, and teaching certification in Speech-Language K-12 and Mild-Moderate Cross-Categorical K-12 from the State of Missouri.