8-28-2012

Effect of repeated readings on the fluency and comprehension scores of an eighth grade student with a learning disability

Michael W. Landers

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The Effect of Repeated Readings on the Fluency and Comprehension Scores of an Eighth Grade Student with a Learning Disability

Michael W. Landers

A Graduate Field Experience

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Arts

Urban Special Education

At Cardinal Stritch University

Milwaukee, Wisconsin

August, 2012
Signature Page

This Graduate Field Experience

Has been approved for Cardinal Stritch University by

____________________________________
(Advisor)

____________________________________
(Date)
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Acknowledgements

This Masters Degree would not have been possible without the love and support of my family and friends. To my loving wife Abby, thank you for the sacrifices you made throughout this process and for helping me maintain my priorities. I greatly look forward to enjoying the benefits of this undertaking with you for the rest of our lives. To my masterful family, thank you for your inspiring examples and steadfast encouragement. I cannot adequately express how blessed I feel to have your love and support. To my friends, especially those I met through Jimmy, I could not have done this without your experience, strength, and hope. The foundation you all provided me with has allowed me to pursue lost dreams and realize new possibilities; for which I am extraordinarily grateful. Finally, I’d like to thank Michael Flaherty for guiding me through the writing process; your detailed and timely feedback helped me create this paper, which is the culminating highlight of my 23 years of formal education.
Abstract

The purpose of this case study was to determine if repeated readings had an effect on the fluency and comprehension scores of an eighth grade student with a learning disability. The researcher conducted pre-intervention assessments that identified fluency as the student’s primary area of need. A repeated reading fluency intervention was implemented, which is a method that utilizes rereading passages until a predetermined fluency goal is achieved (Samuels, 1979). Four dependent variables were measured with pre and post-tests and progress monitoring: rate, accuracy, prosody, and comprehension. Post-tests revealed a substantial decrease in rate, no change in accuracy and comprehension, and a minimal increase in prosody. However, progress monitoring data demonstrated a considerable increase in rate, moderate gains in accuracy, and a minimal increase in prosody. Analysis identified an unequal distribution of motivational factors—such as text-interest and passage length—between assessment and intervention passages. Intervention passages contained more favorable motivational components; thus, motivation was determined to be the moderating variable between the results. Therefore, the researcher concluded that motivation is a highly salient variable that must be taken into account when designing literacy interventions for struggling adolescent readers. Limitations of the study, recommendations for future research, and instructional implications for the student were also discussed.
Chapter One: The Effect of Repeated Readings on the Fluency and Comprehension Scores of an Eighth Grade Student with a Learning Disability

The purpose of this case study was to design a research-based literacy intervention for a student identified as a struggling reader. A case study is a descriptive research method that is commonly used when performing research with individuals or small groups (Becker et al., 2005). Case studies provide an excellent, focused opportunity to develop the crucial pedagogical ability to assess the needs of students, design an evidence-based intervention to address them, and perform ongoing testing to determine the intervention’s effectiveness (Becker et al.). In this chapter, pertinent background information and key terms are presented, including an introduction to the student, an examination of how the study relates to current special education law, and a discussion of its alignment with common core state standards.

The study began with a thorough analysis of the student’s current educational performance. The pseudonym Lewis was used to protect the student’s confidentiality. Lewis was a 14 year 10 month old male student that recently finished eighth grade. In fourth grade he began to attend a charter school located in a large urban city in the upper Midwest. Prior to that he was enrolled in a public elementary school in the same city. In second grade he was referred for special education testing due to concerns with academic progress, most evident in his delayed reading development. The Individual Education Program (IEP) team identified a learning disability (LD) using established district criteria, which included a regression analysis formula that was used to establish a data-based significant discrepancy in Lewis’ achievement (Initial IEP, May 24, 2006). LD services were continued at subsequent reevaluations on April 16, 2009 and April 5, 2012.
One of the most important considerations for students with disabilities is the determination of their educational setting. Lewis’ IEP (April 5, 2012) stipulated that he participated more than 80% of the time in the regular education setting. Special education services were provided within the regular education setting except for testing support, which he received from his IEP teacher in a small group or individualized setting. The placement decision was consistent with the Individuals with Disabilities Education Improvement Act (IDEA) of 2004, which provides the basis for special education law. IDEA guidelines required that “students must be educated in the setting most like that of typical peers in which they can succeed when provided with the needed supports and services, or the least restrictive environment (LRE)” (Friend, 2011, p. 14). For students to succeed in the LRE, teachers must carefully consider the type of accommodations they require. Multiple supports and services were included in Lewis’ IEP to ensure that he had an opportunity at experiencing success in the LRE, including: front-loading vocabulary, extra time on assignments and assessments, shortened reading passages, regular review of background knowledge, use of graphic organizers, and access to his special education teacher for test support.

Lewis adequately functioned in regular education classes with those supports in place, according to his most recent IEP (April 5, 2012), a cumulative file review completed on June 8, 2012, and anecdotal notes received from his IEP teacher on May 23, 2012. Academic strengths included math, in which he made significant gains over the last three years, going from struggling with two-step problems to being able to consistently solve multi-step algebraic equations by applying order of operation and chunking strategies (IEP, April 5, 2012). His math teacher reported that at times he enjoyed completing problem solving packets, and was proud of the fact that he often finished them quickly (IEP, April 5, 2012). Lewis was passionate about
content related to war, weapons, and gaming, which translated to a preference for non-fiction books in the military/war genre that he occasionally read for pleasure on his own time (anecdotal notes, May 23, 2012). At his IEP (April 5, 2012) the biggest concern raised was Lewis’ lack of motivation in class, which multiple teachers reported was a significant problem that caused him to fall behind in class, adding that it required substantial energy on their part to keep him engaged. His IEP teacher corroborated these observations and emphasized that Lewis must be pushed and held accountable in order to use his full potential (anecdotal notes, May 23, 2012). No other medical, physical, or mental health concerns were noted.

Lewis had a unique combination of literacy characteristics. His IEP teacher reported that he read at approximately a sixth grade instructional level based on informal reading assessments and classroom observations (anecdotal notes, May 23, 2012). Fluency was identified as the main concern with his literacy skills, and he was described as a very slow, choppy reader. Fluency is defined as a reader’s ability to read with appropriate speed, accuracy that occurs automatically, and prosody (proper expression) and is considered an integral component of reading comprehension (National Reading Panel (NRP), 2000). Comprehension is the interactive process between reader and text in which meaning is derived from reading; it is considered the purpose of reading (NRP, 2000). Generally, students with poor fluency also struggle with reading in general and therefore comprehension; yet, despite his slow fluency Lewis still displayed a relative strength in the area of reading comprehension (anecdotal notes, May 23, 2012).

Results from standardized tests also demonstrated struggles with reading, particularly fluency. Lewis received a score of 186 in reading on the Measures of Academic Progress (MAP) school based assessment, substantially below the average score of 210 (completed January,
He also obtained a broad reading grade equivalent score of 4.5 on the Woodcock-Johnson III Brief Assessment (Form A) administered by his teacher on March 26, 2012 when he was at the 8.7 grade level. His grade equivalent achievements on reading subtests were: (a) letter-word identification 5.4, (b) reading fluency 3.3, (c) spelling 4.4, (d) passage comprehension 3.8, (e) writing samples 5.5, (f) word attack 3.7, (g) reading vocabulary 5.3, and (h) academic knowledge 6.4. The subtest scores ranged from low (academic knowledge) to very low (reading fluency) when compared to his same age peers. These results supported his teacher’s observations, and provided data-based evidence that fluency was Lewis’ biggest literacy weakness.

The importance of fluency in the reading process is reflected by its inclusion in the Common Core State Standards for English Language Arts. It is listed as a foundational reading skill, codified in the following way, “Read with sufficient accuracy and fluency to support comprehension. (a) Read on-level text with purpose and understanding. (b) Read on-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings. (c) Use context to confirm or self-correct word recognition and understanding, rereading as necessary” (p. 43). The NRP (2000) provided additional reinforcement as to the importance of fluency when it asserted that regardless of intelligence, students that do not increase their reading fluency will likely struggle with reading throughout their lives. Given the importance of fluency in the reading process, the next step was to identify a literacy intervention that could be used to improve Lewis’ reading fluency. The remainder of this study describes the selection, design, implementation, and results of the intervention.

Chapter Two begins by elucidating components vital to the foundation of all literacy interventions. It then explores the presence of fluency difficulties among older students with LD,
and closes by providing evidence for a fluency intervention called repeated reading. Repeated reading is a method that consists of rereading short, meaningful passages multiple times until a fluency goal is achieved (Samuels, 1979). Subsequent research has replicated its effectiveness in a variety of settings, establishing it as an evidence-based intervention for improving fluency (Herman, 1985; Sindelar, Monda, & O’Shea, 1990; Therrien, 2004). Next, chapter three describes the study procedures, including a discussion of the student’s specific skills related to the intervention, a description of the method used in the study, and an explanation of data collection protocol. Then, chapter four presents and analyzes the results of the intervention. Lastly, chapter five explains the results of the study, connects them to existing research, examines the strengths and limitations of the study, and provides instructional recommendations for future work with the student.
Chapter Two: Review of Literature

The purpose of this study was to investigate the effect of repeated readings on the fluency and comprehension scores of an eighth grade student with a learning disability (LD). The LD was identified by an Individualized Education Program (IEP) team using established district criteria (Initial IEP, 04/2006). Research has demonstrated that repeated reading is an effective intervention for improving reading fluency (Therrien, 2004). Research has also provided evidence of a relationship between fluent reading and strong comprehension (Rasinski et al., 2005). This relationship is theoretically grounded in the work of LaBerge and Samuels (1974) who developed a theory of automatic information processing. According to this theory, students have a limited amount of cognitive resources available for the reading process. If students have not learned to automatically decode words then they will need more resources for this process, leaving fewer left over for the higher order skill of comprehension. This theory continues to inform research today, including many of the studies presented in this chapter. The first section of this chapter focuses on designing effective literacy interventions. Section two presents studies that established the importance of including fluency instruction when considering interventions, even when working with older students. Section three examines the relationship between motivation and reading among older students. Section three focuses on studies that demonstrated the effectiveness of using repeated reading interventions to increase fluency and comprehension scores.

Literacy Intervention Design

Three research studies are presented in this first section: Report of the National Reading Panel (2000); Roberts, Torgesen, Boardman, and Scammacca (2008); and Roth, Speece, and
Cooper (2002). The studies establish a foundation for reading instruction, analyze the design of effective literacy interventions, and point to the importance of considering fluency needs when designing reading instruction.

In 1997, Congress directed the National Institute of Child Health and Human Development (NICHD), in conjunction with the Department of Education, to create a committee in order to study the effectiveness of how students are taught to read (National Reading Panel, 2000). From this, the National Reading Panel (NRP) was created, and their foundational report was released in the year 2000. The panel was composed of 14 individuals representing a broad range of stakeholders, from eminent researchers and scientists to parents and school administrators. Based on previous research and five regional public hearings that were held around the country, the NRP identified dozens of potential topic areas for inclusion in the report. After much debate and analysis, the topics were narrowed down and represented by a set of seven research questions:

1. Does phonemic awareness instruction improve reading?

2. Does instruction in phonics improve reading achievement?

3. Are comprehension and fluency improved by guided oral reading instruction?

4. Does instruction in vocabulary increase achievement in reading?

5. Does strategy instruction in comprehension improve reading outcomes?

6. Are achievement and motivation improved by independent reading programs?

7. Is the effectiveness of teacher instruction influenced by teacher training programs?
A follow up question, how the instruction could best be implemented, was included with the other questions. With the guiding questions in place, the NRP began designing the literature review.

The method of the study was structured around rigorous procedural standards. In justifying the standards, the panel noted the incredible volume of research to potentially review, estimating that 100,000 studies had been conducted on reading since 1966. Broadly, the panel adopted standards common in medical and psychological research, arguing that reading research should be held to just as high of standards. Initial screening consisted of ensuring that studies contained experimental or quasi-experimental designs. With that filter in place, the panel created subgroups to more efficiently analyze the research. All searches were performed with academic databases, and all studies had to be published in English in a peer-reviewed journal. Studies were required to focus solely on the reading development of students in preschool to grade 12. They were also required to contain detailed descriptions of participants and interventions, including length of time implemented, methods, and outcome measures. Once the studies had been accepted, the subgroups set about coding the data in preparation for analysis. Ten codes were used: reference, research question, sample, setting, design, independent variables, dependent variables, nonequivalence of groups, results for every measure, and coding information from the study.

Based on a review of previous studies, input from public hearings, and meta-analysis results, NRP (2000) determined five reading areas as crucial to effective reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension. In their exhaustive analysis, they determined that these factors and their related instructional practices were the most important factors in reading acquisition. Of them, perhaps the most surprising was the inclusion
of fluency. Allington (1983) first alerted the field to the lack of attention given to fluency in his descriptively titled article, “Fluency: The neglected reading goal”. Similarly, the NRP recognized that “Despite its importance as a component of skilled reading, fluency is often neglected in the classroom. This is unfortunate” (p. 11). While the NRP (2000) study did much to simplify and establish an accepted foundation of reading instruction, it was too broad to be able to provide specific recommendations about intervention combinations for use with all students. As the next study makes clear, analyzing the interactions between reading factors is a complex task, especially for the purposes of designing effective interventions that will work for all students.

Roth, Speece, and Cooper (2002) conducted a longitudinal study that analyzed the relationship between oral language and early reading development. The authors stated:

The purpose of this study was twofold: (a) to determine the predictive relationship of a broad spectrum of oral language skills measured in kindergarten with the reading ability of children in first and second grades, taking into consideration a variety of background factors and (b) to determine whether different aspects of oral language are important to reading skills at different points in development” (pp. 262-263).

They predicted that semantic skills in kindergarten would be strongly related to reading comprehension in first and second grades. They also predicted that phonological awareness in kindergarten would be strongly correlated with decoding in later grades, which is consistent with past research. They measured three main variables, oral language, background, and reading measures. The oral language variable was composed of structural language consisting of semantics and syntax, metalinguistics consisting of phonological awareness and metasemantics,
and narrative discourse consisting of familiar story production and story comprehension. The reading variable consisted of print awareness, decoding, and comprehension. The background variables consisted of race, socioeconomic status, family literacy, and performance IQ.

The study occurred in a mid-Atlantic state at a public elementary school. The initial kindergarten sample consisted of 88 students with a mean age of five years, six months. The sample contained 58% boys and 42% girls and was diverse racially (45% African American, 48% White, 5% Asian American, and 1% American Indian) and economically (32% enrolled in free/reduced lunch program). Students whose primary language was not English composed 25% of the sample. The first grade sample decreased to 48 students, and the study finished with 39 students in second grade as a result of common study attrition factors. No significant demographic differences were found between the original kindergarten sample and the follow up samples in first and second grades.

The authors determined that phonological awareness in kindergarten was the best predictor of single word decoding in second grade, which was expected and consistent with past research. The main finding of their study, however, was that oral language development in kindergarten, not phonological awareness, was the best predictor of reading comprehension in second grade. They identified the specific semantic abilities of oral definitions and word retrieval as the two variables most strongly correlated with comprehension. Another important finding from this study was that narrative discourse was not a consistently correlated variable throughout the study. It was more predictive of reading comprehension in first grade than in second grade. This result confirms the legitimacy of the researchers’ initial question regarding developmentally specific skill acquisition and use.
The authors suggested that when considered with phonological awareness, semantic variables such as word retrieval and oral definitions provided the strongest chance of helping to develop understanding of the connection between early reading and language development. More widely, their findings imply that reading interventions must be designed on an individual basis. The authors not only demonstrated the developmental specificity of a certain skill, but in showing the change in the influence of that skill from first to second grade, they also provided strong evidence of how quickly developmental needs evolve. Effective reading interventions must incorporate current developmental factors of the individual into consideration. In the next study by Roberts, Torgesen, Boardman, and Scammacca (2008), the researchers continue to focus on developmental factors, but demonstrated that developmental attention must extend beyond its traditional emphasis on the primary grades. Further, they included the presence of LD as a crucial factor in identifying appropriate interventions based on the developmental readiness of students.

Roberts, Torgesen, Boardman, and Scammacca (2008) conducted a meta-analysis to investigate the effectiveness of strategies used for reading instruction with students with LD. Students identified with LD comprise a significant portion of below basic readers and, as a result of their disability, present unique instructional challenges. The purpose of the authors’ research was to analyze how students with LD learn differently in order to assess the strategies that have been used in reading instruction for them. They focused their research on upper elementary and older students, citing a lack of thorough analysis with these populations of students. Their analysis was organized around the major areas of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension—and consisted of reviews of past research within those areas as it applied to older students with LD.
The authors began their analysis by reviewing the five essential areas of reading instruction from the NRP report (2000). They immediately called into question the applicability of those areas to older, struggling readers, noting that much of their research foundation took place with primary grade readers and that not all reading characteristics are relevant at all stages of development. For instance, research demonstrated that motivation was a factor which had a disproportionately larger influence on older readers (Guthrie & Humenick, 2004). In line with their age based objections, the authors revised the five essential reading areas to be more consistent with the needs of older readers, resulting in the following: word study, fluency, vocabulary, comprehension, and motivation. The major difference was the inclusion of word study and motivation. Fluency, vocabulary, and comprehension remained from the original report.

The authors justified their decision to include word study and motivation as major areas of reading for older students by providing sufficient evidence from past research. Archer, Gleason, and Vachon (2003) determined that older students, even those with LD that were struggling to read, generally have an understanding of the correspondence between sound and text and can usually decode simple words. The authors acknowledged that there were older students that do not have basic phonemic and phonics awareness who will require targeted interventions to fill in those foundational gaps. However, they argue that older students that fit into this category are in the minority. The authors reported that the majority of older readers typically struggled because of complex word decoding challenges combined with a lack of effective strategies for word analysis. Thus, effective instruction should consist of word study interventions that address these areas.
The other major distinction the authors illustrated between older and younger struggling readers was in the area of motivation. Previous research had established an interaction between motivation and comprehension, in that less motivated students scored lower on comprehension tests. Guthrie and Humenick (2004) established four crucial factors for addressing motivation in older students: (a) offering interesting goals, (b) encouraging independence, (c) providing relevant and high-interest texts, and (d) creating positive reading experiences between peers.

The authors stressed that though these distinctions between older and younger students had been established by research, older students still needed to be thoroughly assessed in order to determine their individual reading characteristics.

The authors maintained fluency, vocabulary, and comprehension as major reading areas for older students but included important caveats. They reported that repeated reading is one of the most common fluency interventions. It involves students rereading a passage until a predetermined fluency goal has been met. Yet, much of the research on repeated reading has been conducted with students in primary grades, as fluency has traditionally been considered an early reading skill. This includes the studies that led the NRP (2000) to recommend repeated reading as an effective, evidence-based strategy for improving fluency. The authors recommended that more research on the effectiveness of repeated reading be completed with older students with LD. Analysis of vocabulary and reading comprehension research resulted in similar findings, as the authors cited a lack of studies focused on older students with LD.

Though the authors were not able to provide thorough recommendations for fluency, vocabulary, and comprehension instruction for older students with LD, their analysis allows for inferences to be made as to directions of combined interventions. Fluency instruction presents a promising starting point. Fluency and vocabulary are strongly related; in fact, research has
demonstrated that the best predictor of fluent reading is the number of sight words a student has in their vocabulary (Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993). Effective fluency interventions should include vocabulary components. The connection between fluency and comprehension has been harder to establish. While there was some disagreement in the literature as to the magnitude of the effect, research had demonstrated a positive correlation between fluency and comprehension amongst older students. If these findings are accurate, it would be expected that fluency interventions would have an effect on comprehension. The next section focuses on this topic, while also exploring the gap in fluency research among older students with LD that Roberts, Torgesen, Boardman, and Scammacca (2008) identified.

**Fluency Needs Among Older Students With Disabilities**

This section presents two studies from fluency researcher Timothy Rasinski and his colleagues. They indicated the importance of paying attention to all aspects of fluency beyond the primary grades, adding to the growing body of research establishing it as a salient reading skill at any grade level.

Rasinski et al. (2005) conducted an analysis of reading fluency among older students. The purpose of the study was to determine if difficulties with reading fluency were an important factor in overall struggles with reading, especially comprehension. Their research was informed by their clinical experience that a majority of the students in second to eighth grades referred to them for reading interventions had significant delays in reading fluency. They hypothesized that comprehension would increase if interventions effectively raised fluency skills. They used two levels of analysis in the study. First, they identified the rate of words correctly read per minute (WCPM) and percentage of words read in one minute as their dependent variables, which they
then compared to national norms using descriptive statistics. Second, they used the two fluency measures as predictive variables and correlated them with the student’s reading comprehension scores from a standardized assessment.

The study was set in a medium-sized, urban area in the Midwest. The school district historically performed below average on standardized assessments. The sample consisted of 303 ninth grade students that were randomly selected for participation. The students were representative of the larger student body. The study occurred at the end of the school year because the researchers assumed it would allow for the most advanced levels of student achievement to be recorded.

A simple and short procedure was utilized. A one minute reading probe was administered to students, using a ninth grade reading level passage. Students were instructed to read the passage orally and told that they would be asked to retell what they read when finished. The retelling protocol was intended to encourage students to read as they normally would for meaning. It was not measured as part of the study. Researchers recorded errors on a duplicate passage while students read, and also recorded how far students read in one minute. By determining the percent of words read correctly they were able to establish word-recognition and fluency scores for each student.

The authors determined that word recognition scores were above average, but that fluency scores were significantly below average. Students read with an accuracy of 97.4%, higher than the 95% level which is commonly regarded as the threshold for instructional reading. Assessing the fluency scores was not as straightforward. Reflecting the traditional assumption that fluency is an emergent reading skill, the authors were not able to find any fluency norms for
students above eighth grade. As a result, they planned to adjust eighth grade norms, expecting that end of ninth grade students would perform higher than their eighth grade counterparts. Extrapolation of the eighth grade norms, however, was unnecessary. In the major finding of the study, a majority of students scored lower than the 25th percentile of the unadjusted eighth grade norms. That is, 61% of the end of ninth grade students scored in a range where only 25% of eighth graders were expected. On the other end, only 4.3% of the ninth graders scored at or above the 75th percentile from the eighth grade norms. Further, the researchers determined that 12% of the ninth graders were below the 100 WCPM, which is the rate associated with the end of third grade. They suggested that this group had significant overall reading challenges. As a result they speculated that the group included a substantial number of students with disabilities.

Next, the researchers matched students’ fluency scores with their comprehension scores from a state standardized test that was also taken during the ninth grade. They identified a statistically significant correlation between the scores at the r = .530 level. By using a coefficient of determination ($r^2$), they determined that approximately 28% of the variance in students’ comprehension scores could be predicted by their fluency skills.

The findings of this study indicated that reading fluency is still a relevant reading characteristic for older students. As demonstrated in this study, a significant number of older students still struggle with fluency, which the authors suggested plays an important role in their overall reading challenges. The relationship between fluency and comprehension is especially noteworthy given that increased comprehension is the goal of most reading programs and is the variable traditionally measured on high-stakes, standardized assessments. These findings indicate a need for increased attention to fluency at the secondary level, both in assessment and instruction.
The next study analyzed the relationship between fluency and comprehension in the developmental process and assessed a generally overlooked aspect of fluency: prosody. Rasinski, Rikli, and Johnston (2009) conducted a study exploring the relationship between prosody and comprehension. Fluency is defined as a reader’s ability to read with appropriate speed, accuracy that occurs automatically, and prosody (proper expression) and is considered an integral component of reading comprehension (NRP, 2000). The authors argued that fluency research rarely looks at prosody, instead focusing only on accuracy and rate. They also noted that fluency assessment and intervention are commonly regarded as a primary grade issues. The purpose of their study was to investigate the interaction between prosodic fluency and comprehension between grades three, five, and seven. The authors’ research was guided by three questions:

1. What is the relationship between the specific fluency component of prosody and overall reading abilities as measured by comprehension?

2. What is the relationship of prosodic reading and comprehension between third, fifth, and seventh grades?

3. How does the relationship between prosodic fluency and comprehension change as students develop as readers between third, fifth, and seventh grades?

They hypothesized that there would be a significant relationship between prosody and comprehension, but that the magnitude of its significance would decrease as students aged. The predictive variable in the study was prosodic fluency, measured by scored passages. The dependent variable was students’ comprehension scores on a standardized, norm-referenced assessment.
The sample consisted of 391 students in grade three, 421 students in grade five, and 392 students in grade seven; for a total of 1,204 students. The site for the study was a small urban district in Nebraska. The district placed an emphasis on reading instruction in the years before the study. Every school had a full-time reading coordinator that supported their district reading program. In the two years prior to the study the third, fifth, and seventh graders averaged between the 58th and 71st percentiles on a standardized reading assessment.

The procedure for determining the prosodic fluency scores involved two steps. First, all students were provided with grade level narrative passages from published trade books. The third and fifth graders were assigned one of two passages, one of which was slightly lower for students identified as having academic concerns. All seventh grade passages were the same. Students were allowed to silently practice the passage, after which they sat at a computer and were instructed to read it orally as they would typically. The first minute of the reading was recorded. Next, the researchers scored the audio files with a system that they developed in conjunction with Educational Service Unit #3 (ESU #3), a state educational service provider that served the Westside district. The recordings were rated from one (low) to four (high) along three prosodic dimensions: phrasing and expression, accuracy and smoothness, and pacing. Raters were thoroughly trained prior to scoring, with inter-rater reliability established among a collection of sample recordings. Additionally, each passage was independently scored by two raters and if their ratings differed by more than one point on any of the three dimensions, the passage was given to a third rater. A third rater was needed 14.3% of the time. The procedure to obtain the dependent measure consisted of administering the standardized assessment, with the comprehension subtest used to determine students’ comprehension scores.
The authors reported three main findings, corresponding to their three research questions. First, they found a significant positive correlation between prosodic fluency and silent reading comprehension scores at all three grade levels with correlation values of .634 (third), .657 (fifth), and .571 (seventh). Second, the shared variance between their fluency measure and the comprehension scores was found to be statistically significant, with magnitudes of .402, .432, and .326 for grades three, five, and seven. This indicated that anywhere from 30-40% of the variability in comprehension scores could be explained by differences in fluency abilities. Finally, the researchers’ prediction that the relationship between fluency and comprehension would decrease between grades was confirmed, as the lowest correlation was found amongst seventh graders. Yet, the finding that the strength of the correlation increased from third to fifth grade was a surprise.

These findings provided strong evidence as to the importance of fluency in the developmental reading process of older students. Contrary to primary grade based fluency models, in this study the relationship between prosodic fluency and comprehension actually increased from third to fifth grade, and the impact of prosody on comprehension in seventh grade was still found to be statistically significant. The results demonstrated the importance of prosody in the relationship between fluency and comprehension, whereas previous studies primarily measured only rate and accuracy. This evidence, in conjunction with the previous studies, created a firm rationale for designing a fluency intervention for an older student with a disability. However, before doing so it is prudent to consider one more component of adolescent literacy for inclusion in the design of an intervention: motivation.
Motivation Needs Among Older Students

This section presents research on the importance of motivation for older readers from two studies: Lepper, Henderlong Corpus, and Iyengar (2005) and Guthrie and Humenick (2004). Similarly to fluency, motivation has been neglected as a literacy factor, but increasing evidence for its pivotal role in the reading process of older students has led some researchers to identify it as one of the five indispensible pillars of adolescent literacy, along with fluency, comprehension, vocabulary, and word study (Roberts, Torgesen, Boardman, & Scammacca, 2008). Moats (2001) connected two of these areas as particularly interdependent: fluency and motivation. She identified the effect of poor fluency on motivation as the most difficult aspect of teaching older students to read, based on her observations of a negative cycle starting with fluency: slow fluency led to dissatisfaction with reading, dissatisfied readers read less, and students that read less remain struggling readers with slow fluency. In other words, she consistently witnessed a strong relationship between slow fluency and students losing motivation and interest in reading. Therefore, an effective fluency intervention should be informed by an examination of motivation and its interaction with reading among older students. The next study began this process by exploring the relationships between motivation and school success.

Lepper, Henderlong Corpus, and Iyengar (2005) conducted a study that analyzed developmental changes in motivation and their effect on academic outcomes. The purpose of their study was to address four questions: (a) what is the connection between extrinsic and intrinsic motivation, (b) is there a substantial age difference in extrinsic and intrinsic motivation when they are analyzed independently of each other, (c) how are the two types of motivation related to academic achievement, and (d) are there significant cultural differences between European American and Asian American students with respect to the first three questions? In
order to answer the four questions, the researchers used questionnaires and academic achievement data to measure three dependent variables: motivational orientation, social desirability, and academic achievement.

The large study was composed of 797 students in third through eighth grades from two public school districts in northern California. One of the districts was in a large urban area, while the other was in a suburban area known for its high academic achievement. The students were divided evenly across the grade levels and between sexes with 401 girls and 396 boys. The demographics of the study were: Asian American (42%), Caucasian (34%), other (10%), unknown (7%), Hispanic (5%), and African American (2%). Students completed questionnaires in their classrooms after researchers explained the procedure and provided examples responses. The questionnaires utilized a 5-point Likert scale and contained features related to general motivational orientation as well as specific intrinsic and extrinsic items. The entire questionnaire required approximately 30 minutes to finish. Researchers returned at the end of the school year to collect academic achievement indicators from student records including report cards and standardized test results when possible.

In relation to the present study, the most important results from Lepper, Henderlong Corpus, and Iyengar’s (2005) research concerned age differences and academic achievement. The authors detected a highly significant trend of decreasing intrinsic motivation with age. Third graders had the most intrinsic motivation, which then steadily decreased in eighth grade, in which the lowest levels were detected. Interestingly, after factoring third graders out who had significantly more extrinsic motivation than any other grade, the researchers did not find a significant difference in it between any other grades. When the researchers analyzed preferences for difficulty of work, they determined that older students preferred easier work more than
younger students. Motivational factors were also significant correlates with academic achievement. The researchers identified significant positive correlations between GPA and intrinsic motivation, and significant negative correlations between extrinsic motivation and GPA. The same correlations were detected when analyzing the relationship between type of motivation and standardized test scores. These results highlighted a concerning trend: as students age they lose intrinsic motivation and prefer easier work, which are both highly correlated with lowered academic performance. The next study asks the logical question that results when considering these findings: what can be done to address motivation deficiencies in older students?

Guthrie and Humenick (2004) conducted a meta-analysis that examined motivational strategies used to increase reading achievement among older students. The purpose of their research was motivated by a simple question: what motivates students to read? Besides short-term motivational strategies, they also sought to determine whether interventions could be designed to engender reading motivation over time. Motivation was defined in relation to literacy as the cognitive engagement that provided direction and energy to the reading process. It was subdivided into three types: external, internal, and self-efficacy. External and internal were synonymous with extrinsic and intrinsic variables measured in the previous study. Self-efficacy was characterized as confidence in one’s own reading ability, as in a sense of capability when confronted with new reading material. The authors established four primary classroom practices for review: knowledge goals, student choices, interesting text, and collaboration. They then measured the effect of these practices on two dependent variables: motivation to read and comprehension.

The researchers included 22 studies in their analysis. The studies were selected due to their comparative formats and random assignment protocols, with 73% of them utilizing
treatment and control experimental designs. Within the selected studies, 131 statistical comparisons were made resulting in a comparative statistic called an effect size (ES), which is a descriptive statistic that measures the strength of a relationship between variables, with larger ES representing stronger relationships. The authors detected highly significant ES on reading motivation and comprehension as a result of the classroom practices. Due to the single participant design of the present study, the results for the classroom practice of collaboration with peers were not reported; they also happened to be the least significant classroom practice (Guthrie & Humenick, 2004). The remainder of the findings were discussed in detail below.

Interesting texts had the greatest impact, with an ES of 1.15 on motivation and 1.64 on comprehension. Interesting texts were defined by student self-reports, not teacher or researcher determination. The effect of interesting text was so strong that students were able to recall unimportant, but interesting details better than important details that they found uninteresting. In discussing what makes text interesting to students, the authors identified four factors: connection to background knowledge, text structure and visual appeal, content relevance to the learner, and connection to engaging activities. Student choice had the next largest impact with an ES of 0.95 on motivation and 1.20 on comprehension. Allowing students to select what to read was not the only choice found in the review. The authors also identified the following choices as effective strategies: where to read, how to respond to the reading, and whether or not to read with a partner. As more diversity within the choice was granted, better results were found. This was especially true when allowing students to self-select text for personal reading. Including multiple genres and a variety of types of books resulted in substantial motivation and comprehension gains. Finally, knowledge goals had a relatively moderate effect, with an ES of 0.72 on motivation and 0.87 on comprehension. Practices that emphasized content learning
goals were determined to be the most effective, as opposed to performance goals related to task completion, tests, and grades.

Motivation has been consistently demonstrated to decrease as students get older; yet, it is also a significantly reliable predictor of academic success at any age (Lepper, Henderlong Corpus, & Iyengar, 2005). Therefore, it is essential for the motivational needs of older students to be addressed when designing instructional interventions. Research has identified multiple high impact strategies that address the motivational needs of older students, specifically in relation to reading (Guthrie & Humenick, 2004). Researchers should strongly consider incorporating these strategies into intervention designs.

In review, the preceding studies demonstrated the necessity of evidence-based fluency instruction at all developmental levels. The NRP (2000) report firmly established five indispensible reading instruction areas necessary for development of literacy skills to occur, which included fluency. The question of how to design an individualized fluency intervention, however, required further research. Roth, Speece, and Cooper (2002) provided the first step by detailing the complex interactions between reading factors in the development of students. Their account of the transitional effect of components at different developmental stages made a clear case for the necessity of selecting literacy interventions based on the characteristics of the students to be served. Roberts, Torgesen, Boardman, and Scammacca (2008) expanded on this intervention foundation by applying it to traditionally under-researched populations in reading instruction, older students and students with LD. Their analysis also reinforced the applicability of fluency interventions in working with older students with LD, leaving implications about the relationship between fluency and comprehension. Rasinski et al. (2005) provided powerful evidence of the presence of fluency problems in older students. Rasinski, Rikli, and Johnston

(2009) reinforced those findings and extended them by demonstrating that the full spectrum of fluency instruction is related to reading improvements, particularly comprehension. Finally, the case for including strategies to address motivation was made by researcher that have demonstrated the impact of motivation on the reading process of older students, particularly in its interaction with fluency (Guthrie & Humenick, 2004; Lepper, Henderlong Corpus, & Iyengar, 2005; Moats, 2001; Roberts, Torgesen, Boardman, & Scammacca, 2008).

Overall, the previously described studies demonstrate the importance of fluency to reading development at all ages and demonstrate the importance of creating developmentally informed, individualized interventions. Together they form a firm basis on which educators can create effective fluency interventions. The last section builds on that foundation by introducing and analyzing evidence for a particular type of fluency intervention: repeated reading.

**Repeated Reading Fluency Interventions**

In this fourth section, seven studies are presented: Samuels (1979); Herman (1985); Sindelar, Monda, and O’Shea (1990); Therrien (2004); Pruitt and Cooper (2008); Therrien and Kubina (2006); and Hudson, Lane and Pullen (2005). The studies provided support for repeated reading as an evidence-based fluency intervention, and consistently demonstrated that repeated reading is an effective method for a wide range of students. Students with disabilities learn differently; thus, effective interventions must be specifically designed to meet their unique needs. The studies provide examples of how research has been designed to specifically meet the needs of students with disabilities, illustrating the importance of researchers including diverse samples in their studies.
Samuels (1979) introduced the method of repeated reading as a fluency intervention in what became a seminal study in the field of literacy (Dowhower, 1997). The purpose of his study was to investigate the effect of repetitive practice of the same reading passage on reading fluency. Research on the developmental stages of word recognition provided the theoretical foundation for the study. Samuels listed three stages: non-accuracy, accuracy, and automatic. In the non-accuracy stage students struggled to decode words even when provided sufficient time. Students in the accuracy stage recognized most words, but expended significant energy to do so, which resulted in non-prosodic reading. The automatic stage was characterized by fluent word recognition that required little overt attention, which resulted in prosodic reading at a high rate during which students were able to actively engage in comprehension. Samuels hypothesized that focused and repetitive practice would increase the automaticity of readers. The independent variable in his study was the use of a repeated reading intervention. The dependent variables consisted of words per minute (WPM) and errors in word recognition.

The experimental procedure consisted of students rereading passages multiple times until a satisfactory fluency level was reached. Students were allowed to select a story that was of interest to them. Researchers then created practice passages from the story that were between 50-200 words. The length of the passage was determined by the student’s previously demonstrated reading skills. Students read the passages orally to a researcher who recorded speed and errors. Students were then provided time to review the passage by themselves, after which they returned to the researcher and read it again. This method was repeated until a predetermined level of WPM was reached. New passages were presented to students once their goal had been met. Researchers recorded the student performances on a single graph that represented both WPM and word recognition errors.
Samuels (1979) determined that students’ fluency improved as measured by an increase in WPM and a decrease in errors. In addition, students demonstrated higher WPM starting points and lower word recognition errors as they proceeded to new passages. A case study conducted at the University of Minnesota involving one student with a cognitive disability was presented to demonstrate the effectiveness of the intervention. The student read five total passages, starting at 30 WPM and 11 word errors. On the four subsequent passages the student’s WPM rates were 51, 55, 62, and 71. The initial word errors decreased to 10, 6, 4, and 2. Overall, on the initial reading of a passage the student increased speed by 41 WPM and decreased word errors by 9. The findings demonstrated that repeated readings can result in skills transferring to previously unread passages.

This result provided important evidence against a common criticism of the method. In early pilot and informal studies, concerns were raised that gains made with repeated reading would be specific only to the practiced text, which would result in no broader reading benefit to the student. In discussing the generalization of gains between passages, Samuels provided an analogy with sports and music. Athletes and musicians improve by focused, repetitive practice of the fundamentals of their pursuit. This is often broken down into short, easily completed regimens that they are required to master before moving on. The problematic difference with reading instruction, he argued, is that students are moved between passages too often, not allowing for the type of practice associated with improved skills. Another important aspect of this study was the use of regular feedback with instruction. Samuels stressed the impact of the tracking graphs on student motivation and effort.

Though this foundational research demonstrated the effectiveness of the method of repeated reading, it was none the less limited due to its simple design and small sample. Further
research was needed to validate the methods effectiveness. The next study was an early effort that sought to replicate Samuels (1979) results with a larger sample and older students.

Herman (1985) conducted a study that investigated the effect of repeated readings on a number of dependent variables. The study was designed around three research goals: (a) confirm repeated reading as an effective strategy with struggling readers; (b) identify literacy components that changed with repetitive practice; and (c) determine if improvements due to repeated readings transferred to new material, or if they were simply a function of rehearsed learning on the original passage. The independent variable was the implementation of the repeated reading method. The dependent variables consisted of reading rate, speech pauses, word accuracy, and comprehension. Herman hypothesized that speed, accuracy, and comprehension would improve; and that the number of speech pauses would decrease with practice.

The study was set in an inner-city school in a larger Midwestern city. The sample consisted of eight students ranging from fourth to sixth grade. All of the students were participating in remedial reading programs at the time of intervention, which they were placed in as a result of scoring in the lowest range—below the 17th percentile—on the reading portion of a district standardized assessment. Additional participation criteria required participants to be reading between 35-50 WPM as assessed on a recorded oral reading of an instructional level passage. Reading passages for the study were derived from materials common to remedial classrooms, and ranged in length from 100-175 words long. Previous assessment data was used to determine students’ specific reading levels, and multiples passages were selected that most closely matched their ability. Students were then allowed to select which story they wanted to practice.
After a passage was selected, the study continued according to the following experimental procedure. Researchers discussed the rationale for the intervention with students before beginning, stressing the relationship between practice and improved skills. A rate of 85 WPM was set as the goal of rereading. Students practiced their story for approximately 10 minutes a session. Researchers tape recorded students as they practiced for later data analysis. Reading assistance was only provided to students if they asked for it. Students required from two to seven days to reach the criterion rate of 85 WPM, with an average of four days. Once the rate was reached, students selected a new passage to work on. This procedure was continued until students had successfully reached the criterion rate on five passages. This took from 17 to 24 days, with an average of 21.

Dependent variables were defined and measured using the following data collection methods. The rate of reading was defined as WPM, and was calculated by two researchers with stopwatches while listening to recordings of students reading. The measurement of speech pauses involved a more complex process. Speech pauses were defined as any hesitation lasting between 166 and 2,666 milliseconds. Pauses were determined and counted using a specially programmed computer processor. The pauses were then compared to a standard number of pauses that was calculated by analyzing the number of punctuation marks in a passage, which researchers determined were accepted indicators of reading pauses. A student’s total number of pauses was then divided by the number of standard pauses and converted into a percent. Miscue analysis was used to determine a score for accuracy. Errors were classified as either acceptable or unacceptable. Acceptable errors included self-corrections and non-meaning changing mistakes. Unacceptable errors were defined as inaccurate decoding, omissions, and meaning changing substitutions. In accordance with these error definitions, two types of accuracy scores
were reported. The first was a total accuracy score that compared all errors (both acceptable and unacceptable) with the total number of words in the story. The second score counted acceptable errors as correct words and then compared them to the total number of words in the story. This second measure of accuracy was also used as an indirect measure of comprehension.

Herman (1985) detected multiple significant effects. Speed in WPM significantly increased both within practiced passages and between the first and fifth passage. Average WPM went from 47 on story one to 69 on story five. Pauses significantly decreased within passages, going from an average of four times too many pauses on the first reading to two and a half times on the final reading of the same passage. However, no significant difference in the number of pauses was found between the first passage and fifth passage. Miscue analysis determined that errors significantly decreased both within the first and last reading of a passage and between the first and fifth passage. An average error rate of 17% on the first passage dropped to an average of 6.5% by the end of the intervention. The comprehension measure was also significant. The percentage of correct words plus acceptable errors increased from 87% on the first reading of the first passage to 92% on the first reading of the fifth passage. Further, rates within the first story significantly increased from 87% to 92% from the first to last reading. Students increased their accuracy within the fifth passage from 92% to 96%, but this increase was not statistically significant.

This study succeeded in replicating the main effects of repeated reading. Moreover, it broadened the findings with a larger, older sample of students by demonstrating significant between passage gains in rate and accuracy and significant decreases in speech pauses. Though these results successfully validated and extended previous findings, the effectiveness of repeated reading with a crucial demographic was still unknown: students with LD. The next study
Sindelar, Monda, and O’Shea (1990) explored the effects of repeated reading across a number of research conditions. The two groups they were most interested in studying were students with LD and their non-disabled (ND) peers. The purpose of their study was to investigate whether the effects of a repeated reading intervention were consistent between students with LD and ND peers. Further, they were interested as to whether student reading level— instructional vs. mastery—would result in significant interactions. Previous research had demonstrated a significant effect of repeated reading on both students with LD and ND peers identified as instructional level readers. The researchers were seeking to extend the findings to mastery level readers. They also added the number of errors per passage as another variable in their analysis. The independent variables were classification as LD or ND, reading level, and number of readings. For the reading level variable, instructional ability was defined as 50 to 100 WPM with two or less errors. Students that read more than 100 WPM were designated as mastery level readers. The dependent variables consisted of words per minute (WPM), errors per minute (EPM), and the number of propositions retold (NPR).

The study occurred at five schools in an urban district located in northern Florida. Students were screened for participation with two third grade level passages that were about 200 words in length. As they read the passages, trained research assistants tracked errors and total reading time. After screening, 25 students with LD (21 male, 4 female) and 25 students without an indentified disability (13 male, 12 female) were matched for participation in the study. The students were in grades three through five. In the students with LD group, 17 read at the instructional level and 8 at the mastery level. Their IQs ranged from 82-135 with an average of
108. The matched ND group, which also contained 17 instructional and 8 mastery level readers, had IQs that ranged from 79-138, with an average of 114. Initial measures of WPM, EPM, and NPR were analyzed to ensure that the groups were appropriately matched, with no significant differences found between the groups.

The procedure consisted of students reading two third grade level passages, each about 200 words in length. They were required to read one passage once, and the other three times. The order that students read the passages was randomized to avoid protocol interference. Students were seated across a table from a researcher and were told to orally read the passages normally. They were also instructed to remember details from the passage. Students were audio recorded during their retelling of the passages for the purposes of further analysis and reliability tests. Researchers tracked time and errors while students read. Researchers were extensively trained in the administration and scoring of the procedure, having had to demonstrate greater than 90% accuracy on practice administrations. The reliability of the examiners was tracked during the study by double scoring one fourth of the trials, which resulted in a satisfactory 93% agreement rate.

The researchers identified significant positive effects of repeated reading on WPM, EPM, and NPR as a result of two of the three independent variables; rereading and level. All measures significantly increased when students reread passages three times, as opposed to once. Students that had been identified as mastery level readers performed significantly better on all three dependent variables, across all conditions. Instructional level readers also made significant within group gains, and actually achieved larger gains relative to their starting point when compared with mastery level readers. The non-significant independent variable, however, was classification as LD or ND. There were no significant interactions across any of the conditions.
based on these classifications. Therefore, the method of repeated reading significantly increased students’ reading performance regardless of whether they had an identified disability or were classified as instructional or mastery level readers. In conjunction with the results of Samuels’ (1979) study, the findings demonstrate that a wide range of students can benefit from repeated readings. Accepting the research basis of repeated reading, the next researcher sought to strengthen the intervention by studying how to most effectively combine its different elements.

Therrien (2004) conducted a meta-analysis to investigate necessary components of effective repeated reading instruction and its impact on fluency and comprehension measures. Fluency was defined as the ability to read with accuracy and speed. Repeated reading was broadly defined as a program that involves re-reading short and meaningful passages until a pre-determined fluency goal is reached. The analysis was guided by three questions:

1. Does repeated reading effectively increase reading comprehension and fluency?

2. What factors within repeated reading methods are most important to the overall success of the intervention?

3. Does repeated reading increase the reading abilities of students with disabilities?

The independent variable was the studies that were selected for analysis. The dependent variable was repeated reading effectiveness, which was divided into non-transfer and transfer categories that were further subdivided for analysis. Non-transfer referred to repeated reading studies where students’ abilities were measured on the same passage after rereading it multiple times. Non-transfer studies were subdivided into three factors: cued reading, corrective feedback, and performance criteria. Transfer referred to studies in which student ability was measured on new passages after having performed repeated reading on other passages. Transfer studies were
subdivided into six factors: adult to peer or peer to peer intervention, modeling, corrective feedback, performance criteria, comprehension, and charting.

The study selection method consisted of multiple steps: (a) studies had to have been published between 1977 and 2001, included the presence of experimental and quantitative procedures, and used participants between the ages of 5-18; (b) studies were located using two academic databases using the following search terms related to repeated reading: rate, accuracy, speed, automaticity, and fluency; (c) studies were reviewed to ensure they satisfied meta-analysis criteria, such as having adequate quantitative data; (d) of the potential studies a determination was made as to the data ranges that would allow for the most information to be analyzed; (e) comprehension measures were defined as story retelling or traditional comprehension questions and fluency measures were defined as correct words per minute, words per minute, or reading speed; and (f) pertinent study variables were included in the analysis to allow for the effect sizes to be better organized. They included length of intervention in sessions, sample (students with or without disabilities, or both), fluency and/or comprehension dependent variables, and repeated reading protocols.

Therrien’s results were reported as effect sizes (ES), a descriptive statistic that measures the strength of a relationship between variables, with larger ES representing stronger relationships. For non-transfer cue types (which were instructions to focus on speed and/or comprehension), the most effective cue for increasing fluency was a combination fluency and comprehension cue (0.94). The most effective cue for increasing comprehension was also a combined fluency and comprehension cue (0.76). Receiving corrective feedback during reading resulted in a lower ES of 0.68 than the ES of 0.88 when no corrective feedback was given. For
both fluency and comprehension, effect sizes were largest when passages were read four times, as opposed to studies in which fewer readings were used.

The following results were found for transfer studies. For tutoring type, adult to peer interventions were substantially more effective than peer to peer interventions for both fluency (1.37 vs. 0.36) and comprehension (0.71 vs. 0.22). Modeling was found to be a mixed transfer factor, with only a slight ES increase for fluency (0.10) and a decrease in comprehension (-0.35). The use of corrective feedback produced only a slight gain for fluency (0.05) and a moderate decrease in performance for comprehension (-0.29). Performance criteria was a salient transfer factor, with a fixed number of readings design producing an ES of 0.38, significantly less than the ES of 1.70 from studies in which predetermined criterion were used. Studies that included charting obtained a fluency ES of 0.57 and a comprehension ES of 0.11. Studies that did not include charting obtained a fluency ES of 0.40 and a comprehension ES of 0.44.

Therrien also reported results comparing ES for ND students and students with disabilities. The only specific disability that he found analyzed in the research was LD. Overall, the average ES across all studies for ND students was 0.76 for fluency and 0.48 for comprehension, compared with 0.77 for fluency and 0.59 for comprehension among studies involving students with LD.

The results demonstrated that repeated reading interventions were significantly effective at increasing fluency and comprehension scores for both ND students and students with LD, regardless of whether the studies were non-transfer or transfer designs. Instructional recommendations may be inferred based on the component analysis that was completed. For non-transfer studies, the most effective design should include a combined fluency and
comprehension cue. Corrcccive feedback while students are reading should not be given, as it was found to decrease fluency measures. Finally, passages should be read at least four times.

Before discussing recommendations for transfer studies, additional discussion on specific factors is warranted. Corrective feedback was observed to have a minimal positive impact on fluency, and a detrimental effect on comprehension. However, when studies with peer-to-peer based interventions were factored out, corrective feedback was found to have a significantly positive effect on fluency with an ES of 1.37. Interpretations of the modeling factor should also take into account that the only studies it was analyzed in were peer to peer based, which overall were significantly less effective. Also, though the charting factor was found to have a mixed effect on fluency and comprehension, there is reason to believe that charting is more effective with older students. A highly significant ES of 1.58 was identified in adult programs using charting. With these caveats in mind, the following conclusions can be drawn about transfer studies. The most effective interventions should be administered by an adult, include corrective feedback after reading has occurred, have rereading success based on performance criterion (either a specified level of WPM or time goals), include comprehension cues, and consider charting when working with older students. Researchers have provided specific examples of how components of repeated reading could be combined to create effective fluency interventions.

A variety of modifications have been made to the repeated reading method to meet the needs of the researchers and students (Pruitt & Cooper, 2008). The flexibility of repeated reading is a major asset that is also thought to be an important factor in the popularity and widespread use of the method (Therrien & Kubina, 2006). The diverse range of repeated reading procedures is united by their common use of rereading passages in order to meet a fluency goal.
In their review of the method, Therrien and Kubina arrived at three essential components of repeated reading. First, the interventions should be administered by teachers, or other trained adults, as methods utilizing peer to peer designs resulted in significantly less gains. Next, corrective feedback should be used, and words should be provided to students if they take longer than three seconds to decode them. Errors should be reviewed and practiced after the passage is completed but before another rereading. Finally, Therrien and Kubina concluded that passages should be reread until an established goal had been met. The use of progress monitoring was strongly advised for use in tracking gains towards the goal. As has been demonstrated with previous studies, when this simple method is implemented properly, significant gains among a variety of variables can be expected (Samuels, 1979; Herman, 1985; Sindelar, Monda, & O’Shea, 1990; Therrien, 2004). A typical repeated reading procedure is described below.

Hudson, Lane, and Pullen (2005) outlined a repeated reading protocol that exemplified many of the elements discussed in the preceding studies. They begin by operationally defining repeated reading as using a brief instructional level passage, setting a criterion rate, followed by directing a student to reread the passage until the criterion is achieved. The researchers recommended implementing these features in the following way:

1. Have the student read the passage with no preparation to establish baseline data.

2. Monitor errors and provide corrective feedback after the reading.

3. Establish a reasonable rate and accuracy goal.

4. Use a graph to record progress.

5. Continue to monitor rate and accuracy while the student rereads the passage.
6. Provide corrective feedback, review or set another goal, and repeat the process.

7. Use the method at least three times per week to increase consistency.

8. Move on to a new passage when the criterion has been achieved or the student is no longer making progress, and repeat the same steps.

The researchers also provided examples of line graphs that could be used as trackers for both rate and accuracy. They also noted that the simplicity of the procedure lends itself well to student acquisition, which invites the possibility of student directed use of the strategy after it has been mastered. They identified recorded reading and paired assisted reading as two variations of repeated reading that could be used once the protocol was mastered.

While the repeated reading method recommended by Hudson, Land and Pullen (2005) is typical of many interventions, there is none the less some disagreement as to how certain steps should be implemented. For instance, research protocols differ on when students should be promoted to new passages. Pruitt and Cooper (2008) provided a developmentally informed recommendation on that topic. They acknowledged that failure to meet the criterion rate in a reasonable number of rereading could present significant problems, especially with older students for which motivation and effort are typically more inconsistent. Assuming the difficulty isn’t due to genre or text structure novelty, the recommended that teachers use their best judgment in problem solving the scenario. In general, Pruitt and Cooper stressed the importance of teacher discretion in managing the progression of repeated readings. Regardless of the specific details and exact intervention design, based on this thorough analysis of repeated reading research, significant positive effects on fluency and comprehension measures can be expected when using the repeated reading method.
Conclusion

In conclusion, fluency should never again be a neglected component of reading, as Allington (1983) so powerfully alerted the field to in his analysis of reading instruction practice. Indeed, thorough reviews of reading research have determined fluency to be one of the most important foundational skills for reading development (NRP, 2000). The results of dysfluent reading are stark. Students that have not achieved fluent reading are more likely to also struggle with comprehension, fall behind their peers, and if unaddressed, become unmotivated, disenfranchised readers. Effective interventions are needed in order to avoid these outcomes. For interventions to be effective, they must be informed by the current developmental levels of students to account for how quickly the influence of reading factors can shift (Roth, Speece, & Cooper, 2002). Interventions must also incorporate the unique characteristics of the students they are designed for. For instance, research has demonstrated that older students with LD require special consideration due to their unique learning needs (Roberts, Torgesen, Boardman, & Scammacca, 2008). These unique needs include struggles with skills well beyond the commonly accepted developmental windows. Multiple studies have found that a significant portion of older students with LD continue to struggle with fluency, resulting in a host of reading complications, most notably low comprehension scores (Rasinski et al., 2005; Rasinski, Rikli, & Johnston, 2009). Thus, there is a need for evidence-based fluency interventions that can be individualized for the exceptional needs of older students with LD.

Repeated reading is an evidence-based fluency intervention that is capable of addressing the needs outlined above. From its earliest use, repeated reading proved to be an effective method for students with disabilities (Samuels, 1979; Herman, 1985). Indeed, though repeated reading has been used successfully with all students regardless of disability status, there is
evidence that it is especially beneficial to struggling readers, who are more likely to have disabilities (Sindelar, Monda, & O’Shea, 1990). Subsequent research analyzing individual components of repeated reading methods now makes it easier to create individualized interventions (Hudson, Lane, & Pullen, 2005; Pruitt & Cooper, 2008; Therrien, 2004; Therrien & Kubina, 2006). Overall, the reviewed studies provide a solid argument for the importance of addressing fluency needs in older students with disabilities, and demonstrate the effectiveness of repeated reading. Based on these findings, it would be possible to design a repeated reading intervention to address the fluency and comprehension needs of an older student with a disability.
Chapter Three: Method

The method that was used in this case study was explained in this chapter. It begins in section one with a description of the student, focusing on his academic characteristics pertinent to the study. In section two the procedures were described with an emphasis on the steps that were taken to implement repeated reading, the primary intervention, but also including the overall tutoring session design and a description of the other literacy strategies that were used. Lastly, section three closes with a description of the data collection method used in this study, particularly detailing the pre and post assessment procedures.

Participant

The single participant in this case study was a student who had been identified by officials at his school as a struggling reader. To protect the student’s confidentiality, the pseudonym Lewis was used. Lewis was a 14 year 10 month old male student that had recently finished eighth grade at a charter school located in a large urban city in the upper Midwest. Lewis was enrolled in special education for a learning disability (LD), which was initially identified in second grade with the use of a district mandated significant discrepancy formula that demonstrated considerable academic delays not attributable to other factors. He was referred by his second grade teacher for evaluation due to specific academic concerns about developmental delays with reading (Initial IEP, May 24, 2006). The Individuals with Disabilities Education Act (IDEA) of 2004 defines LD as a disorder related to the fundamental psychological processes, evident in delays with basic academic skills that cannot be attributed to any other factors. The biggest concerns with Lewis’ academic performance were his struggle with reading, most evident in his poor fluency skills, and his lack of motivation in class, which multiple
teachers reported as a significant problem (IEP, April 5, 2012). For example, Lewis’ Language Arts teacher reported that he regularly failed to finish reading assignments in class, especially when longer passages were used. Also, his IEP teacher observed him in the Language Arts class and determined that he was off-task approximately 40% of the time. The off-task behavior was not disruptive and he was not sleeping, it was primarily described as him just sitting there doing nothing (IEP, April 5, 2012). Lewis’ IEP teacher described his reading as very slow and choppy, adding that he required considerable redirection and encouragement in order to complete all of his work (anecdotal notes, May 23, 2012).

Assessment data verified his teachers’ observations. On the Woodcock-Johnson III Brief Assessment (Form A) administered by his IEP teacher when Lewis was at the 8.7 grade level, he obtained a broad reading grade equivalent score of 4.5, with his lowest grade equivalent score (3.3) recorded on the reading fluency subtest (completed March 26, 2012). On a school-based assessment (Measures of Academic Progress), Lewis received a score of 186 in reading, well below the average score of 210 for students of his age (completed January, 2012). Two assessments administered by the researcher, which will be described in the third section, also identified fluency as the student’s primary literary weakness. The assessments were: 3-Minute Reading Assessments (Rasinski & Padak, 2005) and Qualitative Reading Inventory-5 (QRI-V) (Leslie & Caldwell, 2011) (See Appendix A). After fluency was established as his greatest literacy need, the decision was made by the researcher to implement a fluency intervention called repeated reading. Repeated reading is a method that consists of rereading short, meaningful passages multiple times until a fluency goal is achieved (Samuels, 1979). The next section explains what the intervention consisted of and outlines the steps that were taken to implement it.
**Procedures**

This section describes the procedures that were used to implement the intervention. It is primarily focused on the design and application of the repeated reading method, but it also provides a description of supplementary literacy strategies that were utilized. The intervention was implemented during one hour tutoring sessions that occurred over the course of 11 days during a summer school program at Lewis’ school. The structure of the sessions was based on the balanced intervention design put forth by Caldwell and Leslie (2009), which included three main areas: word study, fluency development, and comprehension. The structure was adapted to meet Lewis’ unique literacy characteristics, delivered in the following order for the stated amount of time: fluency development (repeated reading), 30 minutes; word study, 15 minutes; comprehension, 15 minutes. Though word study and comprehension activities were used, since improving fluency was the primary goal, repeated reading was the principal focus. Repeated reading was also the independent variable in this study; therefore, it was consistently implemented and performed the same way every session, as opposed to word study and comprehension activities that varied throughout the sessions. The specific steps that were implemented during the intervention are described below.

**Repeated reading.** The focus of this study was repeated reading because previous research had demonstrated it to be effective at increasing fluency skills (Therrien, 2004). A wide variety of methods have been used to implement repeated reading interventions, related by their use of rereading passages in an effort to achieve a fluency goal (Therrien & Kubina, 2006). The repeated reading procedure used in this study was specifically designed to meet the needs of the participant. Instructional level passages were used were utilized during the first six sessions, with an average Flesch-Kincaid Grade Level of 7.8, and an average word count of 131.
However, as the intervention went on progress monitoring data demonstrated that lower level passages were required as Lewis was making minimal gains on grade level instructional passages, evident by his failure to achieve the daily WPM goal during sessions three thru six. For the remaining sessions, the average Flesch-Kincaid Grade Level was 6.7 with an average word count of 105. Overall, the average passage level was rated at 7.5 with an average word count of 123. The passages were derived from high interest books and magazines, as determined by Lewis, and he was allowed to choose which passage he wanted to work with on a daily basis. The first five passages were derived from the “Weapons” chapter of one of his favorite books: *The Zombie Survival Guide: Complete Protection from the Living Dead* (Brooks, 2003). Other passages were taken from a list of the top 10 infantry weapons of World War II (Shakespeare, 2011). At the beginning of every session the rationale for the intervention was reviewed along with progress from previous sessions. Next, a daily goal of words per minute (WPM) and accuracy in percent was set using a daily goal tracker sheet (see Appendix A). Daily goals were set as benchmarks on the way to the final goal of greater than 92% accuracy and 151 (WCPM), which is the average instructional level reading rate for a student at the end of their eighth grade year (Hasbrouck & Tindal, 2006).

After the daily goal was set, Lewis read the passage for the first time without pre-reading strategies in order to establish baseline WPM and accuracy levels. A stopwatch was started as soon as he read the first word and was stopped when he read the last word of the passage. Lewis was asked to evaluate his performance on the three parts of fluency—speed, accuracy, prosody—immediately after reading the passage. A chart which indicated the definition of fluency and a short description of its three parts was posted for reference during the discussions (see Appendix B). Next, errors from the first reading were highlighted and discussed, and definitions with
examples were provided when needed. Accuracy and WPM were calculated and tracked in relation to the daily goal and the starting point from the previous session. The WPM rate was computed by multiplying the number of words in the passage by 60 (completed prior to session), and then dividing it by the total number of seconds that were required to read the passage. The researcher monitored accuracy by marking errors while following along on a duplicate passage.

Following the initial reading and discussion of the first passage, a strategy developed by Rasinski (2006) was used that consisted of modeled reading, assisted reading, and further practice. During modeled reading the researcher demonstrated fluent reading while Lewis followed along silently. Next, while continuing to model fluent reading, the researcher assisted the participant by having him read along orally. Further practice consisted of continuing to reread the passage until the daily goal was met or the participant’s motivation precluded him from continuing. The same procedure utilized with the first passage was implemented after each subsequent rereading: (a) WPM and accuracy were tracked during rereading; (b) Lewis was asked to judge his performance in relation to the components of fluency upon completion; (c) corrective feedback was provided and discussed; and (d) WPM and accuracy were calculated and evaluated in relation to the daily goal. The number of times a passage was reread depended on goal completion and Lewis’ motivation. If the goal was met, then the repeated reading component was completed and the next activity began. However, the completion of the daily goal was affected by Lewis’ daily motivation, despite the fact that specific, research-based motivational strategies had been designed into the intervention, including using high interest material that he selected, providing him with the choice between supplementary activities, and openly discussing the relevance of the study rationale (Guthrie & Humenick, 2004). The number of rereading ranged from three to seven with an average of 4.9.
**Word study and comprehension.** The remainder of the tutoring sessions consisted of word study and comprehension activities. Lewis’ primary need in the area of word study was improved complex decoding. Specifically, Lewis struggled with recognizing and accurately decoding suffixes in polysyllabic words, such as reading “immigrations” instead of “immigrants”. Morphological analysis that focused on root words and suffixes was used to address this need, which is a recommended strategy for teaching older students complex decoding (Caldwell & Leslie, 2009). Common roots and suffixes were discussed and then identified within passages that had been read. In conjunction with this, a variation of an evidence based strategy called making words was used (Cunningham & Cunningham, 1992). Lewis was provided a root word and then challenged to create as many new words from it by adding different suffixes. After adding suffixes, he was encouraged to develop similar words by rearranging letters in the original root word and by utilizing rhyming words.

Lewis demonstrated relatively strong recall during comprehension assessment with passage questions, but struggled with summarizing main ideas. For instance, when asked what the pre-test QRI-V passage was mainly about, Lewis responded “slaves”, omitting the main theme of the passage which concerned the slaves’ struggle for freedom. In order to address these areas, instruction in metacognitive comprehension strategies was provided. The most common strategy used was reciprocal teaching. This strategy was designed to encourage deeper interaction with the text, which is associated with improved comprehension (Palinscar & Brown, 1984). The strategy consists of four parts: predicting, questioning, summarizing, and clarifying (Palinscar & Brown). After the researcher modeled the strategy during its initial use, Lewis was increasingly encouraged to independently use the strategy. Besides reciprocal teaching, higher order questions were asked throughout the sessions to address comprehension. The questions
were designed to be high interest and to encourage him to more deeply consider the content. For instance, when reading a passage about a video game, Lewis was asked to predict who would win in a fight between all the characters and why. The sessions concluded with a discussion about progress and a preview of the activities for the next session. The next section explains how progress was assessed before, during, and after the intervention.

**Data Collection**

Two pre and post assessments and progress monitoring that occurred throughout the sessions were used to determine the effectiveness of the intervention on four dependent variables: rate, accuracy, prosody, and comprehension. The independent variable in this study was the repeated reading fluency intervention. The dependent variables were measured by two pre and post intervention assessments: 3-Minute Reading Assessments (Rasinski & Padak, 2005) and Qualitative Reading Inventory-5 (QRI-V) (Leslie & Caldwell, 2011).

**3-Minute Assessment.** The first assessment administered was one of the 3-Minute Assessment passages developed by Rasinski and Padak (2005). Administration consisted of directing Lewis to read a grade level passage orally in a normal manner. Eighth grade passages A and B were administered. Passage A was 280 words long and detailed a recently immigrated family’s symbolic trip to the Statue of Liberty. Passage B was 248 words long and concerned a family’s process of selecting vegetables for dinner. Before beginning, he was instructed that he would be asked to retell the passage after reading it. Lewis then read the passage for 60 seconds. The researcher monitored Lewis’ performance by following along on a duplicate passage. Errors were defined as uncorrected mistakes, mispronunciations, omissions, and words that were not decoded after two seconds. In accordance with the assessment protocol, self-corrections were
not counted as errors. After 60 seconds, the place in the text Lewis reached was marked. Because he had not finished the whole passage, Lewis was instructed to continue reading the rest of it silently. The passage was removed from view, and he was asked to retell what he remembered from the reading. After his retelling, he was queried if there was anything else he remembered from the passage, which concluded the administration of the assessment.

The assessment was scored with four variables consistent with those measured in previous repeated reading research: fluency rate, fluency accuracy, fluency prosody, and comprehension (NRP, 2000; Therrien, 2004). Fluency rate was calculated by counting the number of words read correctly during the 60 seconds, which produced a words correct per minute (WCPM) score. Fluency accuracy was determined by dividing the total number of correct words read by the total number of all words read, and then converting it into a percent. The 3-Minute Assessment classified reading levels in relation to accuracy in the following way: (a) frustration, less than 92% accuracy; (b) instructional, between 92-98% accuracy; and (c) independent, greater than 98% accuracy. Fluency prosody was scored using a scale with four dimensions, which included: expression and volume, phrasing and intonation, smoothness, and pace. Each dimension was rated by a four point scale on which one represented minimal prosody and four represented advanced prosody. Finally, a comprehension score was derived from the retelling of the passage. The 3-Minute Assessment included six-point comprehension rubric was used with the following ratings: 1 = minimal or no recall; 2 = unrelated facts; 3 = main idea with few details; 4 = main idea with unorganized supporting details; 5 = comprehensive summary with main idea; 6 = comprehensive summary including connection beyond the passage (Rasinski & Padak, 2005). These four scores—rate, accuracy, prosody, and comprehension—provided valuable diagnostic data that was used in the design of the repeated
reading intervention and in evaluating its effectiveness. In particular, the student demonstrated a substantially low reading rate that helped establish fluency as the student’s greatest literacy need.

**QRI-V.** The second pre and post assessment was the *QRI-V* (Leslie and Caldwell, 2011). The *QRI-V* is designed to be administered at a student’s instructional reading level and includes passages from pre-primer to high school. To determine Lewis’ instructional level he was assessed with grade level passages, beginning at third grade, until a frustration level was reached indicating that the previous instructional passage should be used. The *QRI-V* defined word list reading levels in the following way: (a) frustration, below 70%; (b) instructional, 70-85%; and (c) independent, greater than 90%. Each word list contained 20 words that were read successively while the researcher recorded whether or not the words were identified automatically. Automatic identification was defined as immediate word recognition occurring within one second. The researcher also recorded incorrect responses and miscues while the student read through the word lists. Self-corrections were not counted as errors. Once a starting point had been determined from the word lists, assessment with an instructional level passage began.

Passage administration consisted of four parts: pre-reading questions and prediction, passage reading, retelling, and comprehension questions. Before reading the passage, Lewis was directed to answer a series of concept questions in order to ascertain his prior background knowledge related to the story. He was also encouraged to make a prediction about the story content based on the concept questions and title of the passage. Next, he was instructed to read the passage orally and was informed that he would be directed to retell the passage when completed. The researcher recorded miscues on a duplicate passage. Miscues were defined as any divergence from the text, such as substitutions, omissions, insertions, self-corrections, word
THE EFFECT OF REPEATED READINGS

reversals, and ignored punctuation. Lewis was instructed to move on when he did not know a word and assistance was not provided. The reading was timed, and the total time was recorded upon completion of the passage. Then, the researcher removed the passage and Lewis was directed to retell the story as if he was explaining it to someone that had never read it before. When finished, he was asked if there were any other details he remembered. The researcher recorded Lewis’ retelling on a scoring sheet. Finally, the assessment was completed when Lewis answered a series of ten comprehension questions that consisted of both explicit and implicit questions.

Two fluency and two comprehension scores from the QRI-V were analyzed for the purposes of this study. The two fluency scores were rate and total accuracy. Two types of rate were calculated: words per minute (WPM) and words correct per minute (WCPM). The WPM was computed by multiplying the number of words in the passage by 60 and then dividing by the number of seconds it took to read the passage. The only difference in calculating WCPM was that the total miscues were subtracted from the number of words in the passage before multiplying by 60. Accuracy was determined by subtracting the number of miscues from the total number of words in the passage. The resulting number was then divided by the total number of words and converted into a percentage. Reading level determined by total accuracy was defined in the following way: (a) frustration, less than 90%; (b) instructional, 90-98%; (c) independent, greater than 98%.

The two comprehension scores were derived from the retelling task and the comprehension questions. As Lewis retold the passage, the researcher recorded his responses in relation to a list of ideas provided on the QRI-V scoring sheet. Accurate details and inferences that were retold, but were not on the scoring sheet, were counted as correct. The number of ideas
retold was then compared with the total number of ideas to assess retelling comprehension. The score was not used to assess reading level, but it was used to assess understanding of story structure, such as awareness of main ideas and supporting details. The other measure of text understanding consisted of ten comprehension questions, composed of explicit and implicit questions. Explicit answers were to be obtained from the text, and the correct response was provided on the scoring sheet. Implicit answers had to be based on textual inferences, and examples of acceptable responses were provided. All answers were scored as either correct or incorrect, with no half points awarded. The total number of correct answers was totaled and compared to given reading level criteria, which for the comprehension questions was defined as: (a) frustration, below 67%; (b) instructional, 67-89%; and (c) independent, above 90%. Performance on explicit and implicit questions was also able to be analyzed separately, allowing for additional data on comprehension abilities.

**Progress monitoring.** Throughout the repeated reading intervention, data was collected on the three components of fluency: rate, accuracy, and prosody. Rate was assessed on every passage by tracking words per minute (WPM). The WPM rate was calculated by multiplying the number of words in the passage by 60 and then dividing that number by the total number of seconds that were required to read the passage. Next, accuracy was computed by subtracting the number of errors from the total number of words in the passage, dividing that number by the total number of words in the passage, and then converting it to a percent. Rate and accuracy were tracked with line graphs that were displayed prominently during the sessions as instructional feedback tools (see Appendix C). Finally, prosody was assessed using the multidimensional fluency rubric that was provided in the *3-Minute Assessment.* (Rasinski & Padak, 2005). In addition to the pre and post-test, prosody was also measured at the beginning of the second and
third weeks of intervention (sessions four and eleven). As a result of the previously described
data collection methods—3-Minute Assessment, QRI-V, and progress monitoring—the
effectiveness of the intervention was able to be assessed.

**Conclusion**

This intervention was designed to meet the literacy needs of an eighth grade student, who
was identified as being LD, and who was struggling with reading. The first step was a thorough
analysis of the student’s present levels of performance and academic history. This analysis, in
conjunction with pre-intervention assessment by the researcher, determined that the student’s
greatest literacy need was improved reading fluency. After an examination of existing research,
repeated reading was identified as an appropriate fluency intervention and was subsequently
implemented. Procedures included an initial baseline reading, with corrective feedback,
followed by modeled reading and assisted reading, after which the rest of the rereading practice
was completed. Data was collected with multiple measures, including two pre and post test
instruments along with progress monitoring that occurred throughout the intervention. Rate,
accuracy, prosody, and comprehension were the variables that were tracked. Rate was
operationalized as words per minute (WPM) and words correct per minute (WCPM). Accuracy
was defined as the percentage of words correctly read in a given passage. Prosody was evaluated
by the four elements of prosodic reading in a multidimensional fluency scale. Comprehension
was assessed by using retelling tasks after story completion and by evaluating performance on
comprehension questions. With these methods in place, the repeated reading intervention was
conducted.
Chapter Four: Results

This case study was conducted to examine the effectiveness of a repeated reading intervention for an eighth grade student with a learning disability (LD). The researcher assessed four dependent variables that previous repeated reading research had demonstrated were positively impacted by this intervention: rate, accuracy, prosody, and comprehension (Rasinski, Rikli, & Johnston, 2009; Therrien, 2004). Pre and post-test assessments included the 3-Minute Reading Assessments (Rasinski & Padak, 2005) and the Qualitative Reading Inventory-5 (QRI-V) (Leslie & Caldwell, 2011). Progress monitoring also occurred throughout the sessions, which consisted of tracking words per minute (WPM), accuracy, and prosody. WPM and accuracy were monitored during all sessions whereas prosody was only measured at the beginning of weeks two and three utilizing the same multidimensional fluency rubric from the 3-Minute Reading Assessment. This chapter was divided into four sections that presented the collected data and analyzed the results. The sections were organized by the dependent variables: rate, accuracy, prosody, and comprehension.

Rate

Fluency has been most strongly associated with reading rate, which has also been the most measured variable within repeated reading research (Samuels, 1979; Therrien, 2004). Rate was defined as reading with appropriate speed to support automatic decoding (NRP, 2000), and was measured in two ways: words per minute (WPM) and words correct per minute (WCPM). WPM was determined by multiplying the total number of words by 60, and then dividing by the number of seconds required to read the passage. WCPM was computed by subtracting the
number of errors from the total number of words read, and then dividing by the number of seconds required to read the passage. The results are presented below by assessment.

3-Minute Reading Assessments  The researcher administered the 3-Minute Assessment during the first and last day of the intervention. Passages corresponding to the student’s grade level were utilized per assessment instructions (eighth grade forms A and B). Pre and post-testing demonstrated a decrease in reading rate performance for WPM and WCPM. The participant decreased from 66 WPM on the pre-test to 41 WPM on the post-test. WCPM decreased from 63 on the pre-test to 40 WCPM on the post-test. The post-test performances represented a considerable decrease in reading rate evidenced by the participant reading 25 fewer WPM and 23 fewer WCPM (See Table 4.1).

QRI-V. Similar decreases in reading rate were detected with the QRI-V that was administered by the researcher on the first and last day of the intervention. Word lists beginning at third grade were administered during the first session in order to determine which passage to use. The student obtained an instructional level score on the Upper Middles School Grade Word List when he correctly 15 of the 20 target words accurately, or 75%, two of which were identified automatically (10%). The student obtained a frustration level score on the high school list, in which he identified 6 out of 20 words accurately (30%); including one word that was automatically identified (5%). Thus, the upper middle school passages were administered. The QRI-V identified a decrease in performance from the pre-test to the post-test on both measures of reading rate from the upper middle school passages. Baseline rates were measured at 53 WPM and 51 WCPM. Post-test rates decreased to 44 WPM and 41 WCPM, decreases of 9 WPM and 10 WCPM (See Table 4.1).
Table 4.1.

Difference in Words per Minute (WPM) and Words Correct per Minute (WCPM) on 3-Minute Reading Assessments (3-Min.) and QRI-V Pre and Post-Tests.

<table>
<thead>
<tr>
<th>Test Measure</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Min. WPM</td>
<td>66</td>
<td>41</td>
<td>-25</td>
</tr>
<tr>
<td>3-Min. WCPM</td>
<td>63</td>
<td>40</td>
<td>-23</td>
</tr>
<tr>
<td>QRI-V WPM</td>
<td>53</td>
<td>44</td>
<td>-9</td>
</tr>
<tr>
<td>QRI-V WCPM</td>
<td>51</td>
<td>41</td>
<td>-10</td>
</tr>
</tbody>
</table>

**Progress Monitoring.** Contrary to the pre and post-test assessments, progress monitoring results in the form of WPM demonstrated increased reading rates within passages and between passages. WPM were determined by multiplying the total number of words by 60, and then dividing that number by the number of seconds that were required to read the passage. Within passage measures referred to progress between the first and last reading of individual passages. The participant increased his WPM within each session from the first reading to the last. The mean WPM gained within passages was 43 (median = 47 WPM, range = 17-59 WPM). Between passage data measured differences that occurred among sessions, including the progress between the first and last sessions. An increase of 71 WPM was recorded between the first reading (50 WPM) of the intervention and the last (121 WPM). Mean WPM per session increased from 81 in the first session to 98 in the last session, an increase of 17 WPM. Yet, a much smaller increase of 2 WPM was identified between sessions when all of the mean session rates were included for analysis. Figure 4.1 depicted the results of all repeated reading sessions. Passage number referred to the separate rereading that occurred within the intervention.
Though overall gains between sessions were recorded over the length of the intervention, by depicting only the mean WPM per session, Figure 4.2 demonstrated that the increased progress did not follow a strictly positive linear trend. To further analyze the mean WPM session results, Pearson correlation tests were conducted with three session characteristics: passage length, day of the week, and passage level. The mean passage length was 123 words, with a range from 101-149 words. Days of the week were assigned a number (Monday = 1, Tuesday = 2, Wednesday = 3, Thursday = 4) that was then correlated with the mean WPM achieved on that day. On the figure, the horizontal axis displayed day of the week (abbreviated) and session number together. Sessions during the first week occurred only on Tuesday and Thursday due to observance of the July 4th holiday. Passage reading levels were determined with the Flesch-Kincaid feature imbedded in Microsoft Word. The Flesch-Kincaid measure has been validated as an accurate gauge of readability, deriving a level based on average sentence length.
and average number of syllables per word (Kincaid, Braby, & Mears, 1988). The average passage level was 7.5, ranging from 5.4-9.5. Passage level and mean WPM were also correlated without the results from session three, which was identified as an atypical testing day by the researcher using both qualitative and quantitative measures. Qualitatively, the student was observed to be significantly unmotivated on that Monday, reporting that he was extremely tired as a result of not acquiring enough sleep the previous weekend (field notes, July 16, 2012). Quantitatively, the results from session three were particularly surprising considering the passage was the second lowest used during the intervention at 5.5, yet the smallest mean WPM was achieved out of all the sessions (60 WPM). Session three also appeared to be an outlier when the mean WPM per sessions were graphed (See Figure 4.2).

![Figure 4.2: Mean Words per Minute (WPM) by Session](image)

Results from the correlation tests were summarized in Table 4.2. Passage length (0.03) was not determined to be correlated with reading rate. The relationship between day of the week
and mean WPM was moderately strong at 0.52. That positive correlation revealed that as the week progressed, and the day of the week code increased, mean WPM also increased. Passage level was only slightly negatively correlated with mean WPM (-0.10). However, when session three was factored out, a more robust negative correlation of -0.59 was identified. Therefore, as the passage level increased, mean WPM decreased. A coefficient of determination ($r^2$) was conducted on this correlation to analyze predictive relationship between the two variables, revealing that approximately 35% of the variance between mean WPM scores could be explained by the difficulty of the passage.

Table 4.2.
Correlations Between Mean WPM per Session and Session Characteristics.

<table>
<thead>
<tr>
<th>Session Characteristic</th>
<th>Correlation with Mean WPM per Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passage Length</td>
<td>0.03</td>
</tr>
<tr>
<td>Day of Week</td>
<td>0.52</td>
</tr>
<tr>
<td>Passage Level</td>
<td>-0.10</td>
</tr>
<tr>
<td>Passage Level Minus Session Three</td>
<td>-0.59</td>
</tr>
</tbody>
</table>

In sum, overall results for reading rate were mixed. The two pre and post-test assessments detected average decreases of 17 WPM and 9.5 WCPM. Progress monitoring results, on the other hand, demonstrated increased reading rates both within passages (mean = 43 WPM) and to a smaller extent between passages (mean = 2 WPM). Correlation tests were conducted to examine the between passage results in greater detail. A moderate correlation was obtained between mean WPM performance and day of the week (0.52). A weak negative correlation was determined between passage level and mean WPM achievement (-0.10), but when session three was excluded a substantially stronger relationship was ascertained (-0.59). That negative correlation indicated an interaction between increased passage level difficulty and
decreased mean WPM per session. Additional discussion of the effect of interactive factors on reading rate performance will be discussed in the next chapter.

**Accuracy**

Accurate reading was defined as correct decoding combined with an absence of miscues, which included: substitutions, omissions, insertions, word reversals. Additionally, the QRI-V considered self-corrections, word reversals, and ignored punctuation as errors, consistent with the authors’ argument that any deviation from the text represented a miscue that decreased the chance for automatic decoding and increased the chance for incomplete comprehension (Leslie & Caldwell, 2011). Previous research identified an over-emphasis on rate when assessing fluency interventions, resulting in recommendations for more balanced intervention designs that emphasized the importance of appropriate speed combined with accurate reading (Rasinski, Rikli, & Johnston, 2009). In the current study accuracy was computed by dividing the number of correct words by the total number of words read, which resulted in a percent accuracy score. All three data collection methods were utilized to measure accurate reading, with the results presented below by assessment.

**3-Minute Reading Assessments**  Accuracy slightly increased from the pre-test to the post-test. On the pre-test the participant identified 63 words of the 66 words accurately, or 95% accuracy. On the post-test, the participant increased his total accuracy to 98%, identifying 40 of the 41 words correctly. Miscue analysis was performed on both passages. On the pre-test, two errors involved the misreading of suffixes (“immigrations” instead of “immigrants”, and “aloned” instead of “alone”) and the other involved incorrect decoding of a compound word (“fisthand” instead of “firsthand”). On the post-test the one error was an omission of the word
“word” in a sentence. Two other errors were made (“Brassels” for “Brussels”, and “dinner” for “dining”), but the student made self-corrections. Consistent with the test protocol, the self-corrections were not counted as errors.

**QRI-V.** No difference was identified in terms of total accuracy between the pre and post-tests. The participant obtained 95% accuracy on both passages (pre-test: 36 errors out of 745 words; and post-test: 42 errors out of 786 words). The broadest pattern of miscue consisted of mistakes with multisyllabic words. The majority of errors on both tests were on words with more than one syllable (pre-test: 61%, post-test: 76%). Another common miscue was omitting or misreading affixes, such as “walk” instead of “walked” and “springing” instead of “springs”. On the pre-test, 33% (12/36) of the errors were made in relation to affixes, which decreased to 23% (10/42) on the post-test. The results from pre and post assessments are summarized in Table 4.3.

Table 4.3.

Difference of % Total Accuracy and Miscue Analysis on 3-Minute Assessments (3-Min.) and QRI-V Pre and Post-Tests.

<table>
<thead>
<tr>
<th>Test Measure</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3-Min. Total Accuracy</strong></td>
<td>95%</td>
<td>98%</td>
<td>+3%</td>
</tr>
<tr>
<td><strong>QRI-V Total Accuracy</strong></td>
<td>95%</td>
<td>95%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>QRI-V Total Multisyllabic Errors</strong></td>
<td>61%</td>
<td>76%</td>
<td>+15%</td>
</tr>
<tr>
<td><strong>QRI-V Total Affix Errors</strong></td>
<td>33%</td>
<td>23%</td>
<td>-10%</td>
</tr>
</tbody>
</table>

**Progress Monitoring.** Increased accuracy was detected within and between sessions (See Figure 4.3). The mean increase in percent accuracy within sessions was 3.2% (median = 3%, range = 0-8%). A mean increase of 5% was determined between the first session and last session (94% to 99%). On passage 51—the last passage of the intervention—the participant read
with 98% accuracy, a 9% increase from passage number one in which 89% accuracy was recorded. When computing mean gains between all the sessions, a minimal increase of 0.5% was detected.

Pearson correlation tests were also conducted between mean session accuracy and four session characteristics: passage length, day of week, passage level, and passage level minus session three. The results are summarized in Table 4.4. Passage length had a modest negative correlation with accuracy (-0.37), indicating that there was a relationship between increased passage length and decreased accuracy. Day of the week had a similar modest correlation with accuracy (0.39), but in a positive direction that indicated a relationship between increased accuracy and sessions later in the week. Passage level (0.01) and passage level minus session three (0.02) demonstrated no correlation with accuracy.
Table 4.4.

Correlations Between Mean Percent Accuracy by Session and Session Characteristics

<table>
<thead>
<tr>
<th>Session Characteristic</th>
<th>Correlation with Mean % Accuracy by Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passage Length</td>
<td>-0.37</td>
</tr>
<tr>
<td>Day of Week</td>
<td>0.39</td>
</tr>
<tr>
<td>Passage Level</td>
<td>0.01</td>
</tr>
<tr>
<td>Passage Level Minus Session Three</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Overall, slight gains in accuracy over the course of the intervention were established with data analysis. The participant began the intervention with relatively strong, instructional level accuracy 95% on the 3-Minute Assessment and the QRI-V passages. The effect of the initial results will be a central focus of discussion in the next chapter, along with other factors that may have influenced reading accuracy performance.

**Prosody**

The third independent variable that was assessed was prosody. Prosody is the ability to read with proper expression and is often referred to as the rhythm or flow of reading (NRP, 2000). Prosody has all but been ignored as a component of reading fluency, with rate receiving the most attention followed by accuracy (Rasinski, Rikli, & Johnston, 2009). Yet, research focused on prosody consistently determined it to be an essential component of reading fluency (NRP, 2000; Rasinski et al., 2005; Rasinski, Rikli, & Johnston). Prosody is more difficult to measure than rate and accuracy, which contributed to its lack of research attention (Rasinski, Rikli, & Johnston). A multidimensional fluency rubric that was a facet of the 3-Minute Reading Assessments test was used to assess prosody (Rasinski & Padak, 2005). The rubric consisted of four criteria: expression and volume, phrasing and intonation, smoothness, and pace. Each dimension was rated on a one (low) to four (high) scale, allowing for a maximum score of 16
points. The researcher appraised prosody four times during the intervention: the first and last
days during 3-Minute Reading Assessments passage administration (sessions one and 11) and at
the beginning of each week (sessions three and nine) in conjunction with progress monitoring.

The participant obtained a prosody score of 6/16 on the pre-test passage. The following
sub-ratings with accompanying descriptions were assessed: (a) expression and volume, 1/4:
words read unnaturally in quiet voice, (b) phrasing and intonation, 2/4: choppy reading,
frequently in two and three word phrases, (c) smoothness, 2/4: extended pauses and hesitations
present, and (d) pace, 1/4: slow and laborious reading. Progress monitoring of prosody in
session three determined that there was not a change from the initial ratings. A small
improvement was detected during evaluation in session nine. Expression and volume increased
from 1/4 to 2/4, resulting in an overall score of 7/16. Slightly more emphasis was detected in the
participants reading, which included instances where expression was clearly used to make text
sound like spoken language. For instance, in reading the sentence “However, if used properly,
such a weapon will enable you to score a kill at a long range with little or no sound,” the
participant noticeably stressed “however”, raising his voice and shortening the end of the word
followed by a slight pause before reading the rest of the sentence. Additionally, “or no” was
slightly stressed to indicate its superior relationship to “little… sound”. The evaluation of
prosody on the post-test remained unchanged from session nine. As a result, an increase of one
point was recorded from the pre-test (6/16) to the post-test (7/16) on the dimension of expression
and volume, which increased from 1/4 to 2/4. Despite this minimal increase during formal
evaluation with the rubric, progress was noted by the researcher at other points in the
intervention, specifically on the dimension of pace. A description of the improvement of
prosodic pace will be discussed in detail in chapter five, along with an examination of the failure of progress monitoring to record that growth.

**Comprehension**

The final dependent variable in this study was comprehension. Comprehension is the interactive process between reader and text in which meaning is derived from reading; it is considered the purpose of reading (NRP, 2000). The inclusion of comprehension as a dependent variable in fluency research has its origin in the theory of automatic information processing that provided the theoretical foundation for repeated reading interventions (LaBerge & Samuels, 1974; Therrien, 2004). According to this theory, readers have a finite amount of cognitive resources available for the reading process. If students have not learned to automatically decode words then they will need more resources for this process, leaving fewer left over for the higher order skill of comprehension. This theory resulted in the hypothesis that increased automatic decoding (fluency) would lead to improved comprehension skills as a result of the increase in cognitive resources (Samuels, 1979). In the present study, comprehension was assessed with the pre and post-tests in two ways: retelling tasks and comprehension questions.

**3-Minute Reading Assessments** Comprehension was evaluated with a single retelling task that occurred subsequent to passage reading. The researcher compiled notes during the retelling, which were then compared to a comprehension rubric that had a maximum score of six points along the following rating scale: 1 = minimal or no recall; 2 = unrelated facts; 3 = main idea with few details; 4 = main idea with unorganized supporting details; 5 = comprehensive summary with main idea; 6 = comprehensive summary including connection beyond the passage (Rasinski & Padak, 2005). The student’s retelling was rated 3/6 in the pre-test, which indicated
understanding of the main idea with a few supporting details. The story detailed an immigrant family’s symbolic visit to the Statue of Liberty. The participant alluded to the main idea, noting that the story described a family going to New York City to view the Statue of Liberty, and that the statue represented freedom. Other than this detail, his retelling was confined to a few details such as the family couldn’t go to the crown because of construction so they had to look at it from the ground.

An increase of one point was recorded on the post-test retelling task, resulting in a score of 4/6. That score corresponded to a recall of main idea along with supporting details and the presence of connections beyond the text. The presence of this last feature, text connection, was responsible for the increased score. The passage described a child’s disdain for Brussels sprouts and his accompanying conspiracy theories about why adults make children eat them. Beyond effectively summarizing that main idea, the student immediately made numerous personal connections to the text, including: I don’t like Brussels sprouts. I agree they taste metallic (story detail). My Dad likes them, which I don’t get. I like corn better, and really like asparagus. Creating personal connections to text is considered an indicator of comprehension (Leslie & Caldwell, 2009). That process, along with the potentially mitigating factor of background knowledge, will be addressed in the next chapter.

**QRI-V.** The *QRI-V* contained two comprehension tests: retelling and passage questions. The retelling procedure was identical to *3-Minute Reading Assessments*, but was scored differently. For the *QRI-V*, the number of ideas recalled during the retelling was totaled and then compared to a total number of possible ideas that had been compiled by the authors (Leslie & Caldwell, 2011). The participant recalled 22 out of 64 ideas on the pre-test, or 34%. On the post-test, the participant retold 30% of the ideas (19/63), which represented a 4% decrease in
retelling comprehension from the pre-test. No difference was identified between comprehension question performance on the pre and post-tests. Seven of the 10 questions were answered correctly on both tests. Further, a difference was not determined between his responses on implicit versus explicit questions. The student answered 4/5 explicit questions and 3/5 implicit questions correctly on both tests.

**Conclusion**

Data analysis of the four dependent variables—rate, accuracy, prosody, and comprehension—revealed mixed results for the effectiveness of the repeated reading intervention. *3-Minute Reading Assessments* determined a substantial decrease in WPM and WCPM reading rates and minimal increases in total accuracy, prosody, and retelling comprehension. *QRI-V* results identified moderate decreases in WPM, WCPM, and retelling comprehension, and no change in total accuracy and comprehension question measures. The most positive results were determined with progress monitoring analysis, which detected considerable gains in WPM rate and total accuracy within and between sessions, along with a minor increase in prosodic reading. Pearson correlation tests were conducted between rate, accuracy, and four session characteristics: passage length, day of week, passage level, and passage level minus session three. Moderate positive correlations were determined between rate and day of week (0.52) and accuracy and day of week (0.31). Moderate negative correlations were found between rate and passage level minus session three (-0.59) and accuracy and passage length (-0.37). The correlations are important indicators to the influence of extraneous factors on the results of this intervention. They, along with other potentially confounding elements, will be analyzed in the next chapter. Chapter Five will also discuss the results, connect the current study
to existing research, evaluate strengths and limitations of the intervention, and provide recommendations for future research.
Chapter Five: Discussion

The purpose of this case study was to design a literacy intervention to meet the needs of a student struggling with reading. The student was an eighth grade male with a learning disability (LD). His second grade teacher referred him for special education testing due to delayed reading development, and the LD was identified with a significant discrepancy formula in accordance with established district criteria (Initial IEP, May 24, 2006). His current teachers continued to express concern over his reading development, which led them to recommend him for the individualized tutoring instruction offered through this case study (anecdotal notes, May 23, 2012). Fluency was identified as his greatest reading need by the researcher based on multiple sources of data that will be described in this chapter. Teachers reported two primary concerns at his most recent IEP (April 5, 2012): poor reading, most evident in slow fluency, and a lack of motivation manifested in his below average effort on reading tasks. Those academic concerns were also emphasized by his IEP teacher, who described the student as a very slow, choppy reader that required considerable redirection and encouragement to work to his full potential (anecdotal notes, May 23, 2012). Concern about the student’s fluency skills was warranted. The Common Core State Standards for English Language Arts identified fluent reading as a foundational reading skill that played a vital role in the reading process, especially in supporting comprehension.

Assessment data also documented the reading difficulties, and confirmed that fluency was the student’s primary challenge. On a norm-referenced assessment the student completed when he was 14 years old, he performed 4.2 years below grade level on a general reading measure, with the lowest score obtained on a fluency subtest on which he was determined to be 5.4 years below grade level (Woodcock-Johnson III, administered by his IEP teacher May 26,
2012). The researcher administered two pre-tests on July 2, 2012 in order to assess the student’s literacy needs. On the *Qualitative Reading Inventory-5 (QRI-V)* (Leslie & Caldwell, 2011), the student displayed instructional level accuracy (95%) in passage word identification and comprehension (70%). Despite those positive results, the student’s reading rate of 51 words correct per minute (WCPM) was significantly below an established grade level fluency norm of 151 WCPM (Hasbrouck & Tindal, 2006). The pre-test from *3-Minute Reading Assessments* (Rasinski & Padak, 2005) determined similar results. The student read with instructional accuracy (95%) and average comprehension (50%), but analysis identified substantially low reading rates of 66 WPM and 63 WCPM. Further, fluency prosody was determined to be below average as assessed with the *3-Minute Assessment* multidimensional rubric that evaluated four areas: expression and volume, phrasing and intonation, smoothness, and pace. The participant obtained a total score of six from a maximum of 16 points. Initial assessment results were consistent with those reported by the student’s school officials, clearly indicating a need for improved reading fluency. As a result, the researcher chose to implement a fluency intervention.

The first section of this chapter summarized previous research that informed the selection of and design of the intervention. Section two reviewed and explained the primary outcomes from this study, critiqued the strengths and limitations of its design, and made recommendations based on the results.

**Connection to Extant Literature**

This section provided a synopsis of the literature review that was conducted in preparation for the current study, with connections between this study and previous research emphasized. The review began with an analysis of literacy components commonly included in successful reading interventions. The National Reading Report (NRP) (2000) provided a broad
foundation from which to begin with a determination of the five most important skills involved in reading development: phonemic awareness, phonics, vocabulary, comprehension, and fluency. Consistent with Allington’s (1983) earlier assessment, the NRP acknowledged that fluency was an often overlooked variable in the reading process. That had been especially true in relation to older students. Indeed, one of the limitations of the NRP’s meta-analysis was that the fluency results were determined from research conducted almost exclusively with younger students. Yet, Roberts, Torgesen, Boardman, and Scammacca (2008) determined that older students, particularly those with LD, often continued to struggle with basic literacy skills well into adolescence. The relevance of fluency instruction to older students was firmly established by research that identified fluency as a significant factor in older students’ struggle with reading (Rasinski et al., 2005). Rasinski, Rikli, & Johnston (2009) confirmed these results and extended them by elucidating the relationship between all aspects of delayed fluency—rate, accuracy, and prosody—and low comprehension abilities in older students with disabilities. According to the anecdotal and assessment data described above, the student in the current case study displayed characteristics—slow reading rate, non-automatic decoding, lack of expressive reading, and age—consistent with the students described in reading fluency research (Rasinski et al., 2005; Rasinski, Rikli, & Johnston, 2009). Therefore, it was determined that the implementation of a fluency intervention was an appropriate and justified instructional decision. Before designing that intervention, however, some of the participant’s other academic characteristics had to be taken into consideration.

Roth, Speece, and Cooper (2002) emphasized the importance of designing individualized interventions based on the current needs of a student with their research that demonstrated how quickly developmental reading needs could change. For instance, Roth et al. determined that the
influence of narrative discourse on the reading process significantly decreased between first and second grades, a relatively short amount of time. One of the most important factors when individualizing interventions for older students is a consideration of their level of motivation (Roberts, Torgesen, Boardman, & Scammacca, 2008). This consideration was particularly salient for the current study considering the multiple sources of information that identified the student’s lack of motivation as a primary concern (anecdotal notes, May 23, 2012; IEP, April 5, 2012). Lepper, Henderlong Corpus, and Iyengar (2005) examined motivation among older students and identified a strong negative correlation between age and motivation and a strong positive correlation between motivation and academic outcomes. That is, motivation decreased with age and decreased motivation was associated with lowered academic achievement. Guthrie and Humenick (2004) came to the same conclusion in their synthesis of motivation research, but they also identified strategies that had been demonstrated to increase motivation. The two most effective motivational strategies were providing interesting texts and allowing students’ to make meaningful instructional choices. The strategies resulted in increased motivation that was recorded as greater engagement in the reading material (Guthrie & Humenick). The present study presumed that combining these strategies would result in even greater positive effects; therefore, allowing the participant to choose high interest text was incorporated into the intervention design.

The decision regarding which fluency intervention to implement was strongly influenced by the NRP’s (2000) results. That large meta-analysis identified the method of repeated reading as the most common fluency intervention, defining it as rereading passages until a predetermined fluency criterion had been met. Moreover, the NRP recommended the repeated reading method based on research that consistently determined it to be effective at increasing reading fluency.
Samuels (1979) introduced the method to the field of literacy by demonstrating its effectiveness at increasing the reading rate and accuracy of students with disabilities. However, Samuels’ study was limited by its small sample of only younger students. Subsequent research demonstrated that all students, regardless of age or disability status, benefitted from the method (Herman, 1985; Therrien, 2004). Therrien and Kubina (2006) established three methodological recommendations based on successful repeated reading interventions: (a) trained adults should administer the intervention, (b) corrective feedback ought to be presented to students, and (c) passages should be reread in relation to a goal. Hudson, Lane, and Pullen (2005) and Pruitt and Cooper (2008) provided design recommendations typical of most repeated reading interventions, which included: (a) establish a baseline, (b) determine a goal, (c) monitor errors and provide corrective feedback, (d) employ graphs to record progress, and (e) use teacher discretion to determine when to begin a new passage. All of these elements were incorporated into the design of the current study.

The reviewed studies provided evidence for the importance of creating developmentally informed interventions based on the current needs of a student, demonstrated that improving fluency is a relevant literacy goal for older students with disabilities, identified motivation as a critical variable related to older students’ reading achievement, and established the method of repeated readings as an effective fluency intervention. Consistent with the results of the literature review, a repeated reading intervention was designed to meet the specific needs of the participant. The results of the intervention are discussed and explained in the next section.
Explanation of Results

The intervention was assessed by its effect on four dependent variables: rate, accuracy, prosody, and comprehension. The variables were measured with three data collection methods: 3-Minute Reading Assessments (Rasinski & Padak, 2005), Qualitative Reading Inventory-5 (QRI-V) (Leslie & Caldwell, 2011), and progress monitoring that the researcher maintained throughout the intervention in the form of tracking words per minute (WPM), percent accuracy, and prosody. The 3-Minute Assessments and QRI-V were pre and post-tests used to measure reading rate in words per minute (WPM) and words correct per minute (WCPM), total accuracy in percent of words read correctly, and comprehension as assessed with a retelling task. Additionally, the QRI-V measured comprehension and 3-Min measured prosody with a multidimensional rubric. Progress monitoring consisted of tracking reading rate in words per minute (WPM) and total accuracy in percent of words read correctly during every reading of a passage, along with evaluating prosody in sessions three and nine with the same rubric utilized in the 3-Minute Assessments. The results are explained below by variable.

**Rate.** Data analysis demonstrated that reading rate substantially decreased on 3-Minute Assessment and QRI-V by a mean of 17 WPM and 16.5 WCPM. Notwithstanding, progress monitoring demonstrated that rate increased by a mean of 43 WPM within passages and 17 WPM between the first and last session. These disparate results were a primary focus of post-intervention analysis. After comparing passage type between the assessments and intervention, four factors implicated motivation as a considerable influence on the results: text interest, text choice, passage length, and day of week. This was consistent with past research that identified a strong reciprocal relationship between slow fluency and a lack of motivation (Moats, 2001). The four motivational factors will be examined with both quantitative and affective analysis.
Text interest and choice. Allowing the participant to select high-interest text was an intentionally designed feature of this study. Previous research demonstrated its effectiveness at improving motivational and reading outcomes (Guthrie & Humenick, 2004). Importantly, the participant was not able to exercise choice and access high interest reading material during the scripted pre and post assessments. The discrepancy was not lost on the student, who was resistant to completing the assessment passages. When presented with the 3-Minute Assessment post-test passage the student asked if he had to read it, commenting that he “really” didn’t feel like it (field notes, July 26, 2012). His reaction to the QRI-V post-test passage about Malcolm X was similar: “I don’t like Malcolm X. I don’t even like black history, it’s boring to me” (field notes, July 26, 2012). The researcher observed that the student appeared visibly bored during reading evident by three prolonged yawns and multiple instances when the student looked away from the text. Thus, the student’s dissatisfaction for the assessment passages content was clearly communicated both verbally and non-verbally.

Overt disinterest was absent from the repeated reading practice. Moreover, the primary behavioral concern observed during the intervention could be classified as over-interest due to the student’s passionate interest in the Zombie and World War II content that he selected. For instance, in between rereading a passage about grenades the student repeatedly attempted to engage the researcher in conversations about his use of grenades in video games (field notes, July 25, 2012). Though these types of text connections were encouraged, the student had to be explicitly redirected at times in order to continue with the intervention. That level of engagement was a direct result of the student being provided with the opportunity to choose the topic. The participant was passionate about weapons, specifically guns; therefore passages were taken from the following sources: The Zombie Survival Guide: Complete Protection from the
Living Dead (Brooks, 2003) and “The Top 10 Infantry Weapons of World War II” (Shakespeare, 2011). Consistent with Guthrie and Humenick’s (2004) recommendation, the researcher also provided a diversity of choices within that topic area. The student was allowed to select the next day’s passage from among three or four options at the end of every session. Finally, one of the strongest pieces of evidence for the effect of text interest on motivation, and therefore reading rate, came from the participants’ own words. While discussing his performance on the QRI-V post-test passage, the student admitted that he “would have tried harder if it was about guns or zombies or something more interesting like that” (field notes, July 26, 2012).

**Passage length.** In addition to passage interest and choice, passage length was identified as an important motivational factor. For unmotivated readers, the length of a passage can also function as a deterrent to effort, especially when the text is deemed low-interest (Guthrie & Humenick, 2004). Consistent with that, the participant demonstrated sensitivity to passage length. Analysis revealed substantial differences between the mean length of assessment (mean = 515 words) and intervention passages (mean = 123 words). The mean increase of 392 words on assessment passages was noticed by the student, evident by the following comment made upon seeing the QRI-V post-test passage about Malcolm X, “Do I have to read the whole thing? It looks way too long.” Further, the participant asked if he had to keep reading on two separate occasions during reading (field notes, July 26, 2012). That type of behavior not only considerably slowed his reading rate, but also communicated his negative relationship with longer text.

Pearson correlation coefficient tests formally documented the negative relationship between reading rate as an indicator of motivation and passage length. When mean rate and intervention passage length were tested, a minimal correlation of 0.03 was detected. However,
when assessment passage length was combined with intervention passage length and then correlated with mean rate, a much more robust correlation of -0.76 was identified. This negative correlation provided evidence that as passage length increased, reading rate decreased. Based on the existing evidence—reading rate performance on shorter, more interesting passages; the researchers observations of the students disposition towards tasks; and the student’s own self-reports—the researcher concluded that increased passage length resulted in a lack of motivation that manifested itself in a slower reading rate. Analysis of an unexpected variable provided additional evidence of the relationship between motivation and reading rate.

**Day of week.** Finally, day of the week was analyzed as an indicator of motivational effects on the results of this study. Results from the intervention provided a reason to explore the possibility of a relationship between day of the week and student performance. The participant acknowledged that he placed value judgments on different days of the week, especially between weekends and the beginning of the week. On both Monday’s of the intervention he reported feeling “super tired” and said that his weekend activities included a lot of video games without much sleep (field notes, July 16, 2012). Therefore, day of the week was identified as an indirect measurement of motivation. The two lowest scores recorded in the intervention occurred on Mondays (session three and seven), whereas the two highest scores each occurred on the last day of repeated reading practice for that week (Thursday session two and Wednesday session nine). A Pearson correlation coefficient test confirmed the presence of a positive correlation between day of week and reading rate (0.52). This result demonstrated a moderate relationship between days later in the week and increased reading rate. However, a limitation of the current study was its brevity. In order to arrive at a better understanding of the relationship between days of the week, motivation, and reading rate, a longer intervention with more data would be necessary.
Accuracy. The second dependent variable analyzed in this study was reading accuracy. Accuracy changed little from pre to post-test, within repeated reading sessions, and between repeated reading sessions. No change was detected between the pre and post-tests of the QRI-V on which the student obtained a score of 95%. The student increased his 3-Minute Assessment post-test score to 98%, only a 3% improvement from the pre-test. Progress monitoring documented a mean increase in percent accuracy of 3.2% within sessions and only 0.5% between sessions. In analyzing those results it is important to take into account the presence of a ceiling effect. That is, only small gains were possible due to the participant’s high baseline performances. For instance, progress monitoring data revealed that the student achieved 98-99% accuracy in every session other than the first.

Despite the minimal changes in recorded on accuracy measures, there were intriguing trends in the data, most notably in the lack of a finding between passage difficulty and accuracy. One could infer that lower level passages would be related to increased accuracy, and vice versa, but an identifiable relationship between passage difficulty and accuracy was not detected in the present study. For example, the correlation between passage level and accuracy was almost non-existent (0.01), even when atypical data from session three was excluded (0.02). A more thorough examination of the participant’s QRI-V word list results provided evidence for a plausible explanation. The student achieved instructional level accuracy (75%) on the initial QRI-V upper middle school word list testing, but only 10% of the words were identified automatically (within one second). The participant correctly identified the other 65% only after active decoding, which in some instances required a considerable amount of time during which the participant was observed to be using basic chunking strategies (field notes, July 2, 2012). Low ratios of automatic to non-automatic word identification were also identified on lower level
The effect of repeated readings

passages: (a) third grade: 60% correct automatic out of 75% correct; (b) fourth grade: 55%
correct automatic out of 75% correct; (c) fifth grade: 40% correct automatic out of 85% correct;
and (d) sixth grade: 15% correct automatic out of 75% correct. Within the context of the results,
it is logical that there was no interaction between passage level and accuracy. The student
maintained high accuracy by diligently decoding complex words. If that explanation was
correct, then more difficult passages would have required increased decoding time, which should
have been reflected in slower reading rates.

Evidence for that process was established by conducting Pearson correlation coefficient
tests between passage levels as measured by Flesch-Kincaid level and reading rates (Kincaid,
Braby, & Mears, 1988). That correlation was conducted without session three, which was
identified as an anomalous session based on four factors: (a) the student recorded his lowest
mean WPM rate during intervention even though it was the second easiest passage from the
intervention, (b) the researcher anecdotally noted that the participant appeared especially tired
and unmotivated on that day, an observation that the participant confirmed saying that he felt
extremely tired and that he hadn’t wanted to go to summer school that day (field notes, July 16,
2012), (c) there had been an 11 day break in the intervention due to the participant attending a
summer camp the entire previous week, and (d) it was a Monday morning, the day of the week
that the participant strongly associated with low motivation. This break between sessions, which
was the same number of days as the entire number of interventions sessions, was a limitation of
the study as the progress and procedural preparation completed during sessions one and two were
negated by the time off. Indeed, the participant did not remember the experimental rationale or
procedure, so in effect the researcher was starting over. With session three excluded, a
correlation of (-0.59) was identified between passage difficulty and mean WPM. This negative
correlation was interpreted as an indirect measure of accurate reading: as passage level increased the student sacrificed speed for the increased time it took to decode the more challenging words. Presumably, had the participant not decreased his rate to decode the more challenging passages, a much stronger interaction between passage difficulty and accuracy would have been determined.

**Prosody.** The third dependent variable was prosody, which was assessed based on previous research that determined its central role in the fluency process (Rasinski, Rikli, & Johnston, 2009). The multidimensional fluency rubric (Rasinski & Padak, 2005) was used to assess prosody at sessions one, three, seven, and eleven. The only change in prosodic reading was a minimal increase of one point recorded on the dimension of expression and volume at session seven, resulting in an overall change from 6/16 points on the pre-test to 7/16 on the post-test. That formal result did not capture other gains evident during the assessment. For instance, in session five the researcher noted improved expression, intonation, and smoothness while the student read this section: “What shotguns *do* possess is stopping power. The scattering shot acts as a solid wall, whereas a rifle bullet might pass clean through or miss the target all together” (field notes, July 17, 2012). The student noticeably stressed “do” and “whereas” with correct intonation, and read the sentences without error at an appropriate pace. Also, pace was noticeably improved during session eight and nine in which the two highest WPM results were recorded (114 WPM and 121 WPM). One of the best informal measures of the prosodic progress was the participant’s own acknowledgement. He expressed recognition and pride in the progress, saying that it felt good to “read normally” and that he had never read like that before (field notes, July 25, 2012). Prosody improvements would have likely been an important result of this study had they been assessed during every session with more sensitive methods.
Comprehension. The final dependent variable assessed was comprehension, which is considered the primary purpose of reading (NRP, 2000). The theory of automaticity provided the theoretical rationale for the inclusion of comprehension as a dependent variable (LaBerge & Samuels, 1974). According to that theory, if fluency increased then comprehension should also improve as the beneficiary of increased cognitive resources. Not surprisingly considering the fluency decreases detected from pre to post-test, comprehension did not improve. The one point improvement on the 3-Minute Assessment retelling task was nullified by the 4% decrease in retelling on the QRI-V. No change was recorded between the QRI-V pre and post-test comprehension questions. However, it was somewhat surprising that comprehension scores didn’t decrease further considering the substantial decreases in fluency. If increased fluency led to increased comprehension, then it would follow that decreased fluency would lead to decreased comprehension. The absence of that result provided corroborating evidence for research that has demonstrated a decomposition of the relationship between fluency and comprehension as students age (Stahl & Hiebert, 2005). Much of the research that established a connection between fluency and comprehension was conducted with younger students (Rasinski et al., 2005). Stahl and Hiebert determined that after third grade factors such as text complexity and vocabulary knowledge supplant reading fluency as the strongest predictors of reading comprehension.

Background knowledge and text connections have been determined to be effective comprehension strategies at all ages (Caldwell & Leslie, 2009). The slight increase that was detected between the 3-Minute Assessment pre and post-tests was most likely the result of the student’s familiarity with the post-test passage content. The pre-test passage detailed an immigrant family’s trip to the Statue of Liberty. The participant stated that he had never been to New York City and that he had no interest in going or seeing the Statue of Liberty (field notes,
In contrast, the student possessed extensive background knowledge related to the theme of vegetable preferences, and made numerous connections to the text. For example, after reading he immediately began discussing his Dad’s relationship with the main vegetable in the story—Brussels sprouts—comparing it not only with his own preferences, but also in relation to the details of the passage. Background knowledge has been identified as an important factor in comprehension, especially when it is used to generate text connections like the student did during the post-test passage (Caldwell & Leslie).

**Summary.** Based on data analysis, several explanations were generated to explain the inconsistent results of this study. The motivational factors of text interest and passage length were determined to be substantial predictors of reading rate, accounting for the difference in performance between assessment and intervention reading rates. Further evidence for a motivational effect was revealed in analyzing performances by day of the week. Decreased reading rate was also determined to be related to days earlier in the week that the student admitted he typically felt less motivated on. The student’s performance on accuracy measures was moderated by a ceiling effect and non-automatic decoding. High baseline accuracies were recorded, making only small gains possible over the course of the intervention. The surprising result that accuracy did not decrease on more difficult passages was explained by the student’s decoding patterns. That is, while accuracy did not decrease on more challenging passages, reading rate did as a result of the increased decoding time the student expended to decipher the more challenging text. Finally, according to the theory of automaticity (LaBerge & Samuels, 1974) it was expected that the substantially decreased fluency performances from pre to post-test would result in considerable declines in reading comprehension. The lack of that result was explained by referencing research that has demonstrated that the connection between fluency and
comprehension is age dependent, with the strength of the relationship dissipating as students age
(Stahl & Hiebert, 2005). Limitations of these results and related recommendations are made in
the next section.

Limitations and Recommendations

The most significant limitation of this study was its short duration. The study only
consisted of 11 tutoring sessions, which were interrupted by an 11 day break between sessions
two and three. Even though there was a precedent for short repeated reading interventions in the
research (Therrien, 2004), all results were limited by the lack of more data and must be
interpreted within the context of a brief intervention that occurred during a summer program.

Differences between assessment and intervention formats were a design limitation of this
study. Assessment passages were low-interest and long, whereas intervention passages were
high-interest and short. These factors were used to explain the divergent results between the
parts of the intervention, with motivation identified as a moderating variable. Considering the
participant’s reading characteristics, especially his history as a seriously unmotivated reader, the
researcher believed it was necessary to incorporate motivational strategies that included high-
interest, short passages that the student was allowed to select. Conceivably, had the assessment
passages also been high-interest and short, substantially more positive results would have been
documented. Future assessments should strive to include more diversity within test passages to
meet the needs of all students, including greater ranges in passage length and broader options for
content matter. Nonetheless, in the absence of such passage options the researcher could have at
least partially extended the motivational strategies by giving the student a choice between the
available test passages. The results demonstrated that future instruction with the participant should make every attempt to allow for the student to choose high-interest, motivating text.

Considering the impact of motivation on the results, a major limitation of this study was the inability to directly measure it. The researcher was confined to identifying motivation through indirect measures, such as reading rate performance and the participant’s statements and observable behavior. Future fluency research, especially with older students, should include formal measures of motivation. Previous research utilized daily self-reports, consistent rating systems for text interest, and the inclusion of motivational questionnaires used throughout interventions (Lepper, Henderlong Corpus, & Iyengar, 2005). The progress monitoring tools that were implemented in this study were determined to be an effective source of feedback. Future work with the student should include frequently updated, visual trackers that allow the student to easily identify progress.

This study was also limited by the lack of consistent, formal evaluations of prosody. This flaw was unfortunate, as prosodic improvements were informally recorded as areas of relatively substantial growth compared with accuracy and comprehension. At the completion of the intervention, the student secured the concept that quality oral reading should sound like regular speaking, and he was increasingly reading parts of passages with rate, expression, and phrasing typical of spoken language. If prosody would have been measured with the 3-Minute Assessment fluency rubric throughout the intervention, gains would have likely been determined. Future research should consider using recording devices to assist with measuring prosodic elements, which is a strategy often utilized in past research (Rasinski, 2003). Teachers should continue to support the student in improving prosodic reading by implementing research-based strategies
such as radio reading, self-recording, amplification, and phrase boundary instruction (Hudson, Lane, & Pullen, 2005).

A more detailed explanation of the student’s performance on comprehension measures would have been possible if related variables had been reliably tracked throughout the intervention. For instance, it was hypothesized that improved performance between the 3-Minute Assessment pre and post-test retelling tasks was the result of background knowledge, but that could not be conclusively stated in the absence of a data measuring pre-reading passage knowledge. The QRI-V included a background knowledge measure that could have easily been adapted for use throughout the intervention. The comprehension improvements that were identified were in the increased use of text connections, which are strongly related to background knowledge and text relevancy (Caldwell & Leslie, 2009). The student made successful text connections on multiple occasions, and future instructional efforts should be directed at continuing to encourage this comprehension strategy.

In review, this study would have benefitted from a longer period of implementation, consistency between assessment and intervention passages—ideally in the form of high-interest, shorter assessment passages—and formal protocols to measure motivation, prosody, and background knowledge throughout the entire intervention. Considering the impact of motivation on the current study, future instruction with the student should incorporate research-based motivational strategies such as high-interest text, allowing for student choice, setting knowledge goals, and providing regular progress monitoring data to the student (Guthrie & Humenick, 2004). Finally, future teachers should continue to emphasize the importance and effectiveness of implementing meta-cognitive comprehension strategies such as text connection, which the student has already demonstrated the ability to successfully utilize.
Conclusion

This study demonstrated that under certain circumstances the repeated reading method was effective at raising the rate, accuracy, prosody, and comprehension scores of an eighth grade male student with LD. Determining the specifics of those circumstances was the main goal of data analysis, which began by comparing the results between the assessments and intervention. Pre and post-test assessments demonstrated substantially decreased rate, minimal improvements in accuracy and prosody, and mixed results in comprehension. Intervention data, however, determined substantially improved reading rate and slight increases in accuracy and prosody. Explanations for the disparate results were developed by analyzing the differences between assessment and intervention reading passages. Assessment passages were deemed too long and of low-interest by the student, as opposed to intervention passages that were self-selected, high-interest, and short. Those factors, instructional choice and access to high-interest text, are documented strategies to improve reading motivation, which is a variable that has consistently been correlated with reading success among older readers (Guthrie & Humenick, 2004). Thus, motivation was identified as a moderating variable between passage type and dependent variables. When the student was interested in passages, his motivation increased, which was reflected in increased intervention performance; and vice versa, when he was not interested, his motivation decreased and his assessment performance was diminished. Future repeated reading interventions conducted with older students should consider incorporating features that support and measure motivation, allow for consistent tracking of prosody and background knowledge, and ensure design consistency across all experimental tasks.
References


Appendix A: Pre and Post Test Assessments

Figure A1: 3-Minute Reading Assessments (Rasinski & Padak, 2005).
Figure A2: Qualitative Reading Inventory-5 (QRI-V) (Leslie & Caldwell, 2011).
Appendix B: Goal tracker sheet used throughout progress monitoring.

Our Fluency Goals

**Speed**: 151 words correct per minute (WCPM)

**Accuracy**: less than 2 errors per minute

**Expression**: make reading sound like speaking

### Daily Goal

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Appendix C: Fluency and Comprehension Definitions for reference during self-evaluations and discussions.

**Fluency: Three Parts**

**Speed:** reading at an appropriate rate.

**Accuracy:** reading the correct words.

**Expression:** reading sounds like talking.

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**Comprehension = Understanding**

Making meaning of the text. This is the goal of reading.
Appendix D: Progress monitoring feedback graphs used to measure WPM (Figure C1) and Percent Accuracy (Figure C2) during the repeated reading intervention.

Figure D1: Words per Minute (WPM) Tracker Graph
Figure D2: Percent Accuracy Tracker Graph