Summer 8-2018

The Effects of School Socio-Economic Status on Oral Reading Fluency Scores of Students Identified and Not Identified With a Specific Learning Disability

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THE EFFECTS OF SCHOOL SOCIO-ECONOMIC STATUS ON ORAL READING FLUENCY SCORES OF STUDENTS IDENTIFIED AND NOT IDENTIFIED WITH A SPECIFIC LEARNING DISABILITY

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Education

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Indiana University of Pennsylvania

August 2018

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Title: The Effects of School Socio-Economic Status on Oral Reading Fluency Scores of Students Identified and Not Identified With a Specific Learning Disability

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The purpose of this study was to evaluate the impact of a school's poverty level on oral reading fluency (ORF) reported for students identified as having a specific learning disability (SLD) versus those who have been referred for SLD assessment but were not identified as having an SLD during the special education eligibility process. The ORF scores and demographic data from 171 students were collected from six school districts located in a Midwestern state. The data were analyzed to determine whether there were differences in the mean ORF scores between the low-, mid- and high-SES groups. The results indicate that the mean student ORF score from the low-SES schools was significantly lower than the mean student ORF score from mid- and high-SES schools. Additionally, a significant difference in mean ORF scores existed between non-eligible and eligible students. Students who were found not eligible for special education services had higher ORF scores than students who were found eligible for special education services. Implications for the local educational agency (LEA) determining the standard used to refer a student for an evaluation to determine special education eligibility and using the results of this study to influence social policy are discussed.

ACKNOWLEDGMENTS

I would like to thank everyone who helped make this dissertation possible. My husband, Tom, who encouraged me to proceed with my 'Big Adventure' and stood by me through my struggles and celebrated my successes. To my children, Megan, Christine, and Joe, who have always inspired me to do my best.

I would like to thank my dissertation chair Dr. Kovaleski. You reached out and supported me when I needed it most. I will always be grateful. I would also like to thank my committee, Dr. Black and Dr. Runge for their guidance, recommendations, and suggestions. I was able to reach a life-long goal with your support.

A very special thank you is extended to my colleagues and most importantly dear friends, Geri Gordon and Paula Snyder. Your encouragement, support and hard work made this dissertation possible. I will always be in your debt.

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CHAPTER 1

INTRODUCTION

The Purpose of This Study

The purpose of this study was to evaluate the impact of a school's poverty level on oral reading fluency (ORF) scores reported for students identified as having a specific learning disability (SLD) versus those who have been evaluated but were not identified as having an SLD during the special education eligibility process. In this study, the effects of the socio-economic status (SES) of the school and the special education eligibility status of the students were investigated. The academic performance of students who were evaluated for special education eligibility under SLD was explored to determine if the students' academic performance differs as a function of the income level of their school district. The student's academic performance was measured by ORF progress monitoring or benchmarking scores reported in the initial eligibility documents used during the evaluation of an SLD.

In this chapter, a brief history of the research that led to the term SLD is provided. The impact that researchers and lobbyists have had on the development of current laws and operational guidelines used in schools to identify students with an SLD will be discussed. Operational definitions of response to intervention (RTI) are presented and how the reported academic performance level can impact a student's opportunity to be referred for a special education evaluation is introduced. Finally, research questions, definitions of terms, assumptions, and limitations are addressed.

Specific Learning Disability

During the 1960s to mid-1970s, teaching students who struggled to read moved firmly into the public-school setting. It was during this time that Samuel Kirk coined one of the most used terms in education, *learning disability*. It was also during the 1960s that the U.S. government and the Easter Seals Research Foundation worked together to establish several task forces charged with defining a learning disability and establishing educational programing for students with learning disabilities (Hallahan & Mercer, 2001). The mid-1970s to mid-1980s brought a period of consensus related to the definition of learning disabilities and methods to identify students with a learning disability. The qualifier, specific, was added to the term learning disability when Public Law 94-142, Education for All Handicapped Children Act, was passed in 1975. The act stated:

> The term "specific learning disability" means a disorder in one or more of the psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. The term does not include children who have learning disabilities, which are primarily the result of visual, hearing, or motor handicaps, or mental retardation, or emotional disturbance, or of environmental, cultural, or economic disadvantage. (U.S. Department of Education [USDOE], 1977, p. 65083)

The 1977 Education for All Handicapped Children Act (EHA) regulations operationalized the definition of a specific learning disability (SLD) through the following provisions:

> A team may determine that a child has a specific learning disability if: (1) The child does not achieve commensurate with his or her age and ability levels in one or more of the areas listed in paragraph (a)(2) of this section, when provided with learning experiences appropriate for the child's age and ability levels; and (2) The team finds the child has a

severe discrepancy between achievement and ability in one of more of the following areas: (i) Oral expression; (ii) Listening comprehension; (iii) Written expression; (iv) Basic reading skills; (v) Reading comprehension; (vi) Mathematics calculation; (vii) Mathematics reasoning. (USDOE, 1977, p. 65083)

This definition presents SLD as a level of performance that is unexpected for the student's ability level and operationalized it as a discrepancy between a student's ability and achievement. The EHA suggested a student with a learning disability does not achieve at an expected academic level for his or her age (Fuchs, Fuchs, Mathes, Lipsey, & Roberts, 2001; Kovaleski, VanDerHeyden, & Shapiro, 2013).

While the discrepancy model was recognized by the EHA as a method to identify students with specific learning disabilities, opponents to the discrepancy model pointed to flawed studies used to support the use of that model (Dombrowski, Kamphaus, & Reynolds, 2004; Fletcher, Francis, Rourke, Shaywitz, & Shaywitz, 1992; Fuchs et al., 2001; Kavale & Forness, 2000; Vaughn, Linan-Thompson, & Hickman, 2003). Further, Kavale and Forness (1999) questioned the validity of the discrepancy model's diagnostic construct used to identify students as learning disabled. The application of the discrepancy model was also met with criticism. Thurlow, Christenson, and Ysseldyke (1983) reported special education team decision making using the discrepancy model was at best inconsistent and rarely used the data that were collected to support the student's eligibility for special education services.

In August of 2001, the USDOE gathered papers written on key issues facing the special education identification of students with SLDs, primarily in reading. The result of this national initiative was the Learning Disability Summit (LD Summit) report which indicated there was evidence to support the concept of SLD, and noted external factors such as poverty and adequate exposure to the curriculum that can also impact learning. The LD Summit report recommended that response to intervention (RTI) be used as an alternative to the discrepancy model for identifying students as having an SLD (Bradley, Danielson, & Hallahan, 2002).

Immediately following the LD Summit, the President's Commission on Excellence in Special Education was formed in October of 2001. The President's Commission report concluded that the focus should be on the results of educating the student and not the process of identifying the student for special education (President's Commission, 2002). It went on to state that a less subjective process that measured a student's response to instruction would simplify the identification process and would increase the likelihood that all students would be able to reach their learning goals (Bradley et al., 2002).

The President's Commission and the LD Summit placed emphasis on RTI as a preferred method to assist students who were struggling academically and encouraged movement away from the use of the discrepancy model to identify students for special education services. In 2004, Congress amended the Individuals with Disabilities Education Act (IDEA) and introduced RTI as an alternative to the discrepancy model for identifying students with a learning disability (34 CFR § 300.307 [a] [2]).

Referring for SLD Determination

Regardless of whether schools use the ability-achievement discrepancy or RTI models to identify students who are eligible for special education services, the decision about whether to refer a student for an evaluation is critical to that student eventually receiving those services. Ysseldyke, Algozzine, Shinn and McGue (1979) analyzed assessment data from two groups of students. The first group had been identified as having an SLD by their school district. The second group consisted of students who were identified as being low achievers based on group-administered standardized tests and were not referred for an evaluation to determine their eligibility for special education services. Ysseldyke et al. found that 96% of individual student median scores overlapped both the SLD and low-achiever group scores, indicating there was no psychometric difference between the two groups of students.

Ysseldyke, Thurlow, Garden, Wesson, Algozzine, and Deno (1983) conducted further research on how school personnel determined if a student had an SLD. They found significant variability in the criteria used by the state and local education agencies when referring and identifying a student with an SLD. Ysseldyke (1981) found, on average, 92% of students who were referred for an evaluation were evaluated, and 78% of those students were found eligible for services. However, there was a significant difference between the percentage of students that were referred, evaluated and found eligible for special education services based on the state in which they attended school. Some states reported that as few as 39% of students referred for evaluation were assessed. Other state data indicated that from 10% to 100% of students evaluated were found eligible for special education services (Ysseldyke, 1981). Algozzine, Christenson, and Ysseldyke (1981) posited several different reasons for these findings including the notion that different communities have different standards, values, and expectations that influence the decision-making process. What was evident across all data was that a student had to first be referred for an evaluation to receive special education services.

Twenty years later, Ysseldyke (2005) found that not much had changed. Ysseldyke wrote that regardless of the push to change, as seen by the countless number of task forces formed to study the issue, the assessment practices of the 1970s and current day, 2005, remained relatively unchanged. The decision-making process was still inconsistent, it was based on pupil characteristics and not data-driven, and students without disabilities were found eligible for SLD services.

Determining a student's status of risk is a key issue in RTI. Fuchs (2003) provided two basic methods, final status and growth models, to measure a student's response to instruction. The final status method uses a measure of the student's level of performance at the end of the intervention, while the growth model compares the growth made by the at-risk student to that of his or her not-at-risk peers. As with the discrepancy model, an indicator or level of performance is used to gauge whether a student has met certain criteria for referral for further evaluation. Students achieving above a predetermined level of performance are presumed to have met an acceptable level of reading mastery and are not at risk of academic failure (Walker & Daves, 2010).

IDEA-approved approaches to identifying an SLD center on the decision to refer a student for evaluation based on at-risk status. Bradley et al., (2002) posited that implementing an RTI process provided a less subjective method for identifying students at risk of academic failure and the data that are collected could be used to identify students with an SLD.

Given the importance of determining whether a student may be at risk of having an SLD, more information is needed to understand how the student's level of performance impacts a specific LEA's decision to refer that student for evaluation. In addition, it is also important to determine whether extraneous factors influence the LEA's determination of acceptable or nonacceptable levels of performance.

Effects of Poverty on Student Achievement

A great deal of research has focused on the individual student's characteristics when discussing achievement, but a school's characteristics, such as the level of poverty in the school district, can also impact a student's academic achievement (Hallihan & Kubischek, 2010). Coleman's (1966) seminal work established the impact of school peers' characteristics on an individual student's achievement. Coleman reported that while school facilities (e.g., access to science laboratories) and the level of the teacher's education had a positive impact on student achievement, the most important factor in a student's academic success was the overall SES of the school population. Jenchs (1985) extended Coleman's research and concluded that students who, regardless of their family's SES, attended schools with student populations consisting of primarily middle class or higher-SES populations demonstrated positive growth in achievement in comparison to low-SES peers attending schools with primarily low-SES populations. Kahlenberg (2001) further posited that the school characteristic with the largest impact on student achievement was the poverty level associated with that school.

Lee, Liu, Amo, and Wang (2014) found that teacher standards are influenced by their students' prior academic achievement and backgrounds. Students from low-SES backgrounds generally demonstrated an achievement disparity with their high-SES counterparts; therefore, teachers were more likely to hold students from low-SES backgrounds to lower academic standards. Paulson and Marchant (2009) posited that students' innate characteristics and background could account for 41% of differences on standardized test scores. Moreover, knowing the local demographics, predictions could be made about student outcomes on the Scholastic Aptitude Test (SAT) used for college admission. Differences among individual schools and school districts could also be identified as a function of student characteristics. SES, race, and inherent academic skills of the student body were predictors of 70% of standardized test variance among school districts on the Indiana Statewide Testing for Educational Progress Plus.

Statement of the Problem

The analysis of the benefits versus the cost may impact the decision to refer a student for evaluation. The needs of an individual student, the student body, and the community have to be balanced. Therefore, academic performance levels can be artificially set to meet the specific needs of a particular situation (Swets, 1992). Setting expected academic performance levels too low may result in a student not receiving an evaluation for special education services. On the other hand, increasing expected academic performance levels could lead to unnecessary evaluations, increasing costs to the school in terms of personnel and materials that could be better utilized in other areas (Barth et al., 2008).

States have left the decision of setting acceptable or nonacceptable academic performance levels and whether the district uses national or local norms up to the LEA (Walker, 2010; Zirkel, 2011). There are many more students in low-SES schools than high-SES schools who are very deficient from state standards (Aikens & Barbarin, 2008; Ladd, 2012; Morgan, Farkas, Hillemeier, & Maczuga, 2009). Given the importance of academic performance levels and whether a student will have access to an evaluation that may lead to special education eligibility, more information is needed to understand the impact of the level of school poverty on the current method of selecting the acceptable or nonacceptable academic performance levels. By analyzing the relationship between a school's level of poverty and the academic performance levels used to initiate evaluations to determine eligibility for special education services, the results of this dissertation may identify a segment of the student population that is not receiving special education services based on the poverty level of the school they attend. It could be theorized that students in low-SES schools have greater deficiencies than students in middle- to high- SES schools. Therefore, high-SES schools would tend to set high cut-scores for referral for SLD and low -SES schools would tend to set lower cut-scores.

Therefore, this study will analyze the effect of the overall school population's SES on the present academic levels of performance reported when a student was evaluated to determine that student's eligibility for special education services. The purpose of this study is to examine the impact of a school's poverty level on ORF scores reported for students identified as having an SLD versus those who have been evaluated to determine eligibility but were not identified as having an SLD during the special education eligibility process. Archival data will be used to investigate whether there are significant differences between the ORF scores of students evaluated for special education eligibility based on the SES status (i.e., low, middle, or high income) of their school.

The data analyzed for this study will be gathered from public schools in a Midwestern state. The schools will be identified as high, mid-, or low-SES schools based on the percentage of students receiving a free or reduced lunch.

Research Questions and Hypotheses

Research Question 1

Do reading fluency scores reported at the time of eligibility and stated in the eligibility documents of students evaluated for SLD differ as a function of the income level of their school district? It was hypothesized that significant differences in ORF scores would exist between high-income schools and low-income schools. The students who attend mid/high-income schools and qualify for special education services overall would have higher ORF scores than students who attend low-income schools and qualify for special education services.

Research Question 2

Do students evaluated for and identified as SLD differ in their reading fluency scores reported at the time of eligibility and stated in the eligibility documents from students who were evaluated for SLD but not identified? It was hypothesized that differences in ORF scores would exist between special education eligible students and non-eligible students. Non-eligible students overall would have higher ORF scores than eligible students.

Research Question 3

Do students evaluated for and identified as SLD and students who were evaluated for SLD but not identified differ in their reading fluency scores reported at the time of eligibility and stated in the in the eligibility documents as a function of the income level of their school district? It was hypothesized that there would be an interaction effect between school classification and special education eligibility on students' ORF scores. First, non-eligible students from high-income schools would have higher ORF scores than eligible students from mid/high-income schools. Second, eligible students from mid/high-income schools would have higher ORF scores than eligible students in low-income schools. Third, there would be no difference in ORF scores between eligible students from mid/high-income schools and non-eligible students from low-income schools. Fourth, non-eligible students from mid/high-income schools would have higher ORF scores than eligible students from low-income schools. Fifth, non-eligible students from low-income schools would have higher ORF scores than eligible students from low-income schools. Sixth, non-eligible students in mid/high-income schools would have higher ORF scores than non-eligible students from low-income schools.

Definitions of Terms

Oral Reading Fluency (ORF)

Oral reading fluency is a measure of a student's reading development in quantitative terms (i.e., words read aloud correctly); it is considered to be a direct measure of a student's reading performance (Christ & Hintze, 2007). For the purpose of this study, the ORF score will be derived from the AIMSweb (Pearson, 2012) universal screening and progress monitoring system. The ORF score will refer to the ORF score as recorded on the referred student's multi-disciplinary evaluation report and is the score that was used in determining eligibility for SLD identification by the evaluation team. This score may be obtained during a screening process or be the final ORF score recorded after the intervention.

Response to Intervention (RTI)

RTI can be considered in two ways, one as a multi-tiered system of support and secondly as an approach to identifying students with an SLD. The National Research Center on Learning Disabilities (2002) identified the core concepts of RTI as: (a) high quality instruction in general education, (b) research-based instruction, (c) universal screening and progress monitoring, (d) research-based intervention, and (e) assessment of the fidelity of the intervention used. Tilly (2006) defined RTI as a multi-tiered school improvement paradigm used to improve general education and supplemental instruction. The use of RTI in this manner is synonymous with Multi-Tiered System of Support (MTSS).

RTI has also been defined as a highly structured procedure to gather data, which are then used to make decisions as to where resources should be implemented to improve the learning of all students. This usage also addresses using RTI data to establish special education eligibility (Jimerson, Burns, & VanDerHeyden, 2007).

The use of RTI in this study will refer to the Jimerson et al. (2007) definition that RTI is a highly structured procedure to gather data, which are then used in decision-making processes, including the determination of special education eligibility.

Social Economic Status

For the purpose of this study, the classification of low-, mid- or high-SES school was established by applying the State of Illinois guidelines for determining if a student lives in a low-income household. The State of Illinois gathers demographic information on the student population which includes the number of students living in low-income households. A household is identified as low-income if the student or a person living in that household receives public aid from the Supplemental Nutrition Assistance Program (SNAP) or Targeted Assistance for Needy Families (TANF); are classified as foster children, Head Start, runaway, migrant, or homeless (Illinois Report Card, n.d.); or live in a household where the household income meets the United States Department of Agriculture (USDA) guidelines to receive free or reduced-price meals (United States Department of Agriculture, n.d.).

Universal Screening

Screening all students with a measure to determine whether an individual student requires additional instruction in the general education curriculum or needs supplemental intervention to reach a standard (Riley-Tillman et al., 2013).

Assumptions

This study is based on several assumptions. First, it is assumed the ORF measures were administered according to standard procedures established by the publisher of the measures. Second, it is assumed the students were adequately engaged in the evaluation process. It is presumed a performance level was used in the decision process as to whether or not to refer the student for an evaluation to determine eligibility for special education eligibility. Lastly, it is presumed the school psychologists conducted evaluations following best practices and the educational team's decision of eligibility was made using objective data.

Limitations

Data will be collected from six school districts in a Midwestern state. As the demographics of the sample may not be reflective of the general population, the results may not be generalized to other school districts. The generalization of the data to other school systems may also be limited by the curricula, demographics, teaching methods, and the overall educational environment of each school in this study. The status of intervention implementation to accelerate reading growth is not available for each student. Therefore, understanding where the student was in the process (i.e., pre-, mid-, or post-intervention) for the reported ORF score is unknown.

Summary

The identification of SLD has been affected by many extraneous factors. It has long been theorized that different students are identified as SLD depending on the SES of their school district. The operational definitions of RTI were presented and how the choice of a performance level can impact a student's opportunity to be referred for a special education evaluation was introduced. Finally, research questions, definitions of terms, assumptions, and limitations were addressed.

CHAPTER 2

REVIEW OF LITERATURE

It is well established that students from families with low socioeconomic status (SES) perform more poorly in school than students from high-SES families (Altschul, 2012; Herbers et al. 2012; Shifer, Muller, & Callahan 2011; Stull, 2013; Waldfogel, 2012). The effects of SES on student achievement are mediated by many factors, some of which originate at home, but other factors, such as the SES of the school also have an impact on student achievement (Adamson & Darling-Hammond, 2012; Altschul, 2012). Research shows that students living in low-SES households achieve at higher levels in high-SES schools than their counterparts at lower SES schools (Jencks, 1985). Additional research indicates the level of poverty in the school district also has a large impact on students' academic achievement (Brockermeier, Starr, Green, Pate, & Leech, 2013; Hallinan & Kubitschek, 2010). Because student achievement is correlated with student SES, the student's SES influences teacher perceptions of the student's ability, which can result in lower expectations for low-SES students and the persistence of the income-achievement gap (Lee, Liu, Amo, & Wang, 2014; Shifrer, 2013).

It is the express purpose of special education to meet the needs of students with disabilities in order to help them close the achievement gap with their non-disabled peers (Smith & Tyler, 2010). According to the U.S. Department of Education (2011), this includes specific learning disabilities (SLD). The disability categories in IDEA are based on the assumption that disabilities are diagnosable and inherent to the individual student and not the result of environmental factors. Therefore, it could be concluded that a student identified in one school district with SLD would be identified with SLD in another school district or even in another state.

Students are typically referred for special education, particularly those thought to have an SLD, because of low academic performance relative to their local peers. Because the overall achievement of a student population correlates to the SES of a given school (Brockmeier et al., 2013; Hallinan & Kubitschek, 2010), it is therefore conceivable that students from low-SES schools are less likely to be referred for an evaluation to determine their special education eligibility status than students from a high-SES school with the same achievement (Hibel, Farkas, & Morgan, 2015). In fact, the range of low-achieving students in low-SES schools could go much lower in terms of academic achievement than the range of low-achieving students in high-SES schools. Therefore, it is possible that students identified as SLD in low-income schools have substantially lower achievement levels than those identified as SLD in high-SES schools. It is also possible that a student identified as SLD in a high-achieving school, while relatively deficient in relation to their peers in that school, would not be deficient as compared to students in a low-SES school, and if the student attended a low-SES school would not be referred for an evaluation to determine their eligibility status for special education services. However, this logical possibility has not been studied empirically to date.

Addressing these concerns will advance knowledge in the field by providing empirically based information regarding the achievement levels used by low-SES and high-SES schools to refer students for an evaluation to determine students' eligibility status. This information will help advance knowledge of how the school SES may impact the student, and provide an understanding of the decision criteria that districts have applied when referring a student for an evaluation that may lead to an eligibility designation of SLD. Because determining an achievement level that warrants a referral for special education consideration is perhaps one of the most important decisions made in the referral process, an understanding of the level of achievement chosen in relation to the SES of the student and school will shed light on the ultimate effectiveness of current methods of referral. More importantly, the knowledge generated by this study will act as a foundation for further research to explore the use of achievement levels, the methods by which they are chosen, and the effects of such choices on students with various demographic characteristics.

The purpose of the proposed study is to examine the impact of a school's SES level on oral reading fluency (ORF) scores reported for students identified as having an SLD versus those who were evaluated, but were not identified as having an SLD during the eligibility process. To examine the impact of a school's SES level on these decisions, whether ORF scores differ as a function of the income level of the school district will be investigated. In addition, it will be determined whether students evaluated for and identified with an SLD differ in their reading fluency ability from students who were evaluated, but not identified with an SLD.

To conceptualize this study, the ecological systems theory and social capital theory will be addressed. Then relevant studies will be reviewed, including (a) methods for identifying students with learning disabilities, including how those methods have changed over time and in response to federal legislation; (b) the factors that influence the accuracy of ORF assessments as measures of fluency and as predictors of reading comprehension; and (c) the effects of home and school SES on ORF, reading comprehension, and academic achievement. The final section will address the gap in the research literature by focusing on the ways that school-level SES relates to the choice of appropriate level of academic achievement, and in turn the referral for special education evaluation and subsequent eligibility.

Theoretical Framework

Ecological Systems Theory

Ecological systems theory and social capital theory will be used to conceptualize this study. Ecological systems theory, developed by Bronfenbrenner (1979), is first described in his book *The Ecology of Human Development.* The theory developed through study in a variety of disciplines and of research from as early as 1870 (Bronfenbrenner, 1994). That research primarily examined neighborhood effects on child development in Berlin (Bronfenbrenner, 1994).

Ecological systems theory posits that an individual's development takes place in a series of five interrelated systems, which influence and are influenced by both the individual and one another. These systems encompass the direct and indirect social ties of an individual, as well as the contexts in which those ties are formed and maintained (Bronfenbrenner, 1979). Each individual, according to this theory, interacts with five environmental systems. The first is the microsystem, which encompasses the family, school, the neighborhood, and peers---with which the individual most directly interacts. The mesosystem is comprised of interactions between the microsystem-level, such as those between a student's family and teachers, which influences the individual via semi-indirect means. Links between microsystem-level influences and social settings in which the individual does not participate make up the third system, called the exosystem. A student's experience at school, for instance, may be influenced indirectly by his or her teacher's experiences at home, which may affect the classroom-learning environment in myriad ways. The macrosystem is next, and this system describes the culture in which the individual lives. The preceding systems are part of this larger system, which includes culture-defining contexts that influence individuals both directly and through mediating factors. Finally, the chronosystem includes sociohistorical contexts, as well as the pattern of events and transitions within and between life stages.

A wealth of research explores the influences of the microsystem variables of family, school, neighborhood, and peers on measurements of student achievement. In terms of family-related variables, studies have identified family income, parental education levels and occupations, educational resources in the home, and parental educational support and expectations as significant predictors of student academic achievement (Altschul, 2012; Stull, 2013; Linder, Ramey, & Zambak, 2013). Also, part of the microsystem is students' race and sex, which are significant factors in academic achievement and in the identification of learning disabilities (Talbott, Fleming, Karabotsos, & Dobria, 2011).

Many of these factors originate at the mesosystem level. For instance, parents' income and educational background may contribute to the presence of educational resources in the home, and the level of expectations they set for academic achievement. Exosystem-level influences, such as the parents' experiences at work may affect the way they relate to their children or the time they have to interact with them. In terms of school, policy decisions at multiple levels influence the assessments and standards that directly influence students' academic experiences. The education level and other qualifications of teachers also originate within the exosystem (Talbott et al., 2011). All of these factors, along with those at macrosystem and chronosystem levels, influence children's development and education.

Social Capital Theory

Social capital theory, as applied by Coleman (1988) to education, results from his work assessing equality in education, particularly as it relates to socioeconomic status and school context (Coleman, 1988). Previous formulations of social capital theory overlooked the importance of self-interest, Coleman's (1988) version emphasized the notion that people act in ways that are goal-oriented. Social capital theory also saw capital as part of the relationships that connect people to one another. In addition, this formulation emphasized that these relationships, and the action and learning that result from them, benefit the whole, rather than merely the participants in the relationship (Tzanakis, 2013). Applied to education, this version of social capital theory suggests that the relationships between students and their families and schools result in learning for that student, and that this learning benefits others, such as peers and people in society at large, outside of those relationships.

As such, this theory is related to Bronfenbrenner's (1979) ecological systems theory, as it asserts that even relationships that do not directly affect students can have indirect and positive effects through networks. These networks are formed by relationships, such as shared norms, values, trust, or obligation. These ties provide the connections through which knowledge is transmitted (Coleman, 1988). Again, in the context of education, students draw from the social capital both at home and at school, and the social capital from both sources is significant to a student's academic achievement. The social capital from home includes the development of cognitive abilities, environmental resources and parental expectations (Dufur, Parcel, & Troutman, 2013). School social capital includes relationships with peers and teachers, and the level of expectations set forth by both. For instance, Catholic schools are perceived to be superior in part because of the culture and norms shared by many students, families, and teachers united by a common faith (Dufur et al., 2013).

Research examining the "Catholic school effect" rests on this very assumption and is thus influenced by social capital theory. Some of the research suggests that this assumption is valid, as low-SES students in Catholic schools were found to perform at higher levels than did low-

SES students in public schools (Jencks, 1985). More significantly, another study shows that low-SES Catholic schools witnessed no deleterious effects of school poverty on mathematics scores, as their students performed just as well as those in high-SES schools on the same assessment (Hallinan & Kubitschek, 2010). Dufur et al. (2013) found that social capital originating from relationships in the home have also predicted increased school achievement. Other research has indicated that SES influences systems and social ties throughout life, resulting in the maintenance of its effects over time (Herbers et al., 2012; Hallinan & Kubitschek, 2010; Hoff, 2013; Jimerson, Hong, Stage, & Gerber, 2013; Singh, 2012; Tucker-Drob, 2013; Waldofogel, 2012).

The underlying logic, then, for designing and conducting this study is to determine how one set of factors, those within a school, mediates the effects of SES on student achievement, thereby making clear how systems and social ties at work in an individual's life influence and transmit knowledge to that individual. In this way, the focus of the study aligns with social capital theory. In terms of ecological systems theory, this research relies on the notion that factors outside of the students' immediate microsystems can influence their development and academic achievement. Specifically, because school SES is determined by the percentage of students receiving free or reduced-price lunch, this influence resides in the exosystem, where microsystem factors (peers, the neighborhood) interact with factors unrelated to the student (ones that determine the SES of their peers' parents).

The ecological systems theory and social capital theory align with the focus of this research. Ecological systems theory, developed in response to research that viewed child development as happening in isolation, stresses the importance of indirect influences that affect development and learning. Social capital theory stresses the learning that occurs through social ties that are formed and maintained by relationships and that generate positive outcomes. Much research on student achievement rests on the foundation provided by these theories, especially as they explore the effects of SES on student achievement. In particular, research focuses on factors, many of them not directly tied to students themselves, which nonetheless affect student achievement, at both family and school levels. This study has a similar focus, as it examines the effects of school SES on the academic achievement levels reported at the time of a referral for an evaluation to determine a student's special education eligibility status.

Review of Relevant Literature

Introduction to Learning Disabilities

Since the 1800s, professionals working in education have grappled with the apparent difficulty that some students experience in learning. It was not until 1962, though, that the issue of struggling learners took on greater importance in education. According to Hallahan and Mercer (2002), educational theorist Samuel Kirk coined the term *learning disability* in 1962, and developed a definition for the term:

> A retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subject resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or culture and institutional factors. (p. 14)

Portions of this general classification, particularly the designations of learning disabilities, remain in use today. Learning disabilities were omitted from the first version of the Education of the Handicapped Act (EHA), enacted in 1966. However, a new definition adding the adjective *specific* was developed in 1968 by the National Advisory Committee on

Handicapped Children (NACHC), and the revised designation was included in the Children with Specific Learning Disabilities Act (CSLDA) passed in 1969 (Hallahan & Mercer, 2002).

The Education for All Handicapped Children Act of 1975 (EHA, 1975) was operationalized in 1977 and the definition of an SLD was differentiated from an unqualified learning disability, guiding professionals to discern an SLD through an observed difference between a student's aptitude and achievement in a narrowly defined area (EHA, 1977; Hallahan & Mercer, 2002). The EHA Regulations (1977) created the aptitude-achievement discrepancy model of identification, which was implemented by schools unanimously until the advent of Response to Intervention (RTI) aligned models almost three decades later, which provided an alternative for schools. The act also instituted Child Find, the mandate that requires schools and districts to take affirmative steps to identify students with disabilities, which include SLD (Hallanhan & Mercer, 2002).

In 2004, Congress amended the IDEA and introduced RTI as an alternative to the discrepancy model for identifying students with a learning disability. The 2006 regulations that followed operationalized RTI by defining 4 criteria to be used when determining the existence of a specific learning disability:

> The child does not achieve adequately for the child's age or to meet State-approved grade-level standards, when provided with learning experiences and instruction appropriate for the child's age or State-approved grade-level standards…(§300.309[a][1]); (2) The child does not make sufficient progress to meet age or State-approved grade-level standards when using a process based on the child's response to scientific, research-based intervention; or the child exhibits a pattern of strengths and weaknesses in performance, achievement, or both, relative to age, State-

approved grade-level standards, or intellectual development (§300.309[a][2][i]); (3) and the group determines that its findings are not primarily the result of: A visual, hearing, or motor disability; Mental retardation; Emotional disturbance; Cultural factors; Environmental or economic disadvantage; or Limited English proficiency (§300.309[a][3]). (4) Ensure that underachievement is not due to lack of appropriate instruction in reading or math, by collecting; (a) Data that demonstrate that prior to, or as part of, the referral process, the child was provided appropriate instruction in regular education settings, delivered by qualified personnel; and (b) Data-based documentation of repeated assessments of achievement at reasonable intervals, reflecting formal assessment of student progress during instruction (§300.309[b][1-2]).

The first two criteria for identifying a student with an SLD will be addressed in this chapter. The level of the students' achievement, the use of an RTI process and the discrepancy model will be discussed. Alternative research-based procedures will not be addressed at this time.

Problems with the validity of the aptitude-achievement discrepancy model, discussed more fully later in this chapter, resulted in a significant increase in the number of students identified with an SLD. This increase drew criticism from the research community, which argued that a large number of students were misidentified and receiving unnecessary services (Hallahan & Mercer, 2002). Another criticism concerned the model's implementation. Schools and districts, in order to avoid the costs or allocation of resources needed to educate all students with SLD, could simply pick and choose the most expedient among the myriad of recommended approaches and state guidelines regarding how the ability-achievement discrepancy was operationalized, given that there has not been a federal definition of an ability-achievement disability.

In addition, a number of classroom variables, such as a teacher's ability to teach all students, were not considered in this approach (Hallahan & Mercer, 2002). To combat this criticism, the Individuals with Disabilities Act (IDEA) of 1997 included a provision to ensure that a student referred for special education services did not suffer merely from a lack of adequate instruction. Other criticisms were addressed by the 2001 LD Summit, which recommended that an RTI model replace the aptitude-achievement discrepancy model (Bradley, Danielson, & Hallahan, 2002). Later that year, the President's Commission on Excellence in Special Education concurred, asserting that greater emphasis should be placed on a student's education, rather than on referral for SLD identification (President's Commission on Excellence in Special Education, 2002). It was recommended, then, that schools and districts transition to RTI, a model that allows for learning gaps to be addressed through increasingly intensive interventions in the general education classroom before a student, showing an inadequate response to those interventions, is referred and evaluated for identification with an SLD.

Methods for Identifying Students With Specific Learning Disabilities

After the designation *learning disability* entered law in 1969 and was operationalized in 1977, the aptitude-achievement discrepancy model was used to determine identification with an SLD. The current regulations outline three approaches that may be used when identifying a student with an SLD, the aptitude-achievement discrepancy model, RTI, or other alternative research-based procedures. Individual states have further mandates regarding the use of these approaches. In the state of Illinois, the LEA must attempt an RTI approach, but are allowed to use the aptitude-achievement discrepancy or other alternative research-based procedures.

When using an RTI approach as part of an evaluation to identify a student with a learning disability, four criteria, two inclusionary and two exclusionary, should be addressed. Periodic data are gathered to indicate which students fail to meet grade- or age-level State standards in one of eight areas: oral expression, listening comprehension, written expression, basic reading skill, reading fluency skills, reading comprehension, mathematics calculation and mathematics problem solving (USDOE, 1977, p. 65083). Next, a student's cognitive and academic scores are analyzed either through a discrepancy model, discussed in the previous section, or an RTI approach. The RTI approach relies on student data collected through progress monitoring to indicate if the student demonstrates a lack of academic progress in response to scientifically based instruction. Equally important is to rule out any concerns with vision, hearing, or motor problems, intellectual disability, emotional disturbance, cultural and/or environmental influences, and limited English proficiency (USDOE, 1977, p. 65083). Lastly, documentation establishing qualified teachers have provided adequate instruction is furnished (Kovaleski, VanDerHeyden, & Shapiro, 2013).

Both the discrepancy model and RTI approach the identification of SLD similarly in that a student must fail to meet age- or grade-level State standards in one of the eight areas previously discussed. The evaluation team must first rule out several other disabilities, environmental and cultural influences and limited English proficiency as primary reasons the student is not achieving at expected levels. Both models address the quality of instruction provided to the student and the qualifications of the teacher providing instruction.

The discrepancy model and RTI differ in the type of data used to determine the existence of an SLD. The RTI model evaluates the difference between the students' data gathered through progress monitoring and/or benchmarking against age- or grade-level expectations. The discrepancy model analyzes data gathered primarily through individually administered, standardized assessments to describe a pattern of strengths and weaknesses unique to that student. If a severe discrepancy exists, based on the concept of a normal curve, between the student's intellectual ability and achievement level, the student is identified as having an SLD (Fletcher, et al. 1998).

In contrast, the RTI model uses the student's rate of improvement (ROI) to determine the impact of an intervention on the student's development of academic skill (Kovaleski et al., 2013). The student is identified as an adequate or inadequate responder based on frequent progress monitoring. The student's growth is compared against age- or grade-level expectations to determine whether the student has responded to instruction and intervention, the resulting rate of growth is referred to as the ROI. The student's ROI is compared relative to grade-level peers, benchmark expectations, and the desired growth rate. This gap analysis provides a quantitative description of the student's current level of performance and is used to determine the presence of an SLD.

Aptitude-Achievement Discrepancy Model

The aptitude-achievement discrepancy model, which preceded RTI, based identification of an SLD on an unexpected difference between the students assessed IQ and their demonstrated achievement on a standardized assessment measuring that skill (Steinberg, 2013). In particular, a student with IQ scores measured in the average range, but who had obtained an academic achievement score significantly lower, generally 15 points, could be considered a student with an SLD.

A criticism of the aptitude-achievement discrepancy model is that it does not identify students at risk of academic failure, but rather only identifies a student as eligible or not eligible for special education services. Barth et al. (2008) concluded that the discrepancy model was particularly poor at identifying first grade students as "inadequate" responders to reading intervention, and the model was no better, overall, than any other methods used for identification of an SLD. Fuchs and Deshler (2007) concluded similarly in their study of 252 first graders that discrepancy-based methods adequately identified students who were low-risk, but not students who were at risk, a finding echoed by other research (Fletcher, Stuebing, Barth, Miciak, Francis, & Denton, 2014). Further, students taking assessments in a particular area rarely achieved that same score on consecutive measurements, prompting critics to describe the model as unreliable (Steinberg, 2013). Moreover, the Matthew effect, which holds that students who have learned more, likely earn higher IQ scores, irrespective of their actual aptitude, has been shown to affect SLD identification (Hallahan & Mercer, 2002). As IQ scores of struggling readers, who have not learned as much about their world, most likely due to their poor reading skills, are more likely to be lower, which then leads to under-identification of those students (Hallahan & Mercer, 2002).

Response to Intervention

RTI is a model developed in response to the amendments to the 2004 Individual with Disabilities Education Act (IDEA). RTI focuses on students' responses to research-based interventions to determine whether they are in need of more supportive instruction or whether they require the more intensive support provided through special education services. RTI is generally implemented using a three-tier model, which has become known as the multi-tier system of support (MTSS), each with unique activities: (a) Tier I, high-quality classroom instruction, screening, and group interventions, (b) Tier II, targeted interventions, and (c) Tier III, intensive interventions and if so indicated a comprehensive evaluation.

In Tier I, the focus is on improving classroom instruction for the whole group. Students who are identified as "at risk" after Tier I interventions have been implemented are then provided additional supports through Tier II interventions. Tier II interventions are implemented to supplement the core curriculum and help the at-risk student close the gap between their achievement and that of their average achieving peer. Students whose skills have improved after taking part in Tier II interventions return to Tier I status. Students who require ongoing support or do not make sufficient progress move to Tier III interventions. Tier III interventions are considered more intensive and center on improving an individual student's ROI. Students who continue to lag behind their peers may warrant a referral to a multidisciplinary team for an evaluation to determine eligibility for special education services (Batsche et al., 2006).

Curriculum-Based Measures of Oral Reading Fluency

Curriculum-based measurement (CBM) was initially developed in the late 1970s to provide teachers with a standardized procedure to quickly measure student growth in reading, mathematics, spelling and written expression (Deno, 1985). CBM evolved over the years into a source of data that was well suited for problem-solving and RTI procedures (Fuchs, Fuchs, McMaster, & Al Otaiba, 2003; Shinn, 2008). Wayman, Wallace, Wiley, Ticha & Espin (2007) evaluated 64 studies that found curriculum-based measurement of oral reading fluency (CBM-R) to be valid and reliable when used for screening, norming and benchmarking, with the majority of criterion related validity coefficients ($\geq .65$) and reliability coefficients ($\geq .85$) in the moderate to high range. An additional literature review of 31 correlational studies provided validity coefficients in the moderate to high range as well (Reschly, Busch, Betts, Deno, & Long, 2009).

CBM can be used to screen student academic progress through different tasks, such as reading aloud from the text, the number of words written or mathematics calculation problems completed correctly (Deno, 2003). Many districts are currently developing MTSS, which incorporates CBM data as part of the decision-making process, irrespective of whether the district uses an achievement-discrepancy model or an RTI approach to identify students with an SLD. Fuchs, Fuchs, Mathes, Lipsey, and Roberts (2001b) found CBMs are valid measures of reading fluency and reading comprehension, especially during the developmental period when students are typically identified with an SLD.

CBM is commonly used in the three-tiered RTI model, in which Tier I consist of effective, evidence-based instruction and benchmarking student progress three times per school year in the general education classroom (Steinberg, 2013). Benchmark scores are then analyzed to determine which students responded well to instruction and which students are in need of the more targeted interventions provided in Tier II. Students who receive Tier II interventions are progress monitored on a more frequent basis using probes similar to the ones used during benchmarking. The data provided by progress monitoring are reviewed every six to eight weeks to determine if student progress has been made and to what degree.

Curriculum-Based Measures

As discussed above, CBM is often used to monitor student achievement and skill development, as well as to assist in the data-based decision-making process that leads to more intensive interventions and/or referrals for special education services. The most common assessments used to assess reading skills involve fluency, comprehension, and word identification. A systematic review of the literature on reading CBMs indicated that reading CBMs provide similar results regardless of the curriculum used or student familiarity with the material and have been proven effective when used in the general education classroom to determine student progress (Wayman, Wallace, Wiley, Ticha, & Espin, 2007). Because ORF is commonly reported in the evaluation documents when determining an SLD, for the purposes of this study, ORF will be the focus of the literature review.

Oral Reading Fluency

Assessments that directly measure students' ORF are administered using reading passages that are read aloud by the student for a predetermined time, typically one minute or three minutes. The number of passages, referred to as probes in the literature, that are administered during a single assessment also varies, with either one or three probes considered a standard administration (Deno, 2003). The differences between the amount of time allowed to read a passage and the number of probes administered will be discussed in more detail later in this section.

ORF has generated a great deal of attention in the literature because it purports to function as accurate measures of two skills: fluency and the much broader skill of overall reading. According to one study, for first grade students, fluency measures were just as accurate predictors of reading ability as were measures of comprehension, with the added benefit of being more efficient (Speece et al., 2011). Further, a number of researchers have concluded that ORF is an accurate predictor of reading comprehension, particularly for elementary school students. In a review of the literature on the link between measures of ORF and reading comprehension, Fuchs, et al., (2001b) found ample support for the claim that ORF scores were predictive of reading comprehension scores. More recent research has also found evidence for this claim, indicating positive correlations between ORF and reading comprehension that ranged from moderate to strong (Abbott, Wills, Miller, & Kaufman, 2012; Denton et al., 2011; Eason, Sabatini, Goldberg, Bruce, & Cutting, 2012; Petscher & Kim, 2011; Scheffel, Lefly, & House, 2012; Smolkowski & Cummings, 2015).

Another landmark study indicated that ORF predicted reading comprehension ability, even after controlling for the potentially confounding variables of age, sex, race or ethnicity, and SES (Hintze, Callahan, Matthews, Williams, & Tobin, 2002). In fact, evidence suggests that an ORF score can predict reading comprehension skill over time. A longitudinal study of elementary school students conducted by Jimerson et al. (2013) revealed that low ORF scores in first grade reliably predicted low reading comprehension ability in the same year, which in turn predicted poor comprehension in fourth grade. Studies have also shown that ORF predicts reading comprehension ability for elementary school children even in other languages, such as French and Turkish (Gentaz, Sprenger-Charolles, Theurel, & Cole, 2013; Turkyilmaz, Can, Yildirim, & Ates, 2013). As such, the literature is clear in its indication that ORF scores effectively predict reading comprehension for elementary school students.

Criticism of Oral Reading Fluency

ORF has been shown to be an effective measure of student reading fluency, however, some criticism of the ability of ORF to predict reading comprehension skills have emerged, with studies revealing that the accuracy of ORF measures declines at certain stages of child development. Specifically, the relationship between ORF and reading comprehension at the middle school level is generally weaker than for younger students (Denton et al., 2011; Fuchs, Fuchs, Hosp, & Jenkins 2001a). For middle school students, these and other studies have indicated that word reading efficiency, or the reading of words in list form rather than a text reading, was a better predictor of reading comprehension (Denton et al., 2011; Luft Baker et al., 2015; Werder, 2012). The lack of predictability for these students may result from the increasing importance of vocabulary knowledge in reading comprehension, a skill that is not assessed fully through ORF probes (Denton et al., 2011; Eason et al.). This finding aligns with a study that affirms the significance of vocabulary in reading comprehension for high school readers as well (Gentaz et al., 2013). Finally, ORF may not be strongly predictive of reading comprehension for students in very early grades. For these students, word fluency measures may actually be more accurate than reading of connected text in passage form (Speece, Schatschneider, Silverman, Pericola-Case, Cooper, & Jacobs, 2011).

The relationship between ORF and reading comprehension is stronger for elementary students (Scheffel et al., 2012). It was found that ORF positively correlates to reading comprehension measures, which then could be used to predict student success. In addition to the general issues that some researchers have noted with ORF as a predictor of reading comprehension, some studies have revealed that the characteristics of some ORF probes, such as their length and number, as well as the complexity of their passages, compromise their predictive accuracy (Barth, Stuebing, Fletcher, Denton, Vaughn, & Francis, 2014a; Fuchs et al., 2001a). In terms of probe length, these studies have suggested that full-passage probes are more valid than probes that last only one minute, though one study qualifies this recommendation by asserting that this phenomenon applies only to struggling readers.

In addition, researchers generally seem to agree that multiple-passage probes are more accurate than single-passage probes when used to predict reading comprehension skills, particularly for younger students (Barth et al., 2012; Beach & O'Connor, 2015; Biancarosa & Fien, 2013; Francis, Santi, Barr, Fletcher, Varisco, & Foorman, 2008; Petscher & Kim, 2011). Some research has noted a practice effect, as students score much higher on the second and third passages in three-passage probes, even after accounting for text complexity (Petscher & Kim, 2011). For students in middle school, one study suggests that single-passage probes are just as accurate, although this result may be a function of the generally more tenuous link between ORF and reading comprehension for these students. It may also be that the practice effects observed in other studies are less pronounced with older readers (Luft Baker et al., 2015).

A final set of criticisms of ORF probes concerns not the tests themselves, but rather the students taking and teachers administering them. For students, engagement, or the degree of attention and interest they show in the task, positively correlates with reading comprehension specifically and student achievement more generally (Fall & Roberts, 2012; Guthrie & Klauda, 2013; Reyes, Brackett, Rivers, White, & Salovey, 2012). Teachers may not interpret the data collected during benchmarking and progress monitoring correctly, leading to inappropriate referrals for intervention or evaluations (Valencia, Smith, Reece, Li, Wixson, & Newman, 2010).

One significant problem that affects the accuracy of ORF measures for younger readers is the apparent insufficiency of readability formulae in determining text complexity. In particular, one study indicated that, across a three-passage probe, students performed best on the third passage, despite the fact that it should have been the most difficult to read (Petscher & Kim, 2011). This finding aligns with those of other studies that indicated inconsistency in the accuracy of readability formulae (Barth et al., 2014b: Francis et al., 2008).

ORF as a Measure of Level of Achievement for Identification of SLD

Given the general consensus in the literature regarding the overall accuracy of ORF as a predictor of reading comprehension, the effects of time-, length-, and bias-related problems may be small. However, even small effects may have significant consequences for students, because the level of achievement indicated by CBM is often used in the decision as to whether to provide a student with additional supports in general education or to refer the student for an evaluation for SLD identification. As such, the identified level of achievement may result in some students being denied the support they need and other students receiving unnecessary interventions. These possibilities are significant, particularly considering the level of achievement used to dichotomize students into adequate and inadequate responder groups and, ultimately, refer and identify them with an SLD. Specifically, if bias results in a student scoring even a little lower than he or she otherwise would, the student may inappropriately fall into the inadequate responder group. In one study, researchers tested different thresholds, including 0.5, 1.0, and 1.5 SD below the mean ORF score achieved by a sample of 399 first grade students. The study's authors concluded that the choice of cut-point is "clearly the most significant determinant of responder status" (Barth et al., 2008, p. 11). That is, because randomly determined levels of achievement identify different groups of students as adequate and inadequate responders to intervention, the choice of achievement level, particularly when it is not located at the maximal point of precision, could generate very large numbers of either false positives or false negatives.

Even a precisely chosen cut-point may not result in a strongly sensitive ORF measure. Another study of ORF assessments of middle school students used a cut-point of 0.5 SD below the mean, and while the study's authors asserted that the choice of this score resulted in an assessment appropriate for diagnostic use, they also argued that the choice of a different cut-point would yield a vastly different result (Barth et al., 2014a). Even with the most precise cut-point (in this case, 0.5 SD) for a different sample of middle school students, a significant number of false positives still resulted, and the authors noted that a lower score (for instance, 1.0 or 1.5 SD) would have resulted in a large number of false negatives (Barth et al., 2014b).

In summary, research on the accuracy of ORF measures suggests that some factors associated with the administering and scoring of ORF probes affects their predictive validity. In particular, the usefulness of ORF measures seems to increase along with the lengths of probes and the number of passages they contain. Results in this area are also muddled by the apparent inadequacy of readability formulae to determine the complexity of passages used in ORF probes. In addition, some confounding factors result from those taking and administering the assessments, as levels of student engagement affect how well ORF measures predict reading comprehension ability. However, despite these issues, studies of ORF assessments suggest that they are accurate, both as measures of reading fluency and as predictors of reading comprehension ability and useful for both instructional and high-stakes decision-making if sufficient probes of high quality are administered.

ORF as a measure of rate of improvement for identification of SLD

ROI is the change in a student's performance over time, which is calculated using frequent, repeated assessments, referred to as progress monitoring. ORF scores can also be used to identify expected levels of performance, otherwise known as benchmarks. The change between benchmark levels can be calculated to determine how much growth is expected between screening levels for a student to meet the next benchmark. Likewise, a student's previous performance can be compared against a current performance level using progress monitoring, which produces the student's ROI. Eligibility teams can then conduct a gap analysis, comparing the ROI to expected levels of performance, to determine if the student's response to intervention and instruction is adequate or inadequate (Kovaleski et al., 2013).

Validity is not unique to the instrument used but also to the interpretation of the data that is collected, prompting progress monitoring data to be interpreted differently from benchmarking data (Christ, Zopluoglu, Monaghen, & Van Norman, 2013). CBM is sufficiently sensitive to assess instructional effects, which allows it to be highly sensitive to other sources of variability, (Christ, & Silberglitt, 2007) including examiner characteristics (Derr-Minneci & Shapiro, 1992), alternate probes (Christ & Ardoin 2009a), delivery of directions (Colon & Kranzler, 2006) and the environment in which the progress monitoring has taken place (Derr-Minneci, 1990). Some portion of the variability in student performance is unrelated to student achievement (Christ et al., 2012) the passage itself, the level of distractions present, time of day, and antecedents that impact student motivation, may contribute to a low-quality dataset. Christ (2006) found it is likely that four times more errors are committed by students when progress monitoring conditions are poorly controlled. Higher-quality datasets are produced with improved control over the administration and environment when progress monitoring (Christ et al., 2013).

Further research indicated that academic achievement improves when data collected, graphed and predefined rules are used to guide the decision process (Christ, Zopluoglu, Long & Monaghen, 2012). The number of data points and quality of the dataset are critical to generating useful progress monitoring outcomes. Establishing strict standardization and providing good environmental conditions by eliminating distractions, providing consistent directions and assuring passages are of consistent difficulty will lead to high quality datasets. The duration and frequency of progress monitoring also leads to valid and reliable data. Christ et al. (2012), analyzed the progress monitoring data collected between four to eighteen weeks and at various levels of density, from one data point per week, low density, to six data points per week, high density. The researchers found that the number of weeks and the density of the progress monitoring impacted the probability of a team decision leading to a student being correctly classified as a responder/non-responder to instruction. The diagnostic accuracy of low-stakes decisions yielded a measure of the area under the curve (AUC) of .87, which is considered sufficient. The accuracy rate improved with longer durations of progress monitoring. Research revealed that educational teams provided with eight weeks of the progress monitoring data correctly classified 75% of the cases presented to them (Christ et al., 2013).

Decision making is further broken down into low-stakes decisions, which are dynamic, reversible and minimize unintended negative consequences and high-stakes decisions, which result in permanent, diagnostic labels that are not easily reversed and have a greater potential for unintended negative side effects (American Educational Research Association, 2000). A longer duration of progress monitoring, with an increased number of data points, correlates with higher reliability when making educational decisions. Christ et al. (2013) found that the reliability was very poor for data collected over two to four weeks, with no support given to data collect for less than four weeks. Christ et al. (2012) found a minimum of 14 weeks of progress monitoring when collecting one data point per week was sufficient to make educational, low-stakes decisions if the dataset was of high quality. Additional research found that six weeks of progress monitoring, using dense data collection and eight weeks of less dense data collection both resulted in coefficients of .70 (Christ, 2013). Validity and reliability analysis indicate 12 to 18 weeks of good quality data should be collected before low- and high-stakes decisions are made respectively. A consensus in the literature indicates a coefficient of .70 is acceptable for screening instruments that provide data when making low-stakes decisions, but recommend coefficients of .90 for high-stake decision making. To meet these levels, good quality data should be collected for a minimum of 8 to 10 weeks for low-stakes decisions and 12 to 14 weeks for high-stakes decision making.

In summary, CBM-R or measures of ORF are an effective and efficient method used to evaluate students' ROI in oral reading fluency. Research has indicated that CBM-R provides valid and reliable data when used for screening, benchmarking and for appraising student progress. To increase the likelihood that accurate decisions are made by educational teams using progress monitoring data, the data should be of high quality, with a sufficient number of data points, and collected for an appropriate duration in consideration of the level of decision making.

Effects of Demographic Factors on Student Achievement

A number of student demographic conditions have been shown to influence student achievement, including sex, race, and SES. Because of the narrow focus of the main research question, this study will be limited to include only the SES of the school, and will not address sex, race, and SES of individual student cases that make up the dataset. However, these issues will be addressed in this section to provide a full treatment of these issues.

Effects of Sex on Student Achievement

Studies have revealed a small but significant effect of sex on various measures of student achievement. At least one investigation into the effects of demographic characteristics on ORF scores for elementary school students indicated that sex influenced scores, with female students performing better than male students (Wanzek, Otaiba, & Petscher, 2013). However, the authors observed this difference only in the group of participants not identified with an SLD, and the study's authors did not offer an explanation for this unexpected difference. Another study examining whether student factors influenced ORF's validity as a predictor of reading comprehension for middle school students revealed that sex had a small but significant effect on students' ORF scores (Barth et al., 2014b). In particular, female students read connected text faster and more fluently than did male students, and the effect of sex remained after the researchers controlled for other student and text characteristics.

In addition to affecting ORF scores, sex has been found to influence reading achievement more generally. Because male students performed more poorly than did their female classmates, their scores lead to increased rates of special education eligibility, in particular SLD (Shifrer, Muller, & Callahan, 2011; Talbott et al., 2011). However, this final result may be insignificant, as the sex-related effect was satisfactorily explained by school variables, such as teacher salary and education levels, district size, and school adequate yearly progress (Talbott et al., 2011). However, research on SLD identification rates does indicate a clear sex gap, with male students comprising approximately two-thirds of the population receiving special education services (Cortiella, 2009: Wanzek et al., 2013). The analysis by Cortiella (2009) noted that male students were more likely to exhibit low engagement, behavior poorly, and face disciplinary action in school and the community. However, these relationships are merely correlational, and whether these phenomena cause or resulted from SLD identification, is unclear.

Effects of Race on Student Achievement

Race also has a significant effect on reading scores and resulting identification with an SLD and other disabilities. In *The State of Disabilities Report* by the National Center for Learning Disabilities, Cortiella (2009) reported that school-aged African American (3.4%), Hispanic (3.1%), and multiracial (3.7%) students were more likely than their Caucasian (2.8%) and Asian (1.4%) peers to be identified for special education services. The existence of these disparities may point to inequities in the process through which students are referred and identified with an SLD, suggesting that some students are categorically disadvantaged through that process.

However, other, more recent research paints a more complex picture. For instance, one study indicated that, among students in grades two through five, ORF measures over-predicted the fluency skills of African American students, resulting in some students not being identified for compensatory programs. Scores for Caucasian students, by contrast, were under-predicted, leading to over-identification of these students for additional interventions (Adkins, 2013). This finding is in line with another study suggesting that minority students are under-identified with learning disabilities, intellectual disabilities, speech or language impairments, and emotional disturbance. In particular, the odds of identification with an SLD was suggested to be 58% lower for African American students and 29% lower for Hispanic students than for Caucasian students (Morgan et al., 2015). It may be that teachers systematically overestimated the ability of African American students through the adoption of lower expectations for them, but the study's authors recommended that further research investigate the potential causes of this phenomenon. In spite of the uncertainty revealed by its results, this study may more accurately reflect identification rates being that it is a more recent study and controlled for other risk factors, such as family SES, that effect student achievement; the analysis by Cortiella (2009) used data from 2005.

Sex and race, then, have been shown to play a significant role in reading fluency and reading comprehension, in particular, and for achievement and special education identification in general. One especially important finding, though, is that some of the sex and race effects disappear or are reduced when other factors, such as SES, are considered. The result, to some extent, is uncertainty regarding the nature and extent of the influences of these factors on student achievement and SLD identification.

Effects of Socioeconomic Status on Student Achievement

In contrast, two studies of race alone, research on the influence of SES on student achievement is much clearer: a strong positive correlation exists between SES and student achievement, with low-SES students often performing at much lower levels than do their more affluent peers. While some studies on the influence of race have yielded contradictory results, the Condition of Education 2013 Report from the National Center for Education Statistics, revealed that minority status is accompanied by another, SES, that also influences measures of academic achievement. Also, according to the report, only 13% each of White and Asian children under the age of 18 lived in poverty in 2011. By contrast, 34% of Hispanic children, 36% of Native American children, and 39% of African American children lived in poverty in that year (Aud, Wilkinson-Flicker, Kristapovich, Rathbum, Wang, & Zhang, 2013).

Some research that explores race, sex, and SES has indicated that it is the latter variable that has the most influence. The study by Shifrer et al. (2011) discussed earlier, in addition to finding a relationship between sex and identification with an SLD, also indicated that minority status, specifically, being a Hispanic or African American, correlated with SLD identification. However, this effect was explained entirely by SES differences between minority and Caucasian students. Other studies achieved similar results; such as one that investigated the racial and economic characteristics of schools together and indicated that attending a racially segregated and a low-SES school had a negative effect on reading and language arts achievement (Mickelson, Bottia, Lambert, 2013).

Other studies on SES alone have indicated a broader link between SES, student achievement, and disability identification, with SES negatively correlating with the risk for identification in most disability categories and explaining some of the race disparities found in other investigations (Sullivan, 2013). In terms of general academic achievement, an analysis of NAEP scores for fourth and eighth grade students found that SES positively correlated with reading and mathematics scores, with low-SES students scoring significantly lower than did their peers (Goodman, Sprenger-Charolles, Theurel, & Cole, 2012). The link between SES and reading comprehension revealed by this research is similarly strong in other countries, as one study indicated a positive correlation between SES and reading comprehension for elementary school students in Turkey (Kayiran & Karabay, 2012), while another suggested that both family- and school-related SES factors predicted reading performance scores for high school students in Albania (Shera, 2014). While these latter studies were conducted outside of the United States, they are significant because they highlight the pervasiveness of SES as an influence on academic achievement using data from PISA, an age-based, cross-country survey of student achievement used across an organized group of European countries, Canada and the United States. As a result, its measurements of SES allow for comparison across countries, including the United States.

Effects of Socioeconomic Status at Various Stages of Development

Not only does SES exert significant influence on various measures of student achievement, but it also does so across many stages of life, including in infancy and before school entry. Fernald, Marchman, and Weisleder (2012), using real-time measures of language processing in a longitudinal study of infants from 18 to 24 months of age, saw significant disparities between low and high-SES infants in vocabulary and language processing efficiency. These differences grew over the six months of the study; by 24 months, there was a six-month gap in processing skills critical to language development. In addition, in a review of the literature on SES and early literacy, Waldfogel (2012) concluded that family SES correlated positively with both early literacy and literacy at school entry. Hart and Risley's (1992) seminal study documented a positive correlation between maternal vocabulary and SES.

Just as the income achievement gap grows throughout infancy, studies have generally shown that this gap, either because or in spite of schooling, continues to grow through childhood

(Waldfogel, 2012). Some additional evidence for this phenomenon comes from the examination of learning growth rates. Examining the "Catholic school advantage," Hallinan and Kubitischek (2010) found that, for both Catholic and public school students, SES positively correlated with achievement growth rates, with low-SES students making smaller gains than did their more affluent peers. Low-SES students in public schools fared even more poorly than did similarly poor students in Catholic schools. This finding regarding growth rates has been repeated by other studies indicating that low-SES in first grade predicted first grade reading comprehension scores, which themselves predicted fourth grade reading scores (Jimerson, Hong, Stage, & Gerber, 2013). Poor readers, then, were more likely to have low-SES, and because of that low-SES, were also more likely to grow more slowly as readers than did their more affluent peers. Additional research has found these effects on reading performance appear to last through high school as well (Hoff, 2013; Mickelson et al., 2013; Singh, 2012). Finally, at least one study indicated that family SES effects persist even after school, in that SES has a positive correlation with adult income level (Agirdag, 2013).

The early, persistent, and widening gap between high-SES and low-SES students in terms of academic achievement may result from significant cognitive differences. Tucker-Drob (2013) concluded, from a study on the link between SES and cognitive functioning, that the widening academic gap in mathematics and academic knowledge may be the result of SES influences on the development of short-term memory, auditory processing and abstract reasoning. Lawson and Farah, (2015) further investigated how student academic achievement was impacted by executive functioning (EF), a cognitive process. While a correlation between SES and EF had previously been established, low SES students' mathematics achievement could be partially mediated by their EF, but a similar relationship was not found for reading achievement. Research utilizing

MRI to study the effects of SES on brain structure indicated correlations between SES and the characteristics of several parts of the brain (Jednorog et al., 2012). The study examined a group of 23 healthy ten-year-old children whose family SES varied widely. The results revealed that, while white matter architecture was similar for all children, low-SES children had smaller volumes of gray matter in their bilateral hippocampi. Among other effects, low-SES children also exhibited local gyrification effects in their brains' anterior frontal regions, which is suggestive of potential developmental lag. These phenomena were present even when no stress or extreme deprivation was reported. In addition to a small sample size, another limitation of the study was that no causality could be determined. In other words, low-SES children's brain structure differences could be linked to environmental factors associated with socioeconomic status, however, genetic characteristics also could have created these differences.

Overall, SES helps to explain some of the effects of race and sex on student achievement. On its own, it is the most significant predictor of student achievement, and influences both narrow skills such as ORF and broader classifications such as reading comprehension and academic achievement. It exerts this influence through a variety of factors in both home and school environments, as well as in the brains of students from low and high-SES families. As such, SES affects cognitive functioning and achievement throughout life.

The Effects of Socioeconomic Status as Mediated by Home and School Factors

Researchers seeking to understand which factors mediate the influence of SES on school achievement often separated those variables into ones originating in the home and ones originating in the school environment. Studies have generally found that both significantly affect achievement and that considerable overlap exists between home- and school–related factors.

Moreover, many variables that mediate the effects of SES are themselves mediated by other factors, resulting in the intensification of SES effects on student achievement.

Home factors. Home variables include family income level, maternal and paternal education levels and occupations, parental educational support and expectations, and the presence of educational resources in the home (Hart & Risley, 1992). In studying these variables, Altschul (2012) found that all of them, with the exception of paternal occupation, were significant. SES was mediated largely by overall parental involvement in education, although maternal occupation and paternal education level were directly related to student achievement. With regard to education, a higher paternal education level correlated with a similar increase in the frequency of discussions of school in the home and in the amount of help children received with homework. Higher levels of maternal education were associated with the increased presence of enriching activities and educational resources in the home, as well as access to extracurricular instruction (Altschul. 2012). A review of the literature by Linder, Ramey, and Zambak (2013) identified a similar set of home-based SES variables that mediate the effects of SES on school achievement. Other research has found that parental expectations, perhaps influenced by parental occupation and education levels, also influence student achievement. Using data from the Early Childhood Longitudinal Study, Stull (2013) concluded that high parental expectations correlate strongly with student achievement, even after controlling for school SES.

Other family SES-related factors not directly related to parental education, occupation, or expectations have also been shown to influence student achievement. One such factor is traumatic stress, rates of which are significantly higher among low-SES students (Goodman et al., 2012). Moreover, the presence of traumatic stress was found to influence students’ achievement scores even after researchers controlled for SES. The study's authors concluded that low-SES students might be exposed to events and situations that cause traumatic stress or that low-SES students have fewer resources to cope with that stress, because of the brain- and hormone-related changes that occur with stress. In support of the former conclusion, it may be that children in particularly abject poverty may struggle with the issues associated with the lack of a stable home environment, and the unpredictability of stressful events that accompany this situation makes coping difficult. Herbers et al. (2012) investigated whether the precise degree of socioeconomic disadvantage experienced by students influence their reading achievement. To do so, the researchers placed students into four district SES groups: students with homelessness or high residential mobility (HRM), students qualifying for free lunch, students qualifying for reduced price lunch, and students not qualifying for free or reduced price lunch. Reading comprehension scores and the growth in scores between grades three and eight were significantly affected by differences in SES, as students with HRM performed more poorly and demonstrated less growth than did students in the other three SES groups. This result suggests that the degree of a student's poverty level can have a particularly damaging effect on their academic achievement (Herbers et al., 2012).

Students in less abject poverty, who may have more consistent housing, have also been shown to suffer from lower academic achievement, in part because of increased socioeconomic segregation, as low-SES families are grouped more closely together in poor communities with a lack of both home- and neighborhood-based educational resources (Reardon, 2011). In these neighborhoods and with few financial resources in the home, low-SES students have been shown to experience summer learning loss, which may be one cause of the growth of the income achievement gap across a child's path through school. While affluent children are able, through a variety of means, to continue learning during the summer, low-SES students lack the same opportunities (Waldfogel, 2012). Such a conclusion is supported by the fact that the positive correlation between SES and student achievement has become stronger over time, as a given difference in income now equates to a 30-60% larger gap in achievement than it did 50 years ago (Reardon, 2011; Reardon, Valentino, & Shores, 2012).

Because of the myriad of home SES-related factors that influence children at the early stages of development, some studies have concluded that home-related influences on student achievement are more significant than school-related influences. For instance, Dufur et al. (2013) used data from the National Education Longitudinal Study of 2002 to determine that, while both sources of social capital were significant predictors of student achievement, social capital from home was more important. Building on work indicating the moderate and significant heritability of reading comprehension skills, Hart (2013a) used data from the Florida Twin Project on Reading, Behavior, and Environment to examine the extent to which inherited genetic traits, as opposed to school characteristics, influence reading ability. The study's author concluded that genetic effects pointing toward poor reading comprehension, which correlated with SES, strongly predicted students' reading ability in first grade, as well as the students' growth in reading through grade five. Another study investigating the effects of SES on reading performance concluded that family SES, but not school SES, had a significant impact on reading performance (Singh, 2012). The results of this study contribute to the conclusions implied by earlier research, namely that the influences of family SES on cognitive development and achievement are mediated through a variety of factors, some of which influence one another. The result then, is the compounding of home SES effects on achievement.

School factors. School-level SES is typically determined by the percentage of students receiving free or reduced-price lunch, and researchers have investigated a number of factors such as teacher quality and turnover, teacher expectations, school culture, and relationships with teachers and peers that mediate the effects of school SES on student achievement (Brockmeier et al., 2013). Many of these factors, including teacher quality, appear to be directly influenced by levels of school funding. In a review of research examining the unequal distribution of quality teachers, Adamson and Darling-Hammond (2012) found that high poverty student populations often attend schools characterized by low overall funding and low teacher salaries. These funding disparities led to lower levels of student achievement. In addition, the same review indicated that increases in teacher salary correlated with significant reductions in the percentage of teachers who lacked credentials or who were newly hired or less well-educated (Adamson & Darling-Hammond, 2012).

Teacher turnover also correlates negatively with school SES, as more affluent schools experience lower rates of turnover. According to one estimate, such turnover is approximately 50% higher in low-SES schools. Research has linked higher rates of turnover to lower levels of student achievement, as well. The results of one study indicated that, in specific grades where turnover rates were higher, students' scores on standardized tests in English Language Arts and mathematics were lower than in grades where teacher turnover was less common. This effect was particularly strong for schools with large numbers of low-performing students (Ronfeldt, Lankford, Loeb, & Wyckoff, 2011).

Some factors, such as the level of teacher expectations, school culture, and peer influence, have not been clearly linked with school funding, but nonetheless positively correlate with school SES and student achievement. Research revealed that teacher expectations of student achievement is often the result of the teachers' perception of the students' past achievement levels (Shifrer, 2013). Lee et al. (2014) reported a very strong link between teacher standards and prior student achievement, and concluded that, while it was true that high teacher expectations to some degree caused increases in student achievement, it was equally, and perhaps more, plausible that the causal link traveled in the opposite direction. That is, teacher standards were just as or more strongly influenced by perceptions of student achievement. External and internal standards-based models using national and state datasets in mathematics and reading were compared to determine how the two models influence student achievement in school systems. External educational models were identified as beginning aligned with the standards developed by the state or state consortia, which shape the teacher standards that affect student achievement. Internal models move the opposite direction, as students' background characteristics and prior achievement influence the development of teacher standards, which are not directly shaped by state standards. Overall, the study used data from 5,638 students, and the results indicated that connections between state standards and teacher standards were tenuous, with state influencing teacher standards only to a small degree. The authors cautioned that such a relationship works to ensure that low-achieving students continue to achieve at low levels, as when students achieve poorly, teacher expectations adjust accordingly, resulting in the continued poor performance of those students.

These teacher expectations, both their own and as they work to create and maintain school culture, influence high school graduation and college enrollment rates, as well. In particular, one study, using data from the 2002 National Educational Longitudinal Study indicated that students at high-SES schools were more likely to graduate high school and enroll in college, an effect mediated by school practices emphasizing academics, an influence that was particularly important in raising rates of four-year college enrollment (Palardy, 2013).

Another mediator of the effects of high-SES schools in this study was peer influence, which may also influence and be influenced by school culture and teacher expectations (Palardy, 2013), and other research has provided similar evidence of this phenomenon. One study that investigated the effects of supportive school relationships in the middle and high schools on the dimensions of engagement revealed a positive correlation between such relationships and engagement (Wang & Eccles, 2012). School compliance, as defined by engagement in extra-curricular activities, compliance with rules and lack of disruptive behaviors, was positively correlated with teacher and parent social support, but negatively associated with peer support. In addition, the presence of teacher support was predictive of higher rates of school identification, which was measured by emotional engagement, interest in and identification with the school, and the sense of belonging to the school community. At least one other study attests to the influence of school identification and participation as a mediator of student achievement. Eccles & Wang (2011) studied a group of 1,148 students in grades 7-11, finding that regular attendance, class participation and self-regulated learning strategies affected academic performance.

The result of the accumulation of these factors, perhaps even to a greater degree than for home SES, is increased achievement. Seeking to replicate work on the “Catholic school effect,” Jencks (1985) assessed a large group of sixth grade students who enrolled at either low-SES or high-SES schools. The results indicated that students at all levels of family SES benefitted from attending high-SES schools. In particular, low-SES sixth graders in high-SES schools were 20 months of learning ahead of low-SES sixth graders in low-SES schools. However, another study concluded that achievement gaps between African American and Caucasian student were not reduced through enrollment in private schools (Simms, 2012). However, the study did not consider which factors led to enrollment in private rather than public school. Given the ways that race has been found to influence student achievement, the study may not bear directly on the issue of whether the school SES variable exerts more influence on student achievement than does home SES variables.

Success of Interventions Targeting Students With Low Socioeconomic Status

Regardless of whether home- or school-based SES matters more to school success, it is clear that the income achievement gap has widened and appears as though it will continue to do so (Reardon, 2011). One way, however, to mitigate the effects of SES on student achievement is through accurate assessments that properly identify students with skill gaps and targeted interventions that help to close those gaps. Several studies have shown that interventions with low-SES students, in particular, have generated meaningful growth, and in some cases, sustained gains in student ability, starting the early grades.

For instance, Hagans and Good (2013) randomly assigned 50 low-SES first grade students to a 10-week phonological awareness intervention or to a control condition. While no significant gains were measured immediately after the intervention, after 24-months students receiving the phonological awareness intervention demonstrated significantly stronger gains than did students in the control group. Each of these studies indicated that gains made through reading interventions with low-SES students were successful and durable (Connor, Alberto, Compton, & O’Connor, 2014; Hagans & Good III, 2013: Vaughn et al., 2012). A final study of remedial reading interventions with second and third grade students indicated gains for all students, including equivalent ones for students with different IQs, SES levels, and races. Most important, these gains were also durable, as determined by a one-year follow-up reading assessment (Morris, Lovett, Wolf, Sevcik, & Steinbach, 2012).

Interventions appear to be successful with older students, as well. For instance, a meta-analysis conducted by Kim and Quinn (2012) examined studies of the effects of summer literacy interventions on reading achievement for students in kindergarten through eighth grade. While the programs generally produced gains in reading ability, studies with a majority of low-SES students in their samples yielded greater reading benefits than did those with mixed SES samples. In addition, two more studies, both working with large populations of struggling readers in grades six through eight, each separated the students into treatment and control groups and administered a reading intervention for three years. In both studies, students in the intervention group showed significantly higher gains than did students in the control group (Roberts, Vaughn, Fletcher, Stuebing, & Barth, 2013; Vaughn et al., 2012).

Interventions, then, have been shown to be successful helping struggling readers, particularly those with low-SES, throughout elementary and middle school. In addition, these interventions, while not completely eliminating the income achievement gap, have reduced its size, particularly when the interventions are administered in small group settings. Such results attest to the power of appropriately administered interventions. In addition, they highlight the importance of accurately identifying students who would benefit from these interventions.

Summary and Need for the Current Study

The literature reviewed for this chapter began with the history of the referral for and identification of SLD in the United States, which effectively began in 1969 with the Children with Specific Learning Disabilities Act. The aptitude-achievement discrepancy model, which emerged from the 1975 Education for All Handicapped Children Act, generated much criticism.

Specifically, researchers argued that a student's IQ was subject to the scope and degree of his or her learning and that a significant number of students identified with an SLD merely lacked effective instruction. RTI was introduced as an alternative to the discrepancy model; RTI emphasizes the use of research-based educational practices and prescribes a series of increasingly intensive interventions in the general education classroom before referral for special education services.

The theoretical framework for this study, consisting of ecological systems theory and social capital theory, posits that student achievement does not happen in a vacuum. Instead, it occurs in a real world filled with influences both direct and indirect. Direct variables interact with one another, and with other factors that do not directly interact with the child. All of these interactions take place within a variety of cultures, different from others, and within a specific time and place (Bronfenbrenner, 1979). Social capital theory, specifically, asserts that networks, formed by relationships and maintained by shared norms and values, allow for the transmission of various kinds of knowledge. Social capital is drawn from a variety of sources, including home and school. Both influence a child's development through the passing on of genetic predispositions, the environment in which learning occurs, and the norms and values that influence relationships (Coleman, 1988).

The data gathered through an RTI process is generally perceived to be more sensitive than the aptitude-achievement discrepancy model when referring a student for an evaluation, and identifying a student with an SLD. A fundamental difference between the two approaches is that in RTI students identified as inadequate responders to research-based instructional methods are given more intensive interventions in smaller settings within the general education classroom.

Only when students fail to respond adequately to research-based interventions in Tiers II and III are they referred and evaluated for identification with an SLD.

In terms of identification for special education services in the more narrowly defined areas of oral reading fluency and reading comprehension, research reveals that current diagnostic methods are generally sufficient, but still subject to problems that lead to a lack of diagnostic sensitivity (Abbott, Wills, Miller, & Kaufman, 2012; Beach & O'Connor, 2015; Denton et al., 2011; Jimerson et al., 2013; Reed, 2015). Confounding factors include the use of one-minute or full-passage probes and one-passage or multi-passage assessments (Barth et al., 2014a; Beach & O'Connor, 2015; Francis et al., 2008; Fuchs et al, 2001a; Petscher & Kim, 2011; Stoolmiller et al., 2013). In addition, the apparent insufficiency of readability formulae to determine the complexity of passages used in ORF measures affects students' fluency scores, as do the potentially confounding variables of student engagement and teacher bias (Barth et al., 2014b; Francis et al., 2008; Guthrie & Klauda, 2013; Petscher & Kime, 2011; Reed, 2015; Reyes et al., 2012).

These issues are compounded by the effects of demographic factors on student achievement. Research has found that ORF probes can be subject to predictive race-related bias, and other studies have found that ORF measurements consistently over-predict the performance of African American students, in particular (Hintze et al., 2002). The potential result of this bias is the under-identification of African American students for special education services, though some research has suggested that minority students are actually over-identified (Adkins, 2013; Cortiella, 2009; Morgan et al., 2015). Sex also exerts influence on achievement and identification with an SLD, as male students are more likely to be found eligible for special education services (Barth et al., 2014b; Shera, 2014; Shifrer et al., 2011; Talbott et al., 2011).

The most influential demographic factor, however, appears to be SES, mediated by both home and school variables. Home-related factors such as family income, parental education levels and occupations, family expectations for academic achievement, and the availability of learning resources and opportunities in the home and neighborhood influence student achievement levels as early as infancy and as late as life after high school (Agirdag, 2013; Altschul, 2012; Fernald et al. 2012; Herbers et al., 2012; Linder et al., 2013; Stull, 2013; Waldfogel, 2012). Also influential were school factors such as school SES as measured by the percentage of students receiving free or reduced-price lunch; school funding; teacher salary, turnover, and expectations; class size; and peer influences (Adamson & Darling-Hammond, 2012; Brockmeier et al., 2013; Palardy, 2013; Ronfeldt et al., 2011; Schwartz, et al., 2012; Wang & Eccles, 2012). Studies have shown that interventions designed to remediate struggling readers, particularly those with low-SES, are successful, producing durable gains that help to narrow the income achievement gap (Hagans & Good, 2013; Kim & Quinn, 2012; Morris et al., 2012; Roberts et al., 2013; Vaughn et al., 2012). These factors, along with the issues associated with cut-points, can significantly influence the population of students identified as inadequate responders to intervention and, as a result, those referred for SLD identification. Up to now, an insufficient amount of research has focused on determining the achievement level that schools and district use.

How SES relates to the referral of students to determine their eligibility status for special education services has not been the focus of current research studies. In particular, it is unknown whether school-level SES affects the achievement level used to dichotomize students into "adequate" and "inadequate" responder groups. This, then, is the gap that will be addressed in this study, as it investigates the impact of a school's poverty level on ORF scores reported for students identified as having an SLD versus those who have been evaluated to determine eligibility but were not identified as having an SLD. The study, in particular, will examine whether students evaluated for SLD identification differ in their reading fluency as a function of school SES. In addition, it will determine if students identified with an SLD differ in reading fluency from those evaluated, but not identified, and if so, whether school poverty level influences that difference.

The next chapter will provide details of the plan for the study. Given the problem and identified gap in the literature, an empirically based research study using archival data will allow for analysis to determine the influence of school SES on students' ORF scores, as well as the specific scores of students identified with an SLD in ORF and those evaluated but not identified. The next chapter will also provide descriptions of the role of the researcher, the participant selection process, instrumentation, procedures for participation and data collection, and data analysis plan.

CHAPTER 3

METHOD AND PROCEDURES

Introduction

In this study, the effects of the socio-economic status (SES) of the school and the special education eligibility status of the student were explored to determine if the student's academic performance differed as a function of the income level of their school district. The oral reading fluency score (ORF) reported in the eligibility documents when determining the student's eligibility status for special education services was utilized to determine the student's academic performance level. Data from the study could be used to determine if the level of poverty of a school, identified by the percentage of students receiving free or reduced-price lunch, impacted the criteria used to identify a student's eligibility for special education services.

The procedures and methods used to answer the research questions in this study are discussed in this chapter. The demographics, location and instructional characteristics of the study sites are provided. Finally, a review of the research questions, the analyses used to answer the questions and discussion about the assumptions are described.

Research Questions and Hypotheses

Research Question 1

Do reading fluency scores reported at the time of eligibility and stated in the eligibility documents of students evaluated for SLD differ as a function of the income level of their school district? It was hypothesized that significant differences in ORF scores would exist between high-income schools and low-income schools. The students who attend mid/high-income schools and qualify for special education services overall would have higher ORF scores than students who attend low-income schools and qualify for special education services.

Research Question 2

Do students evaluated for and identified as SLD differ in their reading fluency scores reported at the time of eligibility and stated in the eligibility documents from students who were evaluated for SLD but not identified? It was hypothesized that differences in ORF scores would exist between special education eligible students and non-eligible students. Non-eligible students overall would have higher ORF scores than eligible students.

Research Question 3

Do students evaluated for and identified as SLD and students who were evaluated for SLD but not identified differ in their reading fluency scores reported at the time of eligibility and stated in the in the eligibility documents as a function of the income level of their school district? It was hypothesized that there would be an interaction effect between school classification and special education eligibility on students' ORF scores. First, non-eligible students from high-income schools would have higher ORF scores than eligible students from mid/high-income schools. Second, eligible students from mid/high-income schools would have higher ORF scores than eligible students in low-income schools. Third, there would be no difference in ORF scores between eligible students from mid/high-income schools and non-eligible students from low-income schools. Fourth, non-eligible students from mid/high-income schools would have higher ORF scores than eligible students from low-income schools. Fifth, non-eligible students from low-income schools would have higher ORF scores than eligible students from low-income schools. Sixth, non-eligible students in mid/high-income schools would have higher ORF scores than non-eligible students from low-income schools.

Design

A quasi-experimental factorial design was used for this study (see Table 1). The independent variables were the SES of the school and the special education eligibility status of the student. The SES of the school was identified as high income, middle income, or low income. The student's eligibility status was reported as eligible or not eligible for special education services as a student with an SLD. The dependent variable was the student's ORF score reported at the time of eligibility and stated in the eligibility documents.

Table 1

Research Design Diagram Using an Experimental 2 x 3 Factorial Design

Eligibility Status	Low-SES	Mid-SES	High-SES
Eligible	Mean ORF percentile score of students found eligible for SLD and attending low-SES schools.	Mean ORF percentile score of students found eligible for SLD and attending mid-SES schools.	Mean ORF percentile score of students found eligible for SLD and attending mid-SES schools.
Not Eligible	Mean ORF percentile score of students found not eligible for SLD and attending low-SES schools.	Mean ORF percentile score of students found not eligible for SLD and attending mid-SES schools.	Mean ORF percentile score of students found not eligible for SLD and attending High-SES schools

Note. SES=Socio-Economic Status

Population

Archival and anonymous data from the 2006-2017 school years were examined in this study. The data were collected from six school districts located in a Midwestern state. The names of the school districts have been withheld to ensure confidentiality. Table 2 provides an illustration of the study site population, including grade levels served, the percentage of low-income students, the percentage of students with an IEP, and the SES of school. The demographic data were taken from the Illinois State Board of Education Report Cards (2006, 2013, 2016). While some change in the demographic data occurred from 2006 through 2016, overall the districts' classification of low-, middle- or high-SES has remained stable.

Table 2

Study Site Population, Grade Levels Served, Percentage of Low-Income Students, Percentage of Students With an IEP, and the SES of the School

Study Site	Population	Grade Level	% of Low Income	% with IEP	SES
Site 1	461	K-8	95	16	Low
Site 2	300	K-8	70	11	Low
Site 3	1023	PreK-12	22	13	High
Site 4	381	PreK-8	29	12	High
Site 5	113	K-8	47	22	Mid
Site 6	1570	PreK-12	41	15	Mid

Note. IEP= Individualized Education Program, SES=Socio-Economic Status

Study site 1 was a suburban school district with a student-to-teacher ratio of 12 to 1. In terms of ethnicity, the district reported that 17% of its students were English language learners; no students were Asian/Pacific Islander, 6.7% of students were White/non-Hispanic, 34.5% were of Hispanic descent and, 55.1% were identified as an African American. The demographic data were taken from the Illinois State Board of Education Report Card (2015-2016).

Study site 2 was a suburban school district and reported a student-to-teacher ratio of 16 to 1. The district reported that 10% of its students were English language learners; no students were Asian/Pacific Islander, 34.7% of students were White/non-Hispanic, 4.7% were African American, and 55.7% were of Hispanic descent. The demographic data were taken from the Illinois State Board of Education Report Card (2015-2016).

Study site 3 is a suburban school district with a student-to-teacher ratio of 18 to 1. The district reported that 81.2% of its students were White/non-Hispanic, 13.7% were of Hispanic descent, 2.2% were African American and less than 1% identified as Asian/Pacific Islander. The district reported 1.4% of its students were English language learners. The demographic data were taken from the Illinois State Board of Education Report Card (2015-2016).

Study site 4 was a suburban school district that reported a student-to-teacher ratio of 16 to 1. The district reported that no students were English language learners; 89.8% were White/non-Hispanic, 5% were of Hispanic descent, 3.9% were African American, and less than 1% identified as Asian/Pacific Islander. The demographic data were taken from the Illinois State Board of Education Report Card (2015-2016).

Study site 5 was a suburban school district that reported a student-to-teacher ratio of 8 to 1. The district reported that 7% of students were English language learners; 42.5% were White/non-Hispanic, 26.5% were of Hispanic descent, 24.8% were African American and no students were identified as Asian/Pacific Islander. The demographic data were taken from the Illinois State Board of Education Report Card (2015-2016).

Study site 6 was a suburban school district with a student-to-teacher ratio of 16 to 1. The district reported that 1.0% of its students were English language learners; 91.7% were White/non-Hispanic, 3.9% were of Hispanic descent, 0.3% were African American and less than 1% identified as Asian/Pacific Islander. The demographic data were taken from the Illinois State Board of Education Report Card (2015-2016).

Demographic data discussed in this section are provided in Table 3. The student-to-teacher ratio and percentage of English Language Learners for each study site are provided. In addition, the racial make-up of each site is presented.

Table 3

Study Site Student/Teacher Ratio, English Language Learners, Asian/Pacific Islander, White/Non-Hispanic, Hispanic, African-American

Study Site	Student/Teacher Ratio	ELL	Asian/Pacific Islander	White/non-Hispanic	Hispanic	African-American
Site 1	12:1	17%	0%	6.7%	34.5%	55.1%
Site 2	16:1	10%	0%	34.7%	55.7%	4.7%
Site 3	18:1	1.4%	<1%	81.2%	13.7%	2.2%
Site 4	16:1	0%	<1%	89.8%	5%	3.9%
Site 5	8:1	7%	0%	42.5%	26.5%	24.8%
Site 6	16:1	1.0%	1%	91.7%	3.9%	0.3%

Note. ELL = English Language Learner

Assignment

Schools were assigned to the low-, mid-, or high-SES category according to the percentage of students reported as receiving free or reduced meals. Initially the National Center for Education Statistics (NC) guidelines for defining the poverty level of a school based on the percentage of students receiving free or reduced lunch was used to categorize the school districts in this study. The NC classified a school as high poverty if greater than 75% of the students received assistance, mid-high poverty 51-75%, mid-low poverty 25-50% and low poverty schools had less than 25% of the student population receiving a free or reduced lunch. Because the schools that agreed to participate in the study did not line up perfectly with these guidelines, three groups were created that were reasonably separated from each other in the percentages of students on free or reduced lunch. As indicated in Table 4, the low-SES group had one site that was above the NC guidelines and one slightly below. The mid-SES sites were in the mid-low poverty range and one of the high-SES sites was in the high NC range and one site was slightly below it. Schools that had reported 70% or more of the student population receiving free or reduced meals were included in the low-SES category. The mid-SES schools reported 30% to 69% of their students receiving free or reduced meals and the high-SES schools reported less than 29% of students receiving free or reduced meals. Student data from sites one and three were included in the low SES group. Student data from sites five and six were included in the middle-income SES group and student data from sites four and two were included in the high-income SES group. Each SES group was further divided into two separate groups, students identified as SLD or not-SLD based on the eligibility status reported in that student's eligibility documents.

Table 4

The Percentage of Students That Receive Free or Reduced Lunch (FRL) as Reported by School Sites 1-6

School Site	Low-SES	Mid-SES	High-SES
Site 1	95%		
Site 2	70%		
Site 3			22%
Site 4			29%
Site 5		47%	
Site 6		41%	

Note. SES=Socio-Economic Status

Sample

Inclusion Criteria

The subjects of this study were students in second through twelfth grades who have been evaluated for special education services due to a suspected SLD and for whom an oral reading fluency score was reported at the time of eligibility and stated in the in the eligibility documents. These students attended one of ten school districts that are served by a special education cooperative and from which the principal researcher received permission to gather data.

Exclusion Criteria

Exclusion criteria were based on the availability of data to be analyzed. Students whose eligibility records did not include an oral reading fluency score were excluded from this study. In addition, cases that were initiated by parent referral were removed from the data set. After a review of the data revealed significant outliers, the principal evaluator interviewed the data collectors and it was indicated that parent referrals were included in the original data set. Data collectors then identified the reference number of students that were referred by their parents for evaluation and the principal researcher removed the data associated with that reference number. Students referred by their parent may have not gone through procedures associated with the RTI process that would have triggered an evaluation due to lower than expected ORF scores, but rather by-passed that process and moved directly to an evaluation.

Measurement

Dependent Variable

The dependent variable for this study was the ORF score reported at the time of eligibility and stated in the in the eligibility documents of students who were evaluated for special education eligibility under the category of SLD. ORF scores, obtained by administering a curriculum-based measurement in reading and reported in the eligibility document, were used for this study. ORF scores were converted into percentile scores using the AIMSweb National Norms Table, Curriculum-Based Measures in Reading retrieved from Pearson Education. The principal researcher of this study contacted the Director of Research at AIMSweb and accessed the norm table that corresponded to the year that each student's ORF was administered and converted to percentiles according to that table (J. Bielinski, personal communication, February 12, 2018).

A large body of research exists examining the reliability and validity of ORF measures and in particular AIMSweb probes. A study examining the test-retest reliability of benchmark data collected over eight years, with three consecutive years using AIMSweb Reading Curriculum-Based Measurement (R–CBM) probes, indicated a test-retest reliability of .93 (Christ & Silberglitt, 2007). Howe and Shinn (2002) reported high alternate-form reliability across grades from .81 to .90 using probes administered within a month of each other. Both studies indicate that the reliability of AIMSweb R-CBM benchmark scores is maintained whether over time or using alternative forms. A criterion validity of .70 was established between students' AIMSweb R-CBM benchmark scores and their Illinois and North Carolina state standardized reading test scores administered at the end of 2009-2010 school year for grades three through five (NCS Pearson, 2012).

Independent Variables

The independent variables were the SES of the school and the special education eligibility status of the student. The SES of the school was identified as high income, middle income, or low income as described above. The eligibility status of the student was based on the student's eligibility status either eligible or non-eligible.

Procedure

This study examined existing archival data. ORF scores, eligibility status, academic year of evaluation, and demographic information (sex, age and grade) were gathered by school personnel, who typically work with that data as part of daily duties at the respective study site. Personally-identifiable information was removed from all student data before they were provided to the primary researcher. An alphanumeric code (Student 1, Student 2, etc.) was used to identify student records.

First, the principal investigator provided the school personnel with a copy of the approved project proposal and discussed the desired participant data set. Using the databases maintained by individual school districts, school psychologists and a special education secretary retrieved a list of students meeting the parameters of the study. Data was collected on students who were evaluated to determine their eligibility status as a student with or without an SLD from academic school years starting in 2006 and going through 2017. The data were compiled by school psychologists and a special education secretary into six spreadsheets, representing Study Sites 1 through 6. The special education secretary then merged the six spreadsheets to three spreadsheets representing low-, mid-, and high-income schools. Data was then sent as an email attachment from the special education secretary to the principal investigator. The principal investigator maintained the data on her personal laptop which was password protected and in control of the principal investigator. The data were analyzed using Statistical Package for the Social Sciences (SPSS) software. At no time did the primary researcher receive access to personally-identifiable data.

Data Analyses

Table 5 provides an illustration of the research questions, hypotheses, statistical methods used, and assumptions. The results were analyzed using SPSS, version 22 for Windows using an analysis of variance (ANOVA) procedure. The archival and anonymous data from six Midwestern school districts were collected for the 2 x 3 model ANOVA. The factorial ANOVA determined whether the combination of eligibility status and SES interacted to create statistically significant mean differences on the ORF dependent variable. The rejection level for all analyses was set at $p = .05$.

An initial analysis was completed using three categories of the independent variable of SES. After analysis revealed there was no significant difference between the mid-SES and high-SES categories (see Appendix 1), those two categories were collapsed to form the mid/high SES category. A subsequent analysis was completed using two categories of independent variable SES.

A two-way ANOVA was performed to examine the impact of two independent variables on one dependent variable. The two-way ANOVA is an appropriate test because it models an interaction, as well as examines the individual effect of each independent variable (Hinton, McMurray, & Brownlow, 2014). In this study, the independent variables were the SES of the school district and the students' eligibility status, while the students' ORF scores are considered the dependent variable.

Table 5

Research Questions, Hypotheses, Variable, Statistical Method, and Assumptions

Research Questions	Hypotheses	Variables	Methods	Assumptions
Do reading fluency scores of students evaluated for SLD differ as a function of the income level of their school district?	Significant differences in ORF scores will exist between high-income schools and low-income schools.	ORF scores and SES of school	Two-way ANOVA	Normality, Homogeneity of Variance, Independence, No significant outliers, Two independent variables, Continuous dependent variables
Do students evaluated for and identified as SLD differ in their ORF scores from students who were evaluated for SLD but not identified?	Significant differences in ORF scores will exist between special education eligible students and non-eligible students.	ORF scores and SES of school	Two-way ANOVA	Normality, Homogeneity of Variance, Independence, No significant outliers, Two independent variables, Continuous dependent variables
Do students evaluated for and identified as SLD and students who were evaluated for SLD but not identified differ in their ORF scores s as a function of the income level of their school district?	There will be an interaction effect between school classification and special education eligibility on student's ORF scores	ORF scores and SES of school	Two-way ANOVA	Normality, Homogeneity of Variance, Independence, No significant outliers, Two independent variables, Continuous dependent variables
What impact does the combination of school SES, and special education classification, SLD or non-SLD, have on a student's academic performance?	There will be an interaction effect between school classification and special education eligibility on student's ORF scores	ORF scores and SES of school	*t*-tests	Normality, Homogeneity of Variance, Independence, No significant outliers, Two independent variables, Continuous dependent variables

Note. SES=Socio-Economic Status, ORF= Oral Reading Fluency, SLD= Specific Learning Disability

The data collected for this study were analyzed to determine if the assumptions for ANOVA had been met. There are six assumptions for a two-way ANOVA. First, there was one continuous dependent variable that was at the ratio level. Next there were two independent variables, each consisting of at least two categorical groups. Third, participants were assigned to only one group or category, referred to as the independence of observations. Fourth, data were inspected for significant outliers which can cause problems when generalizing results to the population. Fifth, data were analyzed to determine if they reflect a normal distribution. Lastly, the data were analyzed to determine if the variances in cells of the design were equal (Hinton, McMurray, & Brownlow, 2014; Lund & Lund, 2013).

Additional analysis included a series of *t*-tests to compare the individual cell means. The three assumptions for *t*-tests; independent observations, normality and homogeneity of variance, were reviewed to determine if the assumptions for *t*-tests had been met (Pallant, 2010).

Summary

The methods and procedures that will be used to answer the three research questions evaluating the difference between the ORF scores reported at the time of a student's eligibility meeting and the SES of the school district were discussed in this chapter. The purpose of the study and design were explained, and a description of the population and sample, as well as the method of assignment were discussed. The instrument used, ORF probes, was discussed and the reliability and validity presented. The procedures used for statistical analyses that answered each research questions were provided.

CHAPTER 4

RESULTS

Research Questions

The purpose of this study was to evaluate the impact of a school's income level on oral reading fluency (ORF) reported for students identified as having a specific learning disability (SLD) versus those who have been referred for the assessment of eligibility but were not identified as having an SLD during the special education eligibility process. To investigate the phenomena, a 2 (eligible, not eligible) x 2 (low-, mid/high-socio-economic status) factorial design with one dependent variable, the ORF score of students who were evaluated for special education eligibility under the category of SLD, was used. The independent variables were the socio-economic status (SES) of the school and the special education eligibility status of the student. Further analysis included a series of *t*-tests to compare the individual cell means. The three research questions posed are as follows:

Research Question 1

Do reading fluency scores reported at the time of eligibility and stated *in the eligibility documents of students evaluated for SLD differ as a function of the income level of their school district?*

It is hypothesized that significant differences in ORF scores will exist between high-income schools and low-income schools. The students who attend mid/high-income schools and qualify for special education services overall will have higher ORF scores than students who attend low-income schools and qualify for special education services.

Research Question 2

Do students evaluated for and identified as SLD differ in their reading fluency scores reported at the time of eligibility and stated *in the eligibility documents from students who were evaluated for SLD but not identified?*

It is hypothesized that differences in ORF scores will exist between special education eligible students and non-eligible students. Non-eligible students overall will have higher ORF scores than eligible students.

Research Question 3

Do students evaluated for and identified as SLD and students who were evaluated for SLD but not identified differ in their reading fluency scores reported at the time of eligibility and stated *in the eligibility documents as a function of the income level of their school district?*

It is hypothesized that there will be an interaction effect between school classification and special education eligibility on students' ORF scores. First, non-eligible students from mid/high-income schools will have higher ORF scores than eligible students from mid/high-income schools. Second, eligible students from mid/high-income schools would have higher ORF scores than eligible students in low-income schools. Third, there will be no difference in ORF scores between eligible students from mid/high-income schools and non-eligible students from low-income schools. Fourth, non-eligible students from mid/high-income schools will have higher ORF scores than eligible students from low-income schools. Fifth, non-eligible students from low-income schools will have higher ORF scores than eligible students from low-income schools. Sixth, non-eligible students in mid/high-income schools will have higher ORF scores than non-eligible students from low-income schools.

Tests of Assumptions

Three out of six assumptions associated with an ANOVA were met. The dependent variable was measured at the continuous level, and the independent variables consisted of at least two categorical groups (eligible or not eligible and low- and mid/high SES). Thirdly, the assumption of independence was also met; the data for each case were assigned to only one group making it unique to that group. The final three assumptions were violated. The data were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$) for two conditions (low-, mid/high-SES), of the not eligible group; however, the data for the two conditions produced a non-normal distribution and were positively skewed. The decision was made to continue with the analysis because ANOVAs are considered fairly robust to deviation from normality, especially when the groups were similarly skewed (Maxwell & Delaney, 2004).

The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variance ($p = .025$). ANOVA is generally forgiving if the ratio of the largest group variance to the smallest group variance is similar (less than 3; Lund & Lund, 2013), and after transforming the data with similar results, the decision was to continue with the analysis. Outliers were identified using boxplots. The inclusion of outliers may not be considered statistically ideal (Lund & Lund, 2013b), but outliers that provide accurate data may be justified if those data lead to a better understanding of the trends being studied (Johnson & Wichern, 2007). An inspection of the outliers did not provide valid reasons to reject them as invalid, therefore, the outliers remained as part of the data set (Johnson & Wichern, 2007; Lund & Lund, 2013b). Further, the data generated by this study were analyzed in three ways; keeping the outliers, removing the outliers, and transforming the data, all with similar results (see Appendix

1). The original data with the outliers were chosen to best represent the phenomena being studied. The final sample used in this study is presented in Table 6.

Table 6

Number of Cases per Low-, Mid-, and High-SES Level, Based on Eligibility

Eligibility	Low-SES	Mid-SES	High-SES	Total
Eligible	46	63	62	171
Non-Eligible	6	9	18	33

Note. SES=Socio-Economic Status

Results of Analyses of Research Questions

An initial analysis was completed using three categories of the independent variable SES. After analysis revealed there was no significant difference between the mid-SES and high-SES categories (see Appendix 1), those two categories were collapsed to form the mid/high SES category (see Table 7). The new category allowed further analysis to be performed using the low- and mid/high-SES categories to test the hypotheses presented earlier. The number of students classified as eligible or non-eligible in the new categories, low- and mid/high-SES are presented in Table 8.

Table 7

Research Design Diagram Using an Experimental 2 x 2 Factorial Design

Eligibility Status	Low-SES	Mid/High SES
Eligible	Mean ORF percentile score of students found eligible for SLD and attending low-SES schools	Mean ORF percentile score of students found eligible for SLD and attending mid/high-SES schools
Not Eligible	Mean ORF percentile score of students found not eligible for SLD and attending low-SES schools	Mean ORF percentile score of students found not eligible for SLD and attending mid/high-SES schools

Note. SES=Socio-Economic Status, ORF= Oral Reading Fluency, SLD= Specific Learning Disability

Table 8

Number of Cases per Low-, Mid/High-SES Level, Based on Eligibility, Collapsed Sample

SES	Non-Eligible Students	Eligible Students
Low	6	46
Mid/High	27	98

Note. SES=Socio-Economic Status

The first research question was analyzed by examining the results of the main effect for socio-economic status using a two-way ANOVA with two independent variables: SES of the school and eligibility status of the student. The independent variable, SES, consisted of two categories; low- and mid/high SES. Descriptive statistics for this analysis are presented in Table 9. There was a statistically significant main effect of SES and moderate effect size according to Cohen's (1988) guidelines (see Table 10). The hypothesis for research question 1 was accepted. There was a significant difference in ORF scores between mid/high-income schools and low-income schools. The students who attended mid/high-income schools had a higher mean ORF scores than students who attended low-income schools.

Table 9

Oral Reading Fluency Means and Standard Deviation Percentiles of Students in Low-, and Mid/ High-SES Schools Based on Eligibility Status

	Low SES		Mid/High SES		Combined	
Eligibility Status	M	SD	M	SD	M	SD
Eligible	9.6	.10	18.9	.16	16.0	.15
Non-Eligible	27.5	.16	51.3	.19	47.0	.20
Combined	11.7	.12	25.9	.21	21.8	.20

Table 10

ANOVA Test of Between-Subjects Effects for Collapsed Categories

Source	*df*	*F*	*p*	*Partial Eta Squared*
SES	1	20.14	.000*	.104
Eligibility	1	46.37	.000*	.211
SES*Eligibility	1	3.88	.051	.022
Error	173			

Note. *Significant at the $p < 0.05$ level SES=Socio-Economic Status

The second research question was analyzed by examining the results of the main effect for eligibility status using a two-way ANOVA with two independent variables: SES of the school and eligibility status of the student. The independent variable eligibility status consisted of two categories: eligible for special education service and not eligible for special education services. Descriptive statistics for this analysis are presented in Table 9. There was a statistically significant main effect of eligibility status and large effect size according to Cohen's (1988) guidelines (see Table 10). The hypothesis for research question 2 was accepted. A significant difference in mean ORF scores existed between non-eligible and eligible students. Students who were found not eligible for special education services had higher ORF scores than students who were found eligible for special education services.

Research Question 3 posited an interaction between SES and eligibility status. The interaction was close to significance but had a small effect size according to Cohen's (1988) guidelines. Because a nonsignificant finding may mask differences (see Table 10), a series of *t*-tests were run to compare the individual cell means. The three assumptions for *t*-tests were that there are independent observations, normality and homogeneity. The assumptions for *t*-tests were reviewed and violations for equality of variances were found according to results of Levene's Test for the data for hypotheses 2 and 4 ($p = .001$). For these analyses, adjusted degrees of freedom (*df*) was used in the analysis (Pallant, 2010). The Levene's Test was not significant for the other hypotheses. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variance ($p=.025$).

Hypothesis 1: Non-eligible students from mid/high-income schools will have higher ORF scores than eligible students from mid/high-income schools. There was a significant difference in the mean scores between the two groups, $t\ (123) = 8.96$, $p = .000$; the mean ORF score of non-eligible students from mid/high-income schools was greater than the mean ORF score of eligible students from mid/high-income schools (see Table 11). The hypothesis was supported.

Hypothesis 2: Eligible students from mid/high-income schools will have higher ORF scores than eligible students in low-income schools. There was a significant difference in the mean scores between the two groups, $t\ (128.6) = 3.61$, $p=.000$; the mean ORF score of eligible students from mid/high-income schools was higher than the mean ORF score of eligible students from low-income schools (see Table 11). The hypothesis was supported.

Hypothesis 3: There will be no difference in ORF scores between eligible students from mid/high income schools and non-eligible students from low-income schools. There was not a significant difference in the mean scores between the two groups, t (102) = -1.27, p = .206; (see Table 11). The hypothesis was supported.

Hypothesis 4: Non-eligible students from mid/high-income schools will have higher ORF scores than eligible students from low-income schools. There was a significant difference in the mean scores between the two groups, t (35.2) = 12.28, p = .000; the mean ORF score of non-eligible students from mid/high-income schools was higher than the mean ORF score of eligible students from low income schools (see Table 11). The hypothesis was supported.

Hypothesis 5: Non-eligible students from low-income schools will have higher ORF scores than eligible students from low-income schools. There was a significant difference in the mean scores between the two groups, t (50) = 3.77, p = .000; the mean ORF score of non-eligible students from low-income schools was higher than the mean ORF score of eligible students from low income schools (see Table 11). The hypothesis was supported.

Hypothesis 6: Non-eligible students in mid/high-income schools will have higher ORF scores than non-eligible students from low-income schools. There was a significant difference in the mean scores between the two groups, t (31) = 2.88, p = .007; the mean ORF score of non-eligible students from mid/high-income schools was higher than the mean ORF score of non-eligible students from low income schools (see Table 11). The hypothesis was supported.

Table 11

Results of Independent Sample t-Test (Two-Tailed)

Hypothesis	*t*	*df*	*p*
1. Non-Eligible, Mid/High-Income / Eligible, Mid/High-Income	8.69	123	.000*
2. Eligible, Mid/High-Income / Eligible, Low-Income	3.61	128.6	.000*
3. Eligible, Mid/High Income / Non-Eligible, Low-Income	1.27	102	.206
4. Non-Eligible, Mid/High Income / Eligible, Low-Income	12.28	35.2	.000*
5. Non-Eligible, Low-Income / Eligible, Low-Income	3.77	50	.000*
6. Non-Eligible, Mid/High-Income / Non-Eligible, Low-Income	2.88	31	.007*

*Significant at the $p < 0.05$ level

Summary

A two-way ANOVA was conducted to examine the effects of SES and eligibility status on the ORF scores reported in the eligibility documents. The data collected for this study was analyzed to determine if the assumptions for ANOVA had been met. Genuine outliers were identified by inspecting boxplots, normality was assessed by Shapiro-Wilk's normality test for each cell and homogeneity of variances was assessed by Levene's test. The data were not normally distributed but were similarly skewed. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variance. ANOVA is generally forgiving if the ratio of the largest group variance to the smallest group variance is similar (less than 3; Lund & Lund, 2013), and after transforming the data with similar results, the decision was to continue with the analysis. After analysis revealed there was no significant difference between the mid-SES and high-SES categories those two categories were collapsed to form the mid/high SES category. The new category allowed further analysis to be performed using the low- and mid/high-SES categories to test the hypotheses presented earlier.

A two-by-two factorial design with one dependent variable, ORF score, was used to test the three research questions. The data was analyzed to determine whether ORF scores differ as a function of school SES and special education status. The results of a two-away ANOVA supported the hypothesis from research question 1 that mid/high-income school student ORF scores are higher than low-income school ORF scores. The hypothesis from research question 2 that a significant difference in ORF scores existed between non-eligible and eligible students was also supported. The non-eligible students had a significantly higher ORF mean score than the eligible students.

To address Research Question 3, the interaction of the 2x2 ANOVA was interpreted and the interaction was found to be not significant. Therefore, a series of independent-sample *t*-tests were conducted. In all but one comparison, non-eligible students displayed higher ORF scores than eligible students. The exception was the comparison of low-income non-eligible students with mid-high-income eligible students; scores in this comparison were not significantly different. Also, as expected, eligible students in mid/high-income schools had higher scores than eligible students in low-income schools.

CHAPTER 5

DISCUSSION

In this study the academic performance of students who were evaluated for special education eligibility under specific learning disability (SLD) was explored to determine if the students' academic performance differed as a function of the income level of their school district. Only the present levels of performance of students that were referred for an evaluation as indicated by their reported oral reading fluency (ORF) scores were analyzed.

Regardless of whether schools use the ability-achievement discrepancy or response to intervention (RTI) model to identify students who are eligible for special education services, the decision about whether to refer a student for an evaluation is critical to that student eventually receiving those services. Ysseldyke et al. (1983) conducted research on how school personnel determined if a student had an SLD. They found significant variability in the criteria used by the state and local education agencies when referring and identifying a student with an SLD. They also found significant differences in the number of referrals, evaluations, and students found eligible for special education services based upon the state in which the student attended school.

States have left the decision of setting acceptable or nonacceptable academic performance levels and whether the district uses national or local norms up to the LEA (Walker, 2010; Zirkel, 2011). Swets (1992) posited that academic performance levels can be artificially set to meet the specific needs of a particular situation. For example, if a school had limited resources to meet the actual needs of its students, the LEA may use an analysis of the benefits versus the cost when determining an appropriate academic performance level. That decision may impact whether a student is referred for evaluation to determine his or her eligibility for special education services. The results of setting academic levels too low could result in a student not receiving a referral to determine his or her eligibility for special education services. However, increasing academic performance levels could lead to unnecessary evaluations, increasing costs to the school in terms of personnel and materials that could be better utilized in other areas (Barth et al., 2008). If schools determine adequate levels of performance based on a cost verses need paradigm, it may be that lower-socio-economic status (SES) schools that have large numbers of students who are academically deficient may set lower academic expectations of adequate progress and consequently lower thresholds for referral for special education evaluations.

Given the importance of academic performance levels and whether a student will have access to an evaluation that may lead to special education eligibility, more information was needed to understand the impact of the level of school poverty on the current method of selecting the acceptable or nonacceptable academic performance levels. In this study, the relationship between a school's level of poverty and the academic performance levels reported in special education eligibility documents was investigated.

Discussion of Research Questions and Results

Discussion of Research Question 1

Do reading fluency scores reported at the time of eligibility and stated in the eligibility documents of students evaluated for SLD differ as a function of the income level of their school district?

It was hypothesized that significant differences in ORF scores of students evaluated to determine eligibility for special education services would exist between mid/high-SES schools and low-SES schools. The results of a two-way ANOVA supported the hypothesis that there was a statistically significant main effect of SES. ORF scores of students from the mid/high-SES schools were higher than the ORF scores of students from the low-SES schools.

The findings of this study are consistent with previous research; students attending schools identified as low-SES have lower academic performance levels. Coleman (1966), Hallihan and Kubischek (2010), and Jenchs (1985) found a school's characteristics, such as the level of poverty of the school and student body characteristics, impact an individual student's achievement. Shinn, Tindal, Spira, and Marston (1987) found that students identified as SLD and typically achieving students from high-achieving schools scored higher on all measures than their peers in low achieving schools. Because there are larger numbers of students with academic deficiencies in low-SES schools, the current study suggests that academic levels reported at the time of determining eligibility for special education services may be lower in low-SES schools than in mid/high-SES schools. That is, a school's poverty level not only influences the performance of individual students, but also the decision regarding who is referred for an evaluation to determine special education eligibility.

Discussion of Research Question 2

Do students evaluated for and identified as SLD differ in their reading fluency scores reported at the time of eligibility and stated in the eligibility documents from students who were evaluated for SLD but not identified?

It was hypothesized that differences in ORF scores would exist between special education eligible students and non-eligible students. Non-eligible students overall would have higher ORF scores than eligible students.

A two-by-two factorial design with one dependent variable, ORF score, was used to test this hypothesis. The results of a two-away ANOVA supported the hypothesis that a statistically significant main effect of eligibility was present. A significant difference in ORF scores existed between non-eligible and eligible students. Non-eligible students obtained higher ORF scores than eligible students.

This finding is consistent with the National Center for Learning Disabilities report that students with SLD have lower academic achievement than those who are not identified as SLD (Mellard, Deshler, & Barth, 2004). Common attributes of students found eligible with an SLD are underachievement in reading, math calculation and reasoning, oral and written expression, and listening comprehension. Shinn, Tindal, Spira, and Marston (1987) compared the academic achievement of three sets of students, identified as SLD, low-achievers/Title 1, and general education/average achievers. The SLD students performed at the 3rd percentile, low-achievers/Title 1 students at the 20th percentile, and general education/average achievers at the 50th percentile. Peterson and Shinn (2002) found that students who obtained standardized achievement scores on the extreme low-end of normative scores, were identified as having an SLD. A meta-analysis of 79 studies comparing academic achievement scores of students identified as SLD to those identified as low-achieving, found that the SLD group had scores that were more than 1.5 standard deviations lower than the low-achieving group (Glass, McGaw, & Smith, 1981).

This result is consistent with the findings of numerous research articles. Researchers have found evidence that students identified as having an SLD in reading perform at the lowest academic levels. Speece and Pericola (2001) found students that were identified as having an SLD in reading had scores that were significantly lower than the scores of students who were identified as at-risk for reading problems. Shaywitz, Escobar, Shaywitz, Fletcher, and Makuch (1992) found that reading scores of students identified as dyslexic were represented in the tail end of a normal distribution and Gottlieb, Alter, Gottlieb, and Wishner (1994) reported that students identified as SLD were the lowest achieving students. During the 2012-2013 school year, students with disabilities earned scores that were 32-41 percent lower than their peers on state tests, with the biggest gap occurring in middle school reading (Samuels, 2015).

The results of this study indicate that students who were found eligible, on the whole, are lower in academic achievement than non-eligible students, which is congruent with past research. However, a significant exception was found and will be explained further in the next section.

Discussion of Research Question 3

Do students evaluated for and identified as SLD and students who were evaluated for SLD but not identified differ in their reading fluency scores reported at the time of eligibility and stated in the in the eligibility documents as a function of the income level of their school district?

It was hypothesized that there would be an interaction effect between school classification and special education eligibility on students' ORF scores. Because the interaction was not significant, a series of independent sample *t*-tests were conducted on the mean ORF scores of four groups; low-income eligible or non-eligible and mid/high-income eligible or non-eligible. The results of the *t*-tests supported the hypotheses that students identified as SLD have lower ORF scores than students who were not identified as SLD regardless of the income level of the school with one significant exception.

Results for the first, fourth and fifth hypothesis are consistent with the findings of research question 2, which examined the differences in ORF scores between special education eligible students and non-eligible students. Non-eligible students overall had higher ORF scores than eligible students.

The first hypotheses, that non-eligible students from mid/high-SES schools would have higher ORF scores than eligible students from mid/high-SES schools, and the fifth hypotheses, that non-eligible students from low-SES schools would have higher ORF scores than eligible students from low-SES schools, were supported. There was a significant difference in the mean scores between non-eligible students and eligible students. For both conditions, the mean ORF score of non-eligible students was greater than the mean ORF score of eligible students whether they attended a mid/high SES school or a low-SES school.

The fourth hypotheses, that non-eligible students from mid/high-SES schools would have higher ORF scores than eligible students from low-SES schools was also supported. There was a significant difference in the mean scores between the two groups; the mean ORF score of non-eligible students from mid/high-SES schools was higher than the mean ORF score of eligible students from low-SES schools.

The results for the tests of the second and sixth hypothesis are consistent with the findings of research question 1; significant differences in ORF scores of evaluated students would exist between mid/high-SES schools and low-SES schools. The second hypotheses, that eligible students from mid/high-SES schools would have higher ORF scores than eligible students from low-SES schools and the sixth hypothesis, that non-eligible students from high-SES schools will have higher ORF scores than non-eligible students from low-SES schools were supported by the data. There was a significant difference in the mean scores between the two groups; the ORF score of eligible students from mid/high-SES schools was higher than the ORF score of eligible students from low-SES schools; similarly, the ORF score of non-eligible students from mid/high-SES schools was higher than the mean ORF score of non-eligible students from low-SES schools.

Analyzing the data from the third hypotheses exposed new, but not unexpected, results. The hypotheses stated there would be no difference in ORF scores between eligible students from mid/high-SES schools and non-eligible students from low-SES schools. There was not a significant difference in the mean scores between the two groups, therefore the hypotheses were supported.

These findings are in conflict with previous reports that students identified as having an SLD achieve at significantly lower rates than students who were considered at-risk or average achievers. National Center for Learning Disabilities report that students with SLD have lower academic achievement than those who are not identified as SLD (Mellard, Deshler, & Barth, 2004). Common attributes of students found eligible with an SLD are underachievement in reading, math calculation and reasoning, oral and written expression, and listening comprehension. Shinn (2017) compared the academic achievement of three sets of students, identified as SLD, low-achievers/Title 1, and general education/average achievers. The students identified as having an SLD performed at the 3rd percentile, low-achievers/Title 1 students at the 20th percentile, and general education/average achievers at the 50th percentile. Peterson and Shinn (2002) found that students who obtained standardized achievement scores on the extreme low-end of normative scores were identified as having an SLD. A meta-analysis of 79 studies comparing academic achievement scores of students identified with an SLD to those identified as low-achieving found that the SLD group had scores that were more than 1.5 standard deviations lower than the low-achieving group (Glass, McGaw, & Smith, 1981).

Alternatively, researchers have found that a student's eligibility status may be impacted by the school they attend. Singer, Palfrey, Butler, and Walker (1989) found that students' IDEA eligibility changed when using eligibility criteria from different districts and that IDEA eligibility categories were correlated to parental income. Further, while there were minor variations in the academic performance of students identified as SLD across the districts, only 64% of those students were consistently identified as SLD using the criteria from the different districts. Additional research advanced that in more prosperous areas, students were more likely to be found eligible under SLD than other socially, less acceptable eligibility categories such as emotional disturbance (Lester & Kelman, 1997; Singer et al., 1989).

Consequently, it is possible that, in the current study, students from low-SES schools that were not referred for an SLD evaluation may have been referred for an evaluation if they attended a mid/high-SES school. The inverse may be true as well, that students referred and identified as eligible in a mid/high-SES school may not have been found to be eligible or may have never been referred for evaluation if they attended a low-SES school. Therefore, it is conceivable that students may be erroneously identified as either eligible or non-eligible, simply based on the school they attend.

Allowing schools to set their academic performance levels has provided an inconsistent system for identifying students with an SLD. In fact, if SLD has a biological component, "a disorder in one or more of the psychological processes…." (U.S. Department of Education [USDOE], 1977, p. 65083), then how would moving from one school district to another remediate that biological disorder? This would be the equivalent of a student diagnosed with diabetes changing schools, and no longer being diabetic.

Limitations

There were a number of imitations with this study. The sample size of non-eligible students from the low-SES schools was small. One reason for this situation is that with the advent of MTSS/RTI, non-eligible students are often not referred because they display adequate response to the intervention before the referral is considered. Therefore, there is a high likelihood that once a student is referred for an evaluation that they will be identified as SLD (VanDerHeyden, Witt, & Gilbertson, 2007). Future studies should strive to gather data from a larger sample size which would increase internal validity.

It is unknown if the ORF score reported in the eligibility document was generated through benchmarking or progress monitoring. Benchmarking is generally conducted three times per year (fall, winter and spring) in the schools that participated in this study. In addition, benchmarking is generally not associated with intervention. On the other hand, it was not established as to how many progress monitoring scores, or over what duration of time, scores were collect before the RTI team determined a student was a non-responder to the intervention. Gathering information about how benchmarking and progress monitoring is conducted in sampled schools may be beneficial in understanding the differences between the schools' intervention and referral practices as they pertain to ORF scores.

The curriculum, instruction methods, and interventions used by the low-SES and mid/high-SES schools in this study were not investigated. The differences in income level of the school may affect many factors including the provision of adequate core instruction and supplemental interventions, which would have an impact on students' ORF scores. Clarification about the curriculum, instructional methods, and interventions used may shed light on the differences in ORF scores. Future research may improve internal validity if the sample is controlled for whether the curriculum and intervention programs used are research based or meet state standards.

Implications for Future Research

The results of this study may be used to advance future research. First, the study may be replicated with larger sample size and in particular a larger sample of students who were found not eligible, especially in low-income schools. A larger sample size may allow for the data to be cross validated and the findings to be generalized to other populations. Using a larger school district or special education cooperative or soliciting data from school psychologists across the nation may increase the sample size.

Increasing the sample size may also allow for examining extraneous variables (e.g., sex, race) in predicting eligibility for special education services. The sex and race of the student were not considered in this study, and these variables have historically resulted in disproportionate identification for special education services (Burns & Senesac, 2005; Speece & Case, 2001). Researchers have found that ORF probes can be subject to predictive race-related bias (Hintze et al., 2002). Sex also exerts influence on achievement and identification of an SLD, as male students are more likely to be found eligible for special education services (Barth et al., 2014b; Shera, 2014; Shifrer et al., 2011; Talbott et al., 2011). Examining the effect of race and sex on the ORF score reported in the eligibility documents could help determine if SES alone is a predictor of the mean ORF score reported at the time of eligibility and if race and/or sex had an impact on that ORF score.

AIMSweb (Pearson Education, 2011) was the assessment used to obtain the ORF score reported in the eligibility documents. School districts are increasing their use of computer-based interventions and assessments such as STAR Reading (Renaissance Learning, 2012) and assessments such as Measures of Academic Progress (Northwest Evaluation Association, 2004). These products produce standardized scores that are being used more frequently in the RTI decision making process. Future research should examine whether the results of this study could be replicated using the standardized data produced using computer-based programs.

The current study used data from eligibility documents of students found eligible of having an SLD in reading without specifying the area of deficit. Currently, under IDEA students can be found eligible for a reading disability if their achievement is below expectations on measures of ORF, reading comprehension, or basic reading skills. Future research should examine the specific area of eligibility (e.g., ORF, reading comprehension, basic reading skills) as it relates to SES.

The ORF scores reported in the eligibility document was based on national norms. The RTI model allows the LEA to choose between local or national norms when determining a student's academic performance level. The use of local norms allows for the comparison of a student's ORF scores to other students' scores in that district. If the school is a low achieving school, then the local norms ORF percentile score may be represented by a significantly different percentile score then the national ORF percentile score. Future research could replicate this study using local norms to determine if the SES of the school had the same impact on the ORF score reported in the eligibility documents.

Additionally, future research should investigate the type and intensity of interventions used by the school. Intervention type and implementation practices may shed light on the question of why students in low-SES schools had lower ORFs. Studies have shown that interventions designed to remediate struggling readers, particularly those with low-SES, are successful at producing durable gains that help to narrow the income achievement gap (Hagans & Good, 2013; Kim & Quinn, 2012; Morris et al., 2012; Roberts et al., 2013; Vaughn et al., 2012). However, if the interventions are weaker at low-income schools, it is safe to presume poorer outcomes for students' ORF scores could be explained as a result of insufficient instruction or interventions at those schools.

Future research could examine the relationship between the school psychologists' eligibility findings, and that of the evaluation team. Evaluation teams may be going beyond the data found in the school psychologists' evaluations and unduly influencing the eligibility process. Addressing the weight that anecdotal or non-objective data carry versus objective data when evaluation teams are making eligibility decisions should be investigated. Further, how does a school psychologists' understanding and application of best practices when determining eligibility status impact evaluation team decisions?

Lastly, parameters provided to data collectors did not explicitly request the exclusion of students that were found eligible for multiple conditions recognized by IDEA. Future research may examine the trend identified in this study as it would pertain to other and multiple disability categories.

Implications for Policy and Practice

High-Stakes Decision-Making

The results of this study may be useful when attempting to impact change in social policy in regards to establishing a uniformed method for identifying students for special education services and the funding of those services. The referral and eligibility process should continue to be refined to establish a method that would produce more objective decision making and consistent results across schools, districts, and states.

While RTI was introduced, in part, as a better method for identifying students with an SLD, RTI has not resolved a problem that has been prevalent since the beginning of IDEA in the late 1970s. As indicated in the current study, there was a significant difference in the mean ORF scores reported at the time of a student's eligibility for special education under SLD based on whether the student attended a low-SES school or a mid/high-SES school. Allowing schools to set their academic performance levels has provided an inconsistent system for identifying students with an SLD. In fact, if SLD has a biological component, "a disorder in one or more of the psychological processes…." (U.S. Department of Education [USDOE], 1977, p. 65083), then how would moving from one school district to another remediate that biological disorder? This would be the equivalent of a student diagnosed with diabetes changing schools, and no longer being diabetic.

Further, research has established a correlation between parental income and the special education eligibility category for a child (Singer et. al., 1989). Lester and Kelman (1997) posited that in more prosperous states, students were more likely to be found eligible under SLD. Those students were more likely to be mainstreamed then their peers in lower income areas, who exhibited more need-based disabilities and were more likely to be placed in more restrictive settings.

The results of this study suggested that depending on the income level of the school, it is possible that there are a group of students that are not considered for special education services based on their ORF score. The mean percentile for students found eligible at low-SES schools was at the 9th percentile and at the 18th percentile for mid/high-SES schools. Previous research compared the academic achievement of three sets of students, identified as SLD, low-achievers/Title 1, and general education/average achievers. The students identified as having an SLD performed at the 3rd percentile, low-achievers/Title 1 students at the 20th percentile, and general education/average achievers at the 50th percentile (Shinn et al., 2017).

The results indicate a gap in the ORF scores reported in the eligibility documents between the low-SES schools and the mid/high-SES schools. This suggests that a student attending the low-SES school that was evaluated and found not eligible for special education services, may be found eligible for services if that student attended a mid/high-SES school. In addition, students attending mid/high-SES schools that were found eligible under SLD, may not have been referred for an evaluation if they attended the low-SES schools. When considering the difference in the mean percentiles for the two groups, some students were not only being rightfully misidentified for special education services, but also erroneously receiving special education services.

Based on this study, low-SES schools appear to have more students requiring significant support than mid/high-SES schools. Several approaches to improving the consistency of identify students with an SLD across districts should be taken. First, providing training for members of the multi-disciplinary team on identifying and qualifying students for special education services may establish more consistent practices. Next, the eligibility process for identifying students with an SLD should be standardized. By standardizing the evaluation criteria, the likelihood of students being misidentified should improve. This would then ensure students would receive the services they are entitled to, no matter which school they attend. Likewise, there may be a reduction in the number of students who are erroneously found eligible for SLD and allow for those services to be reallocated to areas of greater need.

With this knowledge, school psychologists may need to reexamine their role in the RTI process and identification of SLD. Are school psychologists actively engaged in analyzing data produced through the RTI process and helping to interpret that data in a way that is meaningful to the RTI team? Secondly, are school psychologists following best practices when evaluating students for special education eligibility? Lastly, the results of this study indicate that a school's culture and expectations may influence the evaluation team when they are determining a student's eligibility status. School psychologists and diagnosticians may benefit from nationally suggested levels of achievement that would indicate what constitutes a deficiency that qualifies as SLD (Kovaleski, VanDerHeyden, & Shapiro, 2013). Otherwise, school psychologists and others who are empaneled on MDTs may be overly influenced by how a student compares to others in the school and not to more widespread markers for disabilities.

Summary

In this study the academic performance of students who were evaluated for special education eligibility under SLD was explored to determine if the students' academic performance differed as a function of the income level of their school district. The results indicate that individual comparisons were in line with these findings, except that the ORF scores of eligible students in high-SES schools were not significantly different than ORF scores of non-eligible students in low-SES schools, as predicted.

The limitations of this study included: there was a small sample size of non-eligible students from the low-SES schools; it is unknown if the ORF score was generated through benchmarking or progress monitoring; and the curriculum, instruction methods and interventions used were not investigated. The direction of future research was considered. Areas discussed included: replicating this study with a larger sample size or using local norms, the use of standardized scores generated from computer-based programs, examining the different areas of reading disability (e.g., ORF, reading comprehension, basic reading skills) as it relates to SES, and considering the impact of a student found eligible with multiple disabilities on ORF.

The implications for public policy and practice when considering high-stakes decision making were discussed. Arguments for establishing a uniformed method for identifying students for special education services were provided. Questions were posed to encourage debate as to the school psychologist's role in the RTI and identification process that would, hopefully, lead to improvements in the field.

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Appendix A

Original Data With Genuine Outliers, Data With Outliers Removed, Transformed Data Log10 Genuine Outliers

Table 12

Original Data With Genuine Outliers, Data With Outliers Removed, Transformed Data Log10 Genuine Outliers

Test/source	original data	data outliers removed	transformed data
Test of Normality Shapiro-Wilk	Significance	Significance	Significance
Low SES- Eligible	.000	.001	.007
Low SES- NOT Eligible	.617	.617	.217
Mid SES-Eligible	.000	.000	.001
Mid SES-NOT Eligible	.181	.475	.008
High SES-Eligible	.000	.026	.035
High SES-NOT Eligible	.275	.383	.073
Levene's Test of Equality	.025	.000	.001
Tests of Between – Subjects Effects			
Corrected Model	.000	.000	.000
Intercept	.000	.000	.000
SES	.000	.000	.008
Eligibility	.000	.000	.000
SES*Eligibility	.115	.026	.793
Pairwise Comparisons			
Low SES – Mid SES	.000	.000	.011
Low SES – High SES	.000	.000	.003
Mid SES – High SES	1.00	.025	.801
Eligible-NOT Eligible	.000	.000	.000
Main Effects Eligible			
Low SES – Mid SES	.023	.000	.003
Low SES – High SES	.004	.021	.000
Mid SES – High SES	1.00	.651	.911
Main Effects NOT Eligible			
Low SES – Mid SES	.004	.000	.414
Low SES – High SES	.006	.007	.433
Mid SES – High SES	1.00	.064	1.000
Low SES Eligible-NOT Eligible	.008	.000	.002
Mid SES Eligible-NOT Eligible	.000	.000	.000
High SES Eligible-NOT Eligible	.000	.000	.000
Univariate Tests			
Eligible Contrast	.003	.000	.000
Not Eligible Contrast	.003	.000	.273
Low SES E/NE	.008	.000	.002
Mid SES E/NE	.000	.000	.000
High SES E/NE	.000	.000	.000
Multiple Comparisons *Tukey HSD*			
Low SES – Mid SES	.000	.000	.001
Low SES – High SES	.000	.000	.000
Mid SES – High SES	.078	.898	.142