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THE EFFECTS OF USING FOUR POWERFUL COMPREHENSION STRATEGIES IN A GRADUAL RELEASE LESSON DESIGN AND LEARNING-STYLE PREFERENCES ON READING COMPREHENSION AND SELF-PERCEPTION OF STRUGGLING READERS

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READING COMPREHENSION AND SELF-PERCEPTION OF STRUGGLING READERS

Laura J. Mead

MS, Western Connecticut State University, 1999
BS, Jacksonville University, 1991

A Dissertation
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Laura J. Mead, BS, MS

Western Connecticut State University

Abstract

This study examined the impact of the Four Powerful Comprehension Strategies on
comprehension achievement and reader self-perception of struggling readers in grades three,
four, and five. The study also observed the relationship between the intervention and learning-
style processing preferences. There is a need for effective reading intervention at the
intermediate level to teach struggling readers how to efficiently manage the complexities of
comprehension.

This study utilized an experimental research methodology. The 63 participants were the
total number of struggling readers identified at one elementary school in an urban school district.
All subjects were randomly assigned to the experimental group or the control group. The
experimental group received small group instruction using the Four Powerful Comprehension
Strategies in a gradual release lesson design approximately four times a week for 14 weeks,
while the control group received alternate intervention instruction.

This research used quantitative analyses to investigate each question. Comprehension
was assessed, posttest only, using the Gates-MacGinitie Reading Test. Student self-perception
was assessed, pretest-posttest, using the Reader Self-Perception Scale. The analysis of pretest
data determined that no initial difference existed between group means. For both the cognitive
and affective measures data were analyzed using separate two-way Analysis of Variances \((p \leq .025)\) to determine a significant difference in mean scores between the two groups for each dependent variable. These data also were analyzed to determine if a significant interaction existed between the two levels of reading comprehension intervention instruction and students’ Learning-Style Processing Preference (global and analytic) with respect to each of the dependent variables.

It was determined that there was a non-significant main effect between group means of the experimental and the control group for reading comprehension and reader self-perception. Additionally, the results indicated no significant interaction between the two independent variables in relation to either of the dependent variables. Although the analyses indicated no significant differences, the mean scores for experimental students identified as having a global processing preference were higher than the experimental students identified as having an analytic processing preference for both cognitive and affective measures.
APPROVAL PAGE

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Department of Education and Educational Psychology
Doctor of Education in Instructional Leadership

Doctor of Education Dissertation

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of course the wardrobe provider and he never complained once. His unwavering reassurance that I could it do – because “I’m good” – means more to me than he will ever know. I did it, Joey! I love you.
DEDICATION

This Work is dedicated to:

*All the remarkable children who have touched my heart and soul and taught me how to be a better teacher and a better person.*

and the memory of
Mary Clotilde Pacific

I dedicate this to my beautiful mother who encouraged me to stay in school to complete my teaching degree over 20 years ago. Teaching and learning have become my life’s passion and this is the beginning of many more wonderful years that I will dedicate in service to all children.

Thanks, Mom.
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CHAPTER ONE: INTRODUCTION

Research consistently indicates that children who initially succeed in reading rarely regress. Those who fall behind tend to stay behind for the rest of their academic lives (Buly & Valencia, 2002; Burns, Griffin & Snow, 1999; Juel, 1988; Valencia & Buly, 2004). “According to the National Assessment of Educational Progress (U.S. Department of Education, 2006), 36% of fourth graders read below the basic level” (Torgesen et al., 2007, p.vii). In the field of education the teaching of reading has been a subject of heated debate for decades. There has been little agreement with regard to the best approach to reading instruction. One theory proclaims a skills-based approach that emphasizes phonemic instruction will produce the best readers. Another theory argues that the only way students learn how to read is through a literature-based approach that has been associated with whole language. Recent literature has suggested that there can be a compromise between these two schools of thought (Baumann & Ivey, 1997; California Department of Education, 1996; Carbo, 2003; Frey, Lee, Tollefson, Pass, & Massengill, 2005; Honig, 1996; Pressley, 2006).

When the teaching of reading and writing is viewed in a more holistic manner, the idea of balanced literacy instruction emerges. Balanced literacy instruction incorporates the various teaching strategies for skills and comprehension to best meet the needs of individual students. This literacy model permits the flexibility of instruction to address individual learning styles (Baumann & Ivey, 1997; Carbo, 2003). Varied instructional methods, grouping, and activities can better support all learning-style preferences (Dunn, Dunn, & Perrin, 1994). One of the most challenging aspects of balanced literacy is structuring a literacy block that is fluid and meaningful while incorporating each component effectively in a timely manner (Au, Carroll, & Scheu, 1997).
Struggling readers need more explicit instruction from a knowledgeable teacher to break through the cycle of reading failure. The Four Powerful Comprehension Strategies specifically target the needs of struggling readers in grades 3-8 (Lanning, 2009). Allington (2001) espouses to improve reading skills students must read extensively and frequently. The theory of self-efficacy and related studies indicate that with increased academic failures a student’s self-perception rapidly declines (Bandura 1977, 1997; Henk & Melnick, 1995; Schunk, 1984).

This study contended that through implementation of the Four Powerful Comprehension Strategies, within a gradual release lesson design, struggling readers in grades 3, 4, and 5 would show significant achievement in reading comprehension and self-perception compared to students who did not receive this type of reading instruction. The study also proposed to recognize whether or not the intervention was more effective for learners with a specific processing style (analytic or global).

**Rationale for Selecting the Topic**

The importance of this topic has stemmed from the overwhelming percentage of intermediate grade level students (grades 3, 4, and 5) nationwide who are reading below basic level. Children who struggle with literacy are not simply developing slowly, they are missing important strategies and knowledge relative to their normally developing peers (Buly & Valencia, 2002; Burns et al., 1999). Throughout the United States, educators have been faced with balancing the demands of the No Child Left Behind (NCLB) legislation and the moral purpose of doing what is best for each student (Valencia & Buly, 2004). To achieve Adequate Yearly Progress (AYP) at the elementary level in the state of Connecticut, from 2007-2010, 79% of the students in grades three through five must be proficient in reading on statewide exams. Although the prime time for intervention is early, not all students are able to meet grade level
expectations in the primary grade level years. There is an abundance of research targeted at primary reading interventions (Baumann & Ivey, 1997; Berninger, Abbott, Vermeulen & Fulton, 2006; Brown, 2008; Burns et al., 1999; Juel, 1988; McIntyre et al., 2005; Oakhill, 1993; Pressley, 2006; Spiegel, 1998). However, there was a significant need for additional research of instructional interventions that effectively support the various needs of readers who are still struggling once they enter the intermediate grade levels. Oakhill (1993) and Pressley (2006), support the notion that there has been limited research in the area of comprehension intervention for intermediate level students.

Of the students who struggle in reading at the end of grade one, it was estimated that only 11% would meet grade level expectations in the future (Juel, 1988). In spite of the emphasis placed on reading over the past decade, literacy scores on high stakes tests remained static. Diverse learners have faced the tyranny of time in trying to catch up with their peers, and teachers have faced teaching more content in less time (Elmore, 2002). Educators must implement instructionally adept literacy blocks that incorporate effective and efficient interventions designed to meet the needs of all learners.

The balanced literacy model provides a structure for classroom teachers to create an effective learning environment for each student. A balanced approach not only incorporates a variety of research-based literacy components, but also addresses individual differences in how children learn and acquire information (Allington & Cunningham, 1996; Baumann & Ivey, 1997; Pressley, 2006). One component associated with an individual’s learning style is processing preference. Processing preference is described as how a person best processes new and difficult information. The two modalities are characterized by being either sequential (analytical) or holistic (global) in manner (Carbo, Dunn, & Dunn, 1991). Although it is only one component of
learning style, understanding how each student processes information can aid in the selection of the most appropriate instructional methods.

There has been a need for effective reading intervention at the intermediate grade level to teach struggling readers how to efficiently manage the complexities of comprehension. As students experience positive associations with reading, they read more often, increase sustainability, and find reading pleasurable. These attributes have led to increased achievement and high self-perceptions as readers (Henk & Melnick, 1995). Struggling readers need explicit strategy instruction over time and across a variety of texts to experience more success in reading (Allington, 2001; Lanning, 2009; Lipson, 2003). In a review of the research on effective comprehension instruction, Allington concluded that, “the textbook teacher guides and many popular comprehension curriculum materials rely on the student acquiring useful strategies through self-discovery. But many students seem not to ‘discover’ these strategies without teacher demonstration” (2001, p. 97). There also has been a need for teachers to carefully consider individual learning styles in regard to instructional options. Matching instructional practices to a student’s processing preference has supported equity in academic ability between analytic and global learners (Dunn et al., 1994).

**Related Literature to Support the Rationale**

The literature to support this study indicates the need for explicit strategy instruction for struggling readers within a balanced approach to literacy. Research also provides evidence of positive student learning outcomes when individual learning-style preferences have a unified approach with instructional decisions.

The rationale for the explicit teaching of comprehension skills is that comprehension can be significantly improved when students know how to use specific cognitive strategies. The
National Reading Panel has shown explicit strategy instruction to be highly effective in enhancing understanding (NICHHD, 2000). Authors have not come to consensus on which combination of specific strategies are most effective. However, there is considerable overlap among the experts (Lanning, 2009). Duke and Pearson (2002) concluded that although researchers could continue to identify numerous strategies to enhance comprehension, it would be best to focus on fewer strategies. Several aspects that can contribute to the comprehension deficits of struggling readers are poor working memory, poor or no use of strategies, lack of relevant prior knowledge, lack of reading engagement, and self-regulatory issues (Duke & Pearson, 2002; Fountas & Pinnell, 1996; Oakhill, 1993). In addition, Lanning (2009) reported:

We decided that a less is more philosophy is important since we recognize that struggling readers are often overwhelmed and easily confused with too much information. We wanted to help these students develop a depth of understanding of a few powerful, transferable strategies rather than have exposure to a breadth of strategies, that become mind-boggling and disconnected. (p. 4)

Lanning (2009) synthesized her research to include the following Four Powerful Comprehension Strategies: summarizing, creating meaningful connections, self-regulating, and inferring (see Appendix A).

The term balanced literacy instruction first appeared in California in 1996 (California Department of Education, 1996; Honig, 1996). Low scores on a national reading assessment were blamed on the use of whole language. A new curriculum, called balanced reading instruction, was mandated. Major principles underlying the new curriculum were (a) phonics is foundational to comprehension and higher order thinking and needs to be taught systematically and explicitly; and (b) instruction is composed of regular but separate periods of explicit skills
Numerous authors have contributed to the existing literature that has continued to define balanced literacy instruction (Allington & Cunningham, 1996; Baumann & Ivey, 1997; Carbo, 2003; Frey et al., 2005; Pressley, 2006). Balance encompasses more than simple choices between strategy instruction and literature-based experiences. The meaning has expanded to include a balance between level of instruction (teacher-directed, student-directed, and coaching), grouping (whole group, small group, pairs, and individual), lesson design and activity (auditory, visual, tactual, and kinesthetic), and pacing (Allington, 2001; Baumann & Ivey, 1997; Dunn et al., 1994; Freppon & Dahl, 1998; Pressley, 2006). In her review of the literature, Spiegel (1998) defined a balanced approach to literacy as “a decision making-approach through which the teacher makes thoughtful choices each day about the best way to help each child become a better reader and writer….It is responsive to new issues while maintaining what research has already shown to be effective” (p. 116).

The balanced reading approach has been commended for offering an alternative to the extremes of pure phonics or whole language, for providing an effective combination of instructional approaches, and for accommodating various learning styles. Carbo (2003) points out the importance of recognizing different learning styles and choosing appropriate instruction to best accommodate struggling readers. Analytic and auditory students benefit from phonics instruction while students with visual, tactile and global learning styles tend to profit from a whole language approach. Dunn and DeBello (1999) report more frequent positive results when instruction responds to each child’s identified learning style. Students identified as struggling often exhibit preferences associated with a global processing style (Dunn et al., 1994). Global learners prefer a more holistic approach to instruction. Global preferences frequently include
knowing the big idea, a general outline of the process, soft light, low levels of background noise, and informal seating. The analytic learner is characterized by the need for step-by-step directions, bright light, and formal seating in a quiet setting (Burke, 2003). In a summary of research on achievement level (high, average, and low) and learning-style characteristics, Honigsfeld (2007) reported the learning-style elements preferred by low achievers were predominantly those of a typical global learner. Dunn et al. (1994) posits that when students are taught through instructional methods that support individual processing style, global and analytic learners are capable of mastering the same material.

Statement of the Problem

Nationwide reports have identified a large percentage of United States students as struggling readers who require carefully constructed support within a literacy framework (Torgesen et al., 2007). For decades, reading achievement in the US failed to show improvement in reading comprehension and research supported that if a child’s literacy development is deficient in the primary grades, then he or she will probably remain below grade level for the rest of his or her educational career (Juel, 1988; McIntyre et al., 2005; Torgesen et al., 2007). Research also indicates a significant relationship between reading achievement and self-perception. Henk and Melnick (1995) discuss that students who have experienced little or no success in reading have poor self-perceptions as readers. These students tend to avoid reading altogether or read with minimal involvement.

The pendulum seems to swing from one extreme to the other between a skills-based approach and a literature-based approach to teaching reading. Balanced literacy is a term that has been coined to meld these two schools of thought and ensure teachers are meeting the academic needs of diverse learners in the classroom (Baumann & Ivey, 1997; California
Department of Education, 1996; Carbo, 2003; Frey et al., 2005; Honig, 1996; Pressley, 2006).

An effectively implemented balanced literacy approach utilizes various teaching strategies designed to target the wide range of needs from struggling readers to advanced readers (Au et al., 1997; Baumann & Ivey, 1997).

Challenging issues that face elementary teachers include the need to develop a deep understanding of the purpose of each component of balanced literacy, how and when to use the various components, and effectively balancing all the components of literacy to best meet the needs of all students. According to Tomlinson (2001), effective differentiation is based on the demarcation of content, process, product, and by accommodating various learning styles. One impediment to effective differentiation has been the mismatch between the majority of students with global learning preferences in schools and the prevalence of teachers with analytic instructional styles (Dunn et al., 1994). Learning-style responsive instruction can be the means to help teachers differentiate instruction accurately.

Teachers also are faced with a multitude of interventions for struggling readers that can be costly, require extensive professional development by experts in the field, and can be difficult to implement (Torgesen et al., 2007). Research for many of these interventions is either inconclusive or nonexistent. Pressley reviewed a variety of studies and determined there has been an insufficient examination of reading problems experienced by students after grade 3. He concluded, “this is an area that needs a great deal of additional study” (2006, p. 81).

It is crucial for educators to have a thorough understanding of the reading comprehension process. Unfortunately, the multitude of essential comprehension strategies created and developed by various authors creates confusion among practitioners. Educators must be informed and be able to distinguish and define their own understanding of the comprehension
process before they can effectively teach struggling readers how to comprehend text (Lanning, 2009). A compounding problem in educational literature is that instructional terms are frequently used interchangeably. The importance of a common language is sometimes underestimated in education. The consistent definition of terms for both educators and students is a critical building block for effective instruction (Allington, 2001).

In conclusion, the problem revealed a need for further empirical research to specifically address the comprehension deficits and self-perception of struggling readers in intermediate grades. Research also posited the necessity of alignment between student learning-style preferences and instructional methods. The contention of this research was to determine if the Four Powerful Comprehension Strategies, implemented through the gradual release lesson design, had the potential to increase reading comprehension, address processing-style differences, and enhance students’ self-perception.

**Significance of the Study**

There are many respected authors who have similar, but sometimes conflicting views on the most essential comprehension strategies. However, numerous publications demonstrate consistency in identifying a number of comprehension strategies as being more effective than others. (Duke & Pearson, 2002; Harvey & Goudvis, 2000; Keene & Zimmermann, 1997; Pearson, Roehler, Dole, & Duffy, 1992; Lanning, 2009; RAND Reading Study Group, 2002)” (2009, p. 2). Fountas and Pinell (1996), provide primary educators with a guided reading model to foster improved reading skills and strategies. The Four Powerful Comprehension Strategies, used in a gradual release lesson design, proclaims to be an effective, easy to use instructional intervention that clarifies teaching reading comprehension for intermediate grade level readers (Lanning, 2009). These essential strategies are based upon a synthesis of reading comprehension
research over the past decade. The Four Powerful Comprehension Strategies provides educators with a foundation to understand the comprehension process and helps to build common definitions to facilitate the practice of teaching reading.

A key component of this instructional intervention was the lesson design used to deliver the instruction (see Appendix B). Pearson and Gallagher (1983) initiated the design of the gradual release of responsibility model that specifies stages of teacher support and scaffolding in reading instruction. Based upon this gradual release work, Duke and Pearson (2002) developed a specific step-by-step gradual release lesson design to provide educators a clear direction and the confidence to teach reading comprehension to struggling readers.

Research repeatedly reports the benefits of choosing instructional methods, activities and materials to best meet the needs of a variety of learning styles (Burke 2003; Carbo et al., 1991; Dunn et al., 1994; Dunn & DeBello, 1999; Dunn, Thies, & Honigsfeld; 2001). The components of the Four Powerful Comprehension Strategies applied using the gradual release lesson design could be viewed as an instructional method that meets the needs of both global and analytic learners. The explicit modeling, teacher direction, consistent sequencing of the lesson and the summarizing and self-regulating strategies would appeal to the analytic learners in the group. Most global learners would prefer the small group setting, potential for background sound, the independent application stage, and the strategies of creating meaningful connections and inferring. Henk and Melnick explain that students with low reader self-perceptions function best in situations that are positive, flexible, and value individual differences. “Self-perceptions can also be enhanced when teachers prepare children well for all reading assignments and group them wisely and flexibly” (1995, p. 475).
The significance of this research was to determine if, in an effort to provide a more explicit means of teaching reading comprehension, the Four Powerful Comprehension Strategies, implemented through the gradual release lesson design, had the potential to increase reading comprehension, address individual learning-style preferences, and enhance students’ self-perception.

**Definition of Key Terms**

1. *Reading Comprehension* is the process of simultaneously extracting and constructing meaning from text (RAND Reading Study Group, 2002).

2. *Balanced literacy* is a comprehensive literacy approach that is not confined to a particular philosophy. Several of the components include but are not limited to reading and writing workshop, interactive reading and writing, read-alouds, accountable talk, and small group instruction. “It is an approach that requires and frees a teacher to be a reflective decision maker and to fine tune and modify what he or she is doing each day in order to meet the needs of each child” (Spiegel, 1998, p. 116). In addition to creating a model with an aspect of balanced components, a balance must be maintained between teacher-directed and learner-directed instruction, explicit and indirect instruction, whole group and small group interactions, and between authentic assessment, high-stakes assessment, and norm-referenced assessment (Au et al., 1997; Spiegel, 1998).

3. *The Four Powerful Comprehension Strategies* identifies the following four essential comprehension strategies: summarizing, making meaningful connections, self-regulating, and inferring. Each strategy has an accompanying set of supporting skills, which often overlap (Lanning, 2009).
4. A strategy is a systematic plan consciously adapted and monitored to improve one’s performance in learning (Harris & Hodges, 1995).

5. A skill refers to the parts of acts that are primarily intellectual (Harris & Hodges, 1995).

6. The gradual release of responsibility model is used to effectively support the transfer of learning. The teacher slowly releases the responsibility of correctly using the specified strategy and skill to the student until eventually the student is able to use the strategy and skill independently (Pearson & Gallagher, 1983).

7. The gradual release lesson design further delineates the gradual release model into a step-by-step process in which teachers are able to plan deliberate instruction at each phase of the release. In this process the teacher will:
   1. Give an explicit description of the strategy and when it should be used;
   2. Model the strategy in action;
   3. Collaboratively use the strategy in action;
   4. Guide practice using the strategy with gradual release of responsibility; and
   5. Allow the student independent use of the strategy (Duke & Pearson, 2002).

8. A struggling reader is identified as being substantially deficient on the Developmental Reading Assessment, Two (DRA2,) a score of basic or below basic in reading on the Connecticut Mastery Test (CMT), and not meeting grade level criteria for the Developmental Spelling Assessment (DSA) and current district running record assessments.

9. Small group instruction is a group of 4-6 students all reading at the same independent reading level. Each group meets 3-5 times a week for approximately 30 minutes per session.
10. *Intermediate grade level* refers to grades 3, 4, and 5 in the elementary setting.

11. *Supplemental support* is additional instructional support that students receive outside of regular classroom instruction. During this time students are not present for the regular classroom instruction (McIntyre et al., 2005).

12. *Learning Style* is “the way in which each learner begins to concentrate on, process, absorb, and retain new and difficult information” (Dunn, Rundle, & Burke, 2007, p. 1).

13. *Processing style* refers to two different processing types: global and analytic. A learner who prefers information presented in an anecdotal manner that initially imparts the “big picture” through stories that can be self-related characterizes the global processing style. Global learners generally prefer to work with a small group in an informal setting with low light. A learner who prefers a step-by-step methodology with specific grading criteria and concise feedback, characterizes the analytic processing style. The analytic learner usually prefers to work alone in a formal setting with bright light (Burke, 2003).

**Methodology**

This study examined the impact of the two levels of the independent variable, reading comprehension intervention instruction, (Four Powerful Comprehension Strategies and no Four Powerful Comprehension Strategies), on the two dependent variables, reading comprehension and reader self-perception of struggling readers in grades 3, 4, and 5. The moderator variable was learning-style processing preference (analytic or global).

**Research Questions and Hypotheses**

1. Is there a significant difference in the reading comprehension of students identified as having a global or analytic learning style when those students have participated in the
Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?

a. Is there a significant difference in the reading comprehension of students who have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?

Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on reading comprehension measures as compared to those who have not participated in this type of instruction.

b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to reading comprehension?

Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to comprehension.

2. Is there a significant difference in students' perceptions of themselves as readers when they have been identified as having a global or analytic learning style and have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?
a. Is there a significant difference in students' perceptions of themselves as readers when they have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?

Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on self-perception measures as compared to those who have not participated in this type of instruction.

b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to students' perceptions of themselves as readers?

Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to self-perception as readers.

**Description of the Setting and the Subjects**

Research was conducted at an urban school district in the northeast region of the United States. The district’s total student population was 9,874. According to the US Bureau of the Census (2000), the socioeconomic background of the city’s population was low to middle class with a median home income of $53,664. At the time of the study, 30% of the school district’s student population was eligible for free or reduced priced meals. The significant ethnic diversity included 52% white students, 30% Hispanic students, 10% black students, and 8% Asian
American students. Also, 37% of the student population resided in non-English speaking homes. The 2007-2008 Strategic School Profile reported that there were 684 full-time teachers in the district. The average teaching experience across the district was 16 years and 77% of the teaching staff had obtained a Master’s degree or higher.

The target population was a group of students identified as struggling readers in grades 3, 4, and 5. The total population of struggling readers identified from one elementary school in the district comprised the 63 student participants in this sample. There were 11 staff members who participated in the study. Four staff members were trained in the implementation of the Four Powerful Comprehension Strategies and the gradual release lesson design during an initial six-hour training session and monthly follow up professional development sessions throughout the course of the research. Seven staff members were not trained in the implementation of the Four Powerful Comprehension Strategies or the gradual release lesson design and conducted traditional small group instructional practices.

Instrumentation

The following three instruments were used to measure reading comprehension, students’ self-perceptions as readers, and to distinguish global from analytic processing style for each student.

**Gates-MacGinitie Reading Test.** The Gates-MacGinitie Reading Test (GMRT) was used to measure students’ comprehension ability. Levels 3-10/12 of the GMRT are intended to measure the general reading ability of students in grades 3-12 (MacGinitie, MacGinitie, Maria, & Dreyer, 2000). The comprehension tests measure students’ ability to read and understand various passages. The passages are representative of reading material considered to be academic and recreational. Students are required to answer both literal and inferential questions. In
addition, the comprehension tests measure the ability of students to determine word meaning within authentic text context (MacGinitie et al., 2000).

For each level of the GMRT, split-half and alternate form reliability has been established. The split-half reliability for comprehension and vocabulary range from .89-.96 and .88-.93, respectively. Over a six-month period the alternate form reliability was acceptable for comprehension, ranging from .80-.89, and for vocabulary, ranging from .78-.87. Construct validity for the instrument is suggested based upon correlation of scores between the GMRT and the Lorge-Thorndike Intelligence test (Powell, 1969).

**Reader Self-Perception Scale.** The Reader Self-Perception Scale (RSPS) was designed by Henk and Melnick (1995) to measure student self-perception as a reader. The instrument contains 33 items that are measured on a 5-point Likert-type response format, ranging from Strongly Agree to Strongly Disagree. There is one general item and 32 items that comprise four scales that readers use to estimate their capabilities: the Progress Scale, the Observational Scale, the Social Feedback Scale, and the Physiological States Scale. These four scales are closely related to Bandura’s (1977) self-efficacy theory.

Preliminary reliability coefficients for each scale were within the acceptable range for an affective measure. However, after an exploratory factor analysis of the RSPS, a panel of eight experts made recommendations to revise the instrument to improve the overall reliability as well as establish content validity across the four scales. Further reliability analysis provided coefficients that ranged from .81 to .84 on all items (Henk & Melnick, 1995).

**Elementary Learning Style Assessment.** The Elementary Learning Style Assessment (ELSA) was used to identify students’ information-processing style. The assessment is intended to identify characteristics that students exhibit and to determine learning-style preferences in the
following categories: environmental, emotional, sociological, physiological, and psychological. This study was concerned with the psychological processing styles determined by the assessment as global and analytic.

ELSA is an online assessment that is divided into three sections. Each section begins with a brief story. After each story, there are 25 multiple-choice questions, for a total of 75 questions, pertaining to individual learning style preferences. Electronic results are immediately available upon completion of the assessment. The One Page Student Report provides a summary of individual learning-style preferences. Test-retest was administered to determine internal-consistency reliability of ELSA. A reliability coefficient was calculated for each element of ELSA that ranged from .719 to .924. The mean value for all reliability coefficients was .822 (Dunn et al., 2007). After extensive review of the model, content validity was established by a five-member panel that unanimously agreed the instrument accurately measured the 20 elements of the Dunn and Dunn learning-style model (Dunn et al., 2007).

**Description of the Research Design**

The design for this study was a pretest-posttest for the affective measure (reader self-perception) and posttest only for the comprehension measure. The experimental design utilized a stratified random assignment to group. The target population of struggling readers in grades 3, 4, and 5 from two elementary schools was randomly assigned to the treatment group or the control group. The independent variable was reading comprehension intervention instruction with two levels: (a) students who received instruction using the Four Powerful Comprehension Strategies and (b) students who did not receive instruction using the Four Powerful Comprehension Strategies. The moderator variable was learning-style processing preference. The two dependent variables were reading comprehension achievement and reader self-perception.
Description and Justification of the Analyses

This research used quantitative analyses to investigate each research question. Question One was analyzed through a two-way Analysis of Variance \((p \leq .025)\) using Statistical Package for the Social Sciences (SPSS, 2007) 16.0 to analyze data from the cognitive dependent variable. These statistical procedures determined if there was a significant difference between group means of the experimental and the control group for the cognitive dependent variable (reading comprehension). These data also were analyzed to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to reading comprehension. Question Two was analyzed using a two-way Analysis of Variance \((p \leq .025)\) using SPSS 16.0 to analyze data from the affective dependent variable. The pretest scores were analyzed to support randomization to group; there were no initial differences between group means. These statistical procedures determined if there was a significant difference between group means of the experimental and the control group for the affective dependent variable (reader self-perception). These data also were analyzed to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to self-perception as a reader.

Data Collection Procedures and Timeline

The following procedures were followed according to the timeline.

1. In spring 2008 approval from the Superintendent of schools and building principals was granted to conduct experimental research in selected elementary schools in the district.
2. Upon approval of Western Connecticut’s Institutional Review Board, district personnel identified struggling readers in grades 3, 4, and 5 in two elementary schools. Students were identified based upon 2007-2008 CMT data (grades 4 and 5 only), spring 2008 Developmental Reading Assessment, Two (DRA2) data, fall 2008 Developmental Spelling Assessment (DSA) data, district running record assessment data, and teacher input.

3. Parent consent forms and student assent forms for all research participants were distributed and collected (November 2008).

4. The researcher collaborated with treatment teachers and district coordinators to plan and organize professional development needed to implement the Four Powerful Comprehension Strategies (Fall 2008 and Winter 2009).

5. Students, for whom permission had been obtained, were randomly assigned to either the experimental or the control group (November 2008).

6. The researcher administered the Reader Self-Perception Scale to all student participants.

7. Trained teachers implemented the model for 30 minutes a day, 4 times a week for 14 weeks (December 2008 and January, February, March [2 weeks], and April [2 weeks] 2009).

8. The researcher administered the Elementary Learning Styles Assessment to all study participants who did not have a current learning-styles profile.

9. Follow up professional development for treatment teachers occurred at least once a month for the duration of the treatment.
10. The researcher administered a posttest for each of the dependent variables. The Gates-MacGinitie Reading Test and the Readers Self-Perception Scale were administered to all participants in the study (May 2009).

**Limitations**

Due to the complexities of comprehension, limitations of this study do exist. Although threats to internal validity were minimized by random assignment to group, the transient nature of the school district posed a threat of mortality of the sample size. Also, because four different teachers implemented the treatment, there was a threat that the implementation varied from teacher to teacher, school to school, and across time (Isaac & Michael, 1997). Inconsistent implementation of the independent variable could have affected students’ self-perceptions and comprehension development. To help lower the possibility of this threat, monthly professional development sessions were conducted with the treatment teachers’ input in regard to the implementation of the Four Powerful Comprehension Strategies. Professional discourse between treatment teachers supported consistent implementation of the intervention for all four teachers. Finally, measuring reading comprehension is a complex issue. Although reliability coefficients have been provided for the comprehension assessment, using a single measure poses a threat to internal validity that the measure completely and accurately reflects the underlying constructs (Isaac & Michael, 1997). These limitations will be discussed in greater detail in Chapter Three.

**Ethics Statement**

Permission to participate in this research was obtained from the superintendent, the deputy superintendent, the district literacy supervisor, each school principal, each student and parents of each students. To ensure confidentiality, each participant was assigned a secured
identification number. All coded data will be kept secure for a minimum of five years after the presentation of this research project.
CHAPTER TWO: REVIEW OF THE LITERATURE

The review of the literature is presented to justify the need for further empirical research in the area of effective intervention strategies for struggling readers at the intermediate grade levels. The review also provides a rationale for the selection of variables and methodologies presented in this research. In this review, a theoretical background for the study is presented. Specific studies that address elementary school reading instruction in the areas of balanced literacy, the comprehension needs of struggling readers, and specific instructional interventions related to this study are also reviewed. Additionally, learning-style responsive implementation investigations are examined in the areas of struggling students, reading achievement, and processing preference in relation to this inquiry. Finally, the conclusion indicates the rationale for further research on this topic.

Theoretical Background

The theoretical foundation for this research is based on the work of Lev Vygotsky (1978), Morris Bigge and Samuel Shermis (2004), Nell Duke and P. David Pearson (2002), and Rita and Ken Dunn (1992). The theorists and researchers cited have all contributed to the body of knowledge upon which this study is based. The highly interrelated underpinnings for each of these theorists and the direct relation to this study are discussed throughout this section.

Zone of Proximal Development

Vygotsky’s zone of proximal development supports the idea of small group instruction within the approach to teaching reading. Vygotsky states that the zone of proximal development “is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (1978, p. 86). In other words, a
child’s actual development is determined by what the child is able to do independently. However, each student has another level that he or she can achieve if assisted by a teacher or more capable peer. Vygotsky refers to this notion as the area of the zone of proximal development that defines “those functions that have not yet matured but are in the process of maturation” (Vygotsky, 1978, p. 86).

In the zone of proximal development, individual children, with help, can raise their levels of learning beyond what they are able to do independently. The acquisition of learning then becomes the child’s actual development and this learning continues cyclically, always extending an individual’s knowledge beyond current capabilities. Accordingly, “the developmental process lags behind the learning process,” (Vygotsky, 1978, p. 90) and not the inverse as prior, and more traditional theories state. In regard to reading, a student’s independent reading level is measured by a specific level of accuracy, fluency, and comprehension. A child’s instructional level is just beyond his or her independent level. In a balanced approach to literacy, the teacher’s role is important and should not be overlooked. The teacher must be supportive while the student gains control of working independently in the zone of proximal development (Vygotsky, 1978).

Each teacher’s use of the Four Powerful Strategies mirrors Vygotsky’s theory. The four strategies and underlying skills also directly relate to this theory. As the reader is able to independently apply what has been learned, the new knowledge becomes the basis for learning additional skills and strategies. However, for struggling readers this process frequently requires more time with direct instruction, longer periods of modeling, collaboration, and guidance before they become independent (Allington, 2001; Duke & Pearson, 2002; Lanning, 2009; Lipson, 2003; Pressley, 2000, 2006).
Transfer of Learning

In conjunction with Vygotsky’s zone of proximal development is the theory of the transfer of learning. Bigge and Shermis state that the transfer of learning “is the relationship between one’s learning process and one’s ability to use what one has learned in future learning and life situations” (2004, p.17). These authors believe that the two main goals of transfer are to accumulate significant knowledge to apply in life’s situations and, more importantly, to be able to acquire new insights and understandings independently. To optimize transfer, teachers must take a similar approach to that of the Gestalt concept, in which the whole is greater than the sum of its parts. Educators must identify the big ideas, the individual parts, and emphasize strategy instruction—even if it may be slightly above the child’s levels of independent functioning (Marini & Genereux, 1995). The idea of simultaneously instructing students to notice the big idea and the distinct parts highly correlates with addressing the needs of analytic and global learners (Dunn et al., 2001; Guastello & Burke, 1998-1999).

According to Bigge and Shermis, “this process of instruction begins with the concerned adult doing most of the cognitive work. But this phase is followed by one within which the child and the adult share responsibility. Finally the child becomes able to think and perform independently” (2004, p. 129). The Four Powerful Comprehension Strategies delivered through small group instruction, utilizing the gradual release lesson design in this study, parallels these goals to produce life-long readers (Lanning, 2009). A gradual release instructional design allows teachers to appropriately scaffold and connect information based upon individual student needs. As students assume responsibility for using the strategies independently, the teacher becomes a mediator. “The mediated support of the Gradual Release Lesson Design offers struggling readers a chance to develop a deep understanding of the essential reading strategies that will help
them make sense of text” (Lanning, 2009, p. 20). The next section details the gradual release process.

**Model of Strategy Instruction**

Duke and Pearson’s (2002) model of strategy instruction is a conceptualized instructional delivery model based upon Pearson and Gallagher’s (1983) gradual release of responsibility. The steps of the model are as follows:

1. An explicit description of the strategy and when it should be used.
2. Teacher and/or student modeling of the strategy in action.
3. Collaborative use of the strategy in action.
4. Guided practice using the strategy with gradual release of responsibility.
5. Independent use of the strategy.

The order of these steps reflects a gradual release of responsibility from teacher to student providing prescribed scaffolding based upon each student’s needs. “As the learner’s abilities increase, the…[teacher] gradually withdraws scaffolding structures to incrementally transfer responsibility to the learner” (Mitchell, 2008, p.18). This instructional delivery model supports the theories of zone of proximal development and transfer of learning where optimal learning is a byproduct of effective instructional assistance.

The model of strategy instruction is grounded in extensive research. Roehler and Duffy (1984) proposed *mental modeling* to define a strategy and explain how and when to apply the strategy by thinking aloud. Afterward students would attempt the strategy with feedback and appropriate guidance continually scaffolded from the teacher until the student gained independent use of the strategy. Duffy et al. (1987) conducted a year-long experimental study
with grade 3 students on the effects of direct-explanation strategy instruction. The results yielded initial and residual effects of the direct-explanation strategy instruction. The experimental group outperformed the control group on standardized measures of reading in third grade and also a year after the direct-explanation intervention had been administered in fourth grade.

Duke and Pearson (2002) reviewed two research-tested comprehension routines that employ the gradual release lesson design: reciprocal teaching and transactional strategies instruction (e.g. SAIL). According to the authors, comprehension routines are characterized as an integrated set of practices that could be used regularly with a variety of texts to “provide students with two significant benefits: (a) better understanding of the texts to which the routines are applied, and (b) the development of an infrastructure of processes that will benefit encounters with future text, especially texts that students must negotiate on their own” (Duke & Pearson, 2002, p. 225).

Each of the comprehension routines incorporates a prescribed “package” of comprehension strategies. Although several literacy experts have come to a consensus on a number of effective comprehension strategies, there has been limited empirical research on the optimal number or specific combination of strategies that would be deemed most effective to teach comprehension (Duke & Pearson, 2002; Harvey & Goudvis, 2000; Keene & Zimmermann, 1997; Pearson, Roehler, Dole, & Duffy, 1992; Pressley, 2006; RAND Reading Study Group, 2002).

Reciprocal teaching (Palincsar & Brown, 1984) involves a gradual release of responsibility from the teacher to the student and is typically conducted in a small group setting for approximately 30 minutes. There are four comprehension strategies that are the focus of the
reciprocal teaching approach: predicting, questioning, seeking clarification, and summarizing. In the initial lesson the teacher models using the four comprehension strategies and scaffolds instruction to turn the responsibility over to a student who then takes on the role of the teacher. The teacher’s role is to monitor and provide feedback on the process (Palincsar & Brown, 1984).

Several studies have documented the effectiveness of the reciprocal teaching approach to teaching comprehension (Hacker & Tenent, 2002; Marks et al, 1993; Moore, 1988; Rosenshine & Meister, 1994). A repeated finding indicated a limited effect with respect to performance on standardized tests, average $es = 0.3 \ SD$ (Hacker & Tenent, 2002; Marks et al, 1993; Pressley, 2006). The gradual release lesson design was a key aspect when it appeared the teacher had released the responsibility prematurely. Hacker and Tenent (2002) reported that students asked a preponderance of low-level literal questions and did not monitor their comprehension. Rosenshine and Meister (1994) reported that when reciprocal teaching included more direct teaching, results were more positive. Moore’s (1988) review found reciprocal teaching to be a more effective approach than teacher modeling alone, explicit instruction and worksheets alone, daily practice at reading test passages and answering accompanying questions, and training at locating information to address different kinds of comprehension questions.

Students Achieving Independent Learning (SAIL) is a transactional strategies approach. Pressley (1995) described transactional strategies instruction as a distinct interaction between the teacher, the student, and the text. In SAIL, the premise of the approach is to assist students to move toward independence in identifying the appropriate use of specific comprehension strategies (Duke & Pearson, 2002). The package of comprehension strategies prescribed with this approach includes predicting, visualizing, questioning, clarifying, making associations, and summarizing. Teacher think-alouds and explicit instruction are the primary instructional
delivery methods used to emphasize the six comprehension strategies (Pressley, 1995). Students are given multiple opportunities to practice interpreting a variety of texts. Although the instruction prescribes modeling one comprehension strategy at a time, student participation should reflect prior learning and an integration of strategies (Duke and Pearson, 2002).

Qualitative studies of transactional comprehension strategies instruction have investigated how the comprehension strategies have been taught and how learning is taking place. “These studies suggest that SAIL and similar programs offer a promising approach to comprehension instruction, with rich, motivating interactions around text and increasing sophistication of student strategy use over time” (Duke & Pearson, 2002). Teachers strongly endorsed direct explanation, modeling, and extensive practice and reinforcement as essential components of effective strategies instruction (Pressley, 2006).

A quasi-experimental study by Brown, Pressley, Van Meter, and Schuder (1996) studied the effects of transactional strategies instruction on comprehension achievement of low-achieving second graders. Ten teachers from ten classrooms were the adult participants in the study. A group of students identified as struggling readers from each class were the student participants. Five teachers were trained in transactional strategies instruction and their students were taught by this method, while the other five teachers used traditional comprehension strategy instruction for the year-long study. The control and experimental groups did not differ on standardized measures for comprehension and word attack skills at the onset of the study. However, the study results indicated that the students who were in the SAIL classrooms outperformed students in the non-SAIL classrooms on both measures (Brown et al., 1996).

Duke and Pearson’s (2002) model of strategy instruction was the sole vehicle for delivery of instruction in each lesson conducted in this study. The carefully scaffolded lesson design
allowed instructors to manage the complexities of comprehension instruction (Lanning, 2009). The five steps were intended to guide teachers through each lesson, but the progress of students determined the amount of scaffolding needed before releasing the responsibility. The study indicated that initial lessons for each strategy may require more time explicitly teaching and modeling with limited collaborative and guided practice. However, building upon each day’s lesson, there should be a distinct shift to student responsibility in the collaborative step until students need minimal guidance and are able to independently manage the skills required to understand each of the Four Powerful Comprehension Strategies.

**Learning Style Theory**

Research consistently supports the theory that learners, “achieve statistically higher achievement test scores with complementary, rather than dissonant instructional strategies” (Dunn, Thies, & Honigsfeld, 2001, p. 9). Teachers should have an awareness of the importance of investigating students’ learning styles and developing strategies based on these preferences. It has been documented over time that instruction based upon learning-style preferences not only raises student achievement but also improves both attitude and behavior toward learning (Dunn & DeBello, 1999).

Drs. Rita and Kenneth Dunn defined learning style as the manner in which individuals process and master new and difficult information. The model encompasses 20 different elements, measured as a “strength of preference,” within five domains: (a) environmental elements of sound, light, temperature, and seating design; (b) emotional elements of motivation, task persistence, responsibility/conformity, and structure; (c) sociological elements of learning alone, in pairs, with peers, in a team, with an authority figure, or in a variety of groupings; (d) physiological elements of perceptual modalities, the need for intake and mobility, and time of
day energy levels; and (e) psychological elements of analytic/global and impulsive/reflective (Dunn & Dunn, 1992). Individual learning styles are derived from a combination of biological and developmental traits. The learning-style instruments measure the degree of preference and indicate which of the 20 elements most affect the learning process (Lovelace, 2005).

The Dunn and Dunn model is based upon the theory that most individuals can learn when the instructional environment, strategies, and resources are responsive to individual strengths (Dunn, Cavanaugh, Eberle, & Zenhausern, 1982; Dunn & Dunn, 1992, 1993, Dunn et al., 1994). Although no individual is impacted by all 20 elements, most students exhibit strengths in 6 to 14 of them. Consequently, identical instructional strategies, settings, and resources for all learners equates to an effective learning environment for some students but not for others. The stronger a student’s preference is for an element or combination of elements, the greater the impact on achievement if the learning environment is matched or mismatched (Braio, Beasley, Dunn, Quinn, & Buchanan, 1997; Doolan & Honigsfeld, 2000; Dunn, Denig, & Lovelace, 2001; Dunn & Dunn, 1992, 1993; Dunn et al., 1994). Lovelace summarized that “individuals’ vastly different combinations of learning-style preferences can explain why there is no single instructional method or resource that is effective for all students” (2005, p. 177).

Empirical research using the Dunn and Dunn model has been conducted in urban, suburban, and rural areas world-wide at each grade-level, in all content areas, and with all populations including special education, low-achieving, average, high-achieving, and gifted learners (Dunn, Denig, & Lovelace, 2001). Dunn and Dunn (2005) reported significant findings during the 35 years of research on perceptual strengths. Low-auditory and low-visual learners were identified in the 1970s. Several studies ensued from the finding that some students could not retain information that they had either read (low-visual) or had been presented with orally in
a traditional lecture style method (low-auditory). Many of the studies led to conclusions that supported the use of tactual and kinesthetic materials to effectively instruct the low-visual or low-auditory learner (Dunn & Dunn, 2005; Fine, 2003; Honigsfeld & Dunn, 2003).

Lovelace (2005) conducted a quantitative synthesis of 76 research investigations that spanned 20 years of research and included 7,196 participants. The meta-analysis produced 168 individual effect sizes for achievement ($n = 131$) and attitude ($n = 37$) to support the overall effectiveness of the model as well as analyzed moderating variables that may have had an effect on the outcomes (Lovelace, 2005). All effect sizes of the study were positive, indicating that learning-style instructional methods produced higher academic achievement and attitude results than traditional instructional methods. Lovelace (2005) reported the potential percentile gains, as translated by Marzano, Pickering, and Pollack (2001), to project a possible increase in student achievement by 25 or 30 percentile points and a 30 percentile point increase for attitudes toward learning when the Dunn and Dunn learning-style model was used to provide a responsive instructional methodology. The moderating variables analyzed as contributing factors for academic achievement were publication type (published/unpublished studies), degree of preference, school type, academic level, and demographic region.

The findings of this meta-analysis highly support “the position that matching students’ learning-style preferences with complementary instruction improved academic achievement and student attitudes toward learning” (Lovelace, 2005, p. 180). Educators must be cognizant of the many and varied learning styles of students beyond auditory and visual perceptual strengths. The Dunn and Dunn (1992) model thoroughly depicts learning modalities and provides suggestions to adapt each instructional environment with the appropriate materials, strategies, and settings to meet the needs of many different learning styles.
Research-Based Reading Instruction

Literacy skills are among the most sought after capabilities in society. Empirical studies on elementary school reading have been conducted for decades. The information is as varied as the topics identified. The following section reviews studies conducted on balanced literacy, comprehension needs of struggling readers, and instructional interventions.

Balanced Literacy

Striving to incorporate all of the instructional components of a balanced literacy model is a difficult task. It is equally as difficult to identify and implement the most effective instructional strategies in a timely manner for students who struggle, while considering the needs of all other students in a classroom. Several studies have attempted to address the complex issues related to implementing an effective balanced literacy instructional model.

A case study of a district mandated balanced literacy program in one urban school district found that although the physical environment was well suited for a balanced literacy approach, there was an inordinate amount of time spent on independent reading and writing (Frey et al., 2005). The participants in this study consisted of 126 kindergarten through grade 5 students, 67 teachers from 32 different elementary schools in a high-poverty, urban metropolitan area. Multiple data sources were collected: (a) classroom observations, (b) classroom physical environment checklists of literacy components, (c) physical building environment checklists of literacy components, (d) teacher surveys, and (e) student group interviews.

A triangulated approach was used to answer the primary research question and the three supporting questions. Findings, based on the measured duration and frequency of activities and strategies consistent with a balanced literacy approach, indicated that independent writing was the most common activity followed closely by read-alouds and independent reading. In addition,
shared reading and guided reading strategies were conducted weekly rather than daily. Fountas and Pinnell (1996) stress the importance of teacher-directed instruction and modeling as a strong basis of a balanced approach. The authors state that, “although the literature does not suggest the most effective balance between the two broad types of activities, direct instruction and modeling should occur” (Frey et al., 2005, p. 278). One of the conclusions this research indicated was the need for specific professional development at the onset of such a monumental curricular change as well as continuous follow-up training opportunities for teachers.

Another case study utilizing grounded theory analysis was conducted by Pressley, Mohan, Raphael, and Fingeret (2007) to determine the potential elements contributing to students’ high reading and writing achievement at one elementary school. The sample consisted of 296 kindergarten through grade 5 students from middle class families and the faculty was comprised of 14 classroom teachers, 6 special area teachers, 2 instructional aides, 8 interns (each held a bachelor’s degree), and the school principal. All forms of data and analyses were consistent with grounded theory methodology (Pressley et al., 2007). The main sources of data for this study were observations. Data also included short interviews with all teachers, 10 semi-structured interviews with selected staff members, and document and artifact analyses. The primary researcher (Michael Pressley) spent over 100 hours in the school conducting formal and informal observations and interviews. However, the total number of hours that the four researchers spent observing or interviewing exceeded 280 hours between January and June 2005.

The researchers used several methods to establish reliability and credibility in this study: triangulation, member checking, interviewer corroboration, and negative case analysis. The study followed an open coded process in which the researchers continually reviewed and refined the codes and categories until no new insights were concluded. Reliable results by the
investigators ensured “that every general conclusion had to be supported by multiple pieces of data and agreed to by all four researchers” (Pressley et al., 2007, p. 225). Observations were done in several settings including classrooms, meetings, the teachers’ room, cafeteria, playground, hallways, and school-wide assemblies. Several of the artifacts and documents studied consisted of the district and school curriculum guides, posters, grading rubrics, student art, and many others. Pressley et al. “attempted to examine any object they encountered in the school that might be revealing about the reading and writing curriculum, instruction, and achievement at the school” (2007, p. 224). The primary researcher conducted the 10 semi-structured interviews. However, the team of researchers mindfully chose the participants for the formal interviews to “better understand particular elements of the reading and writing instruction at the school…and to clarify individual teacher’s instruction” (Pressley et al., 2007, p. 224). At the conclusion of the study, extensive member checking involved the principal and all teachers. Each teacher had the option to respond to the results concerning his or her grade level.

The results indicated four major elements: setting, people, literacy-focused curriculum, and positive social environment, each with numerous subsets that could be attributed to the school’s success. In their conclusions the researchers recognized the powerful combination of the factors that led to success, the substantial body of research that supports each component, and the continued need for future discoveries. “Delineating the factors that are present in schools with high achievement [serving advantaged as well as disadvantaged populations] can inspire school-wide reform, research-based initiatives, and future quasi-experimental investigations of causality” (Pressley et al., 2007, p. 238).
Comprehension Needs of Struggling Readers

Many studies focus on reading difficulties and the needs of children in regard to word recognition problems but far fewer studies have attempted to isolate and identify comprehension difficulties. However, in a series of experimental studies (Oakhill, 1982, 1983, 1984; Oakhill, Hartt & Samols, 2005; and Oakhill & Yuill, 1986), the authors recurrently compare children with strong comprehension skills to students with weak comprehension skills on similar measures. Three of the studies that are most pertinent to the current study are outlined in this section.

In a 1983 study conducted by Oakhill, she compared the results of three different groups of skilled and less-skilled comprehenders. The treatment group received specific training in inferential skills. One control group received rapid decoding training and the other control group received traditional comprehension reading instruction. Each group participated in seven training sessions for 30 minutes each over a period of 3.5 weeks and the same narrative texts were used for all three groups (Oakhill, 1983). After the seven training sessions the results showed more significant improvement in less-skilled comprehenders who received inferential training than in skilled comprehenders in the same group or in the group that received rapid decoding training. However, there was no significant difference between the treatment group and the control group that received traditional comprehension instruction.

The conclusions of this study seem contradictory to Vygotsky’s (1978) theory of the zone of proximal development. Oakhill states, “Our own training studies have shown that marked improvements in comprehension can be attained with only brief periods of training” (1993, p. 234). She further concludes that poor comprehenders may not be able to learn comprehension strategies exhibited by students with strong comprehension skills even when explicitly taught to do so. Finally, Oakhill (1993) delineates a time frame in which to teach children deliberate
comprehension strategies, warning that providing such instruction prematurely may prove to be counterproductive to the child still struggling with decoding words. Oakhill contradicts Vygotsky’s theory by implying that development leads learning. Contrarily, in the zone of proximal development, learning can lead to development. An adult or more capable peer can support a child in the development and maturation of cognitive skills such as comprehension strategies.

A second study conducted by Oakhill (1984) compared a group of 7 and 8-year-old skilled comprehenders to a group of less-skilled comprehenders who had comparable decoding speed, accuracy, and automaticity skills. A total of 24 students participated in the study. The purpose of the study was to explore the observed relationship between comprehension skills (strong and weak) and the ability to use implicit inferences to create a deeper understanding of the text. The groups of skilled and less-skilled comprehenders were selected so that they were matched on ability to read words aloud, on skill at understanding the meaning of isolated printed words, and on short-term memory level. However, the two groups differed significantly on reading comprehension scores, $t(22) = 8.18, p < .001$.

Each student was independently assessed on four passages of approximately 100 words each. Students were required to orally respond to eight open-ended questions after reading each passage aloud. The four literal questions could be found directly within each text and the four inferential questions “asked for inferential information not explicitly stated in the passage” (Oakhill, 1984, p. 33). The students were required to respond to all eight questions for each passage under two conditions: (a) from memory (always directly after the read aloud), and (b) again with the text in front of them. For each condition, the researcher recorded the respondent’s answers.
In the first step of data analysis, errors and omissions (clearly defined by the researcher) were calculated by level of comprehension (skilled/less-skilled) for each type of question (literal/inferential) as well as each condition (unseen/seen). A 2 x 2 x 2 factorial analysis of variance was conducted to analyze these data. The results indicated a significant main effect for all factors. The skilled comprehenders made fewer errors than the less skilled comprehenders: overall, $F(1, 51) = 12.85, p < .001$, in regard to the condition, $F(1, 42) = 33.72, p < .001$, and on the type of question, $F(1, 46) = 9.42, p < .005$ (Oakhill, 1984). There was also a significant interaction for each pair of factors. One significant interaction was the improved performance on literal questions, which was greater for the less-skilled comprehenders compared to the skilled group when the passage was visible, $F(1, 42) = 5.23, p < .05$. However, the most interesting interaction revealed that although skilled comprehenders performed better on both types of questions without seeing the text $F(1, 22) = 5.21, p < .05$, they only performed better on inferential questions when the text was accessible. Finally, the main effect for each question type was analyzed using separate ANOVAs for the literal and inferential questions (Oakhill, 1984). There was a significant interaction between comprehension level and presentation condition. Less-skilled comprehenders performed as well as the skilled students for literal questions when they could see the text, $F(1, 22) = 7.80, p < .025$, but not when they had had to answer from memory, $F(1, 22) = 2.95, p > .10$ (Oakhill, 1984).

Although it is difficult to establish a causal relationship between less-skilled comprehenders and the ability to draw implicit inferences, Oakhill (1984) offers two possible suggestions: (a) students do not possess the necessary background knowledge, or (b) students do not know how to use the information in the text to formulate an inference. Oakhill further suggests that the ability of skilled comprehenders to infer using prior knowledge and the ability
to create meaning “not only helps their understanding but also their literal memory of the text” (1984, p. 36). Finally, Oakhill (1984) offers suggestions that complement Vygotsky’s zone of proximal development. She suggests that teachers build upon the students’ current ability to infer explicit information by encouraging and guiding students to use information that is not explicitly stated in the text. Teacher-directed strategies sometimes help clarify the importance of making inferences to struggling students.

According to the Dunn and Dunn (1992) learning-style theory, these findings could indicate that the less-skilled comprehenders exhibited processing preferences associated with a global learner. As indicated by several learning-style research studies, global learners are often identified as struggling until instructed through their preferred strengths (Burke, 2003; Dunn & DeBello, 1999; Guastello & Burke, 1998-1999). It was evidenced in Oakhill’s (1984) study that when the less-skilled comprehenders were able to use their visual perceptual strength in combination with other perceptual modalities, they performed as well as the skilled comprehenders. Global learners prefer to use a variety of perceptual modalities when completing a task (Burke, 2003; Dunn & DeBello, 1999; Guastello & Burke, 1998-1999).

The final study reviewed in this section conducted by Oakhill et al. (2005) sought to compare the cognitive differences between good comprehenders and poor comprehenders. The purpose of this study was to explore a student’s ability to detect contradictions between two sentences in a given passage. Two groups of 9 and 10-year-olds were selected based upon comprehension scores on the Neale Analysis of Reading Ability and the Gates MacGinitie Reading Comprehension Test. After the initial screening, it was determined that each group was average or above in terms of word recognition. However, in regard to comprehension, the groups differed significantly, $p < .001$. 
Oakhill et al. (2005) wanted to determine what cognitive attributes students with strong comprehension skills exhibited that poor comprehenders lacked. The researchers used six short passages (2 control and 4 experimental) about animals of high interest to 9 and 10-year-olds. The four experimental passages each contained two sentences with inconsistent information in either adjacent (consecutive) or distant sentences. In two of the four experimental passages the inconsistent sentences were consecutive, for example, “Moles cannot see very well, but their hearing and sense of smell are good. Moles are easily able to find food for their young because their eyesight is so good” (Oakhill et al., 2005, p. 676). As reported in the findings the poor comprehenders experienced more difficulty when the contradictory sentences were distant (e.g. sentences two and six contained the inconsistent information).

The readings were individually administered to each student under careful observation of the researcher. The students were instructed to read all six passages and identify any problems in the text (i.e. anything that did not make sense). The students were scored according to correct identification of inconsistencies as well as a written explanation for a total possible score of three on each passage. However, if the students responded incorrectly they were prompted to reread the passage. Students were awarded two points if they answered correctly after being prompted. Finally, if the subject did not correctly identify the problem, the researcher underlined the two contradictory sentences and asked if the two sentences made sense. A one was given for a correct response and a zero for an incorrect answer (Oakhill et al. 2005).

A 2 x 2 x 2 factorial analysis of variance was performed to analyze the results of student scores on each passage for group, distance of sentences (adjacent or distant), and order (adjacent or distant passage first). “Skill group and order were between-subject variables, and distance was within subject” (Oakhill et al., 2005, p. 678). For the between group analysis, main effects
were significant for group, $F(1, 20) = 7.29, p < 0.025$, and for distance, $F(1, 20) = 13.62, p < 0.01$, that indicated the good comprehenders outperformed the poor comprehenders. There was also a significant interaction between group and distance, $F(1, 20) = 7.66, p < 0.025$. The good comprehenders performed equally as well on distant and adjacent sentences, but the poor comprehenders experienced a great deal of difficulty appropriately identifying the inconsistencies in the distant sentences (Oakhill et al., 2005).

The directional hypothesis that “the detection ability of poor comprehenders would be more markedly affected when pieces of inconsistent information were further apart was confirmed” (Oakhill et al., 2005, p. 681). However, the scoring of the passages appears to be a very subjective method. Although the results indicate significance for the main effects, the reliability and validity of this instrument are questionable. The authors do not account for inter-rater reliability when scoring the assessment. Also, the validity of the instrument is based on a pilot of five children and five adults. To establish the validity and reliability of an instrument, the minimal number of subjects required to pilot the instrument must exceed eight to ten times the number of items on the instrument (Fraenkel & Wallen, 1993).

**Instructional Interventions**

In a year-long mixed methods study conducted by McIntyre et al. (2005) the authors compared the reading and phonics achievement of first graders and the comprehension achievement of first and second grade struggling readers who received daily supplemental instruction to first and second grade students who did not receive additional support beyond regular classroom instruction. The population included 196 students and 29 teachers in 17 schools. The community was 79% Caucasian and 57% of the student population received free or
reduced lunch. Students in the study were identified as being the lowest achieving students in each participating class.

The intervention included 39 first-grade and 20 second-grade students “served by models that included daily intensive instruction as a supplement to their regular reading instruction” (McIntyre et al., 2005, p. 103). The authors used qualitative data to establish an operational definition of supplemental instruction for the study. “Through the analyses, [of observations, teacher interviews, and field notes] we identified those students who received supplemental instruction as children receiving a structured daily or almost-daily literacy experience in addition to their regular literacy instruction” (McIntyre et al., 2005, p. 102). The types of supplemental instruction varied in format in each setting but were consistent in that the additional instruction was daily or almost daily for at least 30 minutes. A second commonality of the supplemental models was that each model was carefully constructed to support the literacy efforts of the regular classroom. Each model also utilized a scaffolding measure and consistent feedback from a knowledgeable teacher. “More reading time usually occurred with more help or scaffolding as the children read, that is, more time with the teacher” (McIntyre et al., 2005, p. 104). This practice is consistent with Vygotsky’s zone of proximal development; the instruction matched each student’s level of competence and was intended to extend the student’s knowledge beyond his or her current capabilities.

The two cognitive measures used were the Clay’s Hearing Sounds in Words Test and the Flynt-Cooter Informational Reading Inventory, to assess phonics application in first graders and reading comprehension in first and second graders respectively. A t test was used to compare the academic gain scores between students who received daily supplemental instruction and those who did not. An analysis of covariance (ANCOVA) was performed to analyze the posttest
scores, using the pretest as a covariate, and compare the results between students who received daily supplemental instruction and those who did not (McIntyre et al., 2005).

The findings indicated a significant difference in reading comprehension mean scores of both first-grade, $F(1, 20) = 4.64, p = .03$, and second-grade students, $F(1, 60) = 5.02, p = .03$, that exceeded the comprehension of those students who did not receive supplemental support. The mean gain of second-grade experimental group ($M = 0.53, SD = 0.06, n = 20$) also significantly outperformed the mean gain of the control group ($M = .0.15, SD = 0.60, n = 43$), $t(61) = 2.23, p = .03$. However, there was no significant difference in phonics achievement or mean gain scores between the two first-grade groups, $p = .06$ (McIntyre et al., 2005).

In conclusion the study promoted supplemental instruction that supports regular classroom teaching and learning. The study also defended the work of literacy scholars who believe that “some children need more time with their teacher and time in small-group settings rather than whole class instruction” (McIntyre et al., 2005 p. 104). This study endorsed the need for effective supplemental support as an early intervention for struggling readers in first and second grade. However, the authors also clearly state, “…there is a paucity of studies that examine effects for students beyond first grade and even fewer with individually administered measures of phonics and reading comprehension” (p. 100).

Berninger et al., (2006) investigated issues related to the processes of reading comprehension in at-risk second grade readers. According to the article, the purpose of this quantitative study was to investigate whether or not a variety of commonly used comprehension assessments measure the same or different processes. After a battery of screening tests, 96 students were selected for the sample.
The researchers chose five different norm-referenced and criterion-referenced comprehension measures for their purposes: Process Assessment of the Learner Test Battery for Reading and Writing (PAL), Woodcock Reading Mastery Test—Revised (WRMT-R), Wechsler Individual Achievement Test (WIAT), Gray Oral Reading Test—Third Edition (GORT-3), and the Qualitative Reading Inventory (QRI). A confirmatory factor analysis was conducted on all five measures, concurrent Pearson product-moment correlations were computed between nine predictor variables and each of the five comprehension outcomes, and “multiple regression analysis was used to test theoretical models of which reading skills contributed to reading comprehension in at-risk second-grade readers” (Berninger et al., 2006, p. 337).

The confirmatory factor analysis indicated that each of the five comprehension measures shared the most common variance. The comparisons of the correlations “showed that although phonological decoding was significantly correlated with reading comprehension, the measures of accuracy and the rate of real-world reading…were consistently stronger predictors of reading comprehension” (Berninger et al., 2006, p. 339). The results of the multiple regression of four measures and three comprehension outcomes (cloze, multiple choice, and open-ended comprehension) showed that in the fall, real-world reading rate “uniquely explained all three outcomes” and in the spring both real-world reading rate and verbal IQ explained the outcomes for the same three measures.

The second of two studies conducted by Berninger et al. (2006) was an experimental design that implemented an instructional procedure as the independent variable. In four treatment schools, 98 second graders identified as struggling readers received supplemental instruction in addition to the general reading program, in the form of before and after school clubs. “The four treatment schools provided supplementary reading clubs for children before
(two schools) or after school (two schools) twice a week for one hour each time from January to early June” (Berninger et al., 2006, p. 344). The instructional focus in the before and after school programs was on vocabulary development, knowledge of the alphabetical principal, accuracy and rate of phonological decoding, accuracy and rate of real-word reading, accuracy and rate of text reading, and comprehension strategies.

Students were assessed on: (a) accuracy of phonological decoding and real-world reading, (b) reading fluency, and (c) reading comprehension. Data from the Woodcock Reading Mastery Test—Revised (WRMT-R), The Developmental Reading Assessment (DRA), and The Gates-MacGinitie Reading Comprehension Test were analyzed using a repeated-measures ANOVA to “evaluate group effects, time effects, and Group x Time interactions for each of the dependent measures in the test battery” (Berninger et al., 2006, p. 345).

Results for comprehension showed that only time effect was significant, $F(1, 78) = 6.249$, $p = .015$. Although both groups of children showed significant improvement in comprehension, the statistical significance in comprehension between the two groups was diminished when statistical controls for differences in oral vocabulary were introduced. The findings indicated the importance of integrated instruction of various reading skills. “The lesson from study two is that instruction that integrated decoding and reading comprehension improved the accuracy of phonological decoding significantly more than the general instruction in the control group…” (Berninger et al., 2006, p. 346). The authors also found that integration of automatic word recognition and comprehension showed improved reading fluency. “Integrated instruction aimed at both automatic word recognition and reading comprehension skills also significantly improved text reading fluency” (Berninger et al., 2006, p. 347).
These findings support the ideas of literacy authors that comprehension skills and strategies are extremely complex because of their highly interrelated nature (Allington, 2001; Cooper, Pikulski, Au, Calderon, & Comas, 1997; Harvey & Goudvis, 2000; Pearson et al., 1992). Berninger (2006) attempted to pinpoint which processes were responsible for specific children’s difficulties. One goal of the study was to diagnose problems and attempt to prescribe specific instruction to address them. “Such individualization of instruction may benefit from assessment information that pinpoints why individual children do not show reasonable annual growth in reading comprehension” (p. 347).

A study conducted by Dole, Brown, and Trathen (1996) compared three different types of comprehension instruction. The authors hypothesized that “even though a teacher-directed strategy may help students understand a text at hand, a student-centered strategy may be more likely to help students with texts they read on their own” (Dole et al., 1996, p. 62). The 67 fifth- and sixth-grade students that comprised the sample were identified as at-risk readers by federal criteria. The students attended a year-round school in a large western U.S. city. All students were homogenously grouped into six different groups according to the previous year’s Stanford Achievement Test (SAT). For the purposes of the study, the highest scoring group and lowest scoring group were not included in the treatments.

The study utilized three treatment groups so that each group received a different type of comprehension instruction. The same instructional narrative texts compiled from the district adopted basal readers were used for each group in the study. The instrument used to assess comprehension was developed by the investigators based upon the selected texts and was scored on a 0-3 point rubric. Students were randomly assigned to one of the three instructional treatments: the story content instructional treatment, the strategy instructional treatment, or the
basal instructional treatment. Three instructors, including one of the authors, rotated among all three groups, spending approximately eight days with each group (Dole et al., 1996).

All assessments (pre, post, and delayed) were administered using an Independent Test and Instructional Test that were identical in structure, but not content. Baseline data were collected for all students. The Independent Pretest was given prior to the start of the treatment and was unrelated to the text used in any instructional practices. The Instructional Pretest was administered on day one of instruction. The Instructional Pretest was directly related to the texts taught on that day. The instructional sessions took place for 50 minutes a day, 4 days a week for 5 weeks. Posttest data were collected immediately following the treatments and seven weeks later. The immediate posttest data were collected in the following manner: (a) the Instructional Posttest was administered on the final day of the treatment because the content was directly related to the day’s lesson and (b) the Independent Posttest was administered the next day because the content was discrete from the treatment lesson content. The two delayed assessments were administered in the same manner as the pretest (Dole et al., 1996).

The data were analyzed using a mixed factorial design. The between-subjects factor was instruction type and the two within-subjects factors were test type and test time. At the time the groups were established the most recent SAT scores were not available. When these data were analyzed it revealed a significant difference among the groups. An ANCOVA was employed to account for the significant difference and the new SAT scores were used as the covariate.

The results indicated a significant main effect for instruction type $F(2, 63) = 17.31, p < .001$, and post-hoc analyses disclosed strategy instruction scored significantly higher than either the story content group or the basal group. There was no significant difference between the latter two groups. There was a main effect for test time $F(1, 64) = 26.23, p < .001$, indicated a benefit
for the delayed tests over the immediate posttests. There was no main effect for test type. There also were three two-way interactions: (a) between instruction type and test type, \(F(2, 64) = 19.55, p < .001\) (b) between instruction type and test time, \(F(2, 64) = 3.32, p < .05\) and, (c) between test type and test time, \(F(1, 64) = 26.97, p < .001\). Post-hoc analyses on the first interaction indicated that the strategy group performed significantly better on the Independent Tests (no direct prior instruction). For the second interaction, post-hoc revealed that the story content group improved significantly from the immediate posttest to the delayed posttest. Neither of the other groups showed such gains (Dole et al., 1996).

**Learning-Style Responsive Implementation**

The Dunn and Dunn (1992) learning style model is one of the underlying constructs of this study. Processing preference (one element of the learning-style model) was analyzed as a possible moderating variable in this study. The relationship between the independent variable (Four Powerful Comprehension Strategies and no Four Powerful Comprehension Strategies) and the dependent variables differed for global and analytic learners. Decades of research have provided an abundance of evidence to support the importance of using instructional techniques that are congruent with each student’s learning style. For the purposes of this study, the reviewed research focused on, students who struggle academically, reading achievement, and processing preferences.

According to the Dunn and Dunn learning-style model, “learning style is the way that students begin to concentrate on, process, internalize, and remember new and difficult academic information” (Lovelace, 2005, p.176-77). One aspect of this theory suggests two different processing types: global and analytic. Learners who prefer information presented in an anecdotal manner that initially imparts the “big picture” through stories that can be self-related characterize
the global processing style. Global learners generally prefer to work with a small group in an informal setting with low light. Conversely, learners who prefer a step-by-step methodology with specific grading criteria and concise feedback characterize the analytic processing style. The analytic learner usually prefers to work alone in a formal setting with bright light (Burke, 2003).

The primary learning-style element examined in this research study was processing preference. However, this section highlights three different aspects of learning-style studies related to the current investigation in following order (a) struggling readers, (b) reading comprehension, and (c) processing preference.

**Struggling Students**

In a study seeking the effects of an incremental implementation approach to learning-style strategies, Braio et al. (1997), examined the achievement and attitudes toward learning in special education (SPED) and low-achieving regular education (RE) classes. Braio et al. (1997) stated that “low achievers typically have strong preferences for structure (Dunn et al, 1994), [therefore] more practical and gradual methods are needed to reduce the confusion and the chaos often associated with drastic environmental changes in classrooms” (p. 18). The samples were comprised of 81 SPED and 35 regular education (RE) students from a low-socioeconomic, urban elementary school. There were significantly more boys in each sample: 62 in the SPED sample and 25 in the RE sample.

The Learning Style Inventory (LSI) was used to analyze each student’s learning-style (LS) preferences. The authors used the results of the LSI to create a categorical variable with three levels for preferences: no LS preferences, environmental or mobility preferences (EMP), and multiple (perceptual, environmental and mobility) preferences (MULT). Accordingly, the
no LS preferences group included 7 SPED students and 1 RE student, the EMP group consisted of 24 SPED and 7 RE students, and the remaining 50 SPED students and 27 RE students were comprised the MULT preferences group.

The study was conducted in five phases. Each phase consisted of a two-week instructional session with a specified gradual implementation of LS accommodations. There were no LS accommodations in the first phase (baseline) or the final phase (comparison). Achievement was measured on five different structural analysis units developed by the authors. Pre and posttests were administered for each of the five phases. “The instructional materials and test for each of the five units were validated by the eight participating teachers, one of the authors, and an elementary teacher external to the study” (Braio et al., 1997, p. 19). Scores from the Semantic Differential Scale (SDS) were used to determine changes in attitude toward learning throughout the five phases of the study.

The analyses for the SPED students and the RE students were performed separately. The initial intention for each of the analyses was to conduct a split-plot ANCOVA. However, Braio et al. (1997) reported that, “the assumptions of homogeneity of regression and the pretest independence were violated” (p. 20). Consequently, for each analysis the gain scores were ranked regardless of preference group or phase and then transformation of ranks was used to perform an ANOVA.

The achievement results for the SPED students indicated statistically significant gains for the EMP group $F(4, 90) = 6.41, p < .0001$, and the MULT group $F(4, 188) = 6.39, p < .0001$, but found no significance for the group with no LS preferences. The highest gains for the EMP group occurred during the second phase when only environmental accommodations were present and consistent achievement through phase four. Although scores decreased for the EMP group
in phase five, the effect was not adverse when the LS accommodations were removed. A similar pattern of achievement was revealed for the MULT group with the greatest significant difference in phase three. However, in the final phase there was a detrimental effect for this group when the LS interventions were removed (Braio et al., 1997).

The achievement results for the RE sample did not demonstrate statistical significance in gain scores for either the EMP or the MULT group. The achievement of the EMP group only gradually increased across the first four phases and the MULT group showed trends similar to the SPED group. Although no significant interaction was detected, a strong main effect for Preference Group x Phase was observed (Braio et al., 1997). The Tukey post hoc indicated the benefits of the LS accommodations as well as the adverse effect when the accommodations were removed, $HSD = 11.09, p < .05$.

The scores on the SDS attitude measure for EMP and MULT were combined into a single category, LS preferences (LSP), for both the SPED and RE samples. The LSP students ($n = 74$) in the SPED sample were compared to SPED students with no LS preference ($n = 7$). The transformed ranked scores on the SDS for the SPED sample showed significant change in attitude as the phases of the study progressed, $F(3, 230) = 13.51, p < .0001$. Although no interaction across preference group was detected (possibly due to small sample size of no LS preference group), Tukey post hoc comparisons indicated that attitudes were more positive during the experimental phase compared to the traditional lecture-style instruction $HSD = 3.16, p < .05$. The LSP group for the RE sample ($n = 34$) also showed significant change in attitude as the phases of the study progressed, $F(3, 98) = 3.75, p = .0134$. Since only one RE student was classified with no LS preference, no comparison was measured (Braio et al., 1997).
The findings of this study are limited due to the violations of statistical assumptions and the small sample size of students with no LS preference. The researchers were unable to determine the exact interpretation of academic gains due to the use of rank transformation. The researchers also detected inconsistencies in the academic assessment tools. However, the results consistently indicate a decline in both achievement and attitude when the LS intervention was removed.

**Reading Achievement**

Nganwa-Bagumah and Mwamwenda (1991) investigated the effects on reading comprehension when the environment matched and mismatched students’ design preference. Design preferences refer to the physical environment and are categorized as either formal or informal. A traditional classroom setting with desks and chairs characterizes a formal design. An area with more comfortable seating such as couches and floor space with rugs and pillows describes an informal design (Dunn et al., 1994).

The initial sample of 111 students in grades two through five attended school in Transkei, South Africa. The ages of the students in this sample ranged from 10 to 13 years. The Learning Styles Inventory (LSI) was administered to all students. The results identified 63 students with a strong preference for environmental design. The cognitive instruments used in each of the four grade levels were two sets of reading tests designed to measure academic achievement based upon the students’ reading textbooks. Fifty-five of the students that exhibited a strong environmental design preference took the comprehension tests whole group under two different conditions: Formal Design (Group 1) and Informal Design (Group 2). Correlations were computed for the two conditions and “the matched-pair test was applied to this correlation” (Nganwa-Bagumah & Mwamwenda, 1991, p. 950).
The results indicated that scores for Group 1 and Group 2 produced significant correlation coefficients, \( r = .63 \) and \( r = .61 \) respectively. The results for each student’s scores showed improved performance when matched with environment for Group 1, \( t(16) = 2.22, p = 1.04 \) and Group 2, \( t(37) = 4.12, p < 1.001 \). Nganwa-Bagumah and Mwamwenda’s hypothesis “that children tested in reading comprehension in their preferred style element of design would perform significantly better than when tested in a mismatching environment” (1991, p. 948) was supported in this study.

**Processing Preference**

In a study conducted by Dunn, Sklar, Beaudry, and Bruno (1990) the researchers investigated the relationship between the mathematics achievement and attitudes of minority college students to two specific instructional approaches. The study compared each student’s hemispheric processing preference and attitude toward instructional differences when instructional materials were presented in a compatible manner and an incompatible manner to the individual’s processing preference. This experimental study utilized a single group repeated measures design (Dunn et al., 1990, p. 285). All participants, regardless of processing preference (successive or simultaneous), received all four sets of instructional materials.

The study intended to include the 1,104 students enrolled in a college preparatory mathematics course at a New York technical college, but due to various attendance issues between 600 and 800 students participated in the different stages of this study (Dunn et al., 1990). The three self-reporting instruments used in this study were: (a) the Differential Hemispheric Activation Test that identified the dominant hemispheric processing preference (right or left described as *successive* or *simultaneous*), (b) the Semantic Differential Instrument that measured student attitude toward the two different instructional strategies, and (c) the
Productivity Environmental Preference Survey that measured adult learning-style preferences. All instruments were established as valid and reliable.

The four different instructional packages designed for use in this study were considered to be representative of a global or analytic teaching style. Instructional packages A and D were structured in an analytic and sequential manner leading to concept development conducive to how right-brained or successive learners tend to process information. Packages B and C were designed with visual techniques and methods that provided the concept at the onset and instruction that supported personal connections beneficial for learners who process information in a simultaneous or global manner. All participants were instructed using all four packages and all pre- and posttests (Dunn et al., 1990).

The results indicated a significant difference in test scores of those students identified as simultaneous (global) processors, $F = 14.49, p = .01$ and $F = 6.36, p = .01$ for packages B and C respectively. The simultaneous (global) processors performed significantly better when the instructional approach matched their processing preference and less well when the instructional approach was congruent to their processing preference. There were no significant differences for the analytic packages (A and D) for either type of processor. Although students identified with a successive processing style achieved higher scores when instructed with analytic packages, there was no significant difference in scores when taught with global practices. Also, there were no significant differences for attitude with either processing preference (successive or simultaneous) when compared to an analytic or global instructional method (Dunn et al. 1990).

The results of this study indicated that simultaneous processors preferred a setting with background sound, informal seating, mobility, and tactile or kinesthetic materials and that successive processors preferred a quiet setting with bright light and formal seating and materials
that present information in a step-by-step manner (Dunn et al. 1990). In addition to supporting these results other researchers have also found that students who have been identified as struggling learners often exhibit global processing preferences (Burke, 2003; Dunn et al., 1982; Dunn, Denig, & Lovelace, 2001; Honigsfeld, 2007). It is imperative for educators to understand that although individuals may process new and difficult information differently (Levy, 1983), most students are capable of mastering information if the new information is presented in a style that is conducive with their processing style.

In conclusion, several aspects of the Four Powerful Comprehension Strategies intervention match suggested teaching methods for global and analytic styles. The consistent step-by-step lesson design and strategies of summarizing and self-regulating can effectively support the analytic learner’s style. The strategy of creating meaningful connections, especially within the underlying skills of visualizing and making connections, and the premise of meaning making through literature can effectively support the global learner’s style. The use of a wide variety of reading material including fiction, nonfiction, poetry, music, the Internet, magazines, and others can support both learning style preferences.

**Conclusion**

Throughout these studies there appears to be a multitude of intervention strategies for struggling readers to improve accuracy and fluency and a limited supply of resources that directly address the teaching of comprehension strategies to intermediate grade level students in elementary school. There is an abundance of research indicating a variety of reasons that students struggle at the primary level. There are also numerous interventions geared for this age group. However, the limited research for readers who continue to struggle especially in regard to comprehension in grades three, four, and five needs to be further explored.
Although educational research has identified effective comprehension strategies, there is still a limited empirical research-base to support explicit strategy instruction, optimal strategy combinations and the distribution of strategies over time (Duke & Pearson, 2002). Pressley posits that “although development of comprehension ability is a widely agreed upon goal of literacy instruction, it is rarely offered as systematically as it could be in the elementary grades” (2006, p. 336). In addition to offering systematic instructional strategies, future research must highlight the importance of providing strategies, materials, and settings conducive to multiple learning styles and an understanding that each approach may not be as effective for some types of learners. Finally, Duke and Pearson (2002) support the need for further research that finds better ways to bring effective comprehension instruction to classrooms.
CHAPTER THREE: METHODOLOGY

This study examined the impact of the two levels of the independent variable, reading comprehension intervention instruction, (Four Powerful Comprehension Strategies and no Four Powerful Comprehension Strategies), on the two dependent variables--reading comprehension and reader self-perception of struggling readers in grades 3, 4, and 5. The moderator variable was Learning-Style Processing Preference (analytic or global).

Research Questions and Hypotheses

This study was designed to determine the effect of the instructional intervention Four Powerful Comprehension Strategies on comprehension capabilities and reader self-perception of struggling readers in grades 3, 4, and 5. All student participants were identified as having either a global or analytic processing style. The research questions that guided the basis of this research project were:

1. Is there a significant difference in the reading comprehension of students identified as having a global or analytic learning style when those students have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?
   a. Is there a significant difference in the reading comprehension of students who have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?

Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will
demonstrate significantly higher mean scores on reading comprehension measures as compared to those who have not participated in this type of instruction.

b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to reading comprehension?

Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to comprehension.

2. Is there a significant difference in students' perceptions of themselves as readers when they have been identified as having a global or analytic learning style and have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?

a. Is there a significant difference in students' perceptions of themselves as readers when they have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?

Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on self-perception measures as compared to those who have not participated in this type of instruction.
b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to students' perceptions of themselves as readers?

Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to self-perception as readers.

**Description of the Setting and the Subjects**

Research was conducted at an urban school district in the northeast region of the United States. According to the 2007-2008 Strategic School Profile for the district the total student population was 9,874 and there were 684 full-time teachers in a city of approximately 85,000 residents. The average teaching experience across the district was 14 years and 74% of the teaching staff had obtained a Master’s degree or higher. Demographically, the socioeconomic background of the city population was low to middle class with a median home income of $53,664 (U.S. Bureau of the Census, 2000) and 30% of the total student population was eligible for free or reduced priced meals. The significant ethnic diversity in the district included 52% white students, 30% Hispanic students, 10% black students, and 8% Asian American students while 37% percent of the student population lived in non-English speaking homes. The number of non-English home languages for the district totaled 46 different languages.

**Student Sample**

The target population was a group of students identified as struggling readers in grades 3, 4, and 5. District personnel identified students district-wide based upon grade 4 and 5 2007-
2008 CMT data, spring 2008 Developmental Reading Assessment 2 (DRA2) data, fall 2008 Developmental Spelling Assessment (DSA) data, district running record assessment data, and teacher input.

The total population of struggling readers identified from one of the 14 elementary schools in the district comprised the 63 participants in this sample of convenience. The school was accessible to the researcher, the principal and teachers willingly granted permission for the study to take place at the school, and 63 out of 64 students identified as struggling readers were granted parental permission to participate. When utilizing nonprobability sampling it is difficult to generalize a study’s findings to another population. Creswell suggests that explicit descriptive statistics be calculated for the sample “to compare them with the larger population to make inferences from the sample to the population” (2008, p. 155). Descriptive statistics for the study’s sample were tabulated to make generalizations to the comparable population of intermediate elementary school struggling readers.

The participating school was one of the most socioeconomically-challenged elementary schools in the district with 64% of the total student population eligible for free and reduced lunch. According to the 2007-2008 Strategic School Profile there was a total minority population of 69% and 58% of the total school population lived in homes where English was not the primary language. One full-time bilingual teacher and one full-time English as a Second Language (ESL) teacher provided services to 36% of the total student population ranging from kindergarten to fifth grade. A comparison of the ethnic diversity and additional demographic data for the district, the school, and the students who participated in this study are outlined in Table 1.
Table 1

*Student-level Demographic Data Comparison*

<table>
<thead>
<tr>
<th>Demographic Descriptor</th>
<th>Percentage of students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>District (N = 9,874)</td>
</tr>
<tr>
<td>White</td>
<td>51%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>30%</td>
</tr>
<tr>
<td>Black</td>
<td>10%</td>
</tr>
<tr>
<td>Asian</td>
<td>8%</td>
</tr>
<tr>
<td>Free or reduced lunch</td>
<td>33%</td>
</tr>
<tr>
<td>Special education</td>
<td>11%</td>
</tr>
<tr>
<td>English language learners</td>
<td>23%</td>
</tr>
</tbody>
</table>

**Adult Participants**

There were a total of eight teachers and the three instructional aides who participated in the study. Three teachers and one instructional aide were trained in the implementation of the Four Powerful Comprehension Strategies and the gradual release lesson design during an initial six-hour training session and monthly follow up professional development sessions throughout the course of the research. Five teachers and two instructional aides were not trained in the implementation of the Four Powerful Comprehension Strategies or the gradual release lesson design and conducted various small group instructional practices. Table 2 illustrates the characteristics of the adult participants.
<table>
<thead>
<tr>
<th>Adult</th>
<th>Gender</th>
<th>Total years teaching experience</th>
<th>Total years in current educational setting</th>
<th>Independent variable grouping</th>
<th>Current grade level or area of responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher A</td>
<td>Male</td>
<td>7</td>
<td>7</td>
<td>Experimental</td>
<td>3</td>
</tr>
<tr>
<td>Teacher B</td>
<td>Male</td>
<td>14</td>
<td>14</td>
<td>Experimental</td>
<td>5</td>
</tr>
<tr>
<td>Teacher C</td>
<td>Female</td>
<td>24</td>
<td>6</td>
<td>Experimental</td>
<td>K – 5 ESL</td>
</tr>
<tr>
<td>Teacher D</td>
<td>Female</td>
<td>8</td>
<td>7</td>
<td>Control</td>
<td>3</td>
</tr>
<tr>
<td>Teacher E</td>
<td>Male</td>
<td>17</td>
<td>11</td>
<td>Control</td>
<td>4</td>
</tr>
<tr>
<td>Teacher F</td>
<td>Female</td>
<td>25</td>
<td>6</td>
<td>Control</td>
<td>K – 5 Literacy specialist</td>
</tr>
<tr>
<td>Teacher G</td>
<td>Female</td>
<td>18</td>
<td>2</td>
<td>Control</td>
<td>K – 5 Special Education</td>
</tr>
<tr>
<td>Teacher H</td>
<td>Female</td>
<td>10</td>
<td>2</td>
<td>Control</td>
<td>K-5 Bilingual</td>
</tr>
<tr>
<td>Aide A</td>
<td>Female</td>
<td>3 as special education tutor</td>
<td>3</td>
<td>Experimental</td>
<td>4</td>
</tr>
<tr>
<td>Aide B</td>
<td>Female</td>
<td>7</td>
<td>5</td>
<td>Control</td>
<td>K-5 Literacy</td>
</tr>
<tr>
<td>Aide C</td>
<td>Female</td>
<td>23</td>
<td>23</td>
<td>Control</td>
<td>K-5 ESL</td>
</tr>
</tbody>
</table>

62
Description of Experimental and Control Groups

The school schedule provided two 30-minute instructional blocks four times a week that serviced students with targeted literacy instruction in small homogeneous groups. All participants in this study received the experimental or controlled instruction within one of the 30-minute instructional sessions approximately 4 times a week for 14 weeks. The 8:30 a.m. to 9:00 a.m. instructional block provided time for grade 4 and 5 small groups to convene. The 9:05 am to 9:35 am block was reserved for grade 3 instructional groups. Classroom teachers, special education staff, ESL staff, and other instructional aides shared the responsibility of the instructional groups. Group size ranged from 4 to 10 students.

The 63 student participants in the sample were randomly assigned to either the treatment group or the control group. After random assignment to a group, the students were subdivided into instructional reading groups comprised of 4 to 10 students each. Control student participants were placed in reading groups that included students who had not been identified by district personnel as struggling readers. However, experimental student participants were placed in treatment reading groups that were exclusively comprised of students identified as struggling readers within the parameters of the district identification.

The 31 participants randomly assigned to the treatment group were selectively placed with one of the four adults that had been trained to implement the Four Powerful Comprehension Strategies. The researcher consulted the four adult participants when creating the groups. Nine of the ten ESL students randomly assigned to the treatment group were selectively placed with the ESL teacher (teacher C) who had been trained. Teacher C conducted two different treatment groups: one group of six students in the first instructional block (grade 4 and 5 students) and one group of five in the second instructional block (grade 3 students only). Each of the other adult
participants conducted one experimental group that corresponded to his or her grade level. Aide A instructed seven grade 4 and 5 students, teacher A instructed six grade 3 students, and teacher B instructed seven grade 5 students.

The 32 participants randomly assigned to the control group were assigned to one of the seven adults participants that had not been trained. The researcher did not have input on the reading group placement of the control student participants. Therefore control group students were in mixed ability groups with students not identified as struggling readers by district personnel. A grade level teacher leader consulted with other grade level teachers and special area teachers to place each of the control participants in an instructional reading group. The composition of the non-treatment instructional reading groups varied. The five special education students that had been randomly assigned to the control group received instruction from a certified special education teacher (teacher G). Five out of the ten control participants who were ESL students received instruction from either the bilingual teacher (teacher H) or the ESL aide (aide C). The remaining control student participants were assigned to various instructional reading groups based upon the most current classroom assessments and additional teacher input. Tables 3 and 4 outline the composition of reading groups that participants in the control group were placed and the area of instructional focus for each group during the course of this investigation. No data were collected for non-identified students.
Table 3

Composition of Grades 4 and 5 Control Groups

<table>
<thead>
<tr>
<th>Instructor</th>
<th># of identified struggling readers</th>
<th># of non-identified struggling readers</th>
<th>Area of instructional focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher E</td>
<td>2</td>
<td>8</td>
<td>Written response and fluency</td>
</tr>
<tr>
<td>Teacher F</td>
<td>4</td>
<td>4</td>
<td>Fluency, word work and comprehension</td>
</tr>
<tr>
<td>Teacher G</td>
<td>8</td>
<td>0</td>
<td>Vocabulary</td>
</tr>
<tr>
<td>Aide B</td>
<td>4</td>
<td>3</td>
<td>Fluency, word work and comprehension</td>
</tr>
<tr>
<td>Aide C</td>
<td>2</td>
<td>2</td>
<td>Vocabulary</td>
</tr>
</tbody>
</table>
Table 4

Composition of Grade 3 Control Groups

<table>
<thead>
<tr>
<th>Reading instructor</th>
<th># of identified struggling readers</th>
<th># of non-identified struggling readers</th>
<th>Area of instructional focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher D</td>
<td>2</td>
<td>4</td>
<td>Vocabulary and Fluency</td>
</tr>
<tr>
<td>Teacher F</td>
<td>2</td>
<td>4</td>
<td>Fluency, word work and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>comprehension</td>
</tr>
<tr>
<td>Teacher H</td>
<td>3</td>
<td>2</td>
<td>Vocabulary and Fluency</td>
</tr>
<tr>
<td>Aide B</td>
<td>5</td>
<td>1</td>
<td>Fluency, word work and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>comprehension</td>
</tr>
</tbody>
</table>
Research Design

The between-group experimental research design employed in this study utilized a pretest-posttest for the affective measure (reader self-perception) and posttest only for the cognitive measure. The target population of struggling readers in grades 3, 4, and 5 from one elementary school in an urban district was randomly assigned to the treatment group or the control group. A t test was used to ensure homogeneity between groups and support random assignment to group for the cognitive measure at the onset of the study. For grades 4 and 5 reading scale scores from the 2008 statewide assessment were analyzed. The categorical independent variable was reading comprehension intervention instruction with two levels: (a) students who received instruction using the Four Powerful Comprehension Strategies and (b) students who did not receive instruction using the Four Powerful Comprehension Strategies. The moderator variable was Learning-Style Processing Preference (analytic or global). The two dependent variables were reading comprehension achievement and reader self-perception.

A true experimental design that employs random assignment to a group is considered to be the most rigorous research design (Creswell, 2008). McMillan and Schumacher (2006) identify the experimental design as “the best approach for determining the causal effect of an intervention” (p.255) and having the potential for the highest degree of controlling extraneous variables. Randomization of subjects to the groups minimizes internal threats because the initial groups are assumed to be equal. Instrumentation threats are also minimal when a posttest-only design is used or if the same instrument is used for the pre- and posttest (Creswell, 2008; McMillan & Schumacher, 2006). The cognitive measure in this study was posttest-only. Table 5 illustrates the experimental design used in this study for the cognitive dependent variable. The
same instrument was used as the pre- and posttest for the affective measurement. Table 6 illustrates the experimental design for the affective dependent variable.

Table 5

Description of Experimental Design for Comprehension Measure

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental (R)*</td>
<td></td>
<td>X</td>
<td>O</td>
</tr>
<tr>
<td>Control (R)*</td>
<td></td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

*Random assignment

(Isaac & Michael, 1997)

Table 6

Description of Experimental Design for Affective Measure

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental (R)*</td>
<td>O₁</td>
<td>X</td>
<td>O₂</td>
</tr>
<tr>
<td>Control (R)*</td>
<td>O₁</td>
<td></td>
<td>O₂</td>
</tr>
</tbody>
</table>

*Random assignment

**Same Instrument

(Isaac & Michael, 1997)

Instrumentation

Three instruments were used to measure cognitive ability, self-perception, and processing style. The Gates MacGinitie Reading Test assessed reading comprehension, the Reader Self-Perception Scale identified students’ self-perceptions as readers, and to distinguish global from
analytic processing style the Elementary Learning Styles Assessment was administered to each student.

**Gates-MacGinitie Reading Test**

The Gates MacGinitie Reading Test (GMRT) is a norm-referenced, group-administered test designed to assess students’ overall level of reading achievement. Levels 3-10/12 of the GMRT are intended to measure the general reading ability of students in grades 3-12. The assessment had alternate forms S and T. Subtests included were Vocabulary (45 items) and Comprehension (48 items).

The GMRT was not intended to be a speed test, but according to the Directions for Administration manual (MacGinitie et al., 2000) each subtest must adhere to the prescribed time allowances for the results to apply to the derived norms. Students were allotted 20 minutes to complete the vocabulary test items and 35 minutes to complete the comprehension test items. Each subtest contained a multiple-choice format. The vocabulary items provided five possible answer choices and the comprehension items provided four possible answer choices. Both subtests of the grade specific level (3, 4, or 5) of form S were administered as a posttest to all student participants in the study.

The vocabulary questions for each level consisted of a test word in a brief context followed by five other words or phrases. The student’s task was to choose the one word or phrase that means most nearly the same as the test word. The purpose of the subtest was to measure word knowledge (see Appendix C).

The comprehension tests measured students’ ability to read and understand various passages. The passages were representative of reading material considered to be academic and recreational. Students were required to answer both literal and inferential questions in the
multiple-choice format. There were no open-ended questions that required a written response. Some questions required constructing an understanding based on information explicitly stated in the passage, while others required constructing an understanding based on information that is only implicit in the passage (see Appendix C).

For each level of the GMRT split-half and alternate-form reliability had been established. The reliability estimates indicate strong total test and subtest internal consistency levels with coefficient values at or above .90. The split-half reliability for comprehension and vocabulary range from .89 to .96 and .88 to .93, respectively. Alternate form correlations for the total test scores are at or above .90. Alternate form correlations for the subtests range from .74 to .92. Total test coefficient values are at or above .88 (Powell, 1969).

Content validity was documented through a process of test development to identify the scope of the subtests and identify effective items within subtests. Problematic items were eliminated. Construct validity is supported by strong intercorrelations between subtests and total test scores between the GMRT and the Lorge-Thorndike Intelligence test (Powell, 1969).

**Reader Self-Perception Scale**

The Reader Self-Perception Scale (RSPS) (see Appendix D), designed by Henk and Melnick (1995), is a norm-referenced, group-administered assessment to measure student self-perception as a reader. The instrument contains 33 items that are measured on a 5-point Likert-type response format, ranging from *Strongly Agree* (5) to *Strongly Disagree* (1). The four scales of the Reader Self-Perception Scale are closely related to Bandura’s (1977) self-efficacy theory.

The first item on the Reader Self-Perception Scale is general and the following 32 items comprise four scales that readers use to estimate their capabilities. The Progress Scale measures a student’s perception of his or her current performance compared to his or her past performance.
Students are required to respond to statements such as, “When I read, I need less help than I used to” for the nine items on the Progress scale. The Observational Comparison Scale measures a student’s perception of his or her own reading performance compared to the performance of his or her classmates. There are six statements on the Observational scale and one example is, “I read better than other kids in my class.” The Social Feedback Scale measures the student’s perception of direct and indirect feedback from classmates, teachers and parents. “People in my family think I am a good reader” is an example of the nine Social Feedback statements on the instrument. The Physiological States Scale measures internal feelings experienced by the student during reading. One of the eight Physiological scale statements is, “I feel good inside when I read.” The four subscales are so closely related that interactions among the subscales is unavoidable. Individual or group results can be examined on the total score and on the four subscales (Henk & Melnick, 1995).

For the purpose of this study the total scores for the RSPS were analyzed. The authors provided extensive research validating internal reliability for each of the subscales (Henk & Melnick, 1997). However, they also indicated the four categories are so closely interrelated “that interactions among them are inescapable” (Henk & Melnick, 1995, p. 472). Another justification for using the total scale rather than the subscales was because “individual children may value one or more sources over the others” (Henk & Melnick, 1995, p. 472). This research project was focused on students’ overall self-perception as readers.

The Reader Self-Perception Scale can be administered in approximately 20 minutes. The purpose of the assessment is shared with students and they are encouraged to provide honest answers. Although the authors suggest focusing on intermediate-level readers and have established normative data for the instrument with grades 4, 5 and 6 students, several studies
(Adunyarittigun, 1997; Ferrara, 2005; Halsey, 2003-2004; Howe, Thames, & Kazelskis, 1997; Mallette, Henk & Melnick, 2004; Nelson & Manset-Williamson, 2006) have used the RSPS with students in grades 3 through 7. The Flesh Reading Ease was calculated at 94.8 and the Flesch-Kincaid Grade Level was assessed at 2.2 for the RSPS. To ensure consistency in the study, the researcher read each statement out loud for each group-administration on both the pretest and the posttest.

The authors of the RSPS used a comparison of two methodologies, forced-choice judgmental review and a latent category judgmental review to establish content validity (Henk & Melnick, 1997). The results of the forced-choice judgmental review indicated that all items were placed in the appropriate a priori categories by 90% of the expert reviewers (n = 30). The latent category review established a 70% criterion level of agreement between expert reviewers (n = 33) before a pair of items could be included in the matrix. The results indicated the overall relationship among the items of the Observational Comparison, Physiological States, and the Progress scales were viewed as equally strong. However, the reviewers distinguished the Social Feedback scale into three subsets: feedback from teachers, feedback from parents, and feedback from peers. The consistent response from the expert reviewers suggested possibly subdividing the Social Feedback scale, but reliability analysis provided satisfactory support for the intercorrelation of all items and the total scale reliability. Both methods provided the authors with sufficient evidence to establish content validity (Henk & Melnick, 1997).

The content validity results were compared with an analysis of each scale’s reliabilities. The instrument was administered to 2,733 fourth, fifth, and sixth graders. Preliminary reliability coefficients for each scale were within the acceptable range for an affective measure. However, after an exploratory factor analysis of the RSPS, a panel of eight experts made recommendations
to revise the instrument to improve the overall reliability as well as further establish content validity across the four scales. Supplemental reliability analysis provided coefficients that ranged from .81 to .84 for all four scales (Henk & Melnick, 1997).

**Elementary Learning Style Assessment**

The Elementary Learning Style Assessment (ELSA) was used to identify each student’s information-processing style. The assessment is intended to identify characteristics that students exhibit and to determine learning-style preferences in the following categories: environmental, emotional, sociological, physiological, and psychological. This study was concerned with the psychological processing styles determined by the assessment as global and analytic.

ELSA is an online assessment that consists of 75 questions interspersed among three sections. Each section begins with a brief story. Students may choose between two stories: 1) a circus story, or 2) a pirate story. Once a student chooses a story, that story theme is continued through the next two sections of ELSA. It is not necessary for children to read every story unless they wish to do so. In each section, there is a set of 25 multiple-choice questions pertaining to individual learning-style preferences. Each question is repeated three times throughout the test for the purpose of assuring response consistency. Students respond to each question using a multiple-choice answer format. Each possible response includes a picture image that is representative of the answer. The inclusion of both verbal and nonverbal message forms is a major feature of the instrument to allow response options to be processed in the style of each individual’s global or analytic preference. The inclusion of picture images allows global students to focus holistically on the subject matter.

The following readability rates were assessed for ELSA:

- Flesh Reading Ease = 97.4
• Flesh-Kincaid Grade Level = 2.0

The Flesh Reading Ease rated text on a 100-point scale under the assumption that the higher the score, the easier it was to understand the document. For most standard documents, it was recommended to aim for a score of approximately 60 to 70. For the purpose of assessment, it was recommended to increase the ease of readability. The Flesh-Kincaid Grade Level score rated text on a United States’ grade-school level. The second-grade reading level was deemed low enough to avoid frustrating elementary-school students. The Flesh-Kincaid Reading Ease is 97.4 and still contains vocabulary that would be interesting and challenging.

The students can be tested individually, in small groups, in a classroom, at home, or in a computer lab. The stories and questions may be read to students. Although the test should take no longer than 40 minutes to complete, it is not necessary to finish in one period. Students may stop after any one of the three stories and log on later to complete the assessment. Electronic results are immediately available upon completion of the assessment. The One Page Student Report (see Appendix E) provides a summary of individual learning style preferences.

After extensive review of the learning-style model and the instrument, content validity was established for ELSA. The five-member panel unanimously agreed the globally formatted instrument accurately measured the elements of the Dunn and Dunn learning-style model and contained suitable and relevant content for the elementary level (Dunn et al., 2007).

Test-retest reliability was established when ELSA was administered to 1,298 students in grades 2, 3, 4 and 5. Test-retest reliability indicates the consistent response to test items from a single sample when the same assessment is administered two different times at sufficient time intervals (Creswell, 2008; Gall, Gall & Borg, 2003). A reliability coefficient was calculated for each element of ELSA that ranged from .72 to .92. The mean value of all reliability coefficients
was .82 (Dunn et al., 2007). Internal consistency reliability coefficients for each element were also established using the data from the same sample. Creswell (2008) states, “Scores from an instrument are reliable and accurate if an individual’s scores are internally consistent across the items on the same instrument” (p. 171). Based on an average of Cronbach’s Alpha for both administrations the mean for all elements was .81. The individual coefficients for internal consistency ranged from .72 for the structure element to .91 for the reflective/impulsive element. In addition, pilot studies \( (n = 1,520) \) indicated evidence of the overall reliability of ELSA beyond the test-retest process (Dunn et al., 2007).

**Data Analysis**

This research used quantitative analyses to investigate each research question. Question One was analyzed through a two-way Analysis of Variance \( (p \leq .025) \) using Statistical Package for the Social Sciences (SPSS) 16.0 to analyze data from the cognitive dependent variable. The more stringent \( p \)-value (Bonferroni correction) was set to compensate for an increased possibility of a Type I error (Meyers, 2006). These statistical procedures determined if there was a significant difference between group means of the experimental and the control group for the cognitive dependent variable (reading comprehension). These data also were analyzed to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to reading comprehension.

According to Creswell (2008) a two-way or factorial Analysis of Variance (ANOVA) is a powerful and accurate statistical procedure used to determine main effect(s). The ANOVA also allows the researcher to simultaneously test the hypothesis concerned with an interaction
between the two or more independent variables. The benefit of using a two-way ANOVA over two or more one-way ANOVAs is that an interaction can be determined as statistically significant even when there is no main effect (Creswell, 2008).

Question Two was analyzed using a two-way Analysis of Variance \( (p \leq .025) \) using SPSS 16.0 to analyze data from the affective dependent variable. Again, the Bonferroni correction was used to compensate for an increased possibility of a Type I error (Meyers, 2006). These statistical procedures determined if there was a significant difference between group means of the experimental and the control group for the affective dependent variable (reader self-perception). These data also were analyzed to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to self-perception as a reader.

A pretest is commonly used as the covariate when attempting to control for between group differences when a researcher is unable to utilize random assignment to group (Creswell, 2008). However, the RSPS pretest scores were analyzed using an independent between-groups \( t \) test to determine no significant differences existed for the group means at the onset of the study to support the random assignment to group (Field, 2009).

**Data Collection Procedures and Timeline**

This section outlines the timeline and the specific procedures prescribed in this study. In an experimental study the data collection procedures should be presented in sufficient detail to allow replication of the study (McMillan & Schumacher, 2006). Data collection for this study began in spring 2008 and concluded one year later. The following procedures adhered to the one-year timeline.
1. In spring 2008 approval was granted from the Superintendent and the building principal to conduct experimental research in the selected elementary school in the district (see Appendices F and G).

2. In October 2008, upon approval of Western Connecticut’s Institutional Review Board (Appendix H) and the verbal consent of the school district’s Deputy Superintendent, district personnel identified struggling readers in grades 3, 4, and 5 in the selected elementary school. Students were identified based upon 2007-2008 CMT data (grades 4 and 5 only), spring 2008 Developmental Reading Assessment 2 (DRA2) data, fall 2008 Developmental Spelling Assessment (DSA) data, district running record assessment data, and teacher input.

3. The researcher collaborated with treatment teachers and district coordinators to plan and organize professional development needed to implement the Four Powerful Comprehension Strategies. For each whole-group session the researcher provided a complimentary breakfast.

4. In August and November 2008 (two six-hour sessions) the researcher provided teachers with a comprehensive resource binder and a variety of activities to review the current research and theoretical background related to the intervention, step-by-step instruction of the process, and practice evaluating the teaching of the Four Powerful Comprehension Strategies using a gradual release lesson design. Appendix I provides agendas for the two training days for teachers prior to the implementation of the intervention. Appendix B shows a blank template of the gradual release lesson design that was used to write lesson plans and Appendix J outlines the contents of the comprehensive binder. At the conclusion of each training session the participants
provided feedback to the researcher on an index card. One side of the card indicated an aspect of the process that he or she felt confident to implement and the other side of the card disclosed an aspect of the process in need of further development or training. The feedback was used to inform the content and process of each future professional development session for the entire group, small groups, and individuals.

5. In November 2008 the researcher conducted several small group sessions with the 64 potential student participants to explain the research project prior to sending consent forms home. Parental and student consent forms (Appendices K and L) for all potential research participants were distributed and collected in November 2008. Complete consent was provided for 63 of the 64 students identified as struggling readers. Each of the 63 student participants was given an identification number to ensure confidentiality throughout the course of the study.

6. After obtaining consent, the researcher administered the Reader Self-Perception Scale (RSPS) to all student participants ($N = 63$). The instrument was administered three different times for the three different grade levels in a whole group format. For each administration the researcher explained the purpose of the instrument, reviewed the five answer choices on the Likert scale, modeled reading and answering the sample statement, and answered each group’s questions. The researcher also read each statement out loud and required students to respond accordingly to one statement at a time.

7. Student participants ($N = 63$) were randomly assigned to either the experimental or the control group November 2008. The researcher used a random number table to assign student participants to each group. Gall et al. (2003) describe utilizing random assignment to group as “the best technique available for assuring initial equivalence
between different treatment groups” (p. 384). Due to the small sample size the researcher utilized a stratified random sampling method for gender (Isaac & Michael, 1997). Grade level was also partially stratified because of the school schedule. Grade 4 and 5 student participants ($n = 40$) were grouped together for random assignment to either the experimental or the control group. Grade 3 student participants ($n = 23$) were randomly assigned to the experimental or the control group.

8. The researcher utilized two independent between-group $t$ tests to compare group means to ensure homogeneity between the experimental and control groups at the onset of the study. Reading scores from spring 2008 state exam for grade 4 and 5 students and scores from the May 2008 DRA2 for grade 3 students were analyzed. Each of the $t$-test results indicated no significant difference between group means.

9. The researcher and trained teacher participants cooperatively created instructional groups for the 31 experimental student participants. Grade level teachers and special area teachers placed the 32 control student participants in various instructional groups. Specific teacher assignment and rationale for student groupings are discussed in the Description of Experimental and Control Groups section above.

10. Trained teachers implemented the Four Powerful Comprehension Strategies utilizing the gradual release lesson design model for 30 minutes a day, 4 times a week for 14 weeks during December 2008 and January, February, March (2 weeks), and April (2 weeks) 2009. To ensure accurate implementation of the process and the individual strategies, the researcher monitored lessons, provided written feedback, and conferred with each treatment teacher throughout the 14 weeks. Each teacher provided instruction for all four strategies over the course of the study. The teachers used the matrix (Appendix A) found
in Lanning’s book titled *4 Powerful Strategies for Struggling Readers Grades 3-8: Small Group Instruction that Improves Comprehension* (2009, p. 8) to track the strategies and skills covered each week. The course of instruction and the order the strategies were taught varied from teacher to teacher based upon student need in each group.

11. The researcher administered the Elementary Learning Styles Assessment (ELSA) to all study participants who did not have a current learning-styles profile.

12. Follow-up professional development for treatment teachers occurred at least once a month for the duration of the treatment. Appendix M outlines the succession of professional development encounters.

13. The researcher administered a posttest for each of the dependent variables. In April 2009, the grade level (3, 4 or 5) form S of the Gates-MacGinitie Reading Test was administered to each student participant in the study. The researcher adhered to the Directions For Administration provided by Riverside Publishing and administered both the Vocabulary test and the Comprehension test. The Readers Self-Perception Scale was administered to all participants in the study in April 2009. The administration of the RSPS posttest mirrored the conditions of the pretest described above. The results and analysis of the data are discussed in the next chapter.

14. Finally, in May 2009, the researcher presented a personal thank you note and gift card to each adult participant and three grade-level lunch celebrations for all student participants.

**Limitations**

There are a variety of internal and external threats that could influence the results of any study. Due to the complexities of experimental studies in behavioral and social sciences, threats and limitations of this study did exist. This section will define the various threats and
limitations, describe how each threat or limitation directly or indirectly influenced the study, and indicate the magnitude of each threat or limitation to the study.

**Internal Validity**

The internal validity of an experiment is substantiated when the researcher utilizes effective research techniques to control for as many extraneous variables as possible. The more stringent control over extraneous variables, the stronger the argument is for the inference that the treatment variable had the greater affect on the desired outcome of the study than any of the extraneous variables (Creswell, 2008; Gall et al., 2003). Utilizing a control group and random assignment to the experimental and control groups in this study minimized most threats to internal validity.

The possible extraneous variables in relation to the participants and the procedures in this study can be characterized as low threats because the experiment was conducted in one elementary school and the researcher took several precautions to guard against internal threats. Students in both the experimental and control groups had equal exposure to the effects of history, maturation, differential selection, experimental mortality, and selection-maturation interaction.

History refers to the participants’ exposure to other experiences that may affect the outcome of the study and maturation implies the physical or intellectual changes experienced by the participants over the course of the study (Gall et al., 2003). In this study, all grade 3, 4 and 5 students were exposed to a similar learning environment reducing the possible risk of an historical effect and the nearly equal numbers at each grade level lowered the threat of maturation. Although the transient nature of the school district posed a threat of experimental mortality of the sample size, the research study utilized a control group. Differential selection was not a concern of this study because all student participants attended the same school and
were identified by district personnel with similar academic traits that categorized the entire group as struggling readers. The same reasoning pertained to selection-maturation interaction.

The key aspect to minimizing the threats of experimental treatment diffusion, compensatory rivalry by the control group, compensatory equalization of treatments, and resentful demoralization of the control groups was that reading group structure had been well established in the school for three years. In addition, the researcher spoke with each group of students to emphasize the importance of each individual’s role in the experimental process.

All students were exposed to similar conditions with two exceptions. First, the experimental group received the specific focus and delivery method of the Four Powerful Comprehension Strategies during the 14-week experiment; the focus and methods for the control group students varied over the course of the treatment. A second difference pertained to the small group composition. Identified struggling readers comprised the Four Powerful Comprehension Strategies groups. However, the preponderance of control students assigned to mixed ability groups presented a limitation to the internal validity of the study. Although no data were collected on non-identified struggling readers in the mixed ability groups, the results indicated that the students with whom they were grouped may have positively influenced the control students. Research consistently supports the positive effects of heterogeneous grouping (Burris, Heubert, & Levin, 2006; Schechter, 2002; Slavin, 1988). Studies have shown significant improvements in academic performance in a multitude of settings when students are grouped heterogeneously.

Additionally there was a threat that the implementation varied from teacher to teacher and across time since four different instructors administered the treatment (Isaac & Michael, 1997). Inconsistent implementation of the independent variable could have affected students’
self-perceptions and comprehension development. To help lower the possibility of this threat, monthly professional development sessions were conducted with the treatment instructors’ input in regard to the implementation of the Four Powerful Comprehension Strategies. Professional discourse between treatment teachers supported consistent implementation of the intervention for all four instructors. To further limit this threat, instructional aides taught groups in both the experimental and control settings.

Finally, measuring reading comprehension is a complex issue. Using a posttest only design for the cognitive measure controlled for the majority of threats to testing, instrumentation, and statistical regression (Creswell, 2008; Gall et al., 2003). Also, the pretest for the affective measure was analyzed using a t test to ensure equal groups at the onset of the study for the affective measure. Although reliability coefficients have been provided for the comprehension assessment, using a single measure poses a threat to internal validity that the measure completely and accurately reflects the underlying constructs (Isaac & Michael, 1997).

External Validity

A study is considered to be externally valid when the findings can be reasonably applied or generalized to another sample or the larger population (Creswell, 2008; Gall et al., 2003). If a study was replicated with a comparable sample and fidelity of implementation was explicitly followed, one would expect similar results. Analogous to internal validity, a researcher must be aware of all possible threats to external validity and utilize the optimal methods available to guard against threats. The findings of this study are limited by population validity and ecological validity.

**Population validity.** The two aspects of population validity related to this study are the extent to which the findings of this study can be generalized to the larger experimentally
accessible population of third, fourth and fifth graders in the district and interaction with
treatment effects. The sample of convenience in this study consisted of the entire population of
grade 3, 4 and 5 struggling readers from one elementary school. The researcher planned to
control for the external sampling threat by including the total population of intermediate
struggling readers at two other elementary schools in the same district. One school did not
respond to the communication efforts of the researcher and the second school withdrew from the
study after several weeks. Due to the limited sample from only one elementary school in the
district, the ability to generalize the results was significantly minimized.

The interaction with treatment effects was controlled to an extent in this study. The
sample paralleled the ethnic, socioeconomic, and English language learner make up of the same
school. However, the school had a significantly higher population of Hispanic students and
students who qualified for free or reduced lunch. The researcher was cautious about generalizing
the results to all elementary schools in the same district. However, for the elementary schools in
the district that were comprised of similar demographics, generalizability may have been
increased.

**Ecological validity.** Threats to the ecological validity of this study were low. The
environmental conditions of this experimental study should have been easily transferred to
another set of conditions. To best control for this threat, the researcher provided an explicit
description of the experimental treatment. In addition, the appendices contained sufficient
information including the affective instrument, the outline for professional development sessions,
sample lesson plans, and several informational resources.

In conclusion, in the behavioral and social sciences threats to internal and external
validity are unavoidable. It is valuable to replicate studies to scrutinize alternative causal
hypotheses. Each successive study should strive to control external factors and produce strengthened evidence of a causal relationship between a prescribed treatment and the results of a given study.

**Ethics Statement**

Permission to participate in this research was obtained from the superintendent, the deputy superintendent, the district literacy supervisor, the school principal, each student and all parents of students. To ensure confidentiality, each participant was assigned a secured identification number. All participant consent forms and responses for the Gates-MacGinitie, Reader Self-Perception Scale, and Elementary Learning Styles Assessment will be retained in a secure format. The archived information will be available to the researcher of this investigation and future researchers should the need arise to confirm the original findings.
CHAPTER FOUR: ANALYSIS OF DATA AND EXPLANATION OF THE FINDINGS

The main focus of this study was to investigate the effectiveness of the Four Powerful Comprehension Strategies as a reading intervention for struggling readers in grades 3, 4, and 5. The research questions addressed the main effect for each of the two dependent variables, reading comprehension and reader self-perception. In addition, the study sought to investigate the interaction effect between the two levels of the independent variable (Four Powerful Comprehension Strategies and no Four Powerful Comprehension Strategies) and students’ learning-style processing preference (analytic or global) in relation to each of the dependent variables.

Chapter Four describes how the results of the statistical procedures addressed the research questions used to guide this investigation. The results are presented in five sections: (a) research questions and hypotheses, (b) description of the data, (c) results of data cleaning and screening, (d) descriptive statistics, and (e) data analysis and findings.

**Research Questions and Hypotheses**

This study was designed to determine the effect of the instructional intervention Four Powerful Comprehension Strategies on comprehension capabilities and reader self-perception of struggling readers in grades 3, 4, and 5. All student participants were identified as having either a global or analytic processing style. The research questions that guided the basis of this research project were:

1. Is there a significant difference in the reading comprehension of students identified as having a global or analytic learning style when those students have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?
a. Is there a significant difference in the reading comprehension of students who have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?

Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on reading comprehension measures as compared to those who have not participated in this type of instruction.

b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to reading comprehension?

Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to comprehension.

2. Is there a significant difference in students' perceptions of themselves as readers when they have been identified as having a global or analytic learning style and have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?

a. Is there a significant difference in students' perceptions of themselves as readers when they have participated in either the Four Powerful Comprehension
Strategies instructional intervention or have not participated in this type of intervention?

Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on self-perception measures as compared to those who have not participated in this type of instruction.

b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to students’ perceptions of themselves as readers?

Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to self-perception as readers.

**Description of the Data**

The data analysis section of this dissertation used the results from the Gates-MacGinitie Reading Test (posttests only) to determine the main effect for reading comprehension. The Reader Self-Perception Scale pretest results were analyzed to equate the groups at the onset of the study. The RSPS posttest results were used to determine the main effect for reader self-perception. Although the Reader Self-Perception Scale is comprised of four subscales, data from the total scale were analyzed. The learning-style processing preference (analytic or global) results from the Elementary Learning Style Assessment were used to determine interaction effects between the two independent variables (reading intervention and learning-style
processing preference) with respect to each of the dependent variables. Each main effect was analyzed using the total adjusted sample \((N = 62)\) after one outlier had been removed. However, each interaction effect was analyzed using a partial data set of the sample \((n = 54)\) because 54 students were identified as having either an analytic or global processing preference and eight students were identified as having an integrated processing preference. The eight integrated students were eliminated from the interaction analyses.

**Results of Data Cleaning and Screening**

The processes of data cleaning and screening were critical precautions taken to ensure the quality of the data prior to analysis. The initial data screening process involved code and value cleaning. Data also were carefully examined for univariate outliers and statistical assumptions. Although small sample sizes can be screened using a simple visual inspection process, the utilization of the computational statistical package SPSS provided a more efficient means for screening all data in this study. Outputs in the form of frequency tables, histograms and bar graphs, stem-and-leaf displays, box plots, and scatterplot matrices helped to further display the ways in which the data were distributed.

**Code and Value Cleaning**

The primary purpose of code and value cleaning was to determine the appropriateness of each numerical code or value for all variables in the study. The goal of code and value cleaning was not to test the accuracy of each code, but to ensure each value was within an acceptable range for each variable (Meyers, Gamst, & Guarino, 2006).

An initial visual inspection for missing values was the first step of the process. Although no missing values were detected, the frequency table for levels of learning-style processing preferences (moderator variable) indicated five levels of processing preferences (strong analytic,
analytic, integrated, global, strong global). The analysis of the interaction between reading intervention instruction and learning-style processing preference with respect to each dependent variable was intended to be a 2 x 3 design with 3 levels of learning-style processing preference (analytic, integrated, global). The resulting five levels were determined to be due to importing the values directly from a summary data report of the assessment. The two levels of strong analytic and analytic were collapsed to represent the analytic level of the moderator variable; the two levels of strong global and global were collapsed to represent the global level of the moderator variable. Integrated maintained its original category. The results for the learning-style processing preference variable were recoded to accurately reflect the three levels.

**Univariate Outliers**

Prior to proceeding with statistical analysis, the next step of code and value cleaning involved the detection of univariate outliers. A univariate outlier is described as a case with an extreme value on a single variable (Meyers et al., 2006). When an outlier can be justified as being representative of the given sample, the researcher would include the results for further analysis. However, if it is determined that the outlying value on a variable is not representative of the given sample the researcher has an obligation to remove the case(s) from the sample before proceeding with the analysis (Meyers et al., 2006).

Hair et al. (1998) identify several reasons for outliers in a data set and guidelines for the researcher to determine retaining or omitting outliers. According to Hair et al. there are outliers for which there is no explanation. The authors suggest deleting the unexplainable outliers from further analysis. Field (2009) also suggests removing outliers that can bias statistics such as the mean. Figure 1 indicates one extreme outlier for the Reader Self-Perception Scale pretest. Although the student was representative of the sample in the academic domain, there was no
explanation for the extreme low score on the RSPS pretest. Therefore the data for the one outlying case were removed before conducting a t test to determine if there was a significant difference between the RSPS pretest means for the control group and the experimental group at the onset of the study.

Figure 1. Box Plot for the Reader Self-Perception Scale pretest indicated one outlier (N = 63) below the lower inner fence for the RSPS pretest.

According to Hair et al. (1998) some outliers may be due to extraordinary events or unusual circumstances. However, it is critical to determine whether or not each case identified as an outlier is representative of the sample being studied. Figure 2 indicates one extreme outlier for the comprehension measure. It was determined to remove this case from any further data analysis because the student was not representative of the sample in the study. The student participant was initially included in the sample due to unusual circumstances. The student had been promoted from first grade to third grade and baseline data were limited. District personnel
erred on the side of caution when identifying struggling readers and the student was included in the sample at the onset of the study.

![Box Plot for the Gates-MacGinitie Reading Test](image)

**Figure 2.** Box Plot for the Gates-MacGinitie Reading Test displayed one outlier \( N = 63 \) above the upper inner fence for comprehension extended scale scores. The three cases below the lower inner fence for the comprehension extended scale scores were determined to be representative of the entire sample because of in-class performance and district assessments not included in this study. The scores of the three students were included in the final data analysis.

**Statistical Assumptions**

The statistical assumptions concerned with univariate analyses are the assumptions of normality, linearity, and homoscedasticity. When one or more of these assumptions are violated the statistical results can be considered inaccurate (Field, 2009). Each of the statistical assumptions was examined for possible violations prior to further analyses.
Although both the cognitive and affective measure data were negatively skewed indicating a greater number of scores at the higher end of each scale, the assumption of normality was met for each continuous variable. The frequency statistics indicated skewness and kurtosis within a normal curve for both comprehension extended scale scores and RSPS posttest scores (see Table 7).

Table 7

*Frequencies Statistics*

<table>
<thead>
<tr>
<th></th>
<th>Comprehension extended scale scores</th>
<th>RSPS scores (posttest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid 62</td>
<td>62</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>468.77</td>
<td>117.50</td>
</tr>
<tr>
<td>Median</td>
<td>475.00</td>
<td>118.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>25.62</td>
<td>16.37</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.629</td>
<td>-.502</td>
</tr>
<tr>
<td>Std. Error Skewness</td>
<td>.304</td>
<td>.304</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>.244</td>
<td>-.282</td>
</tr>
<tr>
<td>Std. Error Kurtosis</td>
<td>.599</td>
<td>.599</td>
</tr>
<tr>
<td>Minimum</td>
<td>402</td>
<td>78</td>
</tr>
<tr>
<td>Maximum</td>
<td>512</td>
<td>144</td>
</tr>
</tbody>
</table>

The scatterplot produced by the SPSS output was elliptical-shaped and indicative of linearity between the two variables (see Figure 3). The Levene’s Statistic ($p > .05$) for the test of
homogeneity of variances revealed no violation of equal variances (Meyers et al., 2006). The variances were considered equal for the comprehension extended scale scores between the control and experimental groups, $F(1, 60) = .947, ns$, as were the variances between groups on the RSPS posttest, $F(1, 60) = .058, ns$.

**Figure 3.** Scatterplot indicating linearity of continuous variables. The oval shape suggests that both variables are normally distributed and linearly related to each other.

**Descriptive Statistics**

The results of the data cleaning and screening processes provided the final data sets ($N = 62$) used in the analysis. The descriptive statistics for the data sets are presented in Table 8 and Table 9.
Table 8

*Descriptive Statistics for Comprehension Extended Scale Scores*

<table>
<thead>
<tr>
<th>Group</th>
<th>Processing preference</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Integrated</td>
<td>460.33</td>
<td>20.207</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Analytic</td>
<td>466.08</td>
<td>27.506</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>474.47</td>
<td>24.991</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>469.58</td>
<td>25.439</td>
<td>31</td>
</tr>
<tr>
<td>Experimental</td>
<td>Integrated</td>
<td>475.80</td>
<td>12.317</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Analytic</td>
<td>462.30</td>
<td>28.308</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>469.06</td>
<td>28.410</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>467.97</td>
<td>26.187</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>Integrated</td>
<td>470.00</td>
<td>16.353</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Analytic</td>
<td>464.43</td>
<td>27.279</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>471.68</td>
<td>26.506</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>468.77</td>
<td>25.616</td>
<td>62</td>
</tr>
</tbody>
</table>
Table 9

*Descriptive Statistics for Reader Self-Perception Scale Posttest Scores*

<table>
<thead>
<tr>
<th>Group</th>
<th>Processing preference</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Integrated</td>
<td>115.00</td>
<td>27.495</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Analytic</td>
<td>113.31</td>
<td>15.440</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>113.40</td>
<td>14.975</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>113.52</td>
<td>15.832</td>
<td>31</td>
</tr>
<tr>
<td>Experimental</td>
<td>Integrated</td>
<td>123.60</td>
<td>12.462</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Analytic</td>
<td>114.40</td>
<td>17.646</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>125.25</td>
<td>15.652</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>121.48</td>
<td>16.176</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>Integrated</td>
<td>120.38</td>
<td>18.015</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Analytic</td>
<td>113.78</td>
<td>16.054</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>119.52</td>
<td>16.229</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>117.50</td>
<td>16.373</td>
<td>62</td>
</tr>
</tbody>
</table>

**Data Analysis**

The data analyses aimed to determine the effects of the Four Powerful Comprehension Strategies within gradual release lesson design of struggling readers in grades 3, 4 and 5 in regard to comprehension and reader self-perception. Further analysis sought to determine if an interaction between the treatment and processing preference existed in relation to each dependent variable. First, three separate $t$ tests were conducted to measure the equality of groups before the study using the scores from mandated comprehension assessments and the RSPS pretest scores.
Second, a two-way ANOVA was conducted to determine the main effect for reading comprehension and to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to reading comprehension. Finally, a two-way ANOVA was conducted to determine the main effect for reader self-perception and to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to reader self-perception.

**Equality of Groups Prior to Treatment**

An independent sample between-group *t* test was conducted to determine if the grade 4 and 5 groups were equal with respect to comprehension. The reading scale scores of the state mandated assessment were analyzed. The results indicated no significant cognitive difference for grade 4 and 5 students, *t*(38) = −.419, *p* > .05, between the control group (*M* = 218.4, *SE* = 2.52) and the experimental group (*M* = 213.5, *SE* = 1.11) at the onset of the study. Therefore, the assumptions of using random assignment to group were supported.

A second independent sample between groups *t* test was conducted using the RSPS pretest to determine if the groups were equal in regard to reader self-perception. The results indicated no significant difference *t*(60) = −.810, *p* > .05, between the control group (*M* = 111.52, *SE* = 2.670) and the experimental group (*M* = 115.45, *SE* = 4.056) at the onset of the study. Again, the assumptions of using random assignment to group were supported.
Results for Research Question One

Research Question One, is there a significant difference in the reading comprehension of students identified as having a global or analytic learning style when those students have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention, was analyzed through a two-way Analysis of Variance ($p \leq .025$) using Statistical Package for the Social Sciences (SPSS) 16.0 to analyze data from the cognitive dependent variable (see Table 10). These statistical procedures determined there was a non-significant main effect between group means of the experimental ($M = 467.97$, $SD = 26.19$) and the control group ($M = 469.58$, $SD = 25.44$) for reading comprehension $F(1, 56) = .068$, $p = .795$, $\eta^2 = .001$.

Table 10

Tests of Between-Subjects Main Effect for Reading Comprehension

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>1461.687$^a$</td>
<td>5</td>
<td>292.336</td>
<td>.424</td>
<td>.830</td>
<td>.037</td>
</tr>
<tr>
<td>Intercept</td>
<td>9393457.981</td>
<td>1</td>
<td>9393457.981</td>
<td>13640.126</td>
<td>.000</td>
<td>.996</td>
</tr>
<tr>
<td>Group</td>
<td>47.066</td>
<td>1</td>
<td>47.066</td>
<td>.068</td>
<td>.795</td>
<td>.001</td>
</tr>
<tr>
<td>Error</td>
<td>38565.161</td>
<td>56</td>
<td>688.664</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13664480.0</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>40026.839</td>
<td>61</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$ R Squared = .037 (Adjusted R Squared = -.050)
These data also were analyzed to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to reading comprehension (see Table 11). The results indicated no significant interaction between the two independent variables in relation to the cognitive dependent variable, $F(1, 50) = .012, p = .914, \eta^2 = .000.$

Table 11

*Tests of Between-Subjects Interaction Effect for Reading Comprehension*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>999.343</td>
<td>3</td>
<td>333.114</td>
<td>.448</td>
<td>.719</td>
<td>.026</td>
</tr>
<tr>
<td>Intercept</td>
<td>11447728.917</td>
<td>1</td>
<td>11447728.917</td>
<td>15410.887</td>
<td>.000</td>
<td>.997</td>
</tr>
<tr>
<td>Group*Processing pref</td>
<td>8.651</td>
<td>1</td>
<td>8.651</td>
<td>.012</td>
<td>.914</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>37141.684</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11895408.000</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>38141.037</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .026 (Adjusted R Squared = -.032)

**Results for Research Question Two**

Research Question Two, is there a significant difference in students' perceptions of themselves as readers when they have been identified as having a global or analytic learning style and have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention, was analyzed using a two-way
Analysis of Variance ($p \leq .025$) using SPSS 16.0 to analyze data from the affective dependent variable (see Table 12). These statistical procedures determined there was no significant difference between group means of the experimental ($M = 121.48, SD = 16.18$) and the control group ($M = 113.52, SD = 15.832$) for the affective dependent variable (reader self-perception) $F(1, 56) = 2.119, p = .151, \eta^2 = .036$.

Table 12

*Tests of Between-Subjects Main Effect for Reader Self-Perception*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>1742.531*</td>
<td>5</td>
<td>348.506</td>
<td>1.336</td>
<td>.263</td>
<td>.107</td>
</tr>
<tr>
<td>Intercept</td>
<td>592032.030</td>
<td>1</td>
<td>592032.030</td>
<td>2269.103</td>
<td>.000</td>
<td>.976</td>
</tr>
<tr>
<td>Group</td>
<td>552.845</td>
<td>1</td>
<td>522.845</td>
<td>2.119</td>
<td>.151</td>
<td>.036</td>
</tr>
<tr>
<td>Error</td>
<td>14610.969</td>
<td>56</td>
<td>260.910</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>872341.000</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>16353.500</td>
<td>61</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .107 (Adjusted R Squared = .027)

These data also were analyzed to determine if a significant interaction existed between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference (global and analytic) with respect to reader self-perception (see Table 13). These results indicated no significant interaction effect between reading comprehension intervention instruction (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-
Style Processing Preference (global and analytic) with respect to self-perception as a reader $F(1, 50) = 1.515, p = .224, \eta^2 = .029$.

Table 13

*Tests of Between-Subjects Interaction Effect for Reader Self-Perception*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>1527.934*</td>
<td>3</td>
<td>509.311</td>
<td>2.041</td>
<td>.120</td>
<td>.109</td>
</tr>
<tr>
<td>Intercept</td>
<td>710541.603</td>
<td>1</td>
<td>710541.603</td>
<td>2847.230</td>
<td>.000</td>
<td>.983</td>
</tr>
<tr>
<td>Group*Processing pref</td>
<td>378.085</td>
<td>1</td>
<td>378.085</td>
<td>1.515</td>
<td>.224</td>
<td>.029</td>
</tr>
<tr>
<td>Error</td>
<td>12477769</td>
<td>50</td>
<td>249.555</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>754148.000</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total</td>
<td>14005.704</td>
<td>553</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .109 (Adjusted R Squared = .056)

**Conclusion**

In conclusion, although the analyses indicated no statistically significant effects, there were two points of interest noted in the data. The data of the experimental group for the cognitive measure showed the mean score for the two groups of students identified as having an integrated processing preference ($M = 475.80$) and a global processing preference ($M = 469.06$) was higher than students identified with an analytic processing style ($M = 462.30$). Traditional reading instruction has often targeted the analytic learning style. According to the reading comprehension data of the students in the experimental group, the intervention appeared to be nearly equally effective for all types of learners. Secondly, although there was no significant main effect for reader self-perception, the mean score of global students in the experimental...
group \((M = 125.25)\) exceeded all other mean scores for the RSPS by 10 or more points. The treatment revealed a self-perception effect for students identified as global learners. The implications of these findings will be discussed in Chapter Five.
CHAPTER FIVE: SUMMARY AND CONCLUSIONS

Chapter Five provides a comprehensive summary of this research study as well as discussion and conclusions that extend the prior four chapters of the investigation. The Summary of the Study gives an overview of the entire inquiry. The Findings section describes the data collection procedures and quantitative methods of analyses of the two research questions that guided this study. The Compare and Contrast section specifically relates the findings of this study to the review of the literature in Chapter Two. The Limitations section expands upon the limitations discussed in Chapter Three including limitations specific to this study that were beyond the researcher’s control. The Implications section provides suggestions for using the Four Powerful Comprehension Strategies as an intervention model as a result of this study, along with the current literature on explicit strategy instruction, learning-style responsive methods, and student self-perceptions. Finally, the Future Research section explores future research topics that were raised during the course of this investigation.

Summary of the Study

This section will restate the research questions, summarize the procedures, and provide an overview of the findings of this study. The summary of the study will provide the basis for the remaining sections of this chapter.

Research Questions

Reading achievement in the US is a nationwide dilemma. High stakes tests have provided evidence of stagnation in reading performance for more than a decade and reading authorities have disputed the best instructional methods. The emergence of a balanced approach to teaching reading has provided educators with research-based components as an instructional delivery framework. Extensive research on decoding, oral reading, and reading readiness
provided a rich background for primary educators. However, the paucity of research conducted on explicit strategy instruction for reading comprehension with intermediate elementary students was the problem that precipitated the need for this study.

This study sought to evaluate the effects of the Four Powerful Comprehension Strategies implemented through the gradual release lesson design on reading comprehension and reader self-perception. The study also addressed learning-style processing preferences as a moderating variable. The research questions that guided the research were:

1. Is there a significant difference in the reading comprehension of students identified as having a global or analytic learning style when those students have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?

   a. Is there a significant difference in the reading comprehension of students who have participated in the Four Powerful Comprehension Strategies instructional intervention as compared to those who have not participated in this type of intervention?

   Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on reading comprehension measures as compared to those who have not participated in this type of instruction.

   b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to reading comprehension?
Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and Non-Participation) and students’ Learning-Style Processing Preference with respect to comprehension.

2. Is there a significant difference in students' perceptions of themselves as readers when they have been identified as having a global or analytic learning style and have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?

   a. Is there a significant difference in students' perceptions of themselves as readers when they have participated in either the Four Powerful Comprehension Strategies instructional intervention or have not participated in this type of intervention?

      Directional Hypothesis: Students who participate in reading comprehension intervention instruction (Four Powerful Comprehension Strategies) will demonstrate significantly higher mean scores on self-perception measures as compared to those who have not participated in this type of instruction.

   b. Is there a significant interaction between having a global or analytic learning style and participating in either the Four Powerful Comprehension Strategies instructional intervention or not participating in this type of intervention with respect to students' perceptions of themselves as readers?

      Non-directional Hypothesis: There will be a significant interaction between instructional method (Four Powerful Comprehension Strategies Participation and
Non-Participation) and students’ Learning-Style Processing Preference with respect to self-perception as readers.

**Procedures**

The experimental research design utilized a stratified random assignment to group and used quantitative measures to explore the research questions using a equivalent group design for both dependent variables. Data for the cognitive measure were collected using the Gates-MacGinitie Reading Test for the achievement measure and the Reader Self-Perception Scale (RSPS) was used for the affective measure. RSPS pretest scores were analyzed to determine that there were no initial differences between group means. The Elementary Learning Style Assessment was administered to all student participants to identify each student’s learning-style processing preference. Two-way ANOVAs \( p \leq .025 \) were conducted to determine a main effect for group for each dependent variable. Data also were analyzed to determine an interaction effect between the independent variable and processing-preference (analytic and global) in relation to each of the dependent variables.

The 63 student participants in the study were the total population of struggling readers in grades 3, 4, and 5 from one elementary school in an urban school district. The sample \( (N = 63) \) was gender-stratified and randomly assigned to either the experimental or control group. The scores used to identify the participants as struggling readers were analyzed to determine no initial differences between group means. The experimental group students \( (n = 31) \) received small group instruction over a 14-week period from four instructors trained to use the Four Powerful Comprehension Strategies intervention. The control group \( (n = 32) \) received instruction over the 14-week period from seven instructors who conducted traditional small group instructional practices.
Prior to the onset of the study, data were analyzed to determine no difference between group means for both the cognitive and affective dependent variables. A t test, conducted using the scale scores of a state assessment, indicated no initial differences in reading comprehension mean scores between the control group and the experimental group. A second t test, conducted using the RSPS pretest scores, indicated no initial differences in mean scores for self-perception between the two groups.

Findings

A two-way Analysis of Variance (ANOVA) was conducted on each of the two dependent variables: reading comprehension and reader self-perception. The data set was analyzed to determine main effect for group (experimental and control) for each dependent variable. These data also were analyzed to determine an interaction effect between the two levels of the independent variable (Four Powerful Comprehension Strategies intervention and no Four Powerful Comprehension Strategies intervention) and processing-preference (analytic and global) in relation to each of the dependent variables.

In each two-way ANOVA ($p \leq .025$) it was determined that there was a non-significant main effect between group means of the experimental and the control group for reading comprehension and reader self-perception. In addition, the results indicated no significant interaction between the two independent variables in relation to either of the dependent variables. Although the analyses indicated no significant differences, the mean scores for experimental students identified as having a global processing preference were higher than the experimental students identified as having an analytic processing preference for both the cognitive and affective measures. These findings will be discussed in the implications section of this chapter.
Comparison and Contrast of Findings

Theoretical Comparisons

The review of literature in Chapter Two spanned the theoretical foundations that this study was based upon as well as empirical research of related studies conducted on literacy. The highly interrelated underpinnings for each of the theories discussed in Chapter Two were evident throughout the course of this investigation. The Four Powerful Comprehension Strategies used as an intervention implemented through the gradual release lesson design exemplified the ideology of Vygotsky’s (1978) zone of proximal development and teaching for transfer (Bigge & Shermis, 2004; Marini & Genereux, 1995). This study supported the assertion that the explicit instruction of a few powerful comprehension strategies, in a gradual release lesson design, would promote transfer of strategy use to new learning situations. The results indicated that the experimental intervention was equally effective for all learners and as effective as the alternative instructional methods.

Marini and Genereux (1995) describe two routes of transfer: “low-road” transfer based on rote memorization of instructional tasks and “high-road” transfer based on a meaningful and exact understanding of instructional tasks. The contention of the Four Powerful Comprehension Strategies was to promote high-road transfer. Through a gradual release of responsibility students were expected to understand how to utilize the strategies independently in new learning situations.

The four adult participants who taught the students in the experimental group received intense short-term training during fall 2008. The intervention was implemented over the course of 14 weeks during the winter and spring 2008 – 2009. The results indicated that in a relatively short period of time, the newly introduced intervention was as effective as the traditional
instructional strategies that were routine to the staff and students. Although no significant main effect was realized for the cognitive measure, the students in the experimental group performed as well as, and in some cases better than, students in the control group. This finding is especially encouraging when considering that strategy instruction “is extremely time intensive, with effects often taking months to occur” (Dole et al., 1996, p. 66).

**Effective Strategy Instruction**

Dewitz, Jones, and Leahy (2009) conducted a curriculum analysis of comprehension strategy instruction in core reading programs that analyzed: (a) which strategies and skills were emphasized, (b) how teachers were directed to teach, (c) the extent to which the gradual release of responsibility was utilized, and (d) the span and amount of time provided to master the use of strategy. The authors’ findings indicated many contradictions to their own literature review that mirrored the review upon which this study was based in regard to effective strategy instruction.

The authors analyzed five of the top-selling basal reading programs nationwide according to the Educational Market Research Group: McGraw-Hill Reading, SRA open Court, Harcourt Trophies, Houghton Mifflin Reading, and Scott Foresman Reading. As compared to this study, the authors analyzed the programs for grades 3, 4, and 5 because of the greater emphasis on direct comprehension instruction in the intermediate grades (Dewitz et al., 2009). Several findings of the core program evaluation study were in direct relation to the study of the Four Powerful Comprehension Strategies intervention.

First, Dewitz et al. (2009) found extensive numbers of disconnected skills and strategies emphasized in the core programs. They also discovered the wide variety of skills and strategies were not well developed or logically connected through successive instruction. Collectively, the researchers coded 51 different skills and strategies that far exceeded the number of effective
strategies agreed upon by prior researchers and educational experts (Duke & Pearson, 2002; Harvey & Goudvis, 2000; Keene & Zimmermann, 1997; Pearson et al., 1992; RAND Reading Study Group, 2002). Duke and Pearson have indicated a respect among educational experts that there is also a point of diminishing return in regard to the optimal number of strategies and that the “field [of education] could continue to focus on developing additional effective strategies, but perhaps our attention is better focused on refining and prioritizing the strategies we already have” (2002, p. 233). However, there is still a quandary concerning the most effective combination of strategies. This investigation sought to assess the effectiveness of the specific combination of the Four Powerful Comprehension Strategies and the underlying skills. The foundation of the Four Powerful Comprehension Strategies instruction also supports prior research and educational experts’ belief that less is more. Lanning’s (2009) work is based upon the conviction that a deep understanding of a few powerful strategies and their interconnectedness can effectively aid the comprehension process.

A second finding indicated that there was no distinction between a strategy and a skill in the core reading programs. The terms were often used interchangeably and directions to teachers offered no explanation of the terms or how to distinguish the difference to students (Dewitz et al., 2009). The Four Powerful Comprehension Strategies concisely delineated the four strategies from the supporting skills. A noticeable overlap exists in each of the four strategies because comprehension is often attained through many of the same skill sets for the use of the various strategies. Therefore, it is critical for students to understand the difference between strategies and skills, when and how they are used, and that the same skills can be applied with a different focus for each strategy. Lanning’s (2009) book, 4 Powerful Strategies for Struggling Readers Grades 3-8: Small Group Instruction that Improves Comprehension, provides distinct definitions,
for each term. The definitions of strategies and skills are supported and modeled throughout the book. In addition, the professional development sessions throughout this study continually emphasized the importance of the distinction between these two terms and how to effectively communicate the difference to students.

Finally, the analyses of the core reading programs revealed that all five programs severely lacked guided practice or sufficient scaffolding. Research touts explicit instruction and guided practice as the most effective methods to ensure comprehension (Duffy et al., 1987; Duke & Pearson, 2002, Palincsar & Brown, 1984; Pearson & Gallagher, 1983). Each lesson conducted using the Four Powerful Comprehension Strategies intervention was predicated on the gradual release lesson design (Duke & Pearson, 2002). The design consistently included explicit explanation and teaching of the strategy and underlying skill along with guided practice that allowed greater student responsibility. Guided practice provided the critical step to ensure appropriate use of each strategy and the integration of strategies; the teacher provided corrective action and appropriate scaffolding techniques when observing students using the strategy in the small group. Students and teachers must be confident in their respective roles at this stage to best promote transfer of learning to a new situation.

A study conducted by Dole et al. (1996) investigated the effects of strategy instruction on comprehension performance of struggling fifth and sixth grade students. The researchers compared two experimental groups (story content instruction and strategy instruction) and a control group (basal reading instruction). The Dole et al. (1996) study mirrored the current investigation in several ways; both studies investigated strategy instruction delivered through the gradual release of responsibility and measured comprehension in comparable elementary grade
levels. However, three discrepancies in design and implementation were identified in the comparison of the two studies.

First, the one strategy (story structure) taught throughout the strategy instruction lessons was not a highly recommended effective strategy by prior research or literacy experts. The premise of all the lessons centered on identifying a main character, identifying the story’s central problem and the story’s solution. The National Reading Panel (NICHHD, 2000) reported this strategy was limited to answering questions and basis recall. There was little evidence of the ability of students to transfer this strategy to new situations or a variety of texts. The Four Powerful Comprehension Strategies is supported by current research as multiple strategy instruction (NICHHD, 2000; Pressley, 2006; Rosenshine & Meister, 1994). Using this type of strategy instruction, readers are explicitly taught to coordinate strategies to construct meaning from a variety of texts and genres.

A second discrepancy between the two studies was the implementation of the gradual release lesson design. Although each study utilized the same steps: explicit teaching, modeling, collaboration, guided practice, and independent practice, the method was notably different. For the five-week treatment period Dole et al. (1996) gradually released responsibility in the following manner: (a) two weeks of modeling that began with explicit teacher instruction followed by peer modeling, (b) one week of collaboration in which students worked in collaborative groups to learn the story structure strategy, (c) one week of students working in pairs as the teacher provided guided practice, and (d) one week of independent practice. In contrast, this investigation utilized the gradual release of responsibility in a cyclical manner over 14 weeks of instruction. In each 30-minute lesson that took place 4 times a week, the experimental groups were guided through to the collaborative or guided practice step of the
process each day. As a new strategy or skill was introduced, it may not have been appropriate to release the responsibility to the students too soon. It is especially important with struggling readers to provide timely support to ensure accurate understanding of how to use strategies leading to successful comprehension (Allington, 2001; Lanning, 2009; Pressley, 2006).

Occasionally, adult instructors provided a session dedicated to independent practice (step 5) to assess command of strategies already learned and to identify the readiness of the group to move on.

Finally, all instruments were researcher developed, administered and scored in the Dole et al. (1996) study. Although the authors stated that the instruments were piloted, validity or reliability measures were not reported. There was a significant main effect $F(2, 63) = 17.31, p < .001$ for the type of instruction students received that indicated the strategy group ($M = 17.76, SD = 3.08$) scored significantly higher than either the story content group ($M = 14.23, SD = 3.41$) or the basal group’s ($M = 13.63, SD = 3.81$) performance. However, the comprehension measures used by Dole et al. (1996) were strictly narrative texts and most questions required a literal response. Response format was open-ended and scored by the three researchers. The researchers identified prototypical responses for each level of a generic four-level rubric. The subjectivity of the researcher-developed instruments and the scoring process should be considered an internal threat to the validity of the study. In comparison no significant main effect was determined for the comprehension measure in the current study. Although the Gates-MacGinitie Test used to collect student data was reported valid and reliable with corresponding coefficients on the overall instrument and two subscales, an open-ended response instrument may determine strategy use more effectively.
A major contrast between this investigation and the studies reviewed on effective strategy instruction was the size and the format of the group. The prior studies used strategy instruction as the main focus of whole group reading instruction. According to the most recent research on balanced literacy, it is imperative to have a balance between level of instruction (teacher-directed, student-directed, and coaching), grouping, (whole group, small group, partners, individual), lesson design and activity (auditory, visual, tactual, and kinesthetic), and pacing (Allington, 2001; Baumann & Ivey, 1997; Dunn et al., 1994; Freppon & Dahl, 1998; Pressley, 2006). Strategy instruction is one area of literacy development and it is difficult to compare any study that investigates this type of instruction as the sole means of reading instruction. This inquiry focused on using multiple strategy instruction in a small group setting as a supplemental support for struggling readers within a balanced literacy model. Although no significant main effect was found for either the cognitive or affective measure, the results indicated that the newly implemented intervention was as effective as the conventional interventions that teachers were extremely familiar with using. The limitations section will expand upon the use of a new instructional method in regard to the study’s outcome.

**Limitations**

The two most significant limitations to this study were the sample size and the implementation dip of a new intervention. During the proposal stages of this investigation the intended sample size included 3 schools in the same district, 150 student participants, and 30 adult participants. At the onset of the study 2 schools (School A and School B), 139 student participants, and 23 adult participants agreed to participate. All 23 adult participants attended the initial 12 hours of training and received all materials and each student participant in the study was granted permission by a parent or guardian.
School A began the treatment and control instruction in December 2009. School B requested to begin in January 2009. After several series of communications with teams and individuals, the group of adult participants from School B decided to withdraw from the study (see Appendix N). The withdrawal of School B was a limiting factor on two levels: (a) a decrease in the number student participants in the sample (Gall et al. 2003), and (b) a change in the structure of the design of the investigation (Meyers et al. 2006). Experimental teachers teaching experimental students and control teachers teaching control students delineated the design in School A. School B had no control teachers; all nine teachers were trained in the Four Powerful Comprehension Strategies. The intent was to have each teacher teach an experimental group using the Four Powerful Comprehension Strategies intervention and a control group using conventional means of intervention support. Structuring the study in this manner would have provided further control over internal threats to validity and would have made the methodology stronger overall.

The second major limitation of this study was the implementation of the new intervention (Gall et al., 2003). Michael Fullen described the implementation dip as “a dip in performance and confidence as one encounters an innovation that requires new skills and new understandings” (2001, p. 124). There are two significant problems faced during a change such as learning a new instructional method: (a) the social-psychological fear of the change itself, and (b) not knowing how to use the new method well enough to make the change work. The teachers and principal in School B distinctly expressed the social-psychological fear of change; it ultimately resulted in withdrawing from the study. Although adult participants in School A had similar concerns, the school was well into a process of transformation and viewed the study more as an opportunity for professional growth. However, using the Four Powerful Comprehension
Strategies as an intervention tool for the first time did require developing new pedagogical skills for instruction and a new understanding of the comprehension process. The implementation dip may explain the cognitive results for the experimental group. Nevertheless, the experimental group performed as well as, and in some cases better than, students in the experimental group.

**Threats to Internal Validity**

The researcher, using the most effective research techniques to control for extraneous variables, regulated further limitations imposed on this study. Utilizing a control group and random assignment to the experimental and control groups in this study minimized most threats to internal validity (Cresswell, 2008; Gall et al., 2003).

Several precautions were taken to guard against internal threats. Students in both the experimental and control groups had equal exposure to the effects of history, maturation, differential selection, experimental mortality, and selection-maturation interaction. All students were exposed to the same, familiar conditions over time with the exception of instructional method minimizing threats of experimental treatment diffusion, compensatory rivalry and resentful demoralization of the control groups (Gall et al., 2003).

The variation in small group composition between the experimental group and the control group posed an internal threat. The experimental group students were strictly homogenously grouped with other struggling readers. The majority of control group students were heterogeneously grouped with students of mixed abilities. Although no data were collected on the non-identified students, research has indicated the positive effects of mixed ability grouping for low-achieving students (Burris et al., 2006; Schechter, 2002; Slavin, 1988). In retrospect, the heterogeneously grouped control students may have benefited from exposure to average- and high-achieving peers. The results indicated that in some cases the control group students
modestly outperformed the experimental group. This was a possible modifying variable that was not taken into account during this study. A future investigation could control for this internal threat by having three or four levels of the independent variable: (a) heterogeneous treatment group, (b) homogenous treatment group, (c) heterogeneous control group, and (d) homogenous control group.

To overcome the threat of inconsistent implementation among the four treatment teachers, monthly professional development sessions were conducted and the researcher employed an observational protocol based upon the professional discourse to ensure consistent implementation of the treatment. Finally, using a posttest only design for the cognitive measure controlled for the majority of threats to testing, instrumentation, and statistical regression (Cresswell, 2008).

**Threats to External Validity**

Analogous to internal validity, all optimal methods available were utilized to guard against threats to external validity. As discussed prior in this section, the researcher attempted to obtain a larger sample size (Cresswell, 2008; Gall et al., 2003). The sample size was decreased by more than half ($n = 75$) four months after the study’s inception. The extent to which the findings of this investigation can be generalized suggests that analogous findings would be realized in another elementary school in the same urban district with similar demographics. However, additional investigations would be required to argue the effectiveness of the intervention with educators who implement the Four Powerful Comprehension Strategies that have a sound pedagogical foundation of the multiple strategy method and the comprehension process.
Implications

This study provided support for the implementation of the Four Powerful Comprehension Strategies within a balanced literacy model as an effective intervention for students in grades 3, 4, and 5. The findings represented by the data showed no significant difference in mean scores, but suggested that students who received the Four Powerful Comprehension Strategies performed as well as and in some cases better on cognitive measures than their control group counterparts. The findings also indicated the experimental conditions were equally effective for all processing preferences; students identified with global and integrated processing preferences scored slightly higher than students identified with an analytic processing preference. The data showed similar findings for the affective measure; global students in the experimental group scored the highest overall score on the Reader Self-Perception Scale.

In light of Response to Intervention (RTI), districts nationwide are striving to provide staff with research-based interventions that are manageable to implement and cost-effective. All aspects of the Four Powerful Comprehension Strategies are research based (Duke and Pearson, 2002; Lanning, 2009; Pressley, 2006). Professional development can be site-based utilizing resident experts in comprehension instruction. The parameters of the instruction (30 minutes a day, 4 times a week) coincide with RTI expectations. The Four Powerful Comprehension Strategies intervention is not curriculum specific and therefore would complement individual district’s curriculum, materials, and resources. The flexibility of the instruction allows teachers to engage students by choosing a variety of texts of high interest and motivation.

The National Reading Panel (NICHD, 2000) has suggested the need for strategy instruction that is effective for both narrative and expository texts. The strategies and skills presented in the Four Powerful Comprehension Strategies are appropriate for either narrative or
expository texts and a variety of genres. The National Reading Panel (NICHHD, 2000) also advocated for a variety of procedures to instruct educators in how to use effective comprehension strategies. The step-by-step process of the gradual release lesson design is a critical component for teaching comprehension. Also, it is imperative for teachers to have a comprehensive understanding of the terms strategy and skill. These two aspects of the Four Powerful Comprehension Strategies are the mainstay of the intervention.

The Dewitz et al. (2009) study informed schools and districts of the significant gaps for a multitude of learners in commercially purchased core programs. Many schools use core programs as the sole vehicle for literacy instruction. However, in each of the reviewed core programs, strategy instruction was evaluated as having breadth but not depth. The core programs were viewed as particularly detrimental to struggling readers. The Four Powerful Comprehension Strategies provides supplemental instruction to support struggling readers with explicit instruction using a variety of texts and genres.

Finally, City, Elmore, Fiarman, and Teitel (2009) endorse the importance of the instructional core; the relationship between the teacher and the student in the presence of the content. The Four Powerful Comprehension Strategies provides a venue for teachers and administrators to effectively address all aspects of the instructional core within an intervention.

Suggestions for Future Research

The intent of future research of reading comprehension should continue to address critical areas in need of additional empirical research. A review of the literature on strategy instruction revealed a scarcity of multiple strategy instructional methods within a balanced literacy model. Previous empirical research primarily focused on a single strategy when literacy experts continue to espouse that simultaneously extracting and constructing meaning from text requires an
interwoven combination of skills and strategies. Additionally, there is a paucity of investigations exclusively focused on the teacher’s practice and instructional methods in delivering instruction. Finally, Pressley (1995) reminds university-based researchers that the most compelling comprehension strategies instruction is being designed and implemented by today’s educators who have the research knowledge base combined with the reality of the classroom. Future research inquiries must take into account the most current issues faced by today’s educators and students to provide accurate and practical information.

**Longitudinal Study**

Longitudinal studies are a time-consuming commitment and require a distinct understanding of how to control for a variety of internal and external threats to validity. However, a well-executed multi-year study implementing the Four Powerful Comprehension Strategies as an intervention would enhance the body of existing research of multiple strategy instruction for struggling readers. Duke and Pearson voiced “we have little research…on optimal combinations and distributions of various strategies over time” (2002, p. 234).

A longitudinal study would also provide a control for the implementation dip described by Fullen (2001). Extended time, experience, and scaffolded professional development for teachers would advance the pedagogical knowledge base of a specific multiple strategy instructional method and the understanding of the comprehension process. In addition, this type of study would yield a method to determine for which age group these four strategies are most effective. The intervention can be targeted for students in grades 3 through 8. A multi-year study would provide access to cohort data and individual year data to do comparisons across each cohort and between cohorts.
Qualitative Aspects of Implementation

The reviewed qualitative studies focused on the student aspects of comprehension or self-perception and their outcomes. Qualitative inquiries are needed to investigate how individual teachers or teams of teachers implement strategy instruction within a balanced literacy framework. Results are frequently reported in student outcomes; the extraneous variable of instructional delivery method is often overlooked. The information attained from a qualitative assessment of the process teachers experience when learning to implement a new teaching strategy will provide important direction for all educators. The use of interviews and classroom observations can identify barriers and breakthroughs to the most effective instructional delivery methods. Through a descriptive process of teacher collaboration, such a study could show how educators elevate their practice through collaboration and a common understanding of effective instructional delivery.

Embedding the Process into the Curriculum

Intervention practices can often be in contrast to a district’s curriculum. With the new special education guidelines and the instructional and assessment demands linked to RTI, it is imperative to find interventions that complement the curriculum. The Four Powerful Comprehension Strategies can be easily adapted to a district’s curriculum, state standards, and assessment practices. Duke and Pearson agree “in terms or research, it would be useful to complement our knowledge of the effectiveness of strategies when they are taught in special units with knowledge of their value added to a comprehension curriculum” (2002, p. 234).

Summary

This study utilized the Four Powerful Comprehension Strategies in a gradual release lesson design as an intervention for struggling readers in grades 3, 4, and 5. The review of
literature provided numerous interventions for primary reading deficiencies. However, the
dearth of empirical investigations of effective multiple strategy instruction to support the
comprehension process for intermediate grade students triggered this study. Despite the need for
future research, this study utilized an amalgamation of effective research-based practices.

This study coupled the theoretical foundations for effective strategy instruction with a
practical approach to implement an effective intervention. The data yielded results that indicated
the treatment was an effective instructional approach for a variety of learning styles and
supported reader self-perceptions. Although no statistical significance was realized, students
who received instruction using the experimental intervention scored as well as and in some cases
better than students who received alternative methods of reading intervention. This is a
substantial finding because the alternative instructional methods were familiar practices
historically implemented by teachers to promote comprehension in the upper elementary grades.

A wealth of information exists on reading comprehension instruction. A variety of
authors have provided lists and the theoretical principles on which the lists are founded.
Questions remain about which strategies work best, in what combination, and for whom. The
Four Powerful Comprehension Strategies used as an intervention in this study provided a step
toward creating practical application information combining a variety of research-based
practices.
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APPENDIX A:

Four Powerful Comprehension Strategies
Figure A1: Four Powerful Comprehension Strategies

<table>
<thead>
<tr>
<th>SUMMARIZING</th>
<th>CREATING MEANINGFUL CONNECTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identifying important information (main idea)</td>
<td>• Imaging</td>
</tr>
<tr>
<td>• Distinguishing between a topic and main idea</td>
<td>• Being aware of text language</td>
</tr>
<tr>
<td>• Generalizing important information &amp; ideas (concepts)</td>
<td>• Activating prior knowledge/experience:</td>
</tr>
<tr>
<td>• Determining and sequencing events and ideas</td>
<td>○ Previewing</td>
</tr>
<tr>
<td>• Identifying genre</td>
<td>○ Making Text Connections:</td>
</tr>
<tr>
<td>• Identifying type of text structure</td>
<td>- Text to Self (T-S) Comparing and evaluating background experiences and images with</td>
</tr>
<tr>
<td>• Categorizing and classifying using text information and background knowledge</td>
<td>information and descriptions presented</td>
</tr>
<tr>
<td>• Paraphrasing</td>
<td>- Text to Text (T-T) Comparing and analyzing characters, plots, themes, information,</td>
</tr>
<tr>
<td>• Questioning: e.g. How does this paragraph relate to the text information read so far? Which graphic organizer would I use to present the information in this selection? What essential points is the author making?</td>
<td>purposes, descriptions, writing styles, and/or versions of texts</td>
</tr>
<tr>
<td>■ Synthesizing concepts and events</td>
<td>- Text to World (T-W) Comparing and considering text information with knowledge of the world</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SELF-REGULATING</th>
<th>INFERRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Knowing: self as a learner, the reading task, and reading strategies</td>
<td>• Using background knowledge</td>
</tr>
<tr>
<td>• Knowing the purpose for reading</td>
<td>• Determining author’s purpose</td>
</tr>
<tr>
<td>• Looking back, rereading and reading ahead</td>
<td>• Being aware of text language</td>
</tr>
<tr>
<td>• Predicting, confirming, clarifying, revising</td>
<td>• Recognizing author’s biases/views</td>
</tr>
<tr>
<td>• Problem-solving words, phrases, or paragraphs</td>
<td>• Making predictions</td>
</tr>
<tr>
<td>• Cross checking multiple sources of information</td>
<td>• Determining theme</td>
</tr>
<tr>
<td>• Adjusting reading rate</td>
<td>• Drawing conclusions</td>
</tr>
<tr>
<td>• Questioning: e.g., What is going on in the text? Why I am reading this text? Are there ideas that don’t fit together? Are there any words I don’t understand? Is there information that doesn’t agree with what I know? How can I problem solve to support my understanding?</td>
<td>• Questioning: e.g., What conclusion can I draw based on the ideas presented? What opinions are revealed in the selection? Where can I find clues about the character’s feelings? What information is missing? Based on what I’ve read so far and what I know about this topic, what might come next? How can I use my questions to modify the emerging theme?</td>
</tr>
<tr>
<td>■ Synthesizing text with background info.</td>
<td>• Synthesizing text clues and various types of connections</td>
</tr>
</tbody>
</table>
APPENDIX B:

Gradual Release Lesson Plan Template
# Gradual Release Lesson Template

<table>
<thead>
<tr>
<th>Teacher/Grade:</th>
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<tbody>
<tr>
<td>Title/Genre/Level:</td>
</tr>
<tr>
<td>Strategy/skill:</td>
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<tr>
<td>Teaching Technique:</td>
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</table>

<table>
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<th>Group:</th>
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<tr>
<td>Explicit: (1-3 min)</td>
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<tr>
<td>Modeling: (5-7 min)</td>
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<td>Collaborative: (5-7 min)</td>
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<tr>
<td>Guided Practice: (5-7 min)</td>
</tr>
<tr>
<td>Independent Application:</td>
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</tbody>
</table>
APPENDIX C:

Gates-MacGinitie Reading Tests
Sample Vocabulary (Forms S and T)

**V-1. a big garage**

- K place for cars
- L machine
- M sidewalk
- N covered porch
- O cloth sack

**V-2. They will close it.**

- P stay near
- Q begin
- R make
- S shut
- T go past

Sample Comprehension (Forms S and T)

Sometimes – not very often – we get two full moons in one month. That second full moon is called a “blue moon.” No one knows why. Now we say “once in a blue moon” to mean “once in a long time.”

**C-1. To be a “blue moon,” the moon must be**

- I dark.
- J long.
- K blue.
- L full.

**C-2. What is it that no one knows?**

- M What the name is.
- N Who uses the name.
- O Where the name came from.
- P What the name means.

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APPENDIX D:

Reader Self-Perception Scale and Scoring Sheet
**READER SELF-PERCEPTION SCALE**

Listed below are statements about reading. Please read each statement carefully. Then circle the letters that show how much you agree or disagree with the statement. Use the following scale:

- **SA** = Strongly Agree
- **A** = Agree
- **U** = Undecided
- **D** = Disagree
- **SD** = Strongly Disagree

*Example:* I think pizza with pepperoni is the best. 

- **SA**          **A**          **U**          **D**       **SD**

If you are *really positive* that pepperoni is the best, circle **SA** (Strongly Agree). If you *think* that it is good but maybe not great, circle **A** (Agree). If you *can’t decide* whether or not it is best, circle **U** (Undecided). If you *think* that pepperoni pizza is not all that good, circle **D** (Disagree). If you are *really positive* that pepperoni pizza is not very good, circle **SD** (Strongly Disagree).

1. I think I am a good reader. 
2. I can tell my teacher likes to listen to me read. 
3. My teacher thinks my reading is fine. 
4. I read faster than other kids. 
5. I like to read aloud. 
6. When I read, I can figure out words better than others. 
7. My classmates like to listen to me read. 
8. I feel good inside when I read. 
9. My classmates think I read pretty well. 
10. When I read, I can’t have to try as hard as I used to. 
11. I seem to know more words than others when I read. 
12. People in my family think I am a good reader. 
13. I am getting better at reading. 
14. I understand what I read as well as other kids do. 
15. When I read, I need less help than I used to. 
16. Reading makes me feel happy inside. 
17. My teacher thinks I am a good reader. 
18. Reading is easier for me than it used to be. 
19. I read faster than I could before. 
20. I read better than other kids in my class. 
21. I feel calm when I read. 
22. I read more than other kids. 
23. I understand what I read better than I could before. 
24. I can figure out words better than I could before. 
25. I feel comfortable when I read. 
26. I think reading is relaxing. 
27. I read better now than I could before. 
28. When I read, I recognize more words than I used to. 
29. Reading makes me feel good. 
30. Other kids think I am a good reader. 
31. People in my family think I read pretty well. 
32. I enjoy reading. 
33. People in my family like to listen to me read.

SCORING SHEET

Student Name _______________________________________________________

Teacher ___________________________________________________________

Grade ____________________________________  Date  ___________________

Scoring key:   5 = Strongly Agree (SA)  
                4 = Agree (A)  
                3 = Undecided (U)  
                2 = Disagree (D)  
                1 = Strongly Disagree (SD)

Scales

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<th>Social Feedback</th>
<th>Physiological States</th>
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<td>32. _____</td>
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<td>28. _____</td>
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<td>33. _____</td>
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Raw Score       _____ of 45       _____ of 30       _____ of 45       _____ of 40

Score interpretation

High  44+         26+         38+         37+  
Average  39         21         33         31  
Low    34         16         27         25
APPENDIX E:

Elementary Learning Style Assessment: *One Page Student Report*
Individual Learning-Styles Profile

The *One Page Student Report* illustrates an individual student's preference or strong preference for each learning-style element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Strong Preference</th>
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<td>Learns by Listening</td>
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<td>Learns by Moving</td>
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APPENDIX F:

Superintendent Letter of Permission
May 29, 2008

Dear Dr. Pascarella:

I have been an elementary school teacher in Danbury for 14 years and am now a doctoral candidate at Western Connecticut State University. I have completed the required course work for the doctoral program and I am preparing to conduct my doctoral research project. I am seeking district permission to carry out my study at the elementary level in Danbury Public Schools.

This study is designed to demonstrate how to integrate small group instruction in the district’s balanced literacy model. This study will focus on struggling readers in grades 3-5. The only impact on classroom teachers who volunteer for this study will be 4-6 sessions of professional development outside the school day. The additional training will ensure a smoother integration of small group instruction within the workshop model. I have worked with Chris Pruss who is supportive of this endeavor pending your approval.

If you have any questions, please feel free to contact me.

Sincerely,

Laura J. Mead
meadla@danbury.k12.ct.us

I. give permission for Laura J. Mead to conduct her doctoral research project at the elementary level in Danbury Public Schools.

X_______________________________________________ Date __________
APPENDIX G:

Building Principal Letter of Permission
June 1, 2008

Dear [Name],

I have been an elementary school teacher in Danbury for 14 years and am now a doctoral candidate at Western Connecticut State University. I am preparing to conduct my doctoral research project and I have obtained the permission from the superintendent of schools. I am seeking permission to carry out my study at [School Name].

This study is designed to demonstrate how to integrate small group instruction in the district’s balanced literacy model. This study will focus on struggling readers in grades 3-5. The only impact on classroom teachers who volunteer for this study will be 4-6 sessions of professional development outside the school day. The additional training will ensure a smoother integration of small group instruction within the workshop model. I have worked with [Name] who is supportive of this endeavor pending your approval.

If you have any questions, please feel free to contact me.

Sincerely,

Laura J. Mead
meadla@danbury.k12.ct.us

I, [Your Name], give permission for Laura J. Mead to conduct her doctoral research project at [School Name] in [District Name].

X__________________________ Date __________________
APPENDIX H:

Western Connecticut State University Human Subjects Research Review Form
Western Connecticut State University
Human Subjects Research Review Form

**Principal Investigator** Laura J Mead

Department Ed. D. Instructional Leadership

Address signed form should be sent to 57 Jefferson Avenue, Danbury, CT 06810

E-mail meadla@danbury.k12.ct.us Phone number: (203) 748-6323

New research project **X** Continuation ____ Modification ____ Teaching ____

__ Exempt Review (attach a completed copy of the “Application for Exemption”)

**X** Expedited/Full Review

To complete this form, please follow the instructions in sections A and B.

---

**Checklist for attachments:**

___ Completed Application for Exemption (if claiming exemption)

___ Answers to A1 through A8

___ Survey or questionnaire

___ Informed consent form

___ Student’s current NIH training certificate

___ Instructor’s current NIH training certificate

___ Chair’s current NIH training certificate

---

The department chair and the principal investigator (PI) must sign this form. If the PI is a student, his/her faculty supervisor must also sign.

 Assurance of continued compliance with regulations regarding the use of human subjects. I certify that the information provided for this project is accurate. If procedures for obtaining consent of subjects change, or if the risk of physical, psychological, or social injury increases, or if there should arise unanticipated problems involving risk to subjects or others, I shall promptly report such changes to the Institutional Review Board. I shall report promptly unanticipated injury of a subject to my department chair and to the Institutional Review Board.

__________________________
Principal Investigator’s Signature Date

__________________________
Faculty Supervisor’s Signature (if PI is a student) Date

__________________________
Department Chair’s signature Date
A. Instructions for completing the HUM-1 Form:

1. Title:

   The Effects of Using Four Powerful Comprehension Strategies in a Gradual Release Lesson Design and Learning Style Preferences on Reading Comprehension and Self-Perception of Struggling Readers

2. Abstract:

   This study will examine the impact of the reading comprehension instructional intervention, *Four Powerful Comprehension Strategies*, on comprehension achievement and reader self-perception of struggling readers in grades three, four, and five. The intervention is intended to be a consistent component of the balanced literacy model. Extensive research has been conducted at the primary level in regard to decoding interventions for struggling readers. However, there are limited sources of empirical research that address specific comprehension needs of students at the intermediate level. There is a need for effective reading intervention at the intermediate level to teach struggling readers how to efficiently manage the complexities of comprehension.

   The benefit of this research will be to determine if *Four Powerful Comprehension Strategies* implemented through a gradual release lesson design, has the potential to increase reading comprehension, promote the transfer of learning, and enhance students’ self-perception. In addition, this study will provide insight on whether or not this type of instructional intervention is more effective for students with a particular type of learning-style (global/analytic).

3. Rationale:

   The purpose of this study is to identify the effectiveness of using *Four Powerful Comprehension Strategies* instruction as opposed to not using the *Four Powerful Comprehension Strategies* instruction and the connection to students’ reading achievement and self-perception as readers. In addition, this research will investigate if the *Four Powerful Comprehension Strategies*
intervention is more effective for global learners or analytic learners. A growing body of research describes a wide range of decoding intervention strategies for kindergarten through grade two students. However, there is limited research on the impact of effective interventions for third through fifth grade students in regard to comprehension and self-perception. More research is needed to explore the specific intervention strategies that have the greatest impact on reading comprehension and student self-perception as readers.

4. Protocol:

Research Questions:

1. Is there a significant difference in the reading comprehension of students identified as having a global or analytic learning style when those students have participated in the *Four Powerful Comprehension Strategies* instructional intervention as compared to those who have not participated in this type of instruction?
   a. Is there a significant difference in the reading comprehension of students who have participated in the *Four Powerful Comprehension Strategies* instructional intervention as compared to those who have not participated in this type of instruction?
   b. Is there a significant interaction between having a global or analytic learning style and participating in either the *Four Powerful Comprehension Strategies* instructional intervention or not participating in this type of program with respect to reading comprehension?

2. Is there a significant difference in students' perceptions of themselves as readers when they have been identified as having a global or analytic learning style and have participated in either the *Four Powerful Comprehension Strategies* instructional intervention or have not participated in this type of instruction?
   a. Is there a significant difference in students' perceptions of themselves as readers when they have been have participated in either the *Four Powerful Comprehension Strategies* instructional intervention or have not participated in this type of instruction?
   b. Is there a significant interaction between having a global or analytic learning style and participating in either the *Four Powerful Comprehension Strategies* instructional intervention or not participating in this type of instruction with respect to students' perceptions of themselves as readers?
This study will utilize an experimental research methodology. All subjects will be randomly assigned to the experimental group or the control group. The experimental group will receive small group instruction utilizing the *Four Powerful Comprehension Strategies* in a gradual release lesson design, approximately four times a week for 20 weeks and the control group will not receive this type of instruction.

This research will use quantitative analyses to investigate each research question. Comprehension will be assessed, posttest only, using the *Gates-MacGinitie Reading Test*. Student self-perception will be assessed, pretest-posttest, using the *Reader Self-Perception Scale*. The Flesch Reading Ease rated the self-perception instrument at 94.8 and the Flesch-Kincaid identified the readability to be at the 2.2 grade level. Although the reading level of the scale is below the grade level of the students in this study, the researcher will read aloud the directions, each statement, and all response choices to all students to ensure consistency. As the students respond to each statement, the abbreviations and the complete terms for the likert-scale choices will be read for each statement. The researcher will also provide each student with a card that identifies each abbreviation. A sample of the card is included at the end of the *Reader Self-Perception Scale* appendix. Student Learning-Style Processing Preference (global/analytic) will be determined using the *Elementary Learning Styles Assessment*. A two-way Analysis of Variance (p ≤ .025) will be used to respond to question 1 to determine a significant difference in mean scores between the two groups. The analysis will also determine if a significant interaction exists between the instructional intervention (participation and non-participation) and learning-style processing preference with respect to reading comprehension. A two-way Analysis of Covariance (p ≤ .025), using the pretest as the covariate, will be used to respond to question 2 to determine a significant difference in mean scores between the two groups. The analysis will also determine if a significant interaction exists between the instructional intervention (participation and non-participation) and learning-style processing preference with respect to student self-perception as readers.

5. **Human Subjects:**

A target sample of students enrolled in at least three public elementary schools from an urban community (total student population of 9,715) located in the Northeast will participate in this study. The research sample will be drawn from the total number of struggling readers identified by the district in grades three, four, and five, and 16 teachers. Subjects will be voluntarily
recruited from at least 3 of the 14 elementary schools in the district. Consent forms will be sent home to parents and guardians of all students in the sample. Permission will be sought from all teachers. Participants will include: 100 third, fourth and fifth grade students and 16 teachers. There are 30% of students in this district who are eligible for free/reduced-priced meals, and the total student minority population is 46.7%. All schools are identified as Title I schools.

6. Risks and Benefits:

The study will not provide an environment of physical, psychological, or social injury. Aggregated findings from the study will be made available to all district personnel.

7. Protection on Human Subjects:

District personnel will provide a list of struggling readers as identified by district and state protocol assessments. Each participant will be recorded as “A1, A2, etc.” to indicate the student and his/her respective school. Teachers will also be assigned a code to indicate school “TA1, TA2, TB1, TB2, TC1, TC2 etc.”; no names will be recorded for this study and no data will become part of personnel files. Data collected from all instruments will remain confidential. All completed instruments will be coded for confidentiality. Although results of the assessment will be made available to the classroom teacher for instructional purposes, no student names will be recorded for purposes of this study. The latter will be clearly stated in the student permission form. Failure to participate or withdrawals from the study will not affect students’ class grades or teachers’ job status.

8. Reports:

The results of the research will be reported as dissertation defense for the researcher’s dissertation committee in the spring of 2010.

B. Answer the following (if you answer yes to either question, the protocol requires full review):

- Does your project involve risk of physical injury to subjects?
  
  _____ Yes  
  X No

  (If yes, describe the nature of the risk, the justification for undertaking the risk, and the procedures used to obtain the subject’s informed consent to take the risk.)

- Does your project involve risk of psychological or social injury to human subjects?
  
  X Yes  
  _____ No

  (If yes, describe the nature of the risk, the justification for undertaking the risk, and the procedures used to obtain the subject’s informed consent to take the risk.)
NOTE: If participation in the research involves physical, psychological, and/or social risk to the subject, the informed consent form must say so in bold type.

Please send the completed form (if the protocol requires full review, send 12 copies) to: Director of Grant Programs, 321 Warner Hall. If you have questions, call 7-8281.

Last updated 6/26/06
APPENDIX I:

Initial Training Sessions: Two-Day Agenda
August 25, 2008:

8:00 – 8:30 Meet & Greet (ask teachers to complete charts upon entering)
- Professional Learning Community (green card)
- House Keeping (green card)
- Hand out evals- both Sue’s and mine (index card)
- Introductions…(me- orange card)
  o How have I put it to practical use?
- Charts
  o How do you currently attend to the needs of struggling readers?
  o What do you hope to learn from this training today?
  o Parking Lot Questions-separate (put questions on post-its or on chart)
- Brief Discussion

8:30-9:00 The “Big Picture”
- Balanced literacy: realistically incorporating small group instruction into a balanced literacy approach
- Video (My video)
- Logistics: 3-5X a week/20-30 minutes per session
- Do an action research project (except for those of you who are going to be in my study ;-) )
- PPT (first 3 slides only)
  o Why Guided reading in grades 3-5?
  o Which Strategies are essential?

9:00 – 9:45 Articles: Read &Discuss w/partners: Candy Partners: hand out candy IDs
- Summarize:
  o What are the main components of comprehension? (Chart Findings: show a model)
  o What terminology can you define in your article?
- Break

9:45 – 10:30 FISHBOWL Group Discussion: (MAX 7 minutes per group IF we are running on time)
- First fishbowl group: Raffle gift to person w/ closest birthday

10:30 – 11:00 Model for this training:
- PPT (begin at slide #6-#14)
- Vocabulary activity (Slide #7)
- Laparoscopic Surgery
  o Laparoscopy is a minimally invasive surgical procedure. After making small incisions while the patient is asleep and under the effects of anesthesia, the doctors use small scopes and specially designed tools to perform the surgery, which includes exploratory, appendix, hernia, gallbladder, colon and hiatal hernia procedures.
  o Two different colored index cards
Define: skill & strategy

- Hand out Glossary
- Hand out Matrix (Slide #9)

11:00 – 12:00 Begin with slide #15-#24
- Lesson Procedures
- Review Lesson Plan outline
  - How to write a plan (hand out lesson plan template)
    - Review: What is the Strategy/Skill?
    - Importance of Book Choice
- Hand out Book: Read from pg 13 to pg 23 (end of Chapter 2)
  - Raffle: Three books with pennies taped inside the back cover
- Critical discussion
- Volunteer(s) to share a “take away” before lunch: RAFFLE PRIZE to ANY VOLUNTEER

12:00 – 12:45 Lunch (Put out additional handouts)

12:45 – 1:00 Shakespeare Activity
- Read independently: script what you are doing as a reader to comprehend what you are reading
- Share with a partner what you have gone thru to understand the sonnet
- BRAVE soul to interpret the sonnet: RAFFLE PRIZE

1:00 – 1:30 Model Lesson
- View Video: Lydia’s explicit
- ? Model Lesson: Greyling (Explicit, Model, Collaborative)
  - Four teachers will role play students
  - Everyone else will critique my lesson using the “Observation Forms” in the second to last section of the binder

1:30 – 2:30 Create FOUR groups: Assign a strategy to each group
- Groups are to:
  - Read the chapter and corresponding section of the glossary
  - Optional: Review the various articles on each strategy in the “Articles” section of the binder
  - Optional: Review the resources section for book choice
  - Create at least one lesson plan for the groups’ designated strategy (any ONE skill)
  - Provide suggestion(s) for follow up activities [EXTRA CREDIT]
  - Prepare a BRIEF presentation for the group that summarizes the Strategy/Skill(s) that your group focused on
  - However, we may not have time to share all presentations- so please put something together to email to me so I can share out with the rest of the group
    - Presentation Ideas: PPT, Role Play, Word Document w/ bulleted list, poster/chart

159
2:30 Any Brave souls to present what they have learned [RAFFLE prize for the group]

2:50 Closure/PD Assessment:
  • Index card one side:
    o What are you comfortable with?
    o Other side: What are you still not quite comfortable with or need further explanation/exposure?
  • Review chart from am
  • Offer VOLUNTEER follow PD sessions

• Practical Application: Section in Binder:
  o Sample Lesson Plans/Graphic Organizers/Feedback forms-not optional
  o Lois’ scripted plans throughout the book
  o Assessment: Written Response- optional (students and teachers need a firm grasp of the strategies and skills orally)
AGENDA: November 4th, 2008

8:00 – 8:30 Breakfast
8:30 – 9:00 Opening/"The Study"
  • Professional Learning Community
  • House Keeping
  • Hand out evals- both Sue’s and mine (index card)
  • Introductions…
    o My Study: Rationale: Proposal PPT
    o What does this mean for YOU?? (Hand out PURPLE paper)
      ▪ Given the lesson design and content for a predetermined group of students
        DURING focus group time
      ▪ 3-5 X a week—preferable 4X a week
      ▪ I will be at you beckon call 24/7
      ▪ Monthly follow-up PD sessions at YOUR convenience
    o Time Line:
      ▪ Complete Identification of Students (today)
      ▪ Send permission home with students (tomorrow)
      ▪ Upon return of the majority of permission slips: Random Assignment to
        GROUP
      ▪ Begin Instruction
      ▪ Mid Nov/Early Dec
        • I will administer RSPS and ELSA (handouts) to ALL students in
          the study
        • Seek permission to video tape students involved in the treatment
      ▪ End April/Mid-May
        • Post RSPS
        • Posttest only comprehension assessment (Gates-Macginitie)
    o Questions?

9:00 – 10:00 The “Big Picture”
  • August 25th Feedback:
    o More videos
    o Closer look into binder (let’s look now…)
    o More practical application of writing lesson plans
  • Balanced literacy: realistically incorporating small group instruction into balanced
    literacy
  • Video (My video)
  • Logistics: 3-5X a week/20-30 minutes per session (4X a week would be LOVELY!!!)
  • Discuss Chapter 1: (Refer to the Activity on August 25th…go to slide #5)
    o What are the main components of comprehension? According to whom?
    o Terminology
    o Vocabulary activity (Slide #7)
• Define: skill & strategy
• Hand out Glossary
• Hand out Matrix (Slide #9) (Brief Discussion)
• Soccer Analogy (#10)
• Teaching Techniques (#11)
• Glossary Chalk Talk: agree/disagree/confusions/”a-has”
  o Speed Dating Technique

Break

10:15 – 10:30 Summarizing Activity and/or Inferring Activity
• Read independently: script what you are doing as a reader to comprehend what you are reading
• Share with a partner what you have gone thru to understand how to summarize the paragraph

10:30 – 11:15
• Lesson Procedures (Chapter 2…slide #18)
• Review Lesson Plan outline
  o How to write a plan (hand out lesson plan template…email)
  ▪ Review: What is the Strategy/Skill?
  ▪ Importance of Book Choice
    • “Resource Section” of binder & additional handouts
    • Sharing as we go along in this process
• Look at Observation Form
• Critical discussion about GRADUAL RELEASE &TRANSFER (Slides 20 & 21)

11:15 – 12:00 Model Lessons: Use observation form
• View Videos:
  o Lydia’s explicit
  o Deanna’s explicit
  o Melissa’s collaborative: 11:30-17:00
• Volunteer(s) to share a “take away” before lunch

1:00 – 2:00 Create FOUR groups: Assign a strategy to each group
• Groups are to:
  o Read the chapter and corresponding section of the glossary
  o Optional: Review the various articles on each strategy in the “Articles” section of the binder
  o Optional: Review the resources section for book choice
  o Create at least one lesson plan for the groups’ designated strategy (any ONE skill)
  o Provide suggestion(s) for follow up activities [EXTRA CREDIT]
  o Prepare a BRIEF presentation for the group that summarizes the Strategy/Skill(s) that your group focused on
However, we may not have time to share all presentations—so please put something together to email to me so I can share out with the rest of the group.

- Presentation Ideas: PPT, Role Play, Word Document w/ bulleted list, poster/chart

2:00 – 2:30 Brave souls to present what they have created

2:30 – 2:50 Closure/PD Assessment:
- Evaluation for Sue Morris
- Index card one side:
  - What are you comfortable with after today’s session?
  - Other side: What are you need further explanation/exposure to in future PD sessions?
- Discuss possible date for next follow-up PD session(s)
- Practical Application: Section in Binder:
  - Sample Lesson Plans/Graphic Organizers/Feedback forms—not optional
  - Lois’ scripted plans throughout the book
  - Assessment: Written Response—optional (students and teachers FIRST need a firm grasp of the strategies and skills orally)
APPENDIX J:

Four Powerful Comprehension Strategies Binder Contents
Professional Development Binder Contents:

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<td>The Challenge of Comprehension Instruction Marjorie Y. Lipson (Lipson, 2003)</td>
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<td>Strategies That Work (excerpt) S. Harvey and A. Goudvis (Harvey &amp; Goudvis, 2000)</td>
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<td>Modeling Strategies for Constructing Meaning In Invitations to Literacy: Chapter 8 J. David Cooper (Cooper, 1997)</td>
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<td>Kids Need to Develop Thoughtful Literacy In What Really Matters for Struggling Readers Richard Allington (Allington, 2001)</td>
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<td></td>
<td>▪ Comprehension is Self-Monitored and Self-Regulated</td>
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<td>▪ Monitoring Comprehension</td>
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<td></td>
<td>Inferring Articles</td>
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<td></td>
<td>▪ What Exactly Is an Inference?</td>
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<td></td>
<td>▪ What Is Inferring?</td>
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<td></td>
<td>▪ Inferences: Learning How to Make Them</td>
</tr>
</tbody>
</table>
| Responding to Text | Guide for Instruction in Responding to Text  
Generation 4 Strand Questions  
Compiled by J. Ribeck and K. Cavanaugh (Carrington School) |
|-------------------|----------------------------------------------------------------|
| Resources         | Cross-Reference Table for Reading Levels  
Teaching Ideas at a Glance  
Annotated Bibliography of Children’s Literature  
Texts for Use in Blended Strategy Practice And Guided Strategy Application  
Picture Books for Modeling Making Connections  
Picture Books for Modeling Sensory Images  
Picture Books for Modeling Questioning  
Picture Books for Modeling Drawing Inferences  
Picture Books for Modeling Identifying Important Information  
Picture Books for Modeling Synthesizing and Summarizing  
Reading Log Sample |
| Supporting Materials | Supporting Materials for Summarizing  
Supporting Materials for Making Meaningful Connection  
Supporting Materials for Self-Regulating  
Supporting Materials for Inferring |
| Observation Forms | Focusing on Comprehension Strategies in a Guided Reading Lesson for Struggling Readers in Grades 3-5 |
| Sample Lesson Plans | Sample Lesson Plans for Summarizing  
Sample Lesson Plans for Making Meaningful Connection  
Sample Lesson Plans for Self-Regulating  
Sample Lesson Plans for Inferring |
APPENDIX K:

Parent Consent Form
Dear Parent or Guardian,

I am currently enrolled in the doctoral program for Instructional Leadership at Western Connecticut State University. This program requires that I design and implement a dissertation research study. This study will occur over the course of a 20-week period during the fall and spring of 2008-2009.

The purpose of this study is to identify the effectiveness of using *Four Powerful Comprehension Strategies* instruction as opposed to not using the *Four Powerful Comprehension Strategies* instruction and the connection to students’ reading achievement, learning style, and self-perception as readers. A growing body of research describes intervention strategies for K-2 students. However, there is limited research on the impact of effective interventions for 3-5 students in regard to comprehension, learning style and self-perception. More research is needed to explore these issues.

The *Gates Macginitie Reading Test* will be administered to your child to measure his/her reading achievement after the 20-week study. At the start and at the end of the study, your child will also be administered *The Reader Self-Perception Scale*. Finally, if your child does not already have a Learning-Styles profile, the Elementary Learning Styles Assessment will be administered to identify your child’s Learning-Style preferences. These assessments will provide valuable information about your child’s reading comprehension, learning style, and self-perception as a reader. Results will be made available to your child’s classroom teacher but will not be reported to the district or impact your child’s reading grade. Student names will be coded and remain confidential throughout the study.

This research study has been reviewed and approved by Western Connecticut State University’s Institutional Review Board. It is hoped that the results of this study will help teachers, school administrators, and educational policy makers understand how the use of research-based reading strategies impact students’ reading achievement and self-perception of themselves as readers.

Participation in this study is completely voluntary. You are free to withdraw your child from the study at any time. All information is completely confidential.

If you have any questions, please contact me via email at meadla@danbury.k12.ct.us or phone at (203) 792-6323.

If you agree to have your child participate in this pilot study, please sign the attached statement and return it to your child’s classroom teacher________________________ by

_________________ (name of classroom teacher)

_________________ (date)

Sincerely,

Laura Mead
I, ___________________________, the parent/legal guardian of the student minor (printed name of parent or guardian)

below, acknowledge that the researcher has explained to me the purpose this research study, identified any risks involved, and offered to answer any questions I may have about the nature of my child’s participation. I voluntarily consent to my child’s participation. I understand all information gathered during this project will be completely confidential.

Student/Minor’s Name: __________________________________________________________

Signature of Parent or Guardian: ________________________________________________
APPENDIX L:

Student Assent Form
Dear Student,

My name is Mrs. Mead. I go to school at Western Connecticut State University. I am doing an exciting research study. I would like you to be a part of my study. I will send a permission slip home with you. But first, I would like you to know about my study.

The study is on reading comprehension. I want to see if one way of teaching reading is better for some students. All students will be involved in small group work. Your teacher will learn a new way of teaching. We will see if this new way is better.

I will need to use a few tests in my study. The tests will tell how helpful the new way of teaching was during the study. One test will be a multiple-choice reading test. One online assessment is called the Elementary Learning Styles Assessment (ELSA). The ELSA will tell me how you like to learn. Finally, we will do a survey that will show how you see yourself as a reader.

When the study is over I will let you know what I learn about the new way of teaching reading. If the new way of teaching is helpful I will share it with other teachers.

I will not use your name in the study. I will use numbers instead of names. The tests we use will have nothing to do with report card grades. All of the information will be kept private.

You will be a volunteer for this study. If you have questions, please ask me.

If you would like to be in my study, please write your name here:

X___________________________________________________

Thank you,
Mrs. Mead
APPENDIX M:

Professional Development Log
<table>
<thead>
<tr>
<th>Date</th>
<th>Person(s)</th>
<th>Topic(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 2008</td>
<td>All treatment teachers</td>
<td>6-hour initial training session</td>
</tr>
<tr>
<td>November 2008</td>
<td>All treatment teachers</td>
<td>6-hour follow-up training session</td>
</tr>
<tr>
<td>12/1/08</td>
<td>All treatment teachers</td>
<td>30-minute session for post 1st day reflections</td>
</tr>
<tr>
<td>Week of: 12/8/08</td>
<td>Observed each treatment teacher for 30 minutes</td>
<td>Researcher provided post-observation feedback on lesson content and gradual release process</td>
</tr>
<tr>
<td>Week of: 12/15/08</td>
<td>All treatment teachers</td>
<td>Researcher provided a 30-minute modeled lesson for each treatment teacher with the respective student treatment groups</td>
</tr>
<tr>
<td>Weeks of: 1/5/09 and 1/16/09</td>
<td>Individual meetings conducted with treatment teachers on an as needed basis and observations of all treatment teachers</td>
<td>Post-observation feedback Book and genre choice Transitioning from one strategy to another Gradual Release process (guided practice) Students that are difficult to engage Types of formative assessment</td>
</tr>
<tr>
<td>1/20/09</td>
<td>All treatment teachers</td>
<td>2-hour session with Dr. Lois Lanning to provide clarification about the Four Powerful Comprehension Strategies and the supporting skills.</td>
</tr>
<tr>
<td>January – February 2009</td>
<td>All treatment teachers</td>
<td>Researcher provided a supplemental binder with sample lesson plans for all four strategies (various skills) for each grade level.</td>
</tr>
<tr>
<td>February 2009</td>
<td>All treatment teachers</td>
<td>Opportunity to observe each other and provide post observation feedback.</td>
</tr>
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<td>--------------------------------------------------</td>
</tr>
<tr>
<td>March and April 2009</td>
<td>Individual, paired, and group meetings conducted with treatment teachers on an as needed basis</td>
<td>Holding students accountable outside of small group Inferring Summarizing Sharing of lesson plans added to supplemental binder</td>
</tr>
</tbody>
</table>
APPENDIX N:

Withdrawal from the Study Communications
Email Thread:

>>> Laura Mead 03/19/09 6:38 PM >>>
Dearest [Redacted] Teachers~
I hope the stresses of the CMTs are winding down. I have spoken to [Redacted] about the timing of implementing the focus groups for the purpose of my study.

I hope you are all still on board. And if you are on the fence because of any uncertainties, let me provide some clarification from my end.

There is still enough time between now and June to get valid results for the study and for you to get a feel of the effectiveness of the intervention.

Here’s the time line I am thinking about:
**Begin next week:
- 3-4X a week for 20-30 minutes a session
- Ending on 5/29 = 9 weeks of instruction
- Posttest: week of June 1st-5th
OR –
- Ending on 6/5 = 10 weeks of instruction
- Posttest: week of June 8th-12th

At some point before the end of the treatment, I will need ALL the participating students to take the online Learning-Style assessment called ELSA and [Redacted] said that she would help me with that process.

**I will have scripted lesson plans to you for the first week of instruction to get you started. I will also provide either enough texts or copies of the text for your group. I will NOT be able to get these to you until Monday 3/23 b/c I need to pull all the materials together this weekend at school.

Please let me know if you are planning on participating in the study so I can have all the materials ready for you on Monday. I look forward to hearing from you. Laura

>>> [Redacted] 03/22/09 2:13 PM >>>
Hi Laura
I am writing to you on behalf of the third, fourth, and fifth grade teams here at [Redacted] regarding your study.
While we all had the intention of completing the requirements of the study in order to give you valid results, we regret that due to several scheduling conflicts and time restraints, we will not be able to give the study the necessary time. In other words, our current schedule will not allow us to not meet with our study groups 3-4 times a week for 30 minutes for the required 10 - 14 weeks period.
Please accept our apologies and best wishes for the completion of your study.
Sincerely,
[Redacted]