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THE EFFECT OF QUESTION-ANSWER RELATIONSHIPS
ON NINTH-GRADE STUDENTS' ABILITY
TO ACCURATELY ANSWER COMPREHENSION QUESTIONS

by

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Education
in the School of Teaching, Learning, and Leadership
in the College of Education
at the University of Central Florida
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2012

Major Professor: Vicky Zygouris-Coe

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ABSTRACT

This experimental research study examined the effects of the Question-Answer Relationships (QAR) taxonomy on ninth-grade students' ability to answer comprehension questions. Participants included 32 incoming ninth-grade students who were required to attend summer school due to poor attendance, grades, and/or standardized test scores. Participants were randomly assigned to experimental and control groups. Experimental group participants received one week of initial strategy instruction followed by three weeks of maintenance activities. Results indicated that the strategy had a negative effect on students' question-answering ability and raised questions regarding comprehension instruction, length of interventions, and the role of scaffolded support for a target population of adolescent readers. Discussion of the results revolves around interventions, QAR instruction, reading ability, and motivation of the participants.

This dissertation is dedicated to my family.

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CHAPTER 1 THE PROBLEM AND ITS CLARIFYING COMPONENTS

Introduction

This chapter describes a research study that was conducted to examine the effects of the direct instruction of Question-Answer Relationships (QAR) (Raphael, 1981) on ninth-grade students' ability to accurately answer comprehension questions after reading. Included are the background of the study, the problem of the study, the significance, and an overview of the methodology used. The chapter concludes by noting the delimitations of the study and defining special terms that pertain to the study.

Background of the Study

Standardized testing has become a ubiquitous practice across the globe (ACT, 2011; Carnegie Council on Advancing Adolescent Literacy, 2010; National Center for Educational Statistics for Educational Statistics, 2010). The trends from these tests suggest that the United States is not keeping up with the rest of the world, especially in literacy skills. Results reported in 2010 regarding the 2009 National Assessment of Educational Progress (NAEP) on standardized reading tests suggested that the United States as a whole was in need of literacy and math interventions across all grade levels, but especially for adolescents (National Center for Educational Statistics, 2010). In reading, 38% of 12th graders, 30% of eighth graders, and 32% of fourth graders scored at or above the Proficient level (ACT, 2011). In mathematics, 27% of 12th graders, an increase of 3% from 2005, and 33% of eighth graders scored at the proficient level.

Scores in 2009 were higher than in 2005, but they were lower than in 1992. Although scores on these tests have revealed small increases and decreases over the years, they have remained relatively unchanged since 1992 with Florida being one of the lowest scoring states (ACT, 2011). Florida 12th-grade students scored an average of four points lower (reading 283; mathematics 148) than the rest of the nation on the 2009 NAEP reading and mathematics assessments (U.S. Department of Education, 2009). The Carnegie Council on Advancing Adolescent Literacy revealed a steady decline in student performance as students advance in grade level. The decline is seen between Grade 4 and Grade 10. In the United States, fourth graders' scores are competitive with the best in the world. Eighth grade scores suggest a decrease, and 10th graders in the United States were among the lowest scoring students in the world. In Florida, only 32% of students scored at or above the proficient level on the 2009 NAEP (U.S. Department of Education, 2009).

Racial and ethnic subgroups' scores in the United States also have remained relatively unchanged since 1992 in reading and mathematics (U.S. Department of Education, 2009). In reading, average scale scores reported for subgroups included Black (269), White (289), Hispanic (277), and Asian/Pacific Islander (296). The Black-White achievement gap in reading was 20 points and the White-Hispanic gap was 12 points. In mathematics, average scale scores reported for subgroups included Black (133), White (156), Hispanic (142), and Asian/Pacific Islander (165). The Black-White achievement gap in mathematics was 23 points, and the White-Hispanic score gap was 14 points. When compared to 1992, the achievement gaps remained the same (U.S. Department of Education, 2009).

Although the skills that are needed upon high school graduation have changed in the 21st century, the 20th century skills that have continued to be taught in classrooms have been a source of struggle for youth in the United States (Carnegie Council on Advancing Adolescent Literacy, 2010). Skills of the 21st century include critical thinking, problem solving, communication, collaboration, creativity, and innovation (Partnership for 21st Century Skills, 2006). Adolescents in the United States are in need of instruction that will close the gap between 20th and 21st century learning.

According to the Carnegie Council on Advancing Adolescent Literacy (2010), if youth in the United States are expected to be competitive in the new global economy, they need to become fully engaged and competent readers. In order to achieve full literacy, students need explicit instruction of reading and writing across all content areas. Teachers need the support of their school and district for professional development and funding for classroom materials. The lackluster literacy achievement of U.S. 10th graders has produced students who under-perform in school and who may, therefore, experience a lifetime of lower income and possible unemployment (Carnegie Council on Advancing Adolescent Literacy, 2010).

In an effort to prepare United States youth for the future, Common Core Standards have emerged in the United States. The Common Core State Standards (CCSS), often referred to as “college and career readiness” standards, are based on the skills an entry level college student will need in order to be successful in college without remediation (ACT, 2011). The Common Core State Standards were examined to determine competitiveness with other countries. The Programme for International Student

Assessment (PISA) was identified as an assessment that could help determine if students were equipped for college and career readiness (ACT, 2011). Scores from the 2009 PISA have been compared in reading and mathematics across 65 countries. Of the 15-year-olds who participated in the study, 69% were in the 10th grade, and most of the remaining students were in grades 9 or 11. Results were reported based on the 2,248 United States 10th-grade students who took the examination. Results from this research suggest that the United States' college and career readiness standards that parallel the Common Core State Standards, are internationally competitive. The 10th-grade college and career readiness benchmark for reading (519) proved to be competitive by outperforming the Organisation for Economic Co-operation and Development (OECD) average of 493. In mathematics, the 10th-grade college and career readiness benchmark (530) was also significantly higher than the OECD average (496). Results from this study also suggest that the Common Core State Standards promise to (a) raise the bar for K-12 students' knowledge and skills and (b) help prepare U.S. students to be competitive in the new global economy (ACT, 2011).

Although the United States has proved its competitiveness in performance standards, there is still work to be done. The lack of improvement in adolescent literacy achievement in the United States has caused educators to be more cognizant of the needs of adolescent readers. The United States has one of the lowest rates of college completion among the OECD countries (ACT, 2011). In 2010, 28% of high school graduates who took the ACT met none of the four college readiness benchmarks. The

lack of skills suggests that 28% of high school graduates who apply to colleges will need remediation before continuing their college career (ACT, 2011).

Kamil et al. (2008) posited that for the United States to be competitive with the rest of the world, students need direct instruction in comprehension strategies throughout their K-12 educational experience. There are a plethora of comprehension strategies available to teachers. In an effort to identify the most effective strategies, the National Reading Panel examined 203 scientific research studies on comprehension (NICHD, 2000). Their examinations led them to recommend seven top research-based comprehension strategies, one of which was question-answering. Based on the National Reading Panel's report, the Carnegie Council on Advancing Adolescent Literacy (2010) also supported direct instruction of question-answering strategies. The Carnegie study addressed the need for direct instruction of comprehension and question-answering strategies through the Question-Answer Relationships taxonomy (Raphael, 1981).

Direct instruction is the explicit teaching and modeling of a strategy, the active participation of the teacher and student while practicing and learning the strategy, followed by a gradual release to independent use of the strategy (Duffy et al., 1987; Kamil et al., 2008). Teachers who have mastered direct instruction are able to slowly transfer the responsibility of a task from themselves to their students (Duffy, 2003; Duke & Pearson, 2002; Pearson & Gallagher, 1983; Pressley, 2000). When students first encounter a problem, they look to adults or peers for assistance. Gradually, students progress from not understanding the task at all to being able to accomplish it with

assistance and, finally, to independent use of the strategy (Duffy, 2003; Duke & Pearson, 2001; Pearson & Gallagher, 1983; Pressley, 2000).

Durkin (1979) was the original researcher who found that direct instruction of comprehension strategies was not being practiced in public schools. She explored elementary classrooms and found that less than 1% of classroom time was being spent on explicit teaching of comprehension, and that more time was being spent on assessment than on instruction of comprehension. She explained that explicit instruction was not being replaced with other reading strategies. Instead, more time was being spent on assigning, grading, and transitions. Although Pressley uncovered good strategy instruction in classrooms in 1992, he later found a lack of strategy instruction across classrooms (Pressley, Wharton-McDonald, Mistretta, & Echevarria, 1998). Pressley et al. (1998) observed six fourth- and fifth-grade classrooms over a period of one school year. Although they observed many good instructional methods in these classrooms, their observations also revealed teacher-led discussions that were often times driven by commercial worksheets and focused on student understanding of the story. Teachers observed in this study mentioned and modeled comprehension strategies. However, they failed to encourage students to orchestrate strategies *during* reading.

Comprehension occurs when readers are able to simultaneously read the word from the page, internalize their thoughts, and synthesize their ideas in order to construct meaning from text. Comprehension strategies can be defined as tools that a reader can utilize when simply reading the words from the page is not enough to make meaning from text (Pearson et al., 1992). During reading, students should be able to monitor

comprehension and orchestrate various strategies when needed. Strategies that aid in comprehension during reading include activating prior knowledge, predicting, monitoring, self-questioning, asking questions, summarizing, graphic organizers, and multiple strategy use.

Teachers are challenged with implementing effective comprehension strategy instruction including question-answering strategies. The Question-Answer Relationships taxonomy (Raphael, 1981) is a question-answering strategy that can be utilized to support students who are learning to answer questions (Raphael & Au, 2005b). QAR is a unique question-answering strategy because it can also be used to frame instruction of comprehension strategies (Raphael & Au, 2006). Teachers who frame comprehension instruction around the QAR taxonomy also provide students with skills that include scanning, using context clues, text organization, summarization, synthesis, visualization, and making predictions, inferences, and connections during the reading process. The proposed research will focus on direct instruction of the QAR strategy that assists students in answering comprehension questions. Direct instruction of QAR provides a systematic approach to reading and answering questions that are required on standardized tests (Raphael & Au, 2005b). In addition, direct instruction of QAR ensures teachers that their students are receiving effective comprehension strategy instruction.

Statement of the Problem

In 2007, the Alliance for Excellent Education estimated that as many as eight million middle and high school students were reading below grade level (Heller &

Greenleaf, 2007). Increased numbers of at-risk adolescent readers have caused this group to receive a great deal of attention at local and national levels. The number of students at risk for failure increased even further when 21st century literacy habits and skills were calculated. These skills include core subject knowledge, 21st century content, learning and thinking skills, information and communications technology, and life skills (Partnership, 2006).

This study focused on developing students' learning and comprehension skills through the instruction of the QAR taxonomy. In the world of higher-level tasks and accountability, it is imperative that students leave high school as independent thinkers and learners who have the ability to collaborate and solve real-world problems within a community. Unfortunately, 28% of students who took the ACT in 2010 were not considered college, career, or workforce ready (ACT, 2011). This percentage of students needs either literacy skill intervention and/or practice in test-taking skills. Instruction of the QAR taxonomy will address this astounding low percentage of students by simultaneously assisting students with comprehension and question-answering skills.

Purpose of the Study

A lack of direct instruction in classrooms has been exposed throughout years of research (Durkin, 1978; Kamil et al., 2008; Pressley et al., 1998). Results from standardized tests suggest that direct instruction in answering comprehension questions could be useful to students who are under the pressure of standardized testing. Therefore, the purpose of this study was to examine the effect of direct instruction of the Question-

Answer Relationships (QAR) taxonomy, when embedded within summer school, on the ability of ninth-grade struggling students to accurately answer reading comprehension questions after reading.

Theoretical Framework

This study was supported by four educational theories. They are (a) schema, (b) automatic information processing, (c) metacognition, and (d) direct and explicit instruction.

Schema

Schema is a person's organized knowledge of the world (Anderson, 2006). It is literally the way that information is filed and stored in the brain. In reading, this is often referred to as prior knowledge. However, prior knowledge and schema should not be used synonymously. Prior knowledge is knowledge that the reader possesses, whereas schema is a way of describing how the information is stored. Prior knowledge is used in constructing meaning from text. As students read and take in new information, the new information is stored as schemata. As students continue to read, they relate text to what is already stored, making connections to old knowledge and possibly reconstructing the knowledge as they learn more. When students encounter text that cannot be related at all to their current schema, they must construct new schema, or the text is incomprehensible (Anderson, 2006). The goal of instruction is to build a more sophisticated schema rather than simply activate it (Bransford, 2006). The schema theory was relevant to this study

because some comprehension questions rely on the reader's prior knowledge. Students who have a more sophisticated schema have a greater ability to answer this type of comprehension question. Students who are low-level readers may not have a well-developed schema, making comprehension and question-answering requiring prior knowledge more difficult.

A sophisticated schema is only part of the equation of comprehension. A reader must also be able to access the information held in their "files." A reader needs to be able to read the words from the page while simultaneously accessing schemata. In addition, they must access the information quickly, as the words from the page are being read so that comprehension does not break down. This means that a reader must perform multiple tasks at once in order for comprehension to occur. Performing multiple tasks at once requires the reader's brain to perform some of the tasks automatically. The automatic information processing theory (Samuels, 2006) suggested that automaticity is a key to reading comprehension.

Automatic Information Processing Theory

The automatic information processing theory (Samuels, 2006) has dual roles in reading comprehension. The first is automaticity. This theory suggests that if a person is working on two tasks simultaneously, at least one of them is being performed automatically. The performance of two simultaneous tasks is only possible if one of the tasks is being performed with little attention. This is easiest explained by the "cocktail party phenomenon" (Samuels, 2006, p. 1,129), the ability to listen to two conversations at

the same time by switching attention back and forth without the switch being noticed by others.

Attention has two entities: external and internal. External attention is observable. For example, if a teacher notes that a student is not paying attention, she is observing that student's external attention, his external observable movements. Internal attention has three unobservable characteristics. The first internal characteristic of attention is alertness, or the "active attempt to come in contact with sources of information" (Samuels, 2006, p. 1129). The second characteristic is selectivity, or the ability to filter out various stimuli of the five senses so that the reader can focus attention on what is needed. For example, as one reads, there are multiple lines in view of the retina. Selective attention aids the reader in focusing on the line needed. The final internal characteristic of attention is limited capacity. The human mind has a "limited capacity to process information" (Samuels, 2006, p. 1130) due to a limited amount of attention available to process information. For example, when first learning to drive, all attention is needed to focus on the task of operating the car. Later, as driving becomes more natural, less attention is needed for operation of the car, and the driver is able to listen to music or have a conversation while driving.

Automaticity can be defined as "the ability to perform a task with little attention" (Samuels, 2006, p. 1130). Attention switching when reading occurs when a reader's focus navigates from one task to another. In reading, these concepts can be related to fluency (decoding), comprehension, and metacognition. If students are unable to decode text, all of their attention will be on reading the words correctly. However, students who

are fluent readers can focus attention on comprehending the text rather than decoding individual words because decoding has become automatic. Comprehension is a cumbersome task because the reader must construct meaning from the text, which requires a good amount of attention (Samuels, Ediger, Willcutt, & Palumbo, 2005). Once readers are satisfied with their level of comprehension, they can switch their attention to metacognition and decide if they are ready to continue to the next section of text (Samuels et al., 2005). After years of reading practice, very little attention is needed for decoding and metacognition. This gives readers the ability to focus on comprehension. The “critical characteristic of fluent reading is that fluent readers can perform all three tasks at the same time” (Samuels et al., 2005, p. 47).

Automaticity also plays a role in reading when teachers introduce a new strategy, such as teachers modeling their thinking for students. In the beginning phases of learning a new strategy, teachers can assist students by choosing text that is easy for them to comprehend. This allows them to focus on the strategy as opposed to directing their attention on comprehending the text.

The second part of the automatic information processing theory is the “speed of lexical access.” This is the speed at which readers can retrieve information from their brains (schemata). Reading comprehension requires students to constantly match what is being read to their prior knowledge, and in some cases adapt the schema to new knowledge. Speed of access is fastest for familiar words and topics. Students who have a slower speed of lexical access will be delayed in comprehension or may not comprehend at all. Students who have quick access to their schemata can continue

reading without a comprehension breakdown. The more prior knowledge readers have filed as schemata, the faster their speed of lexical access, and the faster their comprehension.

The theory of automaticity supported this study through automaticity and speed of lexical access. The level of text used during initial strategy instruction was lowered so that the students could focus their attention on learning the new strategy, as opposed to struggling to comprehend difficult text. It was important to be aware that students who were reading below the level of the selected text might still have trouble understanding the new strategy. There are two reasons for this. The first is that lower level readers may lack the speed of lexical access needed to comprehend unfamiliar text. The second is that more of their attention will be required to comprehend the text, thus leaving very little for learning the strategy.

Metacognition

When readers have trouble comprehending, metacognition comes into play. Metacognition is the intentional, purposeful, and directed thinking and goal monitoring (Flavell, 1976). It has been very simply defined as “thinking about thinking” (Jacobs & Paris, 1987, p. 255; Wilson, 2009, p. 21). In reading, metacognition is the ability to plan, evaluate, and regulate comprehension (Jacobs & Paris, 1987).

The theory of metacognition includes the knowledge of cognition and the regulation of cognition (Schraw, 2002). When a student learns how to perform a task, whether it is how to tie his shoe or engage in a comprehension strategy, it is stored as part

of his cognition. Students learn many comprehension strategies that help them understand text, such as making predictions and connections, summarizing, question-asking and answering, and paraphrasing. When students fail to comprehend, they must rely on metacognition to get back on track. After recognizing that they do not comprehend, readers must select a comprehension strategy from their cognition, apply the strategy to the text, and then self-monitor the use of the strategy. In other words, they must know what the strategy is, how to use it, and when to use it. The cycle of reading, confusion, strategy selection, and rereading continues until readers have completed the text. It is students' metacognition that helps readers recognize that they are confused, then select and monitor the use of comprehension strategies. Students who are metacognitive know when they are having a comprehension breakdown, whereas struggling readers may continue to read, unaware that they are confused (Israel & Massey, 2005). As metacognitive students read, they are continuously orchestrating multiple strategies and actively regulating their own comprehension (Singer, 1978).

Teachers can assist students in utilizing strategies by developing their metacognitive awareness. There are three stages of metacognitive awareness: declarative, procedural, and conditional (Jacobs & Paris, 1987). The declarative stage is the simplest form of knowledge. When individuals have declarative knowledge about something, they know "what" it is. Teachers who introduce a reading strategy to a class are giving students only declarative knowledge until they explain "how" to use the strategy. Once teachers explain how to use the strategy, they have taken students to the next stage of knowledge, procedural knowledge. After achieving the "what" and the

“how” (declarative and procedural), students are more likely to choose an appropriate strategy and perform tasks automatically (Schraw, 2002). The final stage of knowledge is conditional knowledge, the target of reading strategy instruction. When students have mastered conditional knowledge, they understand “why” and “when” to use a strategy and can adjust to changes that occur within a learning task (Schraw, 2002).

Regulation of cognition occurs when a student can control their learning by planning, monitoring, and evaluating strategy use (Jacobs & Paris, 1987). Students who are metacognitive not only have knowledge (of strategies) but they also understand that the knowledge exists and can regulate knowledge for the task that needs to be accomplished. In reading, these three levels of knowledge relate directly to strategy instruction. Teachers must teach students what strategies to use, how to use them, and why and when to use them. This theory is relevant to the proposed study in that students will learn through direct instruction what strategies to use to answer questions (QAR), how the strategies work, and when and why to use the strategies.

Direct and Explicit Instruction

Direct and explicit instruction is an essential and powerful instructional technique for adolescent comprehension instruction (Biancarosa & Snow, 2004; Kamil et al., 2008). Direct and explicit instruction is an instructional model that includes the explanation and modeling of the comprehension strategy, guided practice with the strategy, and eventually independent practice of the strategy (Duffy, 2003; Duffy et al., 1987; Duke & Pearson, 2001; Pearson & Gallagher, 1983; Pressley, 2000; Kamil et al., 2008).

According to Kamil et al. (2008), explaining and modeling include “defining each of the strategies for students and showing them how to use those strategies when reading a text” (p. 18). During guided practice, teacher and students should work closely together to ensure that students correctly apply the strategies to the text (Kamil et al., 2008). Guided practice can also occur by grouping students so that they may assist one another. Once teachers are certain that their students can effectively use the strategy, students may move to the independent practice phase of instruction. During independent practice, students work by themselves in order to apply the strategy to the text.

The idea behind this approach to instruction is that by teaching students to use specific cognitive strategies their ability to comprehend text and overcome obstacles during the reading process is improved (National Institute of Child Health, and Human Development, 2000). Once students have mastered how to use a strategy, they must also learn how to be metacognitive so that they can determine which strategy to choose for the current reading task (Carnegie Council on Advancing Adolescent Literacy, 2010). This theory is relevant to the current study in that the teacher used the direct instruction model to teach students to utilize the QAR taxonomy in order to more accurately answer comprehension questions.

Research Question

The state of adolescent literacy in the United States suggests that high school students are in need of strategies that can improve their literacy and question-answering skills. By teaching students to accurately answer the four types of questions included in

the QAR taxonomy, students received instruction in fundamental comprehension strategies and increased their knowledge of how to accurately answer comprehension questions. Thus, the following research question was formulated and was used to guide this study.

Research Question: To what extent does direct instruction of the Question-Answer Relationships (QAR) taxonomy, when embedded within summer school, affect struggling ninth-grade students' ability to accurately answer comprehension questions after reading?

Research Design

This study was conducted using an experimental design, a quantitative method suggesting that variables can be identified, controlled, and measured. The use of an experimental design will help satisfy the critical need for “rigorous scientific research in education” (Gersten et al., 2005, p. 149). In 2002, the National Research Council (NRC) suggested that experimental design allows the study to adhere to the same scientific methods as other disciplines. The NRC (2002) suggested that experimental design, although underutilized in education, is the most valued method in scientific research.

Participants in this study were chosen because of their placement in a local high school's summer program for incoming freshmen who have not met requirements for promotion to ninth grade due to (a) low grades, (b) failure to pass basic comprehension examinations, (c) poor attendance, and/or (d) the breach of the maximum age for middle school.

This permitted the researcher to utilize experimental and control groups and allowed for randomization of participants. The teacher selected for this study provided instruction to both groups in this convenience sample of 32 students. This experimental study utilized quantitative data collected before and after four weeks of strategy instruction. Students were pre- and posttested based on their ability to answer comprehension questions after reading. The results of this study are generalizable to other similar studies whose population includes middle school-going-to-high school transition students who have become transition students for various reasons.

Assumptions

1. The researcher assumed that participants in the study did not have solid previous knowledge of the QAR strategy.
2. The researcher assumed that students in the transition program would represent a population of struggling readers.

Delimitations

Prior to initiating the study, the researcher recognized several conditions that imposed constraints on the conduct of the study. They were:

1. This study utilized a convenience sample of participants. Due to the immediate start of summer school after the end of the regular school year and the late registration of students, Lexile and standardized test scores were unavailable, making it difficult to determine the true reading ability of the

participants. Also, because of the target population desired for this study and the time constraints imposed by the immediate start of summer school, the researcher was very limited in the selection of teacher participants.

2. The required summer curriculum called for QAR to be taught as part of the required summer curriculum which also included annotation, making connections, vocabulary, main idea, and author's point of view and purpose.

Significance of the Study

The significance of this study lies in the population that was being utilized and in the recent trends in educational testing. Schools throughout the nation have increasingly been evaluated based on students' ability to excel on standardized tests. It is common knowledge among schools that the weakest point in school evaluations typically resides with those students who are performing and reading below grade level. Raphael and Au (2005b) examined questions on a fourth-grade NAEP examination and discovered that of 12 questions, five were "Right There," four were "Think and Search," and three were "Author and Me" questions. This analysis suggests that even at the fourth-grade level, tests are riddled with challenging questions. An analysis of questions on the eighth-grade reading FCAT (Raphael, Highfield, & Au, 2006) revealed an increase in difficulty, with two "Right There," eight "Think and Search," and six "Author and Me" questions. Researchers have indicated that the QAR strategy can increase standardized test scores. Ezell & Kohler (1992) successfully instructed third graders to use the QAR taxonomy and tested their ability to increase scores on a classroom passage and the California

Achievement Test. Increased scores on both the classroom passage and California Achievement Test suggest that the taxonomy can assist in increasing scores in the classroom and on standardized tests.

Highfield (2003) utilized fourth graders to compare instruction of the QAR taxonomy with instruction that included standard test preparation. Findings indicated that students in both groups increased their standardized test scores. However, students who learned the QAR taxonomy spent less instructional time on test preparation and reported the use of more comprehension strategies.

In the current study, the researcher examined the effects of direct instruction using Question-Answer Relationships (QAR) on students who have struggled through eighth grade. Although an increase was not seen in the results, this study should serve as a reminder that researching comprehension instruction for adolescents is multi-faceted. Research that includes this population should address direct instruction, appropriate scaffolds, corrective feedback, and teachers who act as motivators.

Definition of Key Terms

Direct Instruction. A method of teaching students that requires the teacher to explicitly teach a strategy. Teachers must explain and model strategies for students. There are three phases of direct instruction: explanation and modeling, guided practice, and independent practice.

Question-Answer Relationships (QAR) (Raphael, 1981). A taxonomy that categorizes questions according to their location in the text. It is important to note that

the QAR taxonomy is not a hierarchy. There are two main categories in the taxonomy: “In the book” and “In my head.” Questions for which answers can be found in the text fall within the first category. Questions for which answers require the reader to make an inference or use prior knowledge to develop the answer are in the second category. There are also four subcategories: “Right There,” “Think and Search,” “Author and Me,” and “On My Own.” “Right There” and “Think and Search” are in the “book” category. Answers to these questions are found directly in the text. Answers that are in only one place are considered “Right There,” and answers that are found in multiple places across the text are “Think and Search.” “Author and Me” and “On My Own” questions require the reader to use prior knowledge or make an inference. Answers to “Author and Me” questions can be found by reading the text and combining what is learned from the text with what the reader already knows. Answers to “On My Own” questions do not require the reader to read and can be answered without the use of the text. The question is about the text, but the text is not required to answer it. These types of questions will not be included in the proposed study.

Reading comprehension. A process in which readers construct meaning by interacting with text through the combination of prior knowledge and previous experience, information in the text, and the stance the reader takes in relationship to the text (Pardo, 2004, p. 272).

Struggling readers. Students who are reading below grade level, according to the state reading assessment (FCAT). Typically, students who participate in the transition

program in the participating county are struggling readers. These students may benefit from direct instruction of reading strategies as taught in the proposed study.

Transition students. Students in a public school district in central Florida who did not meet the requirements as set by the school district for promotion but have been placed in the ninth grade. Reasons for this include grades, attendance, and age of the student.

Organization of the Study

This chapter was organized to present the problem and its clarifying components. The background for the study has been discussed followed by a statement of purpose and the theoretical framework on which the study will be based. Key definitions, the research question that will guide the study, and the research design were presented. The chapter concluded with underlying assumptions, delimitations, and the significance of the study.

Chapter 2 contains a review of the literature, and Chapter 3 details the methodology that was used in conducting the study. Chapter 4 presents the analysis of the data, and Chapter 5 concludes the dissertation with a summary of the findings, discussion and recommendations.

CHAPTER 2 LITERATURE REVIEW

Introduction

This chapter presents a review of the literature and research related to several topics relevant to the proposed research: (a) the state of and need for adolescent literacy in the United States at the time of the present study, (b) comprehension instruction, (c) metacognition, and (d) studies of Question-Answer Relationships (QAR). This research is supported by four educational theories: (a) schema, (b) automatic information processing, (c) metacognition, and (d) direct and explicit instruction. Seminal research related to QAR relationships will be discussed using three categories: instruction, transfer and maintenance, and content areas. A brief summary follows the discussion of each of the QAR categories of studies.

Question-Answer relationships is a taxonomy that categorizes comprehension questions based on where their answers can be found. According to the taxonomy there are four categories: “Right There,” “Think and Search,” “Author and Me,” and “On My Own.” “Right There” and “Think and Search” questions can be found directly in the text, in one location or in multiple places across the text, respectively. “Author and Me” and “On My Own” questions require more thinking, as readers must use the text to make inferences or use the information from their heads entirely. The QAR taxonomy assists teachers and students by (a) providing a common language between teachers and students’ questions, (b) providing a framework for answering questions, and (c) providing a framework for comprehension instruction.

The Critical State of Adolescent Literacy in the United States

Teaching students the skills required of them in college and beyond starts at a young age. As students shift from elementary to middle to high school, the type of reading that is required of them shifts from “learning to read” to “reading to learn.” After the fourth grade, the level of reading intensifies greatly. Students in secondary grades are “expected to learn new words, new facts and ideas from reading, as well as to interpret, critique, and summarize the texts they read” (Carnegie Council on Advancing Adolescent Literacy, 2010, p. 10). As students enter later grades, the textual landscape changes drastically depending on the following:

- an introduction of longer texts;
- increased word, sentence, and structural complexity;
- increased focus on graphic representations;
- greater conceptual challenges;
- and a variance of texts across content areas (Carnegie Council on Advancing Adolescent Literacy, 2010).

Textual landscape has drawn attention recently by the introduction of the Common Core State Standards (CCSS). Text complexity and disciplinary literacy are at the heart of the CCSS. The new set of state standards requires students to use various types of text across disciplines to learn vocabulary, collaborate with others, and utilize discussion and writing as tools for communication (Fisher & Frey, 2012). In order to be successful in today’s global economy, students who graduate from high school need to be able to read complex text independently, critically, and provide evidence-based responses to questions. This type of reading cannot be mastered by simply reading more books. Instead, in Grades K-12, additional reading should be enhanced with systematic support

that includes specific strategies in order to learn how to “read to learn” across a variety of texts and genres (Carnegie Council on Advancing Adolescent Literacy, 2010).

Interest in adolescents’ comprehension has been on the rise in the world of educational research. This can be attributed, in part, to the staggering numbers of middle and high school students who have not performed well on standardized reading tests (Cassidy & Cassidy, 2007; Cassidy, Garrett, & Barrera, 2006). Results from the National Assessment of Educational Progress (NAEP) indicated that though academic improvement is needed at all grade levels, secondary school students are in the most critical need of literacy skills (ACT, 2011). In 2005-2009, only 38% of 12th graders performed at or above the proficient level in reading (ACT, 2011; U.S. Department of Education, 2009). Unfortunately, this number has remained stagnant since 1992. Twelfth graders are not alone in the secondary literacy crisis. According to the Council on Advancing Adolescent Literacy (2010), 10th graders in the United States score among the lowest in the world on standardized reading tests.

When national results were disaggregated by state, the picture of Florida students was even more bleak. Compared to the average for the rest of the nation, the average scale scores of Florida’s 12th graders were four points lower (283) in reading. Only 32% of Florida students scored at or above the proficient level. This was 5% lower than the national average (U.S. Department of Education, 2009).

The literacy problem does not end at high school graduation. Of the high school graduates who took the ACT in 2010, 28% met none of the four college readiness benchmarks. The same students who were failing to meet college readiness scores after

high school are still applying to and attending colleges. The increase of students who are attempting college level courses who are not performing at the college ability level is forcing post-secondary institutions to offer remedial reading courses (National Center for Educational Statistics, 2001, 2003). Remedial college students are likely to suffer through unemployment and lower income levels throughout their lives (Carnegie Council on Advancing Adolescent Literacy, 2010). Economic disadvantages that remedial students face in their futures can be avoided by teaching students the literacy skills they need throughout their school years.

In order for students to progress to and be successful in college, they must take several standardized tests. Standardized testing begins in elementary school and continues at various points throughout students' academic careers, often culminating in college entrance exams. Standardized tests are not getting any easier. In a discussion of an upcoming 2009 National Assessment of Educational Progress, the National Assessment Governing Board (2004) explained that in order to push students to a higher level of proficiency, they would see an increased number of questions calling for integration, interpretation, critique, and evaluation of texts and would see a decrease in the number of fact-focused recall questions. Students would also be required to provide a short or extended written response on most of the higher level questions. When reading fiction, students were to be held accountable for their ability to think deeply about text elements such as themes and lessons, elements of plot structures, and multiple points of view. When reading nonfiction, students needed to understand how text is organized and be able to locate information in texts, graphs, photos, and other materials.

If students are expected to answer challenging questions, they also need to be explicitly taught by teachers how to do so. Researchers have suggested that QAR is one strategy that can assist students in reaching the comprehension scores that they need on standardized tests and aids teachers by providing a clear plan for comprehension instruction (Raphael & Au, 2005b).

Comprehension

Comprehension Strategies

Comprehension begins when readers begin to internalize their thoughts as they read (Block & Israel, 2004). A reader can begin to internalize thoughts once they have learned to decode words and can simultaneously read the words and construct meaning from text. Comprehension strategies are tools that a reader can utilize when comprehension of text breaks down.

Reading researchers have identified numerous core strategies that assist in comprehension (Block & Pressley, 2002; Duke & Pearson, 2002; Palinscar & Brown, 1984; Paris, Lipson, & Wixson, 1983). The National Reading Panel (2000b) has suggested summarizing, question asking and answering, the use of graphic organizers, and multiple strategy use as key strategies that should be included in reading instruction. In addition, Kamil et al. (2008) advocated for summarizing, question-answering and asking, paraphrasing, and finding main idea. Researchers have confirmed that direct

instruction of comprehension strategies can be effective in improving students' ability to understand text (Biancarosa & Snow, 2004; Kamil et al., 2008).

Predicting during reading requires readers to look at what has been previously stated in the text and what they think may happen next. By predicting prior to reading, readers activate their prior knowledge. This engages old schema and allows for new information to be "filed."

Text structure pertains to how authors organize text. Bartlett (1978) suggested that students who have a better understanding of how text is organized are also able to recall more information from text. Monitoring, also referred to as metacognition or self-monitoring, occurs when readers think about what they are reading in the process of, and after, reading. Readers who are successful at self-monitoring have the ability to self-evaluate their comprehension of text.

Graphic organizers have become commonplace in the reading classroom. These are used to provide a visual representation of text that aids in organization in order to assist with comprehension. Summarization requires students to sift through text, discern more important from less important information, and synthesize information into a coherent text that can represent the original (Dole, Duffy, Roehler, & Pearson, 1991).

Questioning takes on dual roles in reading, question asking, and question-answering. Question asking is also called self-questioning, a metacognitive strategy that helps students comprehend text by posing questions about the text as they read. Self-questioning requires the reader to summarize, select important information, and put pieces of text together to formulate a question. Question answering is a very common

practice in classrooms. Questions can take on many forms and may be posed by other students, the teacher, or a test.

Reading strategies can be employed before, during, and after reading. According to Kamil et al. (2008), multiple strategy use results in better comprehension than single strategy use. Multiple strategy use means that students are able to use strategies almost simultaneously, because thoughts are quickly developed and internalized as the reader moves across the page.

In addition to assisting students, the QAR taxonomy also helps teachers in scaffolding questions to meet the various phases of comprehension instruction (Raphael, 1986). Direct instruction of “Right There” questions teaches students to scan for important details and use context clues. Direct instruction of answering “Think and Search” questions requires students to locate important information and synthesize information from multiple places in the text. In doing so, students must summarize, think about text organization, visualize, clarify, and make connections and simple inferences. When answering “Author and Me” questions, students must connect information from the text with information that they already know. In doing so, they must be able to predict, visualize, and make connections and more complex inferences. When answering “On My Own” questions, students are not required to refer to the text. Therefore, text-based strategies are not necessary. However, this type of question does require the activation of prior knowledge and text-self connections. As displayed in Table 1, Raphael et al. (2006) suggested that QAR instruction can help facilitate the instruction of many core comprehension strategies.

Table 1

Using Question-Answer Relationships (QAR) to Frame Comprehension Strategy Instruction

QAR	Sample Comprehension Strategies
Right There	<ol style="list-style-type: none"> 1. Scanning to locate information 2. Note-taking strategies to support easier recall of key information 3. Using context clues for creating definitions
Think & Search	<ol style="list-style-type: none"> 1. Identifying important information 2. Summarizing 3. Using text organization (e.g. comparison-contrast, problem-solution, list, explanation) to identify relevant information 4. Visualizing (e.g. setting, mood, procedures) 5. Using context to describe symbols and figurative language 6. Clarifying 7. Making text-to-text connections 8. Making simple inferences
Author & Me	<ol style="list-style-type: none"> 1. Predicting 2. Visualizing 3. Making simple and complex inferences 4. Distinguishing fact and opinion 5. Making text-to-self connections
On My Own	<ol style="list-style-type: none"> 1. Activating prior knowledge (about genre, experiences, authors, etc.) 2. Connecting to the topic (self-to-text)

Note. Reproduced with permission from “QAR Now,” by T. E. Raphael, K. Highfield, and K. H. Au, *Scholastic*, 2006, p. 77. Copyright 2006 by *Scholastic*.

Many researchers believe that it is “not the specific strategy taught, but rather the active participation of students in the comprehension process that makes the most difference on students’ comprehension” (Kamil et al., 2008, p. 17). If this is true, instruction regarding the aforementioned strategies might be particularly useful in assisting adolescents whose needs are to transition from passive to active reading. As students transition from elementary to middle and high school reading, the need for the active use of comprehension strategies increases along with the level of text being

presented. Students entering secondary grades are required to read more intensive text and answer comprehension questions. By engaging in a more active reading process students are able to focus on and internalize the information being presented.

Comprehension Instruction

Because the goal of various teaching strategies is to aid in comprehension, teachers should choose strategies that benefit the needs of their students. With countless numbers of reading strategies available to teachers, comprehension instruction has many facets in classrooms.

Reading comprehension instruction requires a balance between the actual instruction of the strategy and student use of the strategy. Pearson & Dole (1987) suggested that too much focus on the process of learning the strategy may hinder students' understanding of the text itself. Teachers should emphasize how the strategy will aid in understanding text rather than dwell on the process of using the strategy. Although the strategies that are taught might vary across classrooms, the instruction should be similar.

Modern strategy instruction research began when Durkin (1979) uncovered a lack of direct instruction of comprehension strategies in classrooms. Durkin explored elementary classrooms and found that less than 1% of classroom time was being devoted to explicit teaching of comprehension and that more time was occupied by assessment than on the instruction of comprehension. She further revealed that explicit instruction was not being replaced with other reading strategies. Instead, more time was being spent

on assigning, grading, and transitions. Later, Pressley et al. (1998) also found a lack of strategy instruction across classrooms. They observed six fourth- and fifth-grade classrooms over a period of one school year. They observed a wide variety of positive instructional practices, such as trade book instruction, writing instruction, independent reading, whole and small group instruction, and projects. Although there were many good instructional methods in these classrooms, the researchers' observations also revealed teacher-led discussions that were often times driven by commercial worksheets and focused on student understanding of the story. Teachers observed in this study mentioned and modeled comprehension strategies. However, they failed to encourage students to orchestrate strategies *during* reading. Instead, teachers surveyed student thinking by posing questions *after* reading, such as "Did you get images in your head while you were reading?" (Pressley et al., 1998, p. 173) and asked students to supply written responses to questions *after* reading. Researchers involved in this study were shocked by the complete lack of strategy instruction during reading in classrooms that included so many other good practices.

Direct Instruction

Kamil et al. (2008) suggested that there was strong evidence supporting the use of direct and explicit instruction in classrooms across all grade levels. They reviewed five experiments that focused on explicit instruction, two in the upper elementary grades and three in secondary grades. Strategies in these studies included comprehension strategies, summarization and question-answering. Kamil and colleagues found that 67% of the

reviewed studies showed a positive impact for struggling readers. Thus, explicit instruction of summarization and question-answering helped struggling readers.

Direct and explicit instruction is an essential and powerful instructional technique for adolescent comprehension instruction (Biancarosa & Snow, 2004; Kamil et al., 2008). Direct and explicit instruction encompasses an instructional model that includes the explanation and modeling of the comprehension strategy, guided practice with the strategy, and eventually independent practice of the strategy (Duffy, 2003; Duffy et al, 1987; Duke & Pearson, 2001; Kamil et al., 2008; Pearson & Gallagher, 1983; Pressley, 2000). According to Kamil et al., 2008, explaining and modeling include “defining each of the strategies for students and showing them how to use those strategies when reading a text” (p.18). During guided practice, teacher and students should work together to apply the strategies to the text. (Kamil et al., 2008). In this phase, students and teacher must work closely with one another in order to ensure that the students are correctly applying the strategy to the text. Guided practice can also occur by grouping students so that they may assist one another. Once the teacher is certain that students can effectively use the strategy, students may move to the independent practice phase of instruction. During independent practice, students work by themselves in order to apply the strategy to the text. The rationale for this approach to instruction is that by teaching students to use specific cognitive strategies their ability to comprehend text and overcome obstacles during the reading process is improved (National Institute of Child Health, and Human Development, 2000).

Block (2004) surveyed 630 second- through sixth-grade students to determine what students felt they needed from their teachers in order to improve their reading. Student responses signified that they needed their teachers to demonstrate how they understood meanings of words and events in books, and expressed a need for teachers to explain what happens in their heads when comprehending.

Klinger, Vaughn, & Schumm (1998) examined the effect of direct instruction of comprehension strategies when reading social studies text. Participants included fourth-grade students, with 85 participants in the experimental group and 56 in the control group. Students in the experimental group received direct instruction of the application of reading comprehension strategies that included activating prior knowledge, predicting, summarizing, clarifying, and questioning. Control group students did not learn comprehension strategies but did receive instruction of the same social studies content. Students in the experimental group outperformed control group students in reading comprehension, with the two groups making equal gains in knowledge of the social studies content.

Dole, Brown, & Trathen (1996) compared the effect of direct instruction of comprehension strategies to standard methods of teaching reading comprehension. Participants included 39 fifth-grade and 28 sixth-grade, low-achieving students who were divided into three treatment groups. All participants took the Stanford Achievement Test to determine reading level. Treatment groups received five weeks of instruction and were divided into (a) strategy instruction, (b) story content instruction, and (c) basal control instruction. The strategy instruction group focused on the development of students'

procedural and conditional knowledge of comprehension strategies used before, during, and after reading. The story content instruction group focused on good comprehension instruction of a specific text. The basal control instruction received instruction from a basal reading program with the idea that some form of instruction is better than none at all, hence the absence of a no-instruction control group. Participants in all three treatment groups participated in a pre-, immediate post- and seven-week delayed posttest for reading comprehension that was based on six basal reading selections. Participants in the strategy instruction group outperformed the story content and basal control groups in reading comprehension. The strategy group performed extraordinarily well when reading text independently without a teacher's instructional support. Findings did not indicate any difference in performance between the three groups when assessed on their ability to perform on instructional tests. The latter finding indicated that all three forms of instruction were effective when preparing students for specific texts. Additionally, the story content and basal control groups performed equally well on instructional and independent tests, a finding that suggests that when compared to one another, both instructional methods were equal in developing students' comprehension. In summary, strategy instruction showed the most significance in transferring strategies to texts beyond the classroom. This revealed how and when to use strategies aids in the overall effect of comprehension instruction.

Vaughn et al. (2011) examined the effect of collaborative strategic reading (CSR) with middle school students. The purpose of CSR was to provide direct instruction to students in comprehension strategies, thereby monitoring and clarifying for

understanding during reading. Students worked in small groups to learn to reflect on text through main idea and self-questioning instruction and then participated in group discussion after reading. Participants included seventh- and eighth-grade students in three school districts in Texas and Colorado. Participants were randomly assigned to 34 treatment group classrooms and 27 control group classrooms. Students in the control group received “business as usual” instruction (Vaughn et al., 2011, p. 938). Treatment groups received direct instruction of comprehension strategies in their regular English/reading class two times per week for four to six weeks and were subsequently divided into peer groups of four to five students for the remainder of the study, totaling 18 weeks. Teachers of the treatment groups received three days of professional development. Student data were based on three measures: knowledge of strategies, reading comprehension, and fluency. Students in the treatment group outperformed control group students on reading comprehension measures and metacomprehension (knowledge of strategies); however, no significant effect was noted for fluency.

In addition to direct instruction of the strategy itself, researchers have also supported providing a rationale for students’ use of a strategy (informed strategy instruction). Teachers who provide students with a rationale for using specific strategies increase the chance that students will be successful in the use of the strategy (Osman & Hannafin, 1994; Paris, Newman, & McVey, 1982.)

Osman & Hannafin (1994) examined the effects of high-level, concept-relevant orienting questions and differences in prior knowledge on learning. They discovered that providing a rationale for strategy use encouraged participants to use the strategies.

Participants included 107 tenth graders of low to mid socioeconomic backgrounds. The study included three lessons for three different groups. One group was encouraged to “think about” how to apply concepts; another group answered questions designed to provoke the use of content specific and prior knowledge; and the final group was the same as the second but was told “why” the strategies were being used. Students in the third group were also encouraged to generate their own reasons as to why questions were important (buy-in). Results suggested that providing a rationale for strategy use improved the likelihood that it would (a) be used by students, (b) increase learning, and (c) improve attitudes toward questioning methods.

Paris et al. (1982) also discovered that providing a rationale for strategy use is beneficial to students. They compared first graders who were informed about memory strategies to those who were simply taught to use them. Results suggested that students who were informed about “why” the strategies were useful were more likely to use them without prompting than were those who were simply directed to use them.

Direct instruction of QAR that includes informed strategy instruction is an effective way of teaching students to utilize the taxonomy. When learning about QAR, students learn to identify different types of questions, where to locate information to answer the question, and how to plan, monitor, and evaluate their own actions as they answer questions (Raphael & McKinney, 1983, Raphael & Wonnacott, 1985).

Think-Alouds

Direct instruction of comprehension strategies can be effective with the use of think-alouds. The think-aloud offers teachers a way to explicitly teach reading comprehension strategies and assist students with the transition from passive to active and independent reading. Teachers read aloud to students and model what they are thinking so that students have the opportunity to see and hear good readers using comprehension strategies as they read. Israel & Massey (2005) offered three reasons that think-alouds may be beneficial to students: (a) students enjoy listening to teachers read and hearing their teacher's thinking; (b) think-alouds explicitly model what students should be focusing on when they read, especially when reading various types of text; and (c) think-alouds permit struggling readers, who may not normally be engaged, to be involved in classroom discussions of text (Ivey, 2002). The main concept behind think-alouds is that students eventually become independent readers and thinkers. At first, the teacher assumes all of the responsibility, but gradually students take control and work independently. The gradual release of responsibility is a key to instruction if students are to gain independence.

The think-aloud helps students become thoughtful and purposeful readers (Duffy, 2003). Of course, this requires metacognitive teachers who are willing to model their thought processes. The goal of teaching metacognition is that the thinking process becomes automated. This automaticity holds true for teachers, sometimes making it difficult for teachers to model their thinking. In fact, teachers may become so automated that they are inaccessible to consciousness (Afflerbach & Johnston, 1986).

Duffy et al. (1987) explored the necessity for teachers to utilize direct instruction to explain the mental processing associated with reading strategies. Researchers examined (a) teacher ability to explain their thinking and (b) the effect of modeling thinking on student achievement and awareness. Participants included 20 third-grade teachers (and their classes) who were divided into control and treatment groups. Findings suggested that teachers who were explicitly trained to share their thinking were also more explicit in explaining the thinking associated with using reading skills as strategies than teachers in the control group. Although students who received teacher modeling were found to be more aware of their own use of strategic reading, they did not do as well as expected on a reading comprehension test. The comprehension score may have been affected by an increased number of students with learning disabilities and the increased number of word-level tasks on the comprehension test.

Once students have mastered the use of a strategy, teachers must also teach students how to be metacognitive so that they can determine which strategy to choose for the current reading task (Carnegie Council on Advancing Adolescent Literacy, 2010).

Metacognition

Although a reader must have mastery of lower level skills such as phonics, phonemic awareness, decoding, and vocabulary, they must also be able to utilize their higher-level reading skills of schema and metacognition (Samuels, 2006). The theory of metacognition was first introduced by Flavell (1976) in the 1970s. Metacognition can be defined as the regulation of one's thinking (cognition). Metacognition is separate from

cognition in that cognition encompasses the skills needed to perform a task, whereas metacognition is needed in order to understand how the task was performed.

Although cognition and metacognition are different, the two work together in the learning process. Schraw and Dennison (1994) generated and tested a metacognitive inventory designed for adolescents and adults. Participants included 197 undergraduate students who were enrolled in an introductory educational psychology course. The inventory measured knowledge and regulation of cognition. Findings suggested that the two were correlated, suggesting that they may work together in helping students self-regulate their learning.

In the simplest terms, metacognition is “thinking about thinking” (Jacobs & Paris, 1987, p. 255; Wilson, 2009, p. 21), self-monitoring, or the thoughtful and purposeful regulation of one’s mental processes (Griffith & Ruan, 2005). This can be transferred to reading instruction, as successful readers understand which comprehension strategy to use and how to use it. In regard to reading, metacognition is the students’ ability to plan, evaluate, and monitor comprehension (Pressley, 2000). Planning for reading includes setting a purpose for reading, understanding the goal, and making predictions. Evaluating reading is checking for understanding as readers move across text. Evaluating may require readers to summarize, ask and answer questions, or check for understanding. Monitoring comprehension requires readers to self-manage their thinking and make changes as needed. Self-monitoring readers can switch strategies as the demands of the task change or if the current strategy is not working (Jacobs & Paris, 1987).

Flavell (1976) proposed that one reason young children fail in reading comprehension is that they are not aware of their own thinking processes as they read. Readers, who are metacognitive in their processing of text, think while they read and are aware that their thoughts exist. This further aides their ability to monitor their understanding of text. Although good readers may recognize when they are having trouble comprehending text, struggling readers are not aware of comprehension breakdowns (Israel & Massey, 2005). This monitoring process is the core of metacognition and is vital for students trying to comprehend text.

Reading teachers generally teach a repertoire of metacognitive strategies. When students are in need of a metacognitive strategy, they must first draw from their store of declarative knowledge. In order to complete the task at hand without assistance, however, they must also have procedural and conditional knowledge of the strategy. This means that in order to become independent readers and strategy users, students must be taught the what, how, why and when for each strategy.

In order for students to get the most out of text, they must have ownership of various metacognitive strategies. Metacognitive strategies include, but are not limited to predicting, connecting, questioning and clarifying. Metacognitive strategies should be taught in the three stages of knowledge: (a) declarative, (b) procedural, and (c) conditional. When students have a breakdown in comprehension, they must first be aware of the breakdown, have knowledge of strategies that may help them correct the problem, and employ the appropriate strategy. For example, students who are reading and suddenly find themselves confused need to first acknowledge that they do not

comprehend and stop reading. Next, they must know where and why the breakdown occurred. If something was unclear, students should reread and try to clarify the confusion. They may need to simply reread or use context clues to figure out the meaning of a word. Once students master metacognitive comprehension strategies, they develop a cognitive approach to learning and a critical understanding of subject matter (Conley, 2008).

Metacognition, comprehension, and schema are interrelated. All three types of knowledge (declarative, procedural and conditional) are stored as schemata (Ruddell & Unrau, 2006) and regulated by metacognition during reading. Schema can be defined as “a person’s organized knowledge of the world” (Anderson, 2006, p. 594). The automatic information theory suggests that schemata are most useful to a reader when it can be retrieved quickly (speed of lexical access). Schemata, often referred to as prior knowledge, provide a basis for comprehension and learning. Prior knowledge is knowledge that previously exists and has been stored as schema. As good readers read, they are constantly connecting new information to old and “filing” the new. When readers come to information that does not match what is already in their schemata, they must either construct new schemata or they will not comprehend the text (Anderson, 2006). Although the activation of old schemata is essential to comprehension, the goal of instruction should be the construction of new schemata (Bransford, 2006).

By effectively activating a student’s prior knowledge, teachers can more effectively prepare students for reading because they are ready to integrate old information (schemata) with new information (Beck, Omanson, & McKeown, 1982). In

regard to comprehension, metacognition is involved when the old and new schemata do not match. When this occurs, students who are metacognitive will facilitate their comprehension monitoring (Johnston, 1985) to either correct the mismatch or file the new information.

Educational research in metacognition diverges into many general areas, including assessment, motivation, reading, mathematics, and self-regulation. Research in metacognition is inclusive of young children through adult age participants. For the purpose of this literature review the scope of research included has been narrowed to metacognition as it pertains to comprehension strategy instruction of late elementary to high school students.

Allen and Hancock (2008) sought to examine the effect of systematic metacognition instruction on students' ability to comprehend text. Participants included 196 fourth and sixth grade students, divided equally between three experimental groups: (a) the control group who received the cognitive assessment only but did not receive their own profiles; (b) cognitive assessment + profile awareness; and (c) cognitive assessment + cognitive profile awareness + metacognitive systematic inquiry. All students were pre- and posttested for reading comprehension using an Individual Reading Inventory and the Oregon State Standardized Test. All students were also pre-tested on the cognitive abilities of working memory, processing speed, long-term retrieval fluency, and general comprehension knowledge using the Woodcock-Johnson III. Each student received an individual profile of their cognitive strengths and weaknesses. Individual profiles were displayed in graph form to avoid negativity of numerical scores. Students in group 3 also

received direct instruction of systematic reflection on their cognitive abilities as they read. Students participated in three weeks of initial preparation that included selection of classrooms, testing of cognitive abilities, reading comprehension pre-test, and explanations of individual cognitive profiles. Students then received 10 weeks of metacognitive treatment, followed by three weeks of posttesting. Results from the Independent Reading Inventory did not show significant differences between the three groups, however results from the Oregon State Standardized Reading Test proved otherwise. Findings from this study showed that students who reflected on their abilities showed the greatest improvements, suggesting that students who possess knowledge of their own cognitive strengths and weaknesses can significantly improve their reading comprehension scores.

Paris and Jacobs (1984) examined correlations between comprehension and awareness during reading. Participants included 91 third graders and 92 fifth graders across four different schools in the same school district. Students in the experimental group received 14 weeks of instruction that included declarative, procedural, and conditional knowledge of reading strategies. Strategies included summarizing, skimming, and inferring. Significant correlations were found between comprehension tasks and reading awareness. In addition, students in the experimental group improved in the areas of reading awareness and strategic reading. Findings from this study indicated that direct instruction of reading strategies improved students' reading ability and demonstrated the importance of including metacognitive awareness in strategy instruction.

Cross and Paris (1988) examined the relationship between reading comprehension and metacognition. Participants included 87 third graders and 84 fifth graders from two different schools. Each school hosted either all experimental group classes or all control group classes. Students in the experimental group received direct instruction (modeling, guided practice, and independent practice) of reading strategies. Instruction included declarative, procedural, and conditional knowledge of comprehension strategies as well as instruction on how to plan, evaluate, and regulate the learned strategies. The experimental groups of both grade levels showed significant gains and outperformed control group participants in metacognition and reading strategy use. Findings suggested that direct instruction of reading strategies could improve students' abilities to employ metacognitive strategies during reading.

Palincsar and Brown (1984) examined the effect of four comprehension strategies on reading comprehension. Participants included seventh grade students who were reading below grade level. Teachers provided direct instruction of questioning, summarizing, clarifying, and predicting. Gradually the students transitioned from participating in a small group to leading their own small groups. The strategies were found to improve students' comprehension. Students in the treatment groups outperformed their peers in comprehension, maintained the use of the strategies over time, and successfully transferred the strategies to other text.

Rosenshine and Meister (1994) conducted an extensive review of reciprocal teaching studies in middle school and adult settings. High school classrooms were excluded from their review because the authors felt that the focus of reciprocal teaching

on strategies did not fit with the focus of subject area knowledge in high school classrooms. It was determined from the 16 reviewed studies that students who receive instruction on reciprocal teaching strategies improve their reading comprehension. Participants in treatment groups of all reviewed studies outperformed control group participants on standardized reading comprehension tests.

Dermitzaki, Andreou, and Paraskeva (2008) examined the relationship between reading ability and use of reading strategies during reading. During the first phase of the study, students were tested on their ability to make predictions, answer questions after reading, and summarize. The first phase included 127 students, 45 of which were selected to participate in the second phase of the study. Second phase participants included 45 third graders comprised of 20 high achieving readers and 25 low achieving readers. Students in the second phase participated in a comprehension test during which their efforts to comprehend text were video recorded as students read aloud. Two observers recorded cognitive, metacognitive, and motivational aspects of students' strategy use during reading. Reading strategies that were observed included predicting, answering questions after reading, inferencing, finding keywords, main idea, and summarizing. Observers also evaluated participants on the ability to self-regulate their comprehension. Findings in this quantitative study revealed a strong correlation between reading level and ability to monitor comprehension during reading. Participants in the high achieving group employed all strategies during reading. Students in the low achieving group did not utilize metacognitive or cognitive strategies.

Metacognition research reviewed in this section indicated that (a) metacognition and cognition are supportive of one another, (b) training in metacognitive reading strategies can improve students' ability to comprehend text, (c) metacognitive awareness can be transferred to other text, and (d) better readers are also better at accessing metacognition during reading.

The Role of Metacognition on Answering Questions

Metacognition and schema are both needed not only in comprehension but also when students are challenged with the task of answering comprehension questions. In regard to answering questions, students need cognitive knowledge of strategies that can assist them in finding their answers as well as the metacognitive ability to monitor their knowledge and strategy use (Baker, 2002). Schema, which is regulated by metacognition, is involved in answering questions that require prior knowledge (schema) to answer them. When answering questions, students need a developed schemata and the ability to retrieve knowledge from schema that is needed in to arrive at a response.

Answering questions on standardized tests has become a standard milestone for students throughout their K-12 education along with the requirement that they prove themselves by the acquisition of a certain number of units indicating course completion. Regardless of the required units, students across the nation have increasingly been required to take and pass standardized tests in order to receive their high school diplomas. Comprehension questions on standardized tests have changed from factual/detail type questions to being concerned with evaluation, interpretation, and analysis (National

Assessment Governing Board, 2004). For students to succeed in answering more difficult questions, they must be taught the explicit strategies that are needed to do so. In addition to direct instruction of metacognition and the development of schemata, it is also critical that students have a metacognitive understanding of sources of information in order to access and utilize information for generating responses to questions (Raphael & McKinney, 1983; Raphael & Pearson, 1985; Raphael & Wonnacott, 1985).

Question-Answer Relationships

Teacher-generated questions are a well-established practice across classrooms (Durkin, 1978). Although answering teacher-posed questions may enhance students' comprehension of a specific text, the goal of comprehension instruction should be to provide students with processes of comprehension that can be applied to many texts (Johnston, 1985). Educators have been charged with the responsibility of teaching strategies that assist students in reading efficiently, accurately answering teacher-posed questions, and overcoming the challenges of standardized tests.

Question-Answer Relationships (QAR) is a taxonomy that assists teachers by providing a framework for answering questions and shaping comprehension instruction. When teaching students to answer comprehension questions, the QAR taxonomy provides students with structured categories for questions. When using this taxonomy as a question-answering strategy, students are able to determine where to find the information needed to answer a question by determining where the question belongs in

the QAR taxonomy. The taxonomy is also useful in that it provides a common language for teachers' and students' questions.

Raphael and Au (2005b) wrote that instruction in the QAR framework can serve as a “reasonable starting point for addressing four problems of practice that stand in the way of moving all students to high levels of literacy” (p. 208):

1. The need for a shared language to make visible the largely invisible processes underlying reading and listening comprehension.
2. The need for a framework for organizing questioning activities and comprehension instruction within and across grades and school subjects.
3. The need for accessible and straightforward whole-school reform for literacy instruction oriented toward higher level thinking.
4. The need to prepare students for high-stakes testing without undermining a strong focus on higher level thinking with text. (Raphael & Au, 2005b, p. 208)

The QAR taxonomy provides two main categories for questions based on where the answer is found: “In The Book” and “In My Head.” Under the “In The Book” category are “Right There” and “Think and Search” questions. “Right There” questions have answers that can be found directly in the passage, typically in one place, and with the same verbiage as the initial question. “Think and Search questions” are very similar to “Right There” questions, except that their answers are found in more than one place in the text. Under the “In My Head” category, there are two sub-categories: “Author and Me” and “On My Own.” “Author and Me” questions require an inference based on the reader’s prior knowledge (schema). Schema plays a role in students’ ability to answer questions that rely on the recall of prior knowledge. Answering “Author and Me” questions requires students to use what the author tells them as well as what they already know or can infer based on the text. “On My Own” questions share a topic with the

reading, but the text is not needed in order to answer the questions. Teachers typically use the common language of the taxonomy to teach students how to go about answering comprehension questions that are asked after reading. It is most helpful in assisting questions to (a) locate information, (b) determine text structures and how the structures may convey information, and (c) determine when an inference might be needed (Raphael, 1986).

Direct instruction of QAR requires teachers to explicitly teach, model, and practice identifying, labeling, and searching for answers to comprehension questions. Its purpose is to develop strategic readers (Kinniburgh & Shaw, 2009). QAR can assist students with standardized tests by first teaching students that there are different levels of questions and then to assist them in learning how to search for answers, depending on the various levels. Researchers have indicated that QAR instruction assists students in their approach to reading texts and answering questions (Raphael, 1984). It is important to note that the QAR taxonomy does not necessarily transition from lower to higher levels, as does Bloom's taxonomy. Though Bloom's taxonomy appears to be a pyramid that takes learning from lower to higher levels, this is not true. It is not necessary to master the simpler skills prior to moving to the next "level" (Krathwohl, 2002). When Bloom and his colleagues (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956) first created this taxonomy, its intended purposes were geared toward providing a common language for, and creating, curriculum objectives. The two taxonomies are comparable in the sense that they were both created with the intent of developing a common language and that they are both taxonomies rather than hierarchies. The "Right There" questions require

the reader to utilize the knowledge level of the taxonomy. “Think and Search” questions require the reader to apply the comprehension and application levels. “Author and Me” questions add the analysis level, and “On My Own” questions prompt readers to weigh several points of view (evaluation) and support their points of view based on research (synthesis). Researchers have addressed the taxonomy’s effectiveness with varying levels of students (Ezell & Koehler, 1992; Raphael, 1981, 1986; Yopp, 1988).

Literature reviewed about QAR has been organized to describe (a) seminal research which began in 1980, (b) QAR as an instructional method, (c) students’ abilities to maintain and transfer QAR knowledge, and (d) QAR in the content areas.

Seminal QAR Research

This section of the literature review focuses on prior research initiatives directly related to the QAR taxonomy. Research of QAR began in the 1980s. With a vision of increasing student ability to answer comprehension questions, Raphael (1986) developed three levels of questions based on seminal research performed by her and her colleagues and also based on Pearson and Johnson’s (1978) original taxonomy of (a) text explicit (TE), (b) text implicit (TI), and (c) script implicit (SI) categories.

In 1981, Raphael completed a dissertation that examined Pearson and Johnson’s (1978) taxonomy for categorizing questions. Raphael’s dissertation included 44 adult skilled readers and 100 fourth- through eighth-grade students of low-average, average, and high reading abilities. The adult skilled readers were utilized in Experiment I to be sure that it was possible for skilled readers to understand and utilize the strategy with

minimal training. Results from Experiment I indicated that adult skilled readers with minimal training could correctly identify question categories. The fourth-, sixth-, and eighth-grade students were divided into treatment and orientation groups by ability levels of low-average, average, and high for the purpose of examining two levels of training on students' ability to correctly label questions according to the taxonomy and utilize the appropriate strategy for answering questions. Materials used in the study were developed through three pilot studies (Raphael, 1981). The training treatment group received only four days of instruction, and the orientation group received a 10-minute introduction to the taxonomy and two practice exercises.

Results indicated that the 10-minute orientation session was sufficient for adult skilled readers. However, elementary and junior high students performed better under the four-day treatment condition. Students in the four-day treatment group increased in ability to correctly label questions according to the taxonomy, match their use of strategies to the appropriate question category, and appropriately respond to the question. Overall, performance was better on text-based questions than script-based. Students' abilities to correctly categorize questions increased as they increased in age and ability. Text-implicit questions seemed to be more difficult to answer for younger students.

Raphael and Pearson (1982) trained sixth graders who were of low, average, and high ability levels as well as average fourth and eighth graders in the use of QAR. Training lasted one week. The purpose of the study was to compare the ability of trained and minimally trained (10 minutes) groups to label and appropriately answer questions. High ability students increased the most on script implicit (SI) questions, but average and

low students improved scores on text explicit (TE) and text implicit (TI) questions. The lack of performance on SI questions in the average and low groups could be due to an inferior general knowledge base. Training provided in this study brought the lower level students to the level of the average control group students and the average trained readers to the level of the high level control group students on text-based questions.

A second study conducted by Raphael, Wonnacott and Pearson in 1983 was reported by Raphael in 1984. The ease of implementation of the QAR program within a fourth grade developmental reading program was examined to determine whether training students in the use of informational sources would transfer to other activities and how much training teachers needed to successfully implement the strategy. This study led to further research by Raphael and McKinney (1983) in which the differences in needs of QAR training for children of varying ages were investigated. The researchers utilized teacher suggestions from Raphael, Wonnacott & Pearson (1983). Fifth- and eighth-grade teachers received a half-day of training on instructional procedures and materials provided by the research team. In this study, the amount of training needed for students of different ages and the role of QAR on performance were examined. Previous studies revealed the possibility that fourth-grade students needed more training than sixth-grade students. The new question revolved around the amount of training needed for students below fourth and above sixth grade levels.

Raphael and McKinney, in their 1983 study, sought to examine age-related differences in teaching QAR to fifth- and eighth-grade students. A sample of 217 fifth-

and eighth-grade students were randomly selected, blocked by ability levels, and assigned to training or control groups.

Training group teachers participated in a half-day in-service to assist in teaching the strategy. Control group teachers did not participate in the in-service, nor were they given instructions prior to the testing day. Data were analyzed based on correct response, hits, and matches. Analysis revealed that the QAR strategy improved trained fifth graders' performance but reduced the performance of the fifth-grade control group. In the eighth-grade classrooms, the QAR strategy seemed to reduce the performance of trained students and made no difference in the control group's performance. The researchers examined the instruction of the strategy in terms of a full training program, a brief orientation, or no exposure to the strategy. Overall, training improved performance more than the brief orientation or no training. This finding varied across groups. Training was found to be more effective among students of average to low ability, especially with text- and script-implicit questions. The researchers claimed that higher ability students may have already possessed skills and, therefore, should not see as much of an improvement. Fifth-grade high ability students saw increases with training, but eighth-grade students' performance decreased, although the eighth graders in the trained group did outperform the untrained control group. Researchers posited that the decline in eighth-grade scores may have been due to differences in cognitive development over the longer training period and may have resulted in a negative attitude on the final performance test. It was concluded that the longer instructional period was useful for fifth-grade students but not necessarily for eighth-grade students. Fifth-grade students in

the control group performed at a much lower level than did those in the trained group. Students increased overall in the eighth-grade groups, but the increase was due to the high numbers of students in the brief 10-minute orientation control group who performed well.

In 1984, Raphael reported on a descriptive study that she, Winograd, and Pearson conducted in 1980 with fourth, sixth, and eighth graders of lower and higher ability levels. They found that ability level was correlated with the ability to accurately answer questions. This led to a question as to whether training in knowledge of information sources would improve students' abilities to answer questions.

Raphael and Pearson (1985) examined the effects of teaching students about specific sources of information for answering questions through the use of the QAR taxonomy. A total of 59 sixth-grade students of low, average, and high ability levels were included in the study. The control group did not receive training in QAR because answering questions was a well-practiced tradition in schools and because the results of previous studies (Raphael & Wonnacott, 1985) had indicated that it was not necessary. Participants were scored on the ability to correctly label and answer questions and on the quality of their answers. Students in the high ability groups performed the best, followed by the average, then low ability students. Students in the low and average ability groups showed the greatest improvements. Students in the low ability groups had the most trouble with SI questions, possibly due to a lack of background knowledge. Low ability students needed assistance in utilizing their prior knowledge, e.g., possibly needing the teacher to provide the knowledge itself prior to reading. Low ability students' increases

in TE and TI questions were attributed to more effective use of “look backs.” This indicated that having knowledge of sources of information may be beneficial to students’ ability to answer questions.

Raphael and Wonnacott (1985) observed that researchers and practitioners were in conflict with one another in that researchers believed that practitioners could be impassive to findings, and practitioners complained that instructional practices proposed by researchers had “little or no utility for the classroom” (p. 283). Because of this, Raphael and Wonnacott (1985) conducted two experiments in order to respond to the needs of theory and practice. Experiment 1 involved a group of 24 fourth graders divided into treatment and control groups. Instruction followed the principle of fading that began with explicit instruction of labeling and explanation of QARs. The trained group received four days of instruction that included an introduction to QAR, small group instruction with group feedback, individual assistance with feedback, and one extra lesson for those who were not proficient after three days. The fifth day consisted of testing for both groups with the control group receiving a mini-lesson that defined each QAR. Students were scored on their ability to answer and label questions accurately. Students performed better on text-explicit questions, likely due to being exposed to more of these types of questions. Additionally, 30% of the students did not reach proficiency after four days of instruction. This finding led to Experiment 2 of this study.

Raphael and Wonnacott’s (1985) second experiment included 10 fourth-grade teachers, 180 fourth-grade students, and three school sites. Students were grouped by ability levels based on standardized test scores and decoding ability. Training group 1

included three teachers and their students. Teachers received a half-day of in-service training, and materials were provided by the research team. Training group 2 also included three teachers and their students. Teachers participated in a half day of in-service but were not provided with instructional materials. Teachers were instructed in the use of the QAR taxonomy in developing questions from texts already in their classrooms. Except for having no materials provided for Training group 2, the in-service for the two training groups was the same.

Control group 1 (practice) students received the same practice passages and questions that training group 1 students received, but students were not instructed in the use of the QAR taxonomy. This group received all pre- and posttests as well as transfer and maintenance passages. Control group 2 (no treatment) students received testing passages but were not exposed to any of the training materials or to the taxonomy.

Results indicated no significant difference between the two control groups, as predicted by the research team. Results from the two treatment groups indicated no significant difference in quality of response for maintenance and transfer passages. Training group 1 did, however, outperform training group 2 in labeling questions according to the taxonomy, but the two groups performed the same in correctly responding according to their labels. Teacher questionnaires revealed that the training and materials provided to group 1 were adequate, but training group 2 teachers indicated that creating their own materials was time consuming and they would have preferred more materials created by the research team.

Several findings resulted from the study. First, the fact that the two treatment groups performed the same suggested that teachers do not need “teacher-proof” materials for teaching students the strategy. This did not indicate that having materials available to teachers would not be of assistance to them. Teachers in this study expressed that supplying materials for initial training would be ideal, allowing them to use their creativity within their own curriculum and teaching styles to supplement basic materials. In addition, teachers did not feel that researcher classroom visits were necessary beyond the first week (initial training). Another finding from the study was that students in the training groups were able to transfer the strategy to a science lesson without being prompted to utilize the strategy. Students of average and lower ability groups seemed to receive the most benefit from the training, suggesting that students of higher ability already possessed the skills. Raphael and Pearson (1985) also indicated that four days of instruction was sufficient for sixth-grade students, but that fourth graders may need more instructional time. Studies conducted from 1980 until 1985 revealed that teaching fourth-through eighth-grade students about information sources assisted them in understanding what task they must perform to answer a question as well as improve the quality of their answers. It was also indicated that teachers benefitted the most from a half-day in-service when materials were provided. They did not, however, need “teacher-proof” materials in order to incorporate a strategy into their curriculum. The amount of training needed by students varied by grade level, with fourth- and sixth-grade students requiring one week of training followed by six to eight weeks of practice. Sixth-grade students made adequate use of the strategy with only a week of training, and eighth-grade students

seemed to need only a 10-minute orientation. In addition, it was indicated that adequate QAR training may be transferred to content area curriculum.

QAR was initiated by Raphael in 1981 using three categories: (a) "Right There," (b) "Think and Search," and (c) "On My Own." Historically, students who had been taught the three QARs were more successful in answering questions than those who had not received the instruction (Raphael, 1986). Raphael added a fourth category of QAR, "Author and Me," in 1986. The four categories of questions developed in 1986 remained in use at the time of the proposed study.

Table 2 contains a chronological listing of seminal research by author dating back to 1980. Included are dates, the sample of students involved in the study, the design, variables, use of control group, and results of the research.

Table 2

Chronological Review of Literature by Authors: Seminal Research

Authors	Sample (Grade level/type of student)	Design/ Methodology	Manipulated Variables	Measured Variables	Control Group	Results
Raphael, Winograd, & Pearson, 1980	4 th , 6 th , 8 th lower and higher ability	Non-Experimental Quantitative	Student ability level	Ability to answer and label questions	No	Ability level is correlated with the ability to accurately answer questions. Lead to the question of whether training in knowledge of information sources would improve answering abilities.
Raphael, 1981	44 adult skilled; 100 4 th -8 th low, average, high ability	Non-Experimental Quantitative	Length of treatment (QAR instruction); 10 min vs. 4 days	Ability to answer and label questions	No	QAR instruction: 10 minute orientation sufficient for adults. Elementary and junior high students need four days.
Raphael, 1982	6 th low, average, high ability and 8 th average	Non-Experimental Quantitative	Length of treatment (QAR instruction)	Ability to answer and label questions	No	Low and average ability students increased the most on text-based questions. High ability students increased on script implicit. Average and low students don't have the prior knowledge to answer script implicit questions.
Raphael, Wonnacott, & Pearson, 1983	4 th	Non-Experimental Quantitative	QAR instruction when implemented into pre-existing reading program; amount of teacher training needed	Transference of QAR to other activities	No	Lead to Raphael & McKinney (1983) Results not described

Authors	Sample (Grade level/type of student)	Design/ Methodology	Manipulated Variables	Measured Variables	Control Group	Results
Raphael & McKinney, 1983	217 / 5 th and 8 th	Quasi-Experimental Quantitative	Teacher training needed for QAR instruction; length of treatment for various age groups (10 min vs. 4 days vs. no training)	Ability to answer and label questions	Yes	Longer instructional period needed for 5 th grade (four days). 10 minute orientation was sufficient for 8 th grade. Eighth graders developed a negative attitude with longer training.
Raphael & Wonnacott, 1985	Experiment 1: 24 / 4 th grade Experiment 2: 180 / 4 th grade and 10 teachers	Exp 1 and 2: Quasi-Experimental Quantitative	Experiment 1 Experimental: QAR instruction Control: no QAR instruction Experiments 1 and 2: - length of QAR instruction Experiment 2: materials provided in teacher training	Experiments 1,2 answer and label questions Experiment 2: transference of QAR to science	Yes Experiment 1 only	Average and low ability showed greatest improvements, possibly because high-level students already possessed the skills. QAR is transferrable to science. Teachers do not need “teacher-proof” materials to successfully implement QAR.
Raphael & Pearson, 1985	59 / 6 th low, average, high ability	Quasi-Experimental Quantitative	Experimental: QAR instruction Control: no QAR instruction	Ability to answer and label questions; quality of answers	Yes	Lowest achieving students showed greatest improvements but had trouble with script implicit questions, due to a lack of prior knowledge.

QAR as an Instructional Method

Some researchers have focused solely on the method of QAR instruction (Ezell, Hunsicker, & Quinque, 1997; Ezell & Kohler, 1992; Graham & Wong, 1993; Kinniburgh & Prew, 2010; McMahon, 2010). In this section, the findings of five such studies are reviewed. Researchers in these studies examined methods that included the gradual release of responsibility, peer-assisted instruction, teacher-assisted instruction, didactic instruction, self-instruction, and a teacher-focused strategy that assists young students in learning the strategy.

Ezell and Kohler (1992) conducted a study with 23 third graders of low, average and high reading abilities (equally distributed). The purposes of this study were to examine the effect of the QAR taxonomy on students' ability to ask and answer questions through peer instructed instruction. A control group was not included in this study, although standardized test results were compared to an anecdotal classroom that did not receive QAR instruction.

Results indicated that low- and average-achieving students' question-answering performance improved across all three question types, with average-achieving students' performance exponentially increased in the "putting it together" category. The high-achieving group of students' performance increased the most on "putting it together" questions, and no increase was seen on "Right There" questions (86% accuracy throughout study). Only a moderate increase was seen in the "Author and You" (high accuracy during intervention also) category. Scores were compared for students in one classroom, their reading passage, and the California Achievement Test, with students in

another classroom who did not participate in the study or receive the strategy instruction. In regard to the classroom passage, students who participated in the study outscored those in the non-participating classroom. Participating students scored 85% accuracy and non-participating students scored 60% in answering questions. Results from the standardized test mirrored these results with the intervention group scoring 5.7 compared to the non-intervention group score of 3.5. The authors noted that these results could perhaps be attributed to increased practice opportunities in answering questions. Although this study utilized peer instruction in the QAR study, there was no control group for either construct. It is unknown which of the two approaches was responsible for the student gains.

Graham and Wong (1993) compared two instructional strategies for teaching a modified version of QAR. Participants in this study included 90 fifth- and sixth-grade students, 45 average readers and 45 poor readers. A total of 30 students were randomly assigned to each group: didactic teaching, self-instruction, or control. In this study, Raphael's mnemonics were replaced with a 3H model of "here, hidden, and in my head" which mirrored "Right There," "Think and Search," and "On My Own" categories. The two instructional approaches compared were didactic and self-instruction. Both groups were taught the 3H strategy in the same way. However, the self-instruction includes modeling through think-aloud, overt guidance and faded self-guidance as the student transitioned from thinking aloud to a whisper to covert self-instruction. Self-instruction requires students to ask themselves (a) how they would answer the question, (b) where the answer is to be found, and (c) if their answer is correct. The three self-questions were

meant to focus and guide students through the question-answering task. Control and training group participants received the same materials, but the control group did not learn a question-answering strategy.

Data analysis revealed that the self-instruction model of teaching was more effective than the didactic model. Students in the self-instruction group out-performed the other groups on posttest and maintenance passages. The authors reported that the self-instruction model requires students to be more metacognitive as they take part in self-regulation, self-evaluation, and self-instruction.

Ezell et al. (1997) compared the effectiveness of QAR instruction when taught using two separate instructional techniques. Peer-assisted (P-A) instruction participants included 25 fourth-grade students, and teacher-assisted (T-A) students included 23 fourth-grade students. Both groups received instruction from the teacher. Students in both groups were pretested and participated in a baseline phase that measured their question-answering and asking ability. Students were also posttested (unannounced visit) eight months after the intervention to measure maintenance of the strategy. In general, the instruction was the same in both groups, with the P-A group working with a peer and the T-A group working individually. Both groups increased their performance in reading comprehension, and there was no significant difference in the groups' gains. The follow-up visit showed that students retained their question-answering and asking skills across the taxonomy. It should be noted that the T-A group's instruction was not the typical didactic instruction, as students were pushed to higher levels as they, rather than the teacher, provided questions for discussion. Ezell et al.'s (1997) finding that P-A

instruction was equally as effective as T-A instruction in increasing students' reading comprehension further supported their earlier findings that "peer-assisted learning may be used to master complex tasks such as question asking and answering" (Ezell, Hunsicker, & Quinque, 1997, p. 376).

Highfield (2003) conducted a mixed methods dissertation as a teacher researcher that compared two approaches to preparing students for high stakes tests. The conceptually driven approach was guided by the QAR taxonomy, whereas the practice test approach was based on test familiarity. Participants included 900 fourth-grade students, three highly qualified teachers, and two similar rural elementary schools. Participants were divided equally between two practice groups. Highfield (2003) had three research questions. First, she explored the influence of two contrasting approaches to test-preparation on teaching practices in fourth-grade test preparation lessons (qualitative). Second, she asked how student learning may vary as a result of participating in two contrasting approaches to test preparation (quantitative). Finally, she explored how students' reading comprehension strategies and students' attitudes toward participating in high-stakes testing situations varied in classrooms using two contrasting approaches to test preparation (qualitative).

The two teachers of the conceptually driven approach, one of which was Highfield, devoted approximately 18 to 22 hours to test preparation that revolved around the QAR taxonomy. Students in this group received five initial lessons over a two-week period that covered the four QAR categories, followed by one booster lessons each week for eight weeks. The taxonomy was applied to various types of text throughout the study.

Instruction in the conceptually driven group followed the gradual release of responsibility model (Pearson, 1985) and included teacher think-alouds, modeling, and small group and individual practice with teacher coaching. The gradual release of responsibility transitioned quickly and on a daily basis.

The teacher of the practice test approach spent between 40 and 50 hours practicing test familiarity. The practice test approach was written by a school district and consisted of instruction that revolved around the format of the state test. The practice test approach also included a series of three practice tests that mirrored the state test. Instruction began with a two-day themed writing prompt. The purpose of the theme was to activate prior knowledge prior to the instructional unit. Next, students practiced using graphic organizers as they read one expository and one narrative text selection that were also related to the theme of the writing prompt. The following practice test included 10 questions derived from each text with an additional five questions that required students to synthesize across the two texts. The unit ended with a one-day themed writing prompt, using the same theme as the first prompt and instructional unit, and required students to reference the two texts. Instruction of the practice test group followed a pattern of whole group/teacher directed instruction. As the group transitioned through the three practice tests, students were individually responsible for more of the graphic organizers. The first unit was “very tightly controlled and led by the teacher” (Highfield, 2003, p. 40). The second allowed more student practice with the teacher leading, and the third allowed mostly student practice. The gradual release of responsibility transitioned very slowly over a three-month period.

When examining the influence of the two contrasting approaches to test-preparation on teaching practices in fourth grade test preparation lessons, Highfield (2003) triangulated data by comparing data from audio and videotapes of the test preparation lessons, observational notes of students, and reflections on her own practice. In order to examine how student learning varied as a result of participating in two contrasting approaches to test preparation, Highfield (2003) analyzed data from test scores and classroom interaction. When exploring how students' reading comprehension strategies and students' attitudes toward participating in high-stakes testing situations varied in classrooms using two contrasting approaches to test preparation, Highfield (2003) analyzed data from interviews with students that focused on use of reading comprehension strategies and attitudes toward testing.

Quantitative results were reported using a classroom-based test, a state criterion referenced test, and a national norm referenced test. Students in both groups performed equally on all quantitative measures. Qualitative results were derived from audio and video tapes, student interviews, and field notes. Results from qualitative measures revealed that students in the conceptually driven group conveyed a more positive attitude toward testing and could identify more comprehension strategies during reading.

Highfield (2003) posited that in an environment where teachers feel the burdens of high stakes testing and a literacy crisis, teachers must make informed decisions about instructional practices in their classrooms. Teachers who taught the conceptually driven approach spent only half the amount of time preparing students for tests than did teachers in the practice test approach. Although students in both groups scored equally on

quantitative measures, students who learned the QAR taxonomy spent less time on test preparation, had better attitudes, and learned more comprehension strategies. Highfield (2003) found that the QAR taxonomy can save teachers time by giving students a direct approach that prepares them for tests and teaches comprehension strategies.

Kinniburgh and Prew (2010) examined the effect of teaching QAR to 69 K-2 students in a mixed methods action research study. The purpose of the study was to determine if such young students could successfully learn the strategy and increase reading achievement with its use. The study was conducted in a Title 1 school with an approximate class size of 20, although one special education class was included that consisted of seven students across the three grade levels. Each classroom consisted of students who were reading on, at, and below grade level. Students in Kindergarten and special education classes were not pre- or posttested, because there was no test available for them. All teachers began with instruction about the two broad categories of questions with lessons that included pictures, chants, posters, and songs. Teachers led students to focus on words, such as who, what, where, and when to teach “book” questions and “how and why” to teach “head” questions.

Data analysis revealed that students in all grade levels were successful in the use of the strategy. First-grade students’ quantitative results yielded an increase in comprehension from 74% to 89% (mean scores) and second-grade students’ scores increased from 58% to 80% (mean score). Qualitative results of teacher and student interviews confirmed that teachers were excited and agreed that the strategy was appropriate across the spectrum of students. Teachers observed that this was a pertinent

strategy in laying a strong foundation in how questions work prior to moving into higher grades (Kinniburgh & Prew, 2010).

McMahon (2010) conducted an action research study with 16 second-grade students. The purpose of this study was to measure the effects of direct instruction of QAR on students' reading comprehension across small groups of students whose instruction was differentiated. One stimulus in deciding on direct instruction for McMahon's study resulted from Ezell et al.'s 1997 study. Ezell et al. (1997) compared direct instruction to peer-assisted instruction in order to determine which style of teaching would be more effective with QAR. Because both groups saw increases in comprehension, it was difficult to determine if the reason was type of instruction or the effects of the QAR strategy.

The students in McMahon's 2010 study worked in groups of four during small group instruction. They were pre- and posttested, although there was a serious validity threat involved with the two tests. During the pretest the teacher was allowed to read the questions to the students. This accommodation was removed for the posttest. The study lasted a total of six weeks. The teacher/researcher in this study utilized direct instruction during whole-class and small group instruction. She also modeled her thinking through think-alouds and required her students to hear one another's thoughts through peer think-alouds. Curriculum consisted of one basal reader per week and one QAR category per week with a basal reader comprehension assessment at the end of each week. The weekly assessments were used for classroom purposes only and were not included in the results of this study. Only two of 16 students increased performance on the posttest. Of

the 16 students, nine had scores that dropped by less than 10 points. Two students dropped between 10 and 15 points, one student dropped between 15 and 20 points and one student's score decreased by 28 points. The researcher expected the drop in scores due to the change in test administration (the removal of the read-aloud accommodation during the posttest). In addition to the change in administration, the pre- and posttests were not balanced in question difficulty. "Right There" questions were included on the pre- but not the posttest. Since these questions were the easiest for students to answer correctly, the lack of this question type on the posttest likely caused a drop in scores as well.

All of the studies in this section included direct instruction of QAR for students in Kindergarten through sixth grade. Results suggested that there were various successful ways to implement the strategy. The exception was the didactic model of instruction. For younger students (grades K-2) it may be necessary to enrich instruction with songs, chants, posters, and pictures. For students in grades three to six, the use of the gradual release of responsibility, peer-assisted, teacher-assisted, and self-instructed models were successful in assisting students to answer comprehension questions.

Table 3 contains a chronological listing of key research studies by author focused on the use of direct instruction of QAR. Included are the sample of students involved in the study, the design, variables, use of control group, and results of the research.

Table 3

Chronological Review of Literature by Authors: Instructional Methods

Authors	Sample (Grade level/type of student)	Design/ Methodology	Manipulated Variables	Measured Variables	Control Group	Results
Ezell & Kohler, 1992	23 / 3 rd equally distributed	Non-Experimental Quantitative	Peer instructed instruction of QAR	Ability to ask and answer questions	No	Students increased in abilities to ask and answer questions.
Graham & Wong, 1993	45 5 th average and poor readers 45 6 th	True Experiment Quantitative	Experimental: didactic QAR instruction Experimental: QAR self-instruction Control: no QAR instruction	Ability to answer questions	Yes	Self-Instruction was more effective than didactic instruction.
Ezell, Hunsicker, & Quinquel, 1997	48 / 4 th	Non-Experimental Quantitative	Peer assisted vs. teacher-assisted instruction of QAR	Maintenance of ability to ask and answer questions over time	No	Both groups equally increased performance on reading comprehension.
Highfield 2003	900 / 4 th	Non-Experimental Mixed	Conceptually driven (QAR) approach vs. practice test approach to instruction	Influence of instructional approaches on students and teachers; student attitudes and strategy use	No	Both groups performed equally on answering questions. Conceptual (QAR) approach required less instructional time, yielded better attitudes toward testing, and students were able to identify more comprehension strategies during reading.

Authors	Sample (Grade level/type of student)	Design/ Methodology	Manipulated Variables	Measured Variables	Control Group	Results
Kinniburgh & Prew, 2010	69 / k-2 nd mixed ability	Non-Experimental Mixed-Methods	Modified QAR instruction for younger age groups	Ability to answer questions; teacher attitudes	No	Quantitative: Increase in comprehension across all grade levels. Qualitative: Teachers had a positive attitude toward the strategy.
McMahon, 2010	16 / 2 nd	Non-Experimental Quantitative	Direct instruction of QAR	Ability to answer questions	No	Only 2 of 16 students increased performance. Serious validity threats regarding pre and post tests. Pretest read aloud to students, posttest not; RT questions included in pre but not posttest

Students' Ability to Maintain and Transfer QAR Knowledge

The QAR strategy has also been examined for its ability to be transferred to various texts and maintained over time. In this section of the review, four studies that were concentrated on the maintenance and transfer of QAR knowledge are discussed.

Ouzts (2005) utilized picture books and the QAR taxonomy in order to explicitly teach master's level reading educators to foster critical thinking in their classrooms. Participants in this case study included 12 current teachers who were either seeking a master's degree in reading education or pursuing certification in elementary education. QAR was used with a picture book as a medium for teaching the participants to develop and answer questions. It was posited in this study that providing explicit instruction in questioning skills would also develop critical thinking skills. Ouzts (1995) purported that the purpose of teaching students about the relationship between questions and answers was to develop critical thinking skills. Questionnaires completed by the participants revealed that teachers were able to successfully integrate the strategy in their classrooms. Feedback from the group confirmed that the QAR strategy was easily transferred to teachers' classrooms and that students' question-answering behaviors were challenged and improved. Teachers claimed that the strategy kept students on track when responding to questions, encouraged them to refer to the text when responding, and provided a guide in teaching students to respond to questions.

Cortese (2003) proposed the value of applying the QAR taxonomy to pictures. Her proposal was based on a body of research in the field of visual literacy. Research

from the field of visual literacy showed that pictures allowed students to engage in higher level comprehension skills that were difficult to understand from print and that it was cognitively easier to interpret a picture versus print (Croll, Idol-Maestas, & Pearson, 1986; Paris & Paris, 2001; Yussen & Ozcan, 1996). By utilizing pictures in the classroom, teachers may be able to teach students skills that are vital to reading comprehension. This could be a critical tool for teaching low-ability students to use the QAR taxonomy, because pictures offer a familiar context that is non-threatening and unfettered by difficult text (Kossack & Bader, 1980). According to Cortese, in addition to reducing the burden of text, pictures offer students a more perceptible approach to answering questions. Cortese also observed that Picture-QAR (P-QAR) followed the same format as Raphael's taxonomy. Under the explicit category, "in the book," answers to "Right There" P-QARs are drawn from a single location on a page. Answers to "putting it together" questions must be brought from various places and may require the student to view several pages or images. Under the implicit category of "in your head," answers to "author and you" or "artist and you" questions may be found by combining what is represented in the picture and what can be inferred or based on prior knowledge of the reader. "On My Own" questions may be answered without the use of the picture or text and rely entirely on the reader's own base of knowledge.

Brabant (2009) examined how QAR affected students' ability to comprehend text in a mixed methods study involving three third-grade non-proficient students, Abby, Jack, and Mario. Abby had an extreme love for learning but went through a period of excessive absences in the second grade causing her to have inefficiencies in the areas of

vocabulary, spelling, decoding words, and reading comprehension. Mario was a hard-working ELL student (level 3) who needed frequent breaks and was easily distracted. Jack was very strong in mathematics but struggled with fluency (53.5 words per minute) and the inability to focus and grasp concepts understood by his peers. The 20-day intervention consisted of a process of direct explicit instruction, modeling, guided instruction, and independent application. Students in this study also generated questions using the QAR taxonomy. Text included short science and social studies passages of student interest. Students were taught to categorize questions according to the taxonomy and determine the appropriate steps needed to answer the question. They were also required to utilize metacognition in describing what led them to take the steps they determined were needed to answer a question.

Results of Brabant's (2009) research showed quantitative improvements for two of the three students, and the third showed improvement through qualitative results. Abby demonstrated extreme difficulty in categorizing and answering questions, a possible explanation for her lack of an increase or decrease in comprehension scores. Mario and Jack both increased in their ability to answer comprehension questions after reading. Qualitative data showed gains in Abby's self-assurance, pride, and ability to make deeper connections to the text, the latter a quality demonstrated by each participant. The teacher, who was also the researcher, reported that the students utilized the strategy in multiple subjects throughout the day, even when QAR use was not prompted. The teacher also reported that the class, as a whole, experienced tremendous improvements in their ability to "think critically and use metacognition to improve their understanding"

(Brabant, 2009, p. 46) of text. Students in the class were more engaged and willing to participate in conversations about text. The teacher suggests that future studies allow students to choose their own text and develop their own language for the QAR categories.

Ezell et al. (1996) trained 34 fourth-grade students to answer questions based on the QAR strategy. Their purposes of this 15-month study were twofold. First, the researchers wanted to measure the students' ability to maintain their question-answering skills over time. Second, they aimed to determine if the strategy assisted students in answering questions about expository text to the same extent as narrative based questions. A control group was not included in this study because their purpose was not to determine the effectiveness of the QAR strategy itself. Instead, the researchers sought to determine the maintenance of the strategy over time.

Instruction was conducted for students in the fourth grade over a span of 36 weeks (three sessions per week, 40 minutes per session, 133 total sessions for both groups combined). Instruction included baseline sessions, instruction on the various question types, peer-assisted sessions, and independent probes. Once students were in the fifth grade, they entered the follow-up phase. This phase included 32 sessions over a 16-week period.

Students' performance was measured independently during each phase of intervention. Throughout the study, the researchers found that too much time was spent and that the "on your own" questions seemed to interfere with the students' focus on the other types of questions. Therefore, the final eight independent sessions focused only on the other three QAR categories.

Ezell et al. (1996) found that (a) QAR training improved student ability to accurately answer comprehension questions; (b) students could maintain answering abilities on text explicit question types, but less success was experienced with text implicit types; and (c) students were able to transfer the strategy from character-based passages to fact-focused passages. Performance on the four different types of questions varied. Students' answering ability improved the most in the text explicit categories, with inconsistencies falling in the "author and you" category. Students did not improve in the "on your own" category of questions. This was due to the amount of background knowledge needed to answer this type of question as well as the lack of training during the maintenance phase of the study.

Results from Ezell et al.'s (1996) study were consistent with other studies of the same type. The finding that students were more successful in answering text explicit types of questions was supported by the work of other researchers (Guszak, 1967; Hare & Pulliam, 1979; Wixson, 1984) who found that students were exposed to more text explicit than text implicit questions and questions that required prior knowledge. These findings indicated that students were more familiar with text-based questions and may have entered the study with some knowledge of how to answer them. In addition, results from this study revealed that training students in QAR did not improve their ability to answer "On My Own" questions. This finding was aligned with the results of Raphael and Wonnocott's (1985) study which showed that QAR training was more beneficial in answering text-based than knowledge-based questions. It was also supported by Raphael and Pearson (1985) who found that QAR training, when implemented with lower-ability

students, did not assist in answering knowledge-based questions. Based on the findings of these studies, it appears that QAR is most beneficial in teaching students to answer text explicit types of questions.

Two of the four studies reviewed in this section favored the use of pictures to teach the QAR strategy and transfer the knowledge to text. Cortese (2003) focused on using pictures to teach students, and Ouzts (2005) utilized a picture book to teach teachers to foster critical thinking in their classrooms. Both authors encouraged direct instruction, and both were successful in the instruction of the strategy. The other two studies in this category were reviewed because of their focus on maintaining the strategy once it had been taught and the ability to transfer the strategy to other types of text and content areas. Ezell et al. (1996) showed that students can successfully transfer knowledge from narrative to expository text and that the knowledge could be maintained over time. Brabant (2009) expressed that her students continued to utilize the strategy without being prompted in other subject areas.

Table 4 contains a chronological listing of key research studies by author focused on students' ability to maintain and transfer knowledge. Included are the sample of students involved in the various studies, the design, variables, use of control group, and results of the research.

Table 4

Chronological Review of Literature by Authors: Transfer and Maintenance

Authors	Sample (Grade level/type of student)	Design/ Methodology	Manipulated Variables	Measured Variables	Control Group	Results
Ezell, Hunsicker, & Quinque, 1996	34 / 4 th	Non-Experimental Quantitative	Time	Ability to maintain question answering skills over time; transference of skill from narrative to expository text	No	Students maintained strategy use over time. The strategy can be transferred from narrative to expository text.
Cortese, 2003	Low ability students suggested	None-practitioner based	Use of pictures to teach QAR			This article is based on a practitioner's point of view and does not involve a research study.
Ouzts, 2005	12 current teachers seeking masters in Reading or elementary certification	Non-Experimental	Explicit instruction of QAR taxonomy	Ability of teachers to implement QAR in their classrooms	No	Teachers were successful in implementing the strategy in their own classrooms.
Brabant, 2009	3 / 3 rd	Non-Experimental Mixed Methods	Direct instruction of QAR	Ability to answer questions; transference of skill to other subject areas; student confidence and comprehension skills (connections)	No	Quantitative: Two of three increased comprehension scores. Qualitative: Increase in self-assurance and willingness to participate in activities. Students transferred the strategy to other subjects.

QAR Use in the Content Areas

The final category of QAR instruction lies in its utility in the content area classroom. In this section, five articles are discussed that focused on utilizing the strategy in mathematics, science, and social studies classrooms.

McIntosh and Draper (1995) extended the use of QARs to middle and high school mathematics classrooms. The purpose of this article was to close the gap that exists between reading and math teachers and to give reading coaches a better understanding of how to navigate through QAR using a mathematics textbook. The authors used the standard four categories of questions and gave examples to make the idea more concrete to mathematics curriculum. A “Right There” QAR is one where the answer is found in one sentence in the text, usually with the same wording as the question. A mathematics example is: “State the slide model for addition” (McIntosh & Draper, 1995, p. 121). A “Think and Search” QAR requires the reader to locate the answer in several places in the text. An example of this question type occurs in mathematics when the question is similar to an example from the text but the numbers are different, therefore requiring students to plug in new numbers and figure out how to solve. An example of this is: “Simplify $-2 + y + -9$ ” (McIntosh & Draper, 1995, p. 121). An “Author and Me” question is defined as one whose answer is not found directly in the text or one that does not have a matching example to which readers can refer. The author gives some information in the text, but readers must use knowledge that they already have (which may come from previous chapters) in order to figure out the answer. An example is “Write an addition expression suggested by each situation: 1) A person withdraws d

dollars, deposits c dollars, and deposits b dollars” (McIntosh & Draper, 1995, p. 123).

“On My Own” questions are rare in mathematics but are still in existence. This question type does not utilize the text at all. Readers should be able to answer these questions on their own. An example is

Negative numbers appear on television in many situations. What real situation might each number represent?

- a. -5.32 in the stock market averages
- b. -9 in rocket launches
- c. -3 in golf” (McIntosh & Draper, 1995, p. 123).

McIntosh and Draper (1995) understood that teachers need strategies that can be integrated with their current content instruction. Teachers are overwhelmed with content and typically do not have time for an “add-on” strategy. The authors employed the model of fading instruction (Pearson & Gallagher, 1983) throughout instruction. Each QAR category was taught separately and followed the same sequence: Step 1 consisted of a grabber and introduction of the QAR label and definition. Step 2 included an example of text from the mathematics book with the question, its answer, and an explanation of the relationship. Step 3 consisted of guided practice in using the textbook in order to find the relationship between the question and its answer. Step 4 included teacher-guided practice in identifying the relationship between a question and its answer. Step 5 required students to complete learning logs. The project also included several whole-class games and activities that reinforced the strategy and allowed students to enjoy their classroom experience. Learning logs that were completed by the students after the final QAR was taught revealed what students had learned in their instruction. Students reported that the strategy helped them “recognize the level of work required and have a better sense of the

time and effort required” (McIntosh & Draper, 1995, p. 128) when answering questions, resulting in more proficient study habits.

Kinniburgh and Shaw (2009) proposed that the push for standardized testing in the areas of reading and mathematics have put other content areas at a disadvantage. In an effort to allow more time for instruction in tested areas, other content areas have lost instructional time, hindering student performance in areas such as science. The researchers posited that students could benefit in reading and science by employing reading comprehension strategies such as QAR in science instruction. QAR instruction requires teachers to develop questions in advance and assists them in creating higher order thinking questions when using the “Think and Search,” “Author and You,” and “On My Own” (Kinniburgh & Shaw, 2009, p. 21). Kinniburgh and Shaw used QAR in an elementary classroom, applying it in a lesson suggested for grades three through six. The lesson was taught to the whole-class as a read-aloud. The teacher read a non-fiction text about storms to the class and asked questions before, during and after the reading. She used sentence strips for her questions and asked the students which category to place the strips under throughout the lesson. After the whole-class reading, the students completed a QAR worksheet on which students were again required to categorize questions. Kinniburgh and Shaw recommended a follow-up lesson during which students searched the Internet or other source for another text on a more specific storm, writing questions from each category. This final activity was to be used as an assessment of the lesson. An extension of this assessment would allow for students to trade and answer one another’s questions. The authors viewed this strategy as valuable to students because

they would spend less time searching through their textbooks for answers to questions that could and should be answered using their background knowledge. This would permit students to embrace the notion that not all answers are found directly in the text, and they could become more confident in their own reading ability and in answering questions. Raphael (1982) summarized: “It is as important for students to be able to justify their responses, on the basis of the text and their own background knowledge, as it is for them to give the “right answer” (p. 189).

Mesmer and Hutchins (2002) taught fifth-grade students to utilize the QAR strategy when answering questions about charts and graphs in science class. The teacher in this classroom found that her students could explain a detailed scientific process but could not accurately answer a multiple-choice question about it. She began teaching the strategy by using it with expository text and multiple-choice questions. During this time, she realized that her students could not explain how they arrived at an answer. This was followed by her realization that her students had increasing problems interpreting graphics. Answering questions that pertain to graphics can be a complex process that requires students to read and understand the question as well as interpret information within the graphic. The teacher found five major problems that students encountered when answering questions about graphics: (a) their perception of graphics, (b) their inattention to the details of graphics, (c) irrelevant data, (d) inattention to the questions, and (e) lack of use of prior knowledge. Her students failed to realize the complexity of the information given in a graphic and treated many questions as if they should be “Right There.” They failed to pay close attention to elements, e.g., units, labels, captions. Her

students assumed that everything in the table (graphic) pertained to every question. They treated “on your own” questions as “Right There.” Also, students were not reading the question carefully prior to searching for its answer, and they were not using their prior knowledge to answer questions. They failed to understand that sometimes questions require readers to use information that they already have in order to answer a question from a graphic.

The teacher used a three-step process for instruction: (a) identifying the types of graphics, (b) understanding the relationships within a graphic, and (c) using QARs with questions and graphics. Students were struggling in differentiating charts, graphs, tables, and figures. Thus, the teacher started by instructing students on the differences in the graphics (tables, charts, bar graphs, line graphs, and pictures), leading them in games and activities for several days to help solidify their understanding. Next, the teacher progressed to teaching about the relationships among the data in the graphics. Graphics typically require students to think abstractly and make inferences, a type of thinking that can be difficult for students. The teacher focused on each type of graphic for two days during this phase of instruction, allowing students to work in pairs. At the conclusion of this step, students had an understanding about properties of graphics such as “tables communicate data in specific numbers. . . line graphs are used to communicate trends and the relationship between two variables” (Mesmer & Hutchins, 2002, p. 25). This knowledge assisted students in the next phase, learning about different types of questions. By the time students reached this phase of instruction, they had a full understanding of the various types of graphics and the relationships that each represented. This final step

had four phases, which varied among whole group, small group, guided, and independent practice using the strategy with graphics. Students were encouraged to read the question, refer to the graphic, and reread the question. This was due to the initial finding that students would often get lost in the graphic, not understanding what the question was actually asking. The teacher was forced to teach explicitly about the types of graphics and the strategy. The framework assisted the students in becoming more metacognitive when answering questions and in carefully analyzing questions before attempting to answer them.

Okebukola and Owolabi (2007) used the QAR strategy with 11th-grade students at four high-achieving schools. To truly learn about science, students must relate the concepts to their knowledge and their world. Otherwise, science is simply a group of abstract facts that mean little to learners. The purpose of Okebukola and Owolabi's study was to examine the effects of QAR on students' understanding of science concepts. Participants included 251 randomly selected 11th-grade students, 138 males and 113 females. The experimental group received four weeks of instruction during which the QAR strategy was implemented, and the control group received the standard lecture method of instruction.

Participants in the treatment group received an introduction to the two broad categories of questions followed by three segments of science instruction utilizing the strategy. The researchers emphasized the use of students' prior knowledge in understanding and answering questions about science concepts. The control group was taught the same three segments of concepts in the form of lecture without the strategy.

Following instruction, students in both groups participated in a series of seven experiments and activities to enrich their understanding of energy. The experimental group (mean = 67) outperformed the control group (mean = 31.7), indicating that the QAR strategy may improve students' conceptual understanding in science. Results of this study were aligned with Raphael & Au's (2005b) theory that the strategy may improve students' achievement in science. Integrating QAR into science curricula may assist in (a) providing more in depth instruction and (b) closing the gap that exists between intended and achieved science education (Okebukola & Owolabi, 2007, p. 177).

Benito et al. (1993) examined the effect of QAR instruction within social studies curriculum. Participants included 20 fourth graders, 8 fifth graders, and one third grader. Participants were selected for the study based on reading ability, then divided into control (n = 14 fourth graders) and experimental groups (n = 15 mixed grade levels). Instructional materials came from an adopted social studies text that included 203 follow-up questions. Textbook questions were analyzed to determine QAR levels. Of the questions, 25% were labeled "Right There", 42% were labeled "Think and Search", and 33% were labeled "Author and Me". There were no "On My Own" questions.

The researchers created one pre- and one posttest packet from the social studies text, each with three passages and 12 follow-up questions. The social studies content packets were used to measure the metacognitive treatment. The Stanford Diagnostic Reading Test was used to measure reading comprehension. Pre-tests were administered on days one (social studies content) and two (Stanford) of the study. Pre-testing was followed with 18 days of instruction. The control group received standard basal reading

instruction of the social studies content. The experimental group learned QAR through the use of social studies content. Experimental group instruction included additional metacognition instruction and followed the gradual release model. Posttests were administered over two consecutive days. Analysis of pretest scores revealed that prior to treatment the two groups were equal in ability to answer social studies questions after reading. Analysis of posttest data revealed that the QAR/metacognitive treatment group outperformed the basal instruction group on answering social studies questions after reading.

Data were further analyzed to determine the effectiveness of the two treatments on the individual QAR categories. Both groups experienced only a slight increase in answering “Right There” questions. In the “Think and Search” category, the control group remained the same. However, the experimental group increased their scores by 25%. Analysis of the “Author and You” category revealed the most interesting finding. Students in the control group outperformed the experimental group on the pretest in this category, but posttest data indicated a drop in the performance of the control group and an increase in that of the experimental group. Analysis of the Stanford Reading Test results indicated a significant drop in the control group’s reading comprehension scores and no change for the experimental group. Results from Benito et al. (1993) suggest that QAR instruction is an effective instructional method not only for teaching comprehension but also for teaching students about social studies content and answering social studies based questions.

The researchers in this section of this review agreed that QAR has great potential in mathematics, science, and social studies classrooms. By including content area teachers in the quest for increasing student comprehension, students and teachers make gains. For teachers, the strategy forces them to explicitly teach their own content, and they improve their ability to answer questions about the content. The QAR strategy is useful to students by ending the relentless quest for “where to find an answer” and assists them in taking a systematic approach to locating information to successfully answer the question at hand.

Table 5 contains a chronological listing of key research studies by author focused on the use of QAR in the content areas. Included are the sample of students involved in the study, the design, variables, use of control group, and results of the research.

Table 5

Chronological Review of Literature by Authors: Content Areas

Authors	Sample (Grade level/type of student)	Design/ Methodology	Manipulated Variables	Measured Variables	Control Group	Results
Benito, Foley, Lewis, & Prescott, 1993	20 / 4 th 8 / 5 th 1 / 3 rd	Quasi- Experimental Quantitative	Experimental: QAR instruction within social studies content and metacognitive treatment Control: standard basal reading instruction of social studies content (no QAR)	Ability to answer questions of social studies content after reading	Yes	Experimental group increased in comprehension and knowledge of social studies content.
McIntosh & Draper, 1995	Middle and High School suggested	None- practitioner based	QAR in Math instruction			This article is based on a practitioner's point of view and does not involve a research study.
Mesmer & Hutchins, 2003	5 th	Non- Experimental Qualitative	QAR instruction for reading charts and graphs	Ability to explain where to locate answers	No	Students became more metacognitive when answering questions and carefully analyzing questions before answering.
Okebukola & Owolabi, 2007	251 / 11 th 138 males; 113 females	True Experiment Quantitative	Experimental: QAR instruction Control: no QAR instruction	Conceptual understanding of science	Yes	Treatment groups increased conceptual understanding of science.
Kinniburgh & Shaw, 2009	Elementary grades 3 6	Non- Experimental Quantitative	QAR instruction within science lesson	Student ability to answer science content questions	No	Students understood where to locate answers to comprehension questions.

QAR Use in Examining Standardized Reading Tests

Wang (2006) conducted a study that did not fit into the previously reviewed categories but is worth noting. Wang examined reading comprehension questions in the Nelson-Denny Reading Test, an assessment used to place college remedial college students into classes. Wang explained that standardized tests mirror the current theoretical lens, meaning that as the constructivist view comes into play, answering questions relies more on prior knowledge than in previous years. Wang utilized Pearson and Johnson's (1978) original taxonomy that included three types of questions, but he created subcategories within the larger categories. A total of 55 developmental students with an average of ninth-grade reading levels participated in the study. The class was scored as a whole rather than by individual student. To do this, the researcher totaled the number of students who correctly answered each question, rather than examining the ability of individual students.

Questions were subcategorized in text explicit, text implicit, and script implicit categories. For vocabulary questions, questions were coded as TI if a context clue was provided, and questions were considered as a test of both comprehension and knowledge of vocabulary. Answers to vocabulary questions independent of the text were labeled SI. Due to a gap in accurately answering text explicit questions, they were also further coded based on syntactic structure. Syntactic structure of the answers within the passages was categorized as simple, compound, and complex. Text implicit questions were categorized depending on the type of connection required between the question and answer. Two categories included paraphrase questions and questions of contextual understanding.

Paraphrase questions required the reader to “translate the explicit expression of the text into an underlying message expressed in a different surface structure of the answer” (Wang, 2006, p. 26). Contextual understanding questions required the reader to “make sense of an unfamiliar word or phrase or to determine the contextual meaning of a familiar word or phrase with the help of the contextual clue” (Wang, p. 26). Since these questions focused on text-based construction of meaning, Wang stated that the “challenge rests more on understanding what is being asked than on finding the answer” (p. 27). Script implicit questions required the reader to use prior knowledge to process text.

Four types of prior knowledge emerged from this study: general, topic, text structure, and author’s purpose. Overall, Wang found that students had the most difficulty with implicit question types. Only 41% of students correctly answered TI questions which was indicative of weaknesses in basic and sophisticated language skills (vocabulary and paraphrasing). Only 45% of students were successful in answering SI questions, which could be interpreted as a weakness in prior knowledge and critical reading. A total of 78% of students correctly answered TE questions, implying that students had the capability to locate and recall details from text. The most interesting finding from this study was Wang’s observation that the QAR taxonomy may be insufficient in guiding instruction, and subcategories may be needed to guide instruction. Results from this study highlighted the need for explicit instruction of comprehension strategies for students to be successful in answering comprehension questions. Use of the QAR strategies in guiding comprehension instruction may be beneficial to the extended need for guiding instruction.

Although there has been a significant amount of research utilizing the QAR taxonomy, the research has several notable gaps. Only one of the 22 studies presented in this review of literature was conducted in a high school classroom, and only four studies included eighth-grade students. Also, only six of the 22 studies that were reviewed were conducted within scientific research parameters that included a control group.

Summary

With the United States in such a literacy crisis, it is imperative that educators implement strategies that are supported by research and can assist students in comprehension and raise scores on standardized tests. Research reviewed in this chapter indicated that educators can improve students' comprehension by taking a research-based approach to instruction. Comprehension is a complex process that requires the reader to master much more than simply reading the words on a page. Students are in need of direct metacognition and comprehension instruction that facilitates the use of strategies. Teachers who choose QAR instruction provide students with a strategy that saves time, yields better test-taking attitudes, and assists with comprehension strategies, metacognition, and question-answering skills.

Based on findings from QAR research, it can be concluded that strategic implementation of the taxonomy can increase students' ability to correctly answer reading comprehension questions. The current study, supported by previous QAR research, utilized the taxonomy in reading curriculum that is taught to low-achieving ninth grade students. Teacher training was provided by the researcher prior to the

beginning of the study. The researcher provided the teacher with instructional materials for the first three days (treatment phase) of instruction. Beyond the treatment phase, the teacher had the liberty to embed the strategy into her curriculum and create appropriate activities. This approach has been supported by Raphael & Wonnacott's (1985) finding that it is not necessary to provide teachers with QAR materials beyond the initial training period. Instruction was focused on the first three categories of questions, "Right There", "Think and Search", and "Author and Me." "On My Own" questions were reviewed when necessary but were excluded from the study due to their base in prior knowledge (Raphael & Pearson, 1985). The exclusion of the "On My Own" category was supported by the finding that QAR is most beneficial in teaching students to answer text-explicit questions (Ezell et al., 1996; Raphael & Pearson, 1985; Raphael & Wonnacott, 1985). Additionally, Ezell et al. (1996) found that instruction of "On My Own" questions was time consuming because of the need for the development of prior knowledge and can distract students when trying to focus on the other categories. An analysis of state standardized reading tests by Raphael et al. (2006) revealed that very few questions came from the "On My Own" category. A review of Florida's state test revealed no questions in the category.

Participants in this study were incoming ninth-grade students who were struggling academically. Students who are struggling academically typically have poor attitudes toward testing and a low tolerance for instruction of reading and testing. Research conducted by Highfield (2003) supports QAR instruction with this group of students. She found that instruction of the taxonomy improved students' attitudes toward testing.

Using this group of students as participants was additionally supported by the findings of Raphael and McKinney (1983) and Ezell and Kohler (1992) who found that QAR was most effective for students of average and low ability.

The treatment phase of the current study lasted four extended days, a period of time that has been supported by Raphael (1981) and Raphael and Pearson (1985). They found that four days of initial instruction was sufficient for sixth- and eighth-grade low and average achieving students, respectively. Highfield's 2003 finding that the strategy was effective with only 18 to 22 total hours of instruction further confirmed the appropriateness of the planned treatment phase. Direct instruction that includes small group and individual practice with the strategy was supported by Graham & Wong (1993) and Ezell et al. (1997). This study mirrored instruction from these two studies by providing instruction that included peer assisted activities and very little didactic instruction.

The effects of QAR instruction were measured using a released version of Florida's state standardized reading test. The short-term goal of QAR instruction is to see improvements in reading comprehension as measured by a standardized reading test. QAR's effectiveness has been found to increase scores on standardized reading tests (Ezell & Kohler, 1992, Highfield, 2003). However, the long-term goal of all comprehension instruction is to transfer the use of the tool to content area texts. Effective instruction of the QAR taxonomy can be maintained over a period of one year (Ezell et al., 1996, 1997). In addition, effective instruction gives students the ability to transfer use of the strategy from character-based to fact-focused text (Ezell et al., 1996) as well as

to other content area text (Brabant, 2009; Raphael & Pearson, 1985). An additional effect of QAR lies in the potentially increased self-efficacy of the student. Brabant provided qualitative data that suggests that QAR improves students' self-assurance, pride, and the ability to make deeper connections to the text.

The United States is in need of literacy strategies that can be implemented at a young age and maintained and transferred to other text. Kinniburgh and Prew (2010) found that kindergarten-age students can utilize QAR and that teachers supported laying the foundation of questions at a young age. Results from this literature review support the notion that the QAR taxonomy is an effective strategy that should be implemented from Kindergarten through Grade 12.

CHAPTER 3 METHODOLOGY

Introduction

The methods and procedures that were used to conduct the study are contained in this chapter. Included is a restatement of the purpose, a description of the population, the methods used to select participants, and the research question used to guide the study. A report of the pilot study is also provided. The instrumentation, which was used in collecting the data, is described along with the validity and reliability of instruments used. Procedures including type of instruction, surveys, pre- and post- measures, and grouping of students will be reviewed. Lastly, the quantitative data analysis methods will be discussed.

Purpose of the Study

The purpose of this study was to examine the effect of direct instruction of the Question-Answer Relationships (QAR) taxonomy, when embedded within summer school, on the ability of ninth-grade struggling students to answer reading comprehension questions after reading.

Pilot Study: Questioning as Thinking (QaT)

Instrumental in the development of the research design for this study was a pilot study conducted in the Summer of 2011. Materials related to the pilot study are contained in Appendix A. Several of the criteria for the current study were based on

results from the pilot study. The purpose of the pilot study was to determine the effectiveness of the QAR strategy when taught in Seminole County Public Schools' middle to high school summer transition program using the QaT strategies. Although the pilot study was not conducted to directly examine the effect of QAR instruction, it did focus on its effect under the QaT umbrella. Under the QaT umbrella, students learn to be metacognitive through think-alouds, Question-Answer Relationships, and self-questioning.

Pilot Study Methodology

The quantitative quasi-experimental study took place in two classrooms, one control (n = 21) and one experimental (n = 23), of incoming ninth-grade students who were struggling academically. This study took place in the students' summer Reading class. All class periods were approximately 75 minutes in length.

Students in both groups completed a pre- and posttest that included assessment of their ability to ask and answer questions about text. Both groups also received approximately four weeks of instruction under the Questioning as Thinking (QaT) umbrella, with the exception of the absence of QAR instruction in the control group.

Instruction about the QAR taxonomy served as the independent variable in this pilot study. This variable was manipulated in the study by allowing only the experimental group to receive the instruction. Dependent variables included student ability to answer comprehension questions and to ask text interactive questions.

During posttesting, five students from each group were randomly selected to perform silent think-alouds. This was completed as an extension of the self-questioning posttest. Students who were selected for this additional task used the same passage as students who were participating in the self-questions task. However, this subgroup was asked to note whether or not the questions they had written during reading had been answered in the text. The template for the think-alouds can be found in Appendix A.

Pilot Study Participants

Participants included a convenience sample of 44 rising ninth-grade students who were struggling academically. In order to be placed into the ninth grade, these students were required to complete the county's summer transition program.

Pilot Study Instruments

The researcher used two ninth-grade passages from FCAT 2.0 for pre- and posttest measures. The researcher worked with another expert in the field in order to balance the pre- and posttests according to categories of Question-Answer Relationships.

Pilot Study Data Analysis

When analyzing students' ability to answer comprehension questions, the researcher was careful to note the varying levels of difficulty of the questions. Questions labeled "Right There" were assigned a value of 1 point. Questions labeled "Think and Search" and "Author and Me" were assigned a value of 2 points. "On My Own"

questions were not included in the comprehension questions but were assigned a point value of zero on the self-questioning assessment.

To analyze students' ability to ask questions, the researcher and expert performed a blind review of student responses to determine the types of questions that students asked during reading for the pre- and posttests. Point totals were awarded per student for each measure (self-questioning and question-answering) using the point system described above, and a repeated measures analysis was performed based on the total derived from correct responses.

Discussion of Pilot Study Results

Findings of the pilot study indicated that the instruction of QAR within the QaT framework did not have an effect on overall comprehension, self-questioning, or students' ability to interact with text. Although self-questioning improved in both groups, there was no indication that QAR was the reason for the increase. The researcher determined that there may have been three possible reasons for this occurrence.

First, the pre- and post-comprehension passages that were used in this evaluation were too difficult for the students. The FCAT 2.0 passage was at a ninth-grade reading level. Though the students in this study were transitioning into the ninth grade, they typically are not tested at their grade level until the end of the school year. Also, the participants were enrolled in a remedial program and were likely not reading at even an eighth-grade level. It would have been beneficial to acquire the reading levels of the

students prior to the study and to choose a passage closer to the average reading level of the group. These data were not, however, available.

Second, the short term of summer school did not provide enough time to properly train remedial students on three metacognitive strategies and to adhere to an already existing curriculum. For the pilot group, it would seem appropriate to continue these strategies throughout the school year.

Third, the Questioning as Thinking (QaT) framework is one that requires training and practice with multiple texts over time for effective teaching and student ownership of strategy. The teacher in this study had previous experience with the three QaT strategies individually. Because, however, QaT was a recently developed transactional strategy (Wilson, 2009), this study offered the teacher her first opportunity for a run of the three as one transactional strategy. In addition, the researcher's observations revealed that the teacher was a novice in true metacognition instruction. Her think-alouds were very procedural, and she had difficulty linking the three strategies together. The main reasons for her difficulties were the short time span of summer school coupled with the varying levels of students with whom she was working. The teacher in this study believed that the strategy could be effective with struggling high school readers, but she believed that she would need more time to work with students individually.

Think-aloud data were available as a posttest only. Findings from the think-aloud posttest did not mirror findings from the self-questioning posttest. In the researcher's opinion, the sample of participants selected for the think-aloud posttest posed serious validity threats. A potential reason for this was a reaction to the experimental situation in

which a group of unmotivated students responded negatively to the instruction. The original low statistical power of the think-aloud test ($n = 5$, $N = 10$) combined with self-selection attrition resulted in non-significance and extremely low power of the think-aloud posttest. Because the number of participants for the think-aloud was much lower than the number of participants in either the pre- and post- self-questioning tests, the think-aloud results were likely not valid.

Findings from this pilot study indicated that four weeks was not an ample time period to teach the QaT strategies. It was recommended that teachers who wish to utilize this umbrella of strategies set aside a time span of closer to 12 weeks for initial instruction. Students would benefit from QaT as a year-long implementation. QaT is an in-depth way to teach students to think while reading. It is imperative that (a) the teacher be metacognitive and have a full understanding of metacognition instruction prior to implementation and (b) the proper amount of time is allotted for implementation of all three strategies.

Based on the results of the pilot study, the following modifications were recommended in the design of the current study. First, the researcher planned a one day training during which she would work with the teacher to implement the strategy within the existing summer curriculum. Participants received four weeks of instruction on QAR, but student think-alouds and self-questioning were not included. Reducing the number of strategies allowed the teacher and students to focus on one strategy over a four-week period instead of feeling the burden and confusion of implementing three strategies in such a short period of time. The reading level of pre- and posttest passages was lowered

to that expected of eighth graders. This decision was based, in part, on pre- and posttest results of the QaT pilot study but also as a result of reviewing lexile and FCAT scores of previous transition students which became available after the completion of the pilot study.

The purpose of the pilot study was to determine the effect of QAR, when taught under the QaT umbrella, on students' ability to interact with text by asking and answering questions. The current study utilized the same summer curriculum and population. However, the QaT umbrella was narrowed to QAR instruction only. The purpose of the current study was also narrowed to the students' ability to accurately answer comprehension questions.

Participants

Students

This study focused on incoming ninth graders who were struggling academically at a high school in central Florida. Students in this population were identified by school administrators, parents, and teachers as performing below to on-grade level in academic areas, including reading.

The researcher used a convenience sample of participants. The participants in this study were chosen because of their placement in a central Florida school district's high school summer program for incoming ninth-grade, low-performing students. Two demographically similar high schools joined at one location for the summer program.

The population of High School I was approximately 2,300 students, with 33% minority and 18% economically disadvantaged (Florida Department of Education, 2011b). The population of High School II was approximately 2,200 students, with 27% minority and 24% economically disadvantaged (Florida Department of Education, 2011b). Both high schools received a school grade of an “A” for the 2010-2011 school year and were located within the same city limits, approximately 10 miles apart. They came together for the transition program on High School I’s campus.

Students in the summer program were rising ninth-grade students, incoming freshmen who either did not have the required grades or a satisfactory attendance record to make them eligible for promotion to high school. There may have been a few students in the program who were not struggling academically, but most were targeted because they were reading below grade level according to the state assessment (FCAT).

The transition program ran for a total of six weeks and included two summer sessions, and students were required to complete both sessions in order to receive full credit upon completion. The transition program at the participating high school included three classes: English, Reading, and Mathematics. The program was intended to prepare students for the start of high school, with the focus of the English/Reading class on study skills, summer English assignments, and specific reading skills. Students spent approximately two hours (110 minutes) in each of the three classes four days per week. All students enrolled in the summer transition program were initially included in the study. Summer school policy states that a student may not miss more than one day of

summer school. Students who discontinued their summer school attendance prior to its end date or enrolled after the pre-test was administered were excluded from the study.

The 32 participants in the study included 17 males and 15 females randomly placed in an experimental group and a control group, each with 16 students. The experimental group included seven females and nine males; the control group included eight females and eight males.

Because student ability scores were not available at the beginning of summer school, it was not possible to separate students by ability levels. Pre-test scores were examined utilizing a t-test and verified that the reading level of the participants in both groups was equivalent, $t(30) = .70, p > .05$. Reading ability across students may become a confounding variable in this study.

The Teacher

A single reading teacher, who came from School II, was appointed to teach the summer school class and participate in the study. As a very experienced teacher who held a reading endorsement and had 17 years of experience in the classroom, she was assigned to teach both the control and experimental classes. Her experience included 10 years of teaching, nine of which were devoted to credit retrieval (dropout prevention). She had also devoted one year to teaching a reading course she had developed based on her credit retrieval program. Her classroom teaching experience was followed by seven years as a high school literacy coach. She had generally taught summer school to

maintain her classroom skills and to make connections with students prior to the beginning of the school year.

A second teacher, an Exceptional Student Education (ESE) facilitator was also available to assist all teachers in the English, Reading, and Mathematics classrooms when needed. The role of the facilitator in the summer program was to make contact with students, provide a testing center if needed, and be sure that students were keeping up with their schoolwork. Occasionally the facilitator was asked to provide additional instruction to students in English and Mathematics. Her services as an instructor were not, however, used in the two Reading classes.

Teachers were hired from both schools for the program. All transition teachers were required to work both sessions (totaling six weeks) of summer school. This policy provided fluidity from Session I to Session II for this fragile group of students.

Research Design

An experimental design was selected for this quantitative research study because of the random assignment of students. Students were pre-enrolled in the program and divided randomly into groups by an administrator. The design involved a control group and an experimental group that received all treatments.

Previous research supports a short term of treatment for the age of students in this study. Four days of QAR instruction can be effective for low level eighth grade students (Raphael, 1981; Raphael & Pearson, 1985) and 18 to 22 total hours of instruction can be effective for fourth-grade students (Highfield, 2003). Historical research suggests that

the inclusion of a maintenance phase is not necessary for student success with the strategy (Raphael, 1981; Raphael & Pearson, 1985). The decision to include three weeks of maintenance activities was based on the population's need for a lengthy exposure to the strategy as well as to give the teacher time to provide further instruction to those who were struggling after initial instruction.

The experimental group received one week of direct instruction of the Question-Answer Relationships taxonomy followed by three weeks of maintenance activities, in addition to strategies already placed within the current summer curriculum. The summer curriculum strategies included annotation, connections, vocabulary, main idea, and author's point of view and purpose. The control group was not introduced to the QAR taxonomy but received instruction in the strategies in the current summer curriculum and completed the same practice passages as the experimental group throughout the study.

Prior to instruction in the QAR taxonomy and beginning the summer session, students completed a pretest to assess their abilities to answer comprehension questions about text. Following treatment and maintenance phase instruction, students in both groups participated in a posttest to re-assess their abilities to answer comprehensions questions about text on a standardized test.

Four passages from the 2005 Grade 8 FCAT released test were selected for pre- and posttest measures. Passages were selected based on length, interest level, number of questions, and QAR categories of questions. Students were presented with one social studies passage on the pre- and posttests that was approximately two pages in length and included a diagram or text box. The second passage for pre- and posttests did not match

in subject matter but were both non-fiction and matched in interest level and length. Both passages were approximately two pages in length, and the pre-test passage included a map of Africa that was not referred to in the comprehension questions. Pre- and posttest comprehension questions were balanced in regard to the QAR taxonomy.

Research Question

To what extent does direct instruction of the Question-Answer Relationships (QAR) taxonomy, when embedded within summer school, effect the ability of struggling ninth-grade students' ability to accurately answer comprehension questions after reading?

Instrumentation

Experimental and control group students completed pre- and posttest instruments to assess their ability to accurately answer comprehension questions after reading. The pretest instrument was utilized prior to the instruction of the QAR strategy. The posttest was utilized following four weeks of instruction that included a one-week treatment phase followed by a three-week maintenance phase of content-focused instruction of Question-Answer Relationships (QAR) in the Reading classes. The purpose of the treatment phase was to provide direct instruction on the QAR taxonomy and target students who might struggle with the concept. Materials utilized during the treatment phase were not part of the summer curriculum and were provided by the researcher (Appendix B). Treatment phase materials include QAR-specific training materials (Raphael & Au, 2002) to help develop initial understanding of the taxonomy. After the

one-week treatment, the teacher implemented the strategy into the summer curriculum (maintenance phase). The researcher provided a script (Appendix C) for the teacher to ensure that instructions for the pre- and posttests were uniform. Students were instructed to read two FCAT passages and answer comprehension questions that were created for the passages. Pre- and posttests were both administered over a two-day period during the first week of summer school. This was due to the lack of reading stamina typically displayed by students in this type of program. Both experimental and control groups received the same passage for pre- and posttest measures.

The researcher used four non-fiction passages and questions from the released practice test for the Florida Comprehensive Assessment Test (FCAT) Grade 8. The Grade 8 test was used because of the low reading ability of the students in the program. This test was available to the public on the Florida Department of Education website and was, therefore, an appropriate text selection for the classroom in terms of content. Pretest passage titles were *The Wreck of the E.S. Newman* and *Cry of the Kalahari*. Posttest passage titles were *Shackleton's Epic Voyage* and *Do Nice Guys Finish Last?* Permission to use the passages and questions was granted by the Florida Department of Education (Appendix D).

Raphael's (1986) Question-Answer Relationships (QAR) taxonomy was used in assessing question categories on the pre- and posttests. All passages and questions were blind reviewed by the researcher and another expert in reading education. When reviewing questions, the researcher and expert agreed on all questions except those that assessed ability to use context clues to define a word. One of the reviewers was of the

opinion that since the context clues were directly in the passage the questions should be treated as “Right There.” The other reviewer believed that context clues required the reader to make an inference and believed this question type belonged in the “Author and Me” category. After deliberation, the reviewers agreed that context clue questions did not fit the “Right There” category because the wording of the question was not the same as the answer. They also agreed that the inference required was not of the same level as an “Author and Me” question that required the reader to utilize prior knowledge. It was decided that vocabulary questions should be placed in their own category for the purpose of balancing the passages.

After the removal of four questions, pre- and posttest passages were balanced in question types. One “Think and Search” question and one “Author and Me” question were removed from “Do Nice Guys Finish Last?” The reason for the removals was to avoid an uneven number of these question types between pre- and posttests. In addition, there were two questions in “Cry of the Kalahari” that assessed student knowledge of literary devices. These two questions were removed from the test for two reasons: (a) no other passages included this type of information, making it difficult to balance the question type; and (b) literary device instruction is not provided in the summer curriculum.

Pre- and posttest passages were also reviewed and selected based on their length and genre. *Shackleton’s Epic Voyage* and *The Wreck of the E.S. Newman* are both approximately two pages in length, have social studies content, and are narrative non-fiction. Because of their similarities in content and question types, one was used for the

pretest and one for the posttest. *Do Nice Guys Finish Last?* and *Cry of the Kalahari* share the similarity of a higher interest level than the two social studies passages. *Do Nice Guys Finish Last?* is a biography of a baseball player and *Cry of the Kalahari* is an autobiographical description of two scientists who live with and study Kalahari lions. Table 6 displays the number of questions proposed for the four passages in pre- and posttests by QAR category.

Table 6

Pre- and Posttest Questions by Question-Answer Relationships (QAR) Category

QAR Category	Pretest Passages		Posttest Passages		Total per Category	
	<i>The Wreck of the E.S. Newman</i>	<i>Cry of the Kalahari</i>	<i>Shackleton's Epic Voyage</i>	<i>Do Nice Guys Finish Last?</i>	Pre-	Post-
Right There	1	1	2	0	2	2
Think and Search	1	1	1	1	2	2
Author and Me	3	3	3	3	6	6
Author and Me Vocabulary	1	0	1	0	1	1

An additional survey instrument (Appendix E) was administered to all participants prior to instruction about the QAR taxonomy. The same survey was then administered to the experimental group as an additional posttest. The purpose of this pre-survey was for the researcher to establish participant background knowledge. This assisted the researcher in determining how students were to be categorized in reporting

the results. The purpose of the post-survey for the experimental group was to assess participant knowledge of the strategy after treatment.

Prior Knowledge Survey as Pretest

Analysis of the pre-survey data for the experimental group indicated that only two participants had heard the terms “QAR” or “Question-Answer Relationships”. Nine students recalled the terminology “In the Book” or “In my Head.” Because of these responses and given that 13 of the 16 students in the experimental group had previously taken an Intensive Reading class, it appeared likely that the students had been introduced to the strategy in prior school years. Although a relatively high number of students had some memory of the strategy, only one student could recall how to find the answer to a “Right There” question, and no students could recall how to answer questions from other categories.

Analysis of the survey data for the control group revealed that this group had more previous knowledge of the strategy than the experimental group. Of the 16 students in the control group, 12 were able to recall the terminology “In the Book” or “In my Head.” Five students were able to explain how to find the answer to a “Right There” question, and four students were able to explain how to find the answer to an “On My Own” question. No students could identify how to answer a question from the “Think and Search” or “Author and Me” category. This suggests that participants in the control group had likely been introduced to the strategy in prior school years. In addition, more students in the control group retained working knowledge of the strategy.

A Pearson product-moment correlation coefficient was computed in order to determine if prior knowledge of QAR was correlated with pre-test scores. First, the number of correct answers on the prior knowledge survey was totaled for each student. Next, the number of correct answers per student were totaled, giving the “Right There” questions one point and the “Think and Search” and “Author and Me” two points each. In order to make the scales equivalent, the values were then calculated as percentages and entered into SPSS. There was no correlation between students’ prior knowledge and pre-test score in either group. For the control group $r = -.083$, $n = 16$, $p = .760$. For the experimental group $r = -.448$, $n = 16$, $p = .082$.

Post Knowledge Survey

In an effort to further evaluate student knowledge of the strategy, the researcher asked experimental participants to retake the prior knowledge survey as an additional posttest. The survey was administered after the completion of the posttest. Participants received 1 point for each correct response. Questions 3 through 6 were calculated using only the second part of the question. This was due to a lack of response to the first part of the question, making it difficult to analyze the data. Questions 1 and 2 were not analyzed in the results of the post-survey, because they did not function in determining student understanding of the strategy.

Reliability and Validity

Reliability of the 2005 Grade 8 FCAT has been reported using Cronbach's Alpha and item response theory (IRT) marginal reliabilities. The eighth-grade reading FCAT (2005) had a classic reliability coefficient of .88 according to Cronbach's alpha and a .91, according to item response theory. Because these scores measure a test's ability to provide consistent measurement of a student's knowledge, it has been confirmed that the FCAT is a "highly reliable test for assessing the educational achievement of Florida students" (Florida Department of Education, 2005, p. 38).

Criterion-related validity was correlated between FCAT's criterion-referenced portion and norm-referenced portion (Stanford 9) of the test. A validity coefficient of .82 (Florida Department of Education, 2007) was reported for the 2005 test. This means that the FCAT "demonstrates concurrent validity with the Stanford 9 test." (Florida Department of Education, 2007, p. 41). However, the validity coefficients have not indicated that the tests provide exactly the same information.

According to the Florida Department of Education (2007), FCAT "assesses the content of the [Sunshine State] Standards and is developed using credible and trustworthy methods, therefore the content validity of the test is substantiated" (p. 40). In terms of construct-related validity, the state performed convergent and discriminate analyses and claimed that the 2005 reading FCAT has "substantial convergent validity" (p. 41). Exact values for construct-related validity could not be located.

Approval to Conduct the Study

Processes required by the University of Central Florida's Institutional Review Board was completed at appropriate points in time prior to beginning the research. Because the researcher chose to implement the QAR strategies using a curriculum that was already in place, this study was granted exempt status in regard to parental consent. The researcher submitted an application, a consent form (although not needed), a Human Research Protocol form, and spoke personally with Institutional Review Board (IRB) personnel as needed in order to secure required approval (Appendix F).

Approval from Seminole County Public School District was also needed. In order to obtain approval, the researcher provided the county's research office with Institutional Review Board (IRB) approval, proof of a literature review, the methodology that would be used in conducting the study, and a copy of the QAR handout that would be used for instruction (Appendix G). The Seminole County Public School District sent a letter of approval approximately three weeks after submission (Appendix H).

Procedures

Students in this program are typically introduced, through the regular curriculum, to a variety of text and genres, including fiction and non-fiction, and both were used to teach the strategies. The summer curriculum was revised in 2010 to include annotation, QAR, connections, main idea, and author's point of view and purpose.

Training for the transition summer teacher and ESE facilitator was planned by the researcher prior to the start of summer school. Initially, the researcher planned to meet

with the teachers during their planning periods prior to the start of summer school to gauge their knowledge of QAR and introduce the study protocols. She then planned a one day training that would assist the teachers in implementing the strategy during the treatment and maintenance phases of the study. The training sessions for the ESE facilitator were not feasible due to her late hire for summer school. The one day training was altered for the reading teacher due to her in-depth knowledge of the QAR strategy and the direct instruction model.

Several criteria were taken into account when deciding to reduce the amount of time allocated to teacher training. Most importantly teachers may be considered experts after three to five years of experience in a specific field with corrective feedback (Palmer, Stough, Burdenski, & Gonzalez, 2005). The teacher in this study was considered an expert because she had 17 years of Reading experience, which included 10 years of teaching reading and seven years as a reading coach. Reading coaches receive corrective feedback from teachers, administrators, and also from the results of standardized testing. Other evidence of teacher expertise was also considered. First, the teacher was able to recite the skills that students would learn through the instruction of each individual category of question. In addition, she was able to explain the model of direct instruction and how she planned to use it throughout instruction of QAR and the summer curriculum. These conversations between the teacher and researcher revealed the teacher's in-depth knowledge of direct instruction and QAR. Second, the teacher was able to explain the benefits of learning the strategy, in regard to test-taking skills and its ability to guide comprehension instruction, to the researcher prior to the start of the study. Third, the

teacher had several years of classroom experience in teaching the strategy. Fourth, the researcher and reading teacher had previously worked together to train other teachers in the implementation of the strategy and provide direct instruction in the school district's reading curriculum. Because of these prior experiences, the researcher believed that the initial meetings to train the teacher on QAR and direct instruction were unnecessary and would have provoked a negative attitude on the part of the participating Reading teacher. The researcher decided that a shorter period of training would be sufficient to orient the teacher to the project. The researcher provided the teacher with a copy of the planned QAR curriculum (Appendix B) to review at her leisure which would be discussed on the revised day of training.

In lieu of the one-day strategy training, the researcher met with the participating teacher and ESE facilitator for approximately one hour during a pre-plan day for summer school. The purpose of the one hour training was to review the study protocols and materials to be used during the treatment phase. After reviewing the curriculum (on her own), the teacher conveyed that she understood the experimental and control group procedures and that the model of direct instruction was one that she routinely followed. She also expressed that what she had planned for the regular curriculum during summer school meshed well with the required study protocols during the maintenance phase. She explained that she typically used the direct instruction model to introduce new strategies and to scaffold reading for struggling readers. During summer school, she planned to read a novel and indicated that she could easily adapt her typical line of questions to the language of the QAR taxonomy.

The one hour training session was held at a pre-plan meeting and allowed the researcher to meet with the teacher and the ESE facilitator to finalize plans and to ensure that the treatment for students was well-practiced and consistent with the direct instruction model. Subsequently, during the treatment phase, the researcher observed the instruction to make certain that the teacher was following the protocols of the study. This helped to ensure that the curriculum students would normally receive in summer school was being followed and that the added dimension of the study enhanced rather than disrupted existing curriculum.

Treatment Phase

Students in the experimental group participated in the treatment and maintenance phases of this study. Experimental group students received an informational handout explaining the QAR taxonomy and daily direct instruction with practice answering questions based on the strategy (see Appendix B). Table 7 contains Duke and Pearson's Five-Phase Model for Direct Instruction which was used in the treatment phase. After the treatment phase, daily direct instruction of QAR was not necessary except for those students who were struggling with the concept.

Throughout the five phases of this model, the teacher and students remained focused on the constant need to orchestrate various comprehension strategies, such as using context clues, making inferences, and summarizing (Duke & Pearson, 2002). When utilizing the QAR taxonomy, students should learn to switch strategies, depending on the type of question they are answering. As good readers read, they use many

strategies constantly. According to Duke and Pearson, throughout the process of teaching a particular strategy, other strategies should be referenced, modeled, and encouraged.

The outcome of this model of instruction presented in Table 7 is a gradual transition from the teacher assuming all responsibility and the students having none to the exact opposite in which students take all responsibility and the teacher has none (Duke & Pearson, 2002). Teachers and students should be engaged in constant and ongoing assessment, monitoring, and self-monitoring the effectiveness of their strategy use.

Table 7

Duke and Pearson's Five-Phase Model for Direct Instruction

	Phase	Teacher/Student Actions	Grouping of Students	Teacher Responsibility (discretion of teacher)
1	Explicit description of strategy	Teacher explains “how, what, and when” to use the strategy	Teacher discretion	100%
2	Modeling	Teacher models the strategy in action.	Teacher discretion	100%
3	Collaborative Use	Teacher and students practice together.	Groups of pairs	40-60%-
4	Guided Practice	Gradual release of responsibility to students. Students attempt the strategy with teacher overseeing its use.	Groups, pair, or independent	20-30%
5	Independent Practice	Students practice strategy independently	Independent	None

The treatment phase encompassed the first week of instruction (four days of summer school). The purpose of the treatment phase was to introduce the students to each category of questions (Ezell et al., 1996) through Duke and Pearson’s (2002) model of instruction and to target students who were having trouble understanding the strategy (Raphael, 1981, 1982, 1986; Raphael & McKinney, 1983; Raphael & Pearson, 1985; Raphael & Wonnacott, 1985). Students learned about the “In the Book” questions on Day 1, followed by the “In my Head” questions on Day 2. The third day was a review of all categories, with a final assessment on day 4. The reading teacher utilized a curriculum (Appendix B) that was provided by the researcher for the first week of summer school with any time remaining allotted for materials from the summer

curriculum. The curriculum during the treatment phase included passages from Raphael & Au's (2002) *Super QAR for Test-Wise Students Grade 7*. It should be noted that initial instruction (treatment phase) of the strategy was at the seventh-grade level. This study utilized text that was lower than grade level for initial instruction so that the struggling ninth-grade students could focus their attention on the strategy rather than on comprehending difficult text (Samuels, 2006). The students who participated in this study were enrolled in the summer program because of low test scores, grades, and/or attendance inconsistencies. Although they had completed Grade 8, they likely had not reached proficiency on the eighth-grade standardized reading test. Initial strategy instruction should utilize text that is readable to the participants. Once students had a grasp of the strategy, the teacher utilized text at the eighth- and ninth-grade levels including the summer curriculum and Raphael & Au's (2002) *Super QAR for Test-Wise Students Grade 8*.

Treatment Phase (Day 1)

The teacher utilized whole group and peer assisted instruction (Ezell et al., 1996), and the ESE facilitator was available, although not needed, for independent instruction. Instruction on Day 1 of the treatment phase included explicit instruction of morphemes (part of the summer curriculum), teacher modeling of her thinking, and direct instruction of the QAR taxonomy. Direct instruction on Day 1 included the first four phases of the direct instruction model: explicit description, teacher modeling, collaborative use, and guided practice.

Throughout the summer school sessions, students learned approximately 10-15 morphemes per week. Morpheme instruction included the mandatory use of note cards, teacher explanation of trigger words for each morpheme, and student practice learning the morphemes. Through the use of morphemes the teacher asked the students to break down the word, metacognition, explained what the word means in terms of reading, and suggested that they would be using it frequently throughout summer school.

On Day 1, the teacher modeled her thinking with a think-aloud using *The Art Lesson*, a picture book by Tomie DePaola. She also modeled her thinking with each read-aloud during QAR instruction and asked students to pause during paired reading to discuss their thinking. The teacher paused to think-aloud when she had questions, had a prediction, a connection, or needed to clarify. QAR instruction included the “In the Book” category of questions.

The teacher followed the curriculum provided by the researcher. Instruction followed the direct instruction model and included the use of the QAR handout, pictures, and seventh-grade text. The teacher also introduced the color coded model for QAR; however, she did not refer to this throughout the maintenance phase. Instruction that involved text also included annotation and highlighting. Students were required to provide evidence by marking the text where they found answers to questions. After each activity the teacher informally assessed students by asking them to hold their fists against their chests and display their understanding by showing zero to five fingers. Prior to reading *Porcupine Necktie*, the teacher discussed what should always be done before reading. The students responded with “Read the title, look at the pictures and passage,

and think about what you already know.” These responses indicated that students had experienced reading strategy instruction in prior classes.

The teacher suggested that students also preview the questions and QAR categories prior to reading. The preview of questions led to a discussion about question stems. The teacher explained that typically a question that begins with “who, what, where, when” is typically a “Right There” question and that “why and how” questions usually require more thinking and typically fall in the “Think and Search” and “Author and Me” categories. Due to time restrictions, the independent practice planned for Day 1 was saved for the next day.

Treatment Phase (Day 2)

Instruction on Day 2 followed the same pattern as day one with the addition of independent practice. Students received five new morphemes and trigger words, the teacher modeled her thinking with each passage, and provided direct instruction of QAR. Day 2’s instruction of QAR began with a review of the “In the Book” question types and the final independent practice that was not completed the previous day. The teacher circulated around the room to assess student progress with the strategy and assisted students who, though they had a QAR handout available for reference, were having trouble completing the independent task. Day 2 focused on the “In my Head” category of questions with practice that included the previous day’s categories. The teacher began by modeling, then transitioned from teacher use of the strategy to student independent practice with the strategy. Additional instruction on Day 2 included a discussion of prior

knowledge prior to reading, annotation of each passage, and the requirement to provide evidence by marking in the text where answers were found or inferred. The independent practice passage, *Sammy Sosa*, was again saved for the next day.

Treatment Phase (Day 3)

Instruction on Day 3 was designed to prepare for the Day 4 final assessment by targeting small groups of students who were having trouble with the strategy. The day began with the independent practice from the previous day, *Sammy Sosa*, which was used solely to guide teacher instruction on Day 3 and not as part of the final data analysis of this study. The independent practice included questions from all four categories of the taxonomy and served as a teacher assessment of understanding prior to moving to the Day 4 assessment and to the maintenance phase. Students were instructed to study their morphemes while the researcher analyzed the students' independent work. Analysis of the *Sammy Sosa* passage (7th-grade level) revealed that though students were able to use the QAR handout as a reference, nine of the 16 students in the experimental group continued to have difficulty with the strategy. Seven of the nine students had trouble with categorizing questions. Five students had trouble answering the questions (two students were also in the group of seven who had trouble categorizing). The students specifically had challenges with the "Think and Search" category of questions. Many students categorized the question correctly but gave a "Right There" answer. Although multiple responses were called for in the text, these students failed to respond appropriately.

The mean percentage of questions answered correctly was 74% at the end of the treatment phase. Because nearly half of the students were not showing proficiency with the strategy, the teacher included the whole class in the final review of the strategy. The final review included an additional review of each question category followed by additional independent practice. During the short independent practice sessions, the teacher circulated among students, providing additional support for those who needed it. Although available, the ESE facilitator was not utilized for instruction during this time.

Treatment Phase (Day 4)

Because the curriculum dictated that the final day of instruction be dedicated to assessment, the final day of the treatment phase did not include instruction (Raphael, 1981; Raphael & Pearson, 1985). The final assessment of the treatment phase included morphemes and categorizing questions. The teacher did not provide a review of the taxonomy but did inform the students that they would be tested on the categories. Students were given time to review independently or with a partner prior to the final assessment, and the teacher was available to answer questions as the students reviewed with one another. Students were not permitted to use their handouts as a reference on the final teacher assessment. The assessment consisted of four questions and included one question from each category that the students were required to categorize as “Right There,” “Think and Search,” “Author and Me,” or “On my Own.” Because the assessment did not include text, the students had to rely on clue words and response requirements in order to categorize the questions. The teacher decided not to include text

in the assessment because she wanted to see if the students understood the categories. She did not want them to focus solely on answering questions correctly.

As there were only four questions on the assessment, a score of 75% or higher was considered passing. The mean number of correct categorizing responses was 2.875 or 72%. Only 5 of the 16 students did not achieve a passing score on the assessment of their ability to categorize questions appropriately. The teacher took note of the students who were still struggling with the strategy so that she could focus on them during the maintenance phase.

The treatment phase utilized the direct instruction model for initial strategy instruction. Next, during the maintenance phase the teacher utilized the model when needed for teaching the summer curriculum strategies.

Maintenance Phase

Students in the experimental group also participated in the maintenance phase of the study which lasted three weeks. Students received content-focused QAR instruction throughout the study in their Reading class, and teachers were asked to keep a daily log of QAR activities (Appendix I). The daily logs were not included as part of the data for this study. They served only to encourage daily use of the strategy and to track instruction through the maintenance phase. The logs were transcribed by the researcher to create a list of maintenance phase activities (Appendix J).

Instruction during the maintenance phase included daily review of the question categories and practice answering questions using the taxonomy. The teacher integrated

QAR instruction into the curriculum for the remainder of the summer session. As suggested by Raphael and Wonnacott (1985), materials for the maintenance phase were not provided by the researcher. These researchers indicated that teachers benefit most from a half-day in-service paired with materials to assist with initial instruction, but they do not need ready-made materials in order to maintain the strategy within their curriculum.

In order to assess student progress throughout the study, the teacher collected one maintenance passage per week (McMahon, 2010). The assessment included three passages from Raphael & Au's (2005) *QAR for Test-Wise Students* and provided passages with questions from each category of the QAR taxonomy. Maintenance passages were only used for periodic assessment by the teacher and were not included in the results of this study. Because of the quick turn-around needed, the researcher graded the maintenance passages for the teacher while students were working on other tasks. The allowed the teacher access to the results almost immediately. The results of the periodic assessments are displayed in Table 8.

When evaluating the maintenance passages, one question from the "On My Own" category was deleted. This question was removed from Passage 1 because questions from this category were not included on the pre- or posttest and because they rely heavily on prior knowledge of the student rather than on comprehension.

In order to more accurately compare the content of the passages, two readability formulas were calculated for each passage. The Flesch-Kincaid readability formula was applied by randomly selecting three 100-word selections from each passage. Each 100-

word selection was entered into Microsoft Word, which automatically calculated a Flesch-Kincaid Readability measurement. The researcher also calculated a Fry Readability on all maintenance passages. The researcher used the same selections that were used for the Flesch-Kincaid test, then counted the syllables and number of sentences in each selection. Finally, the researcher plotted the readabilities using the Fry Readability Graph. The researcher averaged the two readability formulas for each passage to determine a final grade level for each passage.

Table 8

Maintenance Passage Analysis

Passage	Timing	Readability	Average Score	Total Questions	Question Types			Students Struggling with Intervention
					RT	TS	AM	
1	End of week 1	6.9	66%	4	25%	25%	50%	6
2	End of week 2	8.7	74%	8	40%	50%	10%	5
3	End of week 3	6.7	44%	3	0%	100%	0%	7

Note. RT = Right There; TS = Think and Search; AM = Author and Me.

At the end of the first maintenance week, the class was able to accurately answer 66% of questions correctly, and six students who scored less than 70% were struggling to correctly answer questions. At the end of the second maintenance week, the class was

able to accurately answer 74% of questions correctly, and five students were still struggling with the strategy. It should be noted that the passage selected for the second week tied into a theme within the summer curriculum. This is important, because the students had prior knowledge of the topic contained in the passage. The additional prior knowledge may have increased their scores on this passage. The passage selected for the third week had only four questions, one of which was from the “On my Own” category and was removed. As a class, the average correct response was 44%, and the number of struggling students had increased to seven.

In addition to QAR maintenance activities, the teacher was responsible for delivering the program’s summer curriculum (Appendix B). Morpheme instruction occurred daily and included a comprehensive assessment on each Thursday. Students were also introduced to note-taking strategies and annotation when reading curriculum texts. Toward the end of the first maintenance week, the teacher introduced a whole-class novel, *Black Ships Before Troy*. Students practiced all strategies with the novel as well as individual practice passages. Throughout the remainder of summer school, students rotated between independent, paired reading, and teacher read-alouds. They utilized note-taking strategies, morpheme analysis, and practiced using QAR to answer teacher-posed questions.

At the conclusion of the treatment and maintenance phases, students were formally assessed on their ability to use the taxonomy by participating in a two-passage comprehension posttest with questions from each category.

Control Group

Students in the control group received the QAR handout but did not receive QAR instruction until after the posttest had been administered. Control group students received instruction that followed the summer school curriculum which includes instruction in annotation, QAR, connections, vocabulary, main idea, and author's point of view and purpose. Throughout the study, the control group received the exact same instruction and practice as the experimental group, with the exception of the language of the QAR taxonomy.

Control group participants received QAR instruction for three days following the study. Raphael (1983) found that sixth-grade students can be successful with the strategy after only four days of training and eighth-grade students can be successful with the QAR strategy after a brief 10-minute orientation (Raphael & McKinney, 1983). This short term of QAR instruction allowed all students in the study to receive sufficient instruction of the QAR strategy.

Variables

Instruction about the Question-Answer Relationships taxonomy was the independent variable in this study. This variable was manipulated in the study by allowing only the experimental group to receive the instruction. The dependent variable in this study was the students' ability to accurately answer comprehension questions after reading.

Reading levels of the participants presented a confounding variable. Because student ability scores were not available at the beginning of the summer session, it was difficult to predict if both groups would truly be reading at the same level. Reading ability may affect how well students perform in using the strategies being taught. According to Samuels (2006), students who are not able to decode text will spend more time reading the words, and this may hinder their ability to comprehend text throughout the study. In addition, lower level students may not have the prior knowledge or lexical access speed to retrieve prior knowledge that may assist in answering questions that require students' prior knowledge (Samuels, 2006).

Data Analysis

Pre- and posttest data were entered into Excel and then imported into SPSS for analysis. The researcher acknowledged the difference in difficulty levels of questions by allocating one point to correctly answered "Right There" questions and two points to questions in the remaining categories. Pre- and posttest scores were compared between experimental and control groups. These yielded a 2x2 Analysis of Variance (ANOVA), which was used to analyze pre- and posttest scores. This test was conducted to examine if there was a significant difference between posttest scores of the two groups.

In addition to the pre- and posttest, experimental participants were required to retake the prior knowledge survey as a post-survey. The information provided by the post-survey was used to determine the level of understanding of the taxonomy. Data

from the survey were analyzed using a t-test to determine significant differences between student knowledge before and after the study.

Summary

This chapter has provided detail regarding the methods and procedures that were used to conduct the study. Included were a restatement of the purpose, a description of the population, the methods used to select participants, the research question used to guide the study, and a report of the pilot study. The validity and reliability of the instrumentation to be used in the study was explained, and the pre- and posttest assessments were described in detail. Procedures used in conducting the study, including the treatment and maintenance phases for the experimental and control groups, were detailed. Processes by which data were collected and analyzed were also explained.

CHAPTER 4 DATA ANALYSIS

Introduction

The purpose of this study was to examine the effect of the Question-Answer Relationships taxonomy on ninth grade students' ability to accurately answer comprehension questions. After pre-testing, students received four weeks of strategy instruction and practice, and participated in a posttest that evaluated their ability to answer comprehension questions after reading and 8th-grade standardized test passage. Participants also completed an additional knowledge survey. The knowledge survey was given as a pretest to both groups and as a posttest to the experimental group. Data were analyzed to determine significance of the treatment and to determine level of understanding of the strategy.

Research Question

To what extent does direct instruction of the Question-Answer Relationships (QAR) taxonomy, when embedded within summer school, affect struggling ninth-grade students' ability to accurately answer comprehension questions after reading?

Results

Assumptions

All pre- and posttest data were screened for any violations of the assumptions related to the statistical test (Table 9). Box's Test of Equality of Covariance Matrices was not significant, $p = .235$. This test tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups. Mauchly's Test of Sphericity was not significant which means the assumptions of the statistical test were met. Skewness and Kurtosis were within normal range which means that the assumption of normality was met.

Table 9

Skewness and Kurtosis for Comprehension: Pre- and Posttest

Tests	Experimental		Control	
	Pretest	Posttest	Pretest	Posttest
Skewness	-.898	.302	-.690	-.189
Kurtosis	1.380	.610	.171	-.832

Graphic Representations of Comprehension Pre- and Posttest

Pre- and posttest data for the experimental and control group are represented as a boxplot (Figure 1) and a bar graph (Figure 2). The lowest possible score was 0, and the highest possible score was 20.

For the experimental group, pretest scores ranged from 2 to 20 and from 7 to 20 on the posttest. Thus, 50% of the scores fell between 11 and 16 on the pretest and between 10.75 and 15 on the posttest. The median was 13 for both the pretest and posttest.

For the control group, pretest scores ranged from 0 to 18 on the pretest and from 8 to 15 on the posttest. For this group, 50% of the scores fell between 8.75 and 16.25 on the pretest and between 9.75 and 13 on the posttest. The median for the control group was 12 for the pretest and 11.5 for the posttest.

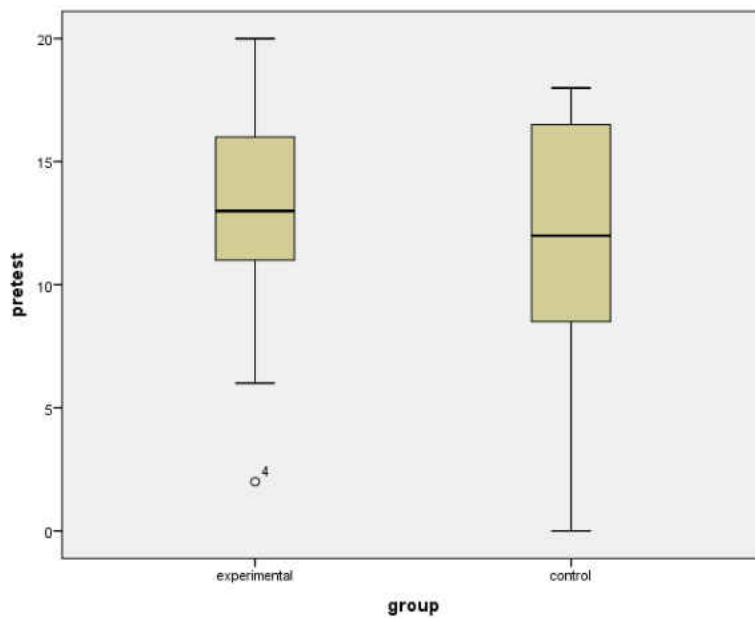


Figure 1. Pretest Scores Represented by a Boxplot

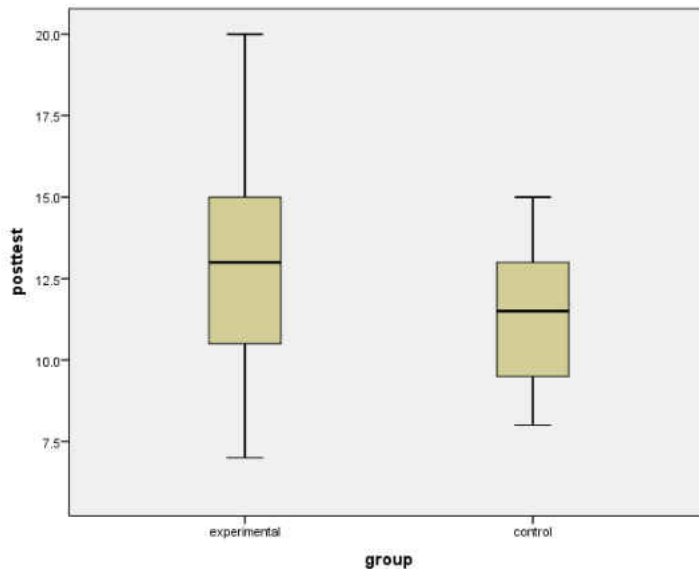


Figure 2. Posttest Scores Represented by a Boxplot

Analysis of Variance

All data were analyzed using IBM SPSS 19 for Windows. A 2 (Pre & Post) x 2 (Experimental & Control) repeated measures ANOVA was run on the data (Table 11). No main effect for time (pre/post) was found. There was no significant difference between pre and post tests for the two groups combined, $F(1,30) = .165$, $p = .687$, $\eta^2 = .005$, observed power = .068. There was no main effect for the group, $F(1,30)$, $p = .227$, $\eta^2 = .048$, power = .222. Although a power of .22 is a small to moderate effect, the low sample size may have contributed to non-significance. No interaction was present, the experimental group was not significantly different than the control group between pre- and posttests, $F(1,30) = .034$, $p = .855$, $\eta^2 = .001$, observed power = .054. The pre and post means and standard deviations for the experimental and control groups are shown in

Table 10 and Figure 3. Because of the small sample size, the statistical power was low (.22). Table 11 displays the results of the analysis to determine within and between subjects effects.

Table 10

Pre and Post Means and Standard Deviations for Experimental and Control Groups

Groups	Mean	Standard Deviation
Experimental		
Pretest	12.94	4.464
Posttest	12.75	3.194
Control		
Pretest	11.75	5.106
Posttest	11.25	2.176
Total	12.00	2.794

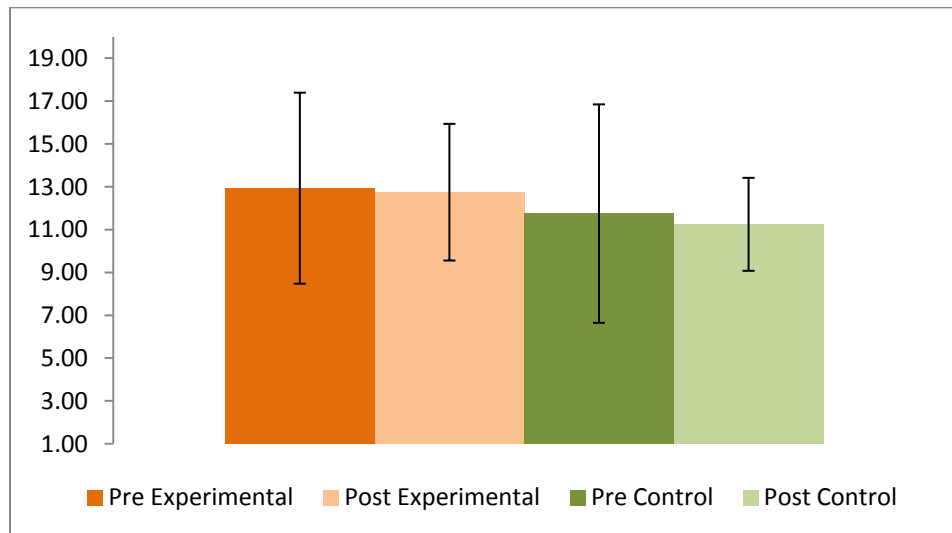


Figure 3. Pre- and Posttest Means and Standard Deviations for Experimental and Control Groups.

Table 11

Tests of Within and Between Subjects Effect

Source	Type II Sum of Squares	df	Mean Square	F	Sig	Partial Eta Squared	Observed Power
<i>Within Subject Effects (Sphericity Assumed)</i>							
Time	1.891	1	1.891	.165	.687	.005	.068
Time and group	.391	1	.391	.034	.855	.001	.054
Error (time)	343.219	30	11.441				
<i>Between Subject Effects</i>							
Group	28.891	1	28.891	1.519	.227	.048	.222
Error	570.791	30	19.024				

Analysis of Pre- and Posttest by Question Type

In order to obtain a better understanding of the results, student pre- and posttests were also evaluated by question type. Pre- and posttests were each balanced with two “Right There”, two “Think and Search”, six “Author and Me”, and one “Author and Me Vocabulary” question. Questions in the “Right There” category were allocated one point each, and questions in all other categories were allocated two points each. There were 16 students in each group. In order to evaluate each group by its performance on each category of question, the number of correct responses was totaled per category for each group, multiplied by 1 (“Right There” questions) or 2 (all other categories). The results of this analysis are displayed in Table 12.

Table 12

Analysis by Question Type

Question Type	<u>Actual Scores</u>				<u>Possible Questions, Points, Percentages</u>		
	Experimental		Control		Question	Points	Percentage
	Pretest	Posttest	Pretest	Posttest			
RT	19	20	16	18	2	32	5%
TS	40	32	38	22	2	64	21%
AM	140	120	118	112	6	192	63%
AMVOC	8	32	16	28	1	32	11%

Note. RT = Right There; TS = Think and Search; AM = Author and Me; AMVOC = Author and Me Vocabulary.

Additional Findings

In order to assess student knowledge of the four categories, a dependent t-test was run on questions 3- 6 of the post knowledge survey. The results of this analysis are contained in Table 13. This test was only computed for the experimental group, pre- and posttest. A significant effect was found, $t = 5.89$, $df = 15$, $p < .000$ for the pre knowledge survey ($M = .06$, $SD = .25$) and the post knowledge survey ($M = 2.31$, $SD = 1.53$). Students were able to answer 37 questions correctly on the posttest, averaging 9.25 per student, whereas on the pretest only one question was answered correctly.

Correlations were also evaluated between the post knowledge survey and the posttest. No significant correlation, $r = .254$, $p = .303$, was found for post knowledge survey and post comprehension when all six questions were included from the survey. In addition, no significant correlation, $r = .275$, $p = .303$ was found when only the last four questions were used in the analysis.

Table 13

Experimental Group Pre and Post Knowledge Survey

Question	Correct Response	Incorrect Response	Number of Correct Responses	
			Pre-	Post-
1. Have you ever heard the term “QAR”, or Question-Answer Relationships?	Yes	No	2	16
2. Have you ever heard the terms “in the book” or “in my head”?	Yes	No	9	16
3. Has a teacher ever taught you what a “right there” question is? If yes, how would you describe where to find an answer to this type of question?	Answer is found in one place in the text or passage.	No response It’s right there.	1	12
4. Has a teacher ever taught you what a “think and search” question is? If yes, how would you describe where to find an answer to this type of question?	Answer is in the text but it is in more than one sentence or paragraph.	No response You have to think about it and search for it.	0	5
5. Has a teacher ever taught you what an “author and me” question is? If yes, how would you describe where to find an answer to this type of question?	Use what the author says and your own prior knowledge. Make an inference based on what the author says.	No response What you and the author have in common.	0	9
6. Has a teacher ever taught you what an “on your own” question is? If yes, how would you describe where to find an answer to this type of question?	Answer using your opinion, prior knowledge, or a connection to the text. Answer is not in the text. You have to use what you already know.	No response You have to answer it by yourself without a partner.	0	11

Conclusion

Results of this study indicated that the QAR treatment did not increase students' ability to accurately answer comprehension questions. Between the pre- and posttests, scores in both groups decreased. In order to further evaluate student learning in the experimental group, students participated in a post-knowledge survey which mirrored the prior knowledge survey administered as a pretest. Survey results indicated that although the experimental group students did not gain a working knowledge of the strategy, they did gain a basic understanding of the taxonomy.

The results of this study lead to some questions about the use of QAR instruction for struggling adolescent readers. The specific needs of the students in this target population may call for additional focus in the planning and delivery of instruction, i.e., a longer time period, direct instruction, appropriate scaffolds, and corrective feedback, to support the QAR strategies. These results are summarized and discussed in Chapter 5. Implications for practice, limitations associated with the research, and recommendations for future study are also presented.

CHAPTER 5 SUMMARY AND DISCUSSION

Introduction

This chapter of the dissertation contains a brief restatement of the problem, a review of the methodology, and a summary and discussion of the results of the study. Implications of the study related to theory and practice are presented, limitations are acknowledged, and recommendations for future research are offered.

Statement of the Problem

In 2007, the Alliance for Excellent Education estimated that as many as eight million middle and high school students were reading below grade level (Heller & Greenleaf, 2007). Increased numbers of at-risk adolescent readers have caused this group to receive a great deal of attention at local and national levels. The number of students at risk for failure increased even further when 21st century literacy habits and skills were calculated. These skills include core subject knowledge, 21st century content, learning and thinking skills, information and communications technology, and life skills (Partnership, 2006).

This study focused on developing students' learning and comprehension skills through the instruction of the QAR taxonomy. In the world of higher-level tasks and accountability, it is imperative that students leave high school as independent thinkers and learners who have the ability to collaborate and solve real-world problems within a community. Unfortunately, 28% of students who took the ACT in 2010 were not

considered college, career, or workforce ready (ACT, 2011). This percentage of students needs either literacy skill intervention and/or practice in test-taking skills. Instruction of the QAR taxonomy can address this astounding low percentage of students by simultaneously assisting students with comprehension and question-answering skills.

Review of the Methodology

The purpose of this experiment was to examine the effect of direct instruction of the Question-Answer Relationships (QAR) taxonomy, when embedded within summer school, on ninth-grade struggling students' ability to accurately answer comprehension questions after reading. Participants included 32 students who were struggling academically, thus were required to complete summer school in order to be promoted to ninth grade. In this experiment, students were randomly assigned to experimental (n=16) and control groups (n=16).

All participants completed a pre- and posttest of their ability to accurately answer comprehension questions. Pre- and posttesting that assessed ability to accurately answer questions included four passages from a released version of FCAT, the state's standardized test (Florida Department of Education, 2005). Questions on the pre- and posttest were balanced using the QAR taxonomy. Posttesting for both groups occurred after four weeks of strategy instruction and practice.

A second instrument, the prior knowledge survey, was used in order to assess student knowledge of the strategy. All participants completed the survey as a pretest. At

the end of the study, although not initially planned, students in the experimental group only repeated the prior knowledge survey in order to assess gains in knowledge.

Instruction of the two groups was identical, with the exception of the direct instruction of the QAR taxonomy in the experimental group. Experimental group instruction included one week (4 days) of initial strategy instruction which included materials provided by the researcher (treatment phase). Following the treatment phase, participants completed three weeks (11 days) of maintenance activities that required the teacher to embed the strategy into her summer lesson plans. Each week, students in the experimental group participated in a progress monitor that included one passage and a set of questions from the QAR taxonomy.

The curriculum that was already in place in the summer program included instruction of annotation, making connections, vocabulary, main idea, and author's point of view and purpose. It should be noted that although the curriculum included instruction of many strategies, the teacher in this study spent most of her time focusing on morphemes, practice reading, and answering questions. A variety of texts were utilized in the classroom, including the novel, *Black Ships Before Troy*, and various fiction and non-fiction passages. Classroom reading was varied between independent reading, paired reading, and teacher read-alouds.

Summary of the Results

This study utilized 32 academically struggling students who had not reached the criteria for promotion to ninth grade due to poor grades, attendance, or standardized test

scores. Students' ability to accurately answer comprehension questions was measured using excerpts from the state's standardized reading test (FCAT). Pre- and posttest scores were analyzed using an ANOVA which indicated that (a) direct instruction of the Question-Answer Relationships taxonomy was not effective in increasing student ability to accurately answer comprehension questions after reading and that (b) the scores of the two groups decreased between pre- and posttest measures.

Pre- and posttests were further analyzed according to question categories. In the experimental group the ability to answer "Right There" questions increased by one point. When answering "Think and Search" and "Author and Me" questions, scores decreased by eight and 20 points, respectively. The only significant increase came from the "Author and Me Vocabulary" questions which increased by 24 points.

In the control group, the ability to answer "Right There" questions increased by two points. When answering "Think and Search" and "Author and Me" questions, students decreased by 16 and six points, respectively. Students in this group also increased their ability to answer "Author and Me Vocabulary" questions by 12 points.

In order to further assess students' knowledge of the strategy, the researcher asked experimental participants to complete the prior knowledge survey as an additional posttest. Pre and post surveys were analyzed using a t-test, which indicated that the students gained a basic understanding of the strategy ($t = 5.89$, $df = 15$, $p < .000$).

The researcher sought to identify correlations between student achievement on the prior knowledge survey and pre/posttests. No correlation was found between students' prior knowledge and the comprehension pretest for either group. For the control group, r

= -.083, $n = 16$, $p = .760$. For the experimental group, $r = -.448$, $n = 16$, $p = .082$.

Additionally, no significant correlation was found between the post knowledge survey and the post comprehension test, $r = .275$, $p = .303$.

Discussion and Interpretation of the Findings

Although this study did not produce the increase in performance that previous researchers found, there are valuable implications in the results. Interpretations of the results are provided for the prior knowledge survey, pre- and posttests of comprehension, and the post knowledge survey. Special attention is devoted to the population of students represented by this study.

Pre- and Posttest Passages

Pre- and post comprehension scores decreased in both groups. There are several factors that may have contributed to this. Factors that may have contributed to the results of this study are (a) length of exposure to the strategy, (b) instruction, (c) reading ability of the participants, and (d) student motivation.

Length of Study

The length of strategy exposure may have been too short to increase students' ability to accurately answer comprehension questions. As suggested by the Carnegie Council on Advancing Adolescent Literacy (2010), students in the United States are in need of strategy instruction throughout their K-12 educational experience. This need was

increased for the population represented by this study, who require more exposure, support, and feedback. This population was in need of strategic reading instruction that embraced their individual abilities and disabilities. In addition, they are likely to need specific strategy instruction across all disciplines. Although previous researchers have indicated success with QAR instruction presented in only four days, this special group of students may need more exposure to the strategy as well as additional decoding, vocabulary, and comprehension instruction.

Metacognition is not a skill that can be acquired from four weeks of instruction. Though the length of this study allowed for students to become comfortable with categorizing questions into the taxonomy, they needed more time in order to learn to strategically answer questions. Previous researchers (Raphael, 1981; Raphael & McKinney, 1983) found that the strategy could yield increased ability to answer questions after four days of treatment. This study extended exposure to the strategy by three weeks, an amount of time that was still insufficient for the study participants.

Instruction

The teacher in this study was an expert teacher of reading skills. She followed the direct instruction model throughout the treatment phase and successfully embedded the strategy into her curriculum (Appendix J). Throughout the study, the teacher and researcher communicated about students who were struggling. Struggling students were identified through the maintenance passages. Although the direct instruction model was followed, the teacher decided not to use small group instruction or the ESE facilitator as a

resource for struggling students. The teacher felt that the use of small group instruction with this particular group of students would have led to class disruptions. Classroom management was imperative in both groups for the students to maintain focus. Instead of utilizing small groups and the ESE facilitator, the teacher felt she could assist students individually as she circulated around the room during QAR activities. Small group instruction has many benefits to instruction, including increased instructional time, easier student management, and more opportunity for corrective feedback and teacher modeling (Polloway, Cronin, & Patton, 1986). The implementation of small group instruction and the use of the facilitator may have assisted students in learning to utilize the taxonomy to answer questions by addressing individual needs (Ezell, 1996; Raphael & Wonnacott, 1985).

There are two scaffolds to QAR instruction that may have assisted the students in learning the strategy: the color-coded model (Hollas, 2008) for QAR instruction and Picture QARs (P-QAR) (Cortese, 2003). The color-coded model is a visual model that assigns a color and description to each category of question. In this model, “Right There” questions are coded green because green is for “go.” “Right There” questions allow the reader to go right to the answer in the text. Yellow is for “Think and Search” questions, because this color typically means slow down and take caution. A yellow question typically requires the reader to slow down and look in more than one place in the text. Red is for “Author and Me” because this type of question requires the reader to stop and read differently. Blue is for “On My Own” questions because they can imagine staring at a blue sky and thinking--there is nothing to read.

Though this model was introduced to students on the first day of the treatment; the teacher preferred to utilize methods more familiar to her. After initial instruction, the QAR color-coded model was not mentioned for the remainder of the study period. This visual model, if continued throughout the study, may have assisted ESE students in understanding the categories.

Another model for teaching QAR that may have been helpful in this study is Picture QARs (P-QAR). Picture QARs were introduced by Cortese (2003) who recommended their use with lower ability readers as a method of learning the strategy without the confusion of text. Participants in this study's population may have benefited from this version of the strategy by removing the matter of text level used to teach the strategy.

The summer curriculum required the teacher to teach morphemes. Morpheme instruction occurred daily, and approximately 15-20 new morphemes were introduced each week. Students were required to create flash cards using trigger words and definitions, then participated in activities and had time to study with a partner and independently. The pre- and posttest each consisted of one vocabulary question. Scores for both groups increased on the posttest in this small vocabulary section. In the experimental group, only four students correctly answered the vocabulary question correctly on the pretest, whereas on the posttest all 16 students correctly answered the question. In the control group, only eight students correctly answered the vocabulary question correctly on the pretest, whereas 14 students answered it correctly on the posttest. This is important when discussing the results because the increase in the

vocabulary section could be attributed to the heavy amount of morpheme instruction rather than on student use of the strategy itself.

Reading Ability

The pre- and posttests consisted of excerpts from the state standardized reading test for eighth graders. Students in the experimental group answered an average of 65% of the questions correctly on the pretest. The pretest was administered during a period of increased motivation in this group and was likely to be closer to a true gauge of student ability. Increased motivation may have been caused by the students' excitement about their first day of high school, increasing their willingness to participate in the pretest. There are several inferences that can be derived from this performance.

First, it can be inferred that the text was too difficult for the participants' reading ability, an inference that can be made from the average test score. Students who are enrolled in the summer program struggle with attendance, grades, and standardized test scores. Although students had just completed the eighth-grade FCAT, their pretest scores from an eighth-grade version of the test reflected that their ability was not on grade level.

Second, the participants lacked prior knowledge or the ability to access their prior knowledge for the content of the passages. Prior knowledge is recognized as a major factor in reading comprehension. Students perform better when prior knowledge is already in their schema and stimulated prior to reading. This was demonstrated in this study during the second maintenance week. The maintenance passage during Week Two was of the highest reading level; however, students performed the best on this passage.

Increased performance on this passage was likely due to the instructional theme of that week which provided and stimulated students' prior knowledge. Instruction during the second maintenance week included several articles, discussion, and written responses to questions about heroes. The teacher selected the maintenance passage, "Heroes," because it aligned with her theme. This means that students' schema had been built and activated for several days prior to answering questions from the maintenance passage.

Third, the tests were heavily weighted with "Author and Me" questions, a category of questions that relies heavily on prior knowledge and inferences. Typically, students of low reading ability do not possess the skills needed to effectively answer questions from the "Author and Me" category (Raphael, 1981; Raphael & Pearson, 1982; Raphael et al., 1980; Wang, 2006).

Motivation

Previous researchers have investigated low ability readers' cognitive and motivational factors and found that students with low reading abilities often have low intrinsic motivation for reading (Lau & Chan, 2003; Morgan & Fuchs, 2007). Students who struggle with decoding often becoming frustrated with the reading task. Because their motivation for completing the task is low, they do not push to complete the task (Logan et al., 2011). Motivation and endurance should be considered factors in this population's inability to achieve. Motivation at the beginning of the study seemed to be quite a bit higher than towards the end of the study. This was due to the fact that the pretest was administered during the students' first week of high school, a time when the

students were fresh and eager to perform. Towards the end of the study, students' motivation decreased as they prepared for the end of summer school and the beginning of their own summer vacations. Several students completed the posttest within a few minutes. Although the lack of motivation was witnessed by the teacher and researcher, they chose not to interfere with the integrity of the study and allowed students to turn in their work. In addition, several students also asked the teacher if they were required to highlight and underline the text. When the teacher responded that there were no requirements, most students did not use these strategies.

All students benefit from motivational support from their teachers, but this particular group, because of their lack of success, needs even more support. In this case the teacher could perhaps have made a difference in the posttest results by improving students' motivation. Had students been reminded about the importance of the strategies in their repertoire and encouraged to do their best, they may have chosen to exercise more care in completing the posttest.

Prior Knowledge Survey

As indicated in the prior knowledge survey, 28 of the 32 students in this study reported that they had previously taken Intensive Reading. This means that the participants had received previous literacy instruction, likely for recurring years. Also noted from the prior knowledge survey, nine students reported that they had heard the terms "In the Book" or "In My Head." However, none of the students could explain how to find the answer to any of the four categories of questions. This suggests that the

students had previously been taught the strategy but had no working knowledge of it. This finding suggests that the population represented in this study needs a longer and more in-depth exposure to the strategy. When selecting strategies, teachers should plan on utilizing the strategy throughout the school year, practicing its use with a variety of texts. It would benefit students for strategies to be used across disciplines, possibly selected through grade level Professional Learning Communities within schools.

Post Knowledge Survey

In the experimental group, the prior knowledge survey was repeated at the end of the study in order to gauge students' understanding of the "basics" of the strategy. The post knowledge survey had mixed results. Although there was a significant increase in student responses, there were also many students who did not perform well on the survey.

Students who increased their survey scores may have gained declarative knowledge of the strategy but not procedural or conditional knowledge. The pre survey suggested that, overall; students could not recall the strategy. When only analyzing questions 3-6, students were able to answer 37 questions correctly on the posttest, averaging 9.25 per student, whereas on the pretest only one question was answered correctly. This means that students were able to explain where to find answers but could not apply the strategy to the posttest, either because of the difficulty of the passage, lack of motivation, or a need for more time with the strategy. This strategy requires time to internalize in order to move beyond memorizing the definitions of each category. With this strategy, students learn to become thoughtful and purposeful when answering

questions. It is possible that the students in this study had time to gain declarative knowledge of the strategy but did not have enough time to gain procedural or conditional knowledge of its use.

Although there was a significant increase in student responses, it was surprising that after four weeks of strategy instruction and practice, some students still could not explain the four categories of questions. Of the 16 experimental participants, four were unable to explain how to find the answer to a “Right There” question, 11 were unable to explain a “Think and Search” question, seven were unable to explain the “Author and Me” question, and five were unable to explain how to answer an “On My Own” question. It should also be noted that though the students in this group did attempt to answer the questions, they were unable to accurately do so. This result may be explained by the lack of small group instruction and use of the ESE facilitator. It is possible that the four students who did not even gain declarative knowledge of the strategy were exceptional education students and needed an alternate learning method. Scaffolds such as the color-coded visual model or P-QARs may have assisted these students in understanding the taxonomy.

The lack of the ability of some students to correctly respond to the post knowledge survey may help explain the drop in scores on the comprehension posttest. After four weeks of daily instruction and reminders of the taxonomy, it can be inferred that students who could not respond were either (a) not motivated to respond, or (b) in need of further scaffolded support and practice with the strategy.

The post knowledge survey and the posttest were examined to see if there was any correlation between the results of the two. The lack of correlation between the survey and the posttest indicated that although students could define the taxonomy, they were still unable to perform on the comprehension posttest. This finding again demonstrated a need for further instruction and practice with the strategy. Students who were able to define the taxonomy but were unable to utilize it when answering questions likely gained only declarative knowledge of the strategy and could not transfer their knowledge to the specific task of answering questions on the posttest.

Connection of the Current Study to its Theoretical Framework

This research was supported by four educational theories: (a) schema, (b) automatic information processing, (c) metacognition, and (d) direct instruction. Each theory was reflected in the results of this study.

The schema theory (Anderson, 2006) suggested that prior knowledge is systematically stored in the brain. Prior knowledge that is stored as schemata is used by the reader to construct meaning from text. In this study, prior knowledge came into play in two ways. First, the participants in the study were struggling readers who likely did not have a well-developed schema for comprehension strategies or for the actual content of the passages. This means that the students' comprehension struggle could be explained by the fact that they were working with an underdeveloped prior knowledge base when constructing meaning from text. This also indicated that although the majority of the participants reported that they were enrolled in previous reading courses, very few

had a developed schema for the QAR strategy. Many had heard of the terms but could not explain them. This means that the development of their schema for the strategy needs to continue beyond this study. The host school for this study stresses QAR in ninth grade Reading classes. The instruction of QAR in summer school assisted these students by initiating the construction of schema for the strategy.

Second, a majority of the questions on the pre- and posttest came from the “Author and Me” category of questions, which require prior knowledge and inferencing skills to accurately answer them. Previous researchers have also found difficulty in improving students’ ability to answer this type of question (Ezell, 1996; Guszak, 1967; Hare & Pulliam, 1979; Wixson, 1984; Raphael & Wonnacott, 1985; Raphael & Pearson, 1985) because of the high demands that “Author and Me” questions place on the reader that other types of questions do not. The “Author and Me” category of questions requires the reader to stop and think differently than the “In the Book” category of questions. “Author and Me” questions require the reader to interpret, or infer, what the author is saying, sometimes after synthesizing the information from multiple places in the text. These skills are learned after years of practice with skilled teachers who offer scaffolds and practice with a variety of texts.

Samuels (2006) would have agreed that the automatic information processing theory was displayed in this study. First, the automatic information theory suggests that if a student is performing two tasks simultaneously, one of the tasks is being accomplished automatically, that is without the need for specific attention to the task. Although the text level during the treatment phase was reduced to accommodate this

theory, some students may have needed a further reduction of text level. The participants in this study were not reading at their own grade level. Ideally, the instruction of QAR is designed to assist with comprehension; however, the additional task of learning something new in addition to dealing with difficult text means that the students had to choose a task to focus their attention. For example, if a student is learning how to scan the text for information, through the use of a “Right There” question, but the text is too difficult to comprehend, the student will still be unable to answer the question and will then be confused about the strategy. This situation would only become more confounded as the difficulty of the question increases and requires the student to synthesize and make inferences based on the difficult text. If, in fact, students were reading below a 7th-grade reading level during initial strategy instruction, they may have had to focus their attention on comprehending the text rather than on comprehending the strategy.

The second part of the automatic information processing theory is the “speed of lexical access.” This is the speed at which readers can retrieve information from their schema. Lower ability readers typically do not have a well developed schema for comprehension strategies or for text content. In addition, lower ability readers have a slower access to their schema (Samuels, 2006). The inability to access schema affects comprehension because the reader must slow down to process the information for the first time. QAR instruction requires repeated and in-depth practice with the strategy while the reader develops a schema for its use. Students with a well-developed schema for comprehension strategies have the ability to quickly access and choose which strategy is needed for the current comprehension task.

The theory of metacognition, in reading, is the ability to plan, evaluate, and regulate comprehension (Jacobs & Paris, 1987). Readers who are metacognitive have the ability to orchestrate multiple strategies while reading, actively regulating their own comprehension (Singer, 1978). Answering comprehension questions also requires students to be metacognitively aware of their use of strategies. Struggling readers, such as the participants in this study, do not have the metacognitive development needed to regulate their use of strategies or comprehension.

Metacognitive awareness is categorized into three stages: declarative, procedural, and conditional. Metacognitive awareness cannot be achieved in four weeks, nor can it be achieved through a strategy alone. Metacognition is a skill that requires years of practice, and most students lack metacognitive maturity upon high school graduation (Pressley, 2002). In this study, students who were able to accurately answer questions on the post knowledge survey achieved declarative knowledge of the strategy. Because of their level of reading ability and lack of metacognitive awareness, however, they needed more time to work with the strategy and practice critical thinking skills in order to achieve procedural and conditional knowledge.

Direct and explicit instruction is a powerful instructional technique for comprehension instruction (Biancarosa & Snow, 2004; Kamil et al., 2008). The direct instruction model was used in this study for instruction of the QAR taxonomy. Students received instruction that included modeling and the gradual release of responsibility of the strategy's use. Although the students in this study received direct instruction of the strategy, they were not metacognitive readers. In order to effectively use the strategy,

readers must also learn to be metacognitive so that they can determine which strategy to use when reading or answering questions.

Relationship of the Current Study to Similar Studies

Use of the Question-Answer Relationships taxonomy to increase comprehension and question-answering ability is not a new phenomenon. QAR has been researched and successfully practiced for 30 years, with success indicated in elementary, middle, and high school settings.

Three reasons for the decrease in posttest scores align with findings in similar studies: (a) the lack of prior knowledge among low ability students, (b) the length of treatment, and (c) instructional methods. Some researchers found that the strategy increased overall comprehension scores (Ezell & Kohler, 1992; Raphael, 1982; Raphael & McKinney, 1983; Raphael et al., 1980 in Raphael, 1984; Raphael & Wonnacott, 1985). Many of the same researchers found that this population did not perform on script implicit (Author and Me) questions (Raphael, 1981; Raphael & Pearson, 1982; Raphael et al., 1980; Wang, 2006) or text implicit (Think and Search) questions (Raphael, 1981; Wang, 2006). Researchers who found this concluded that a lack of prior knowledge among readers could explain their performance on this question type. These findings aligned with those in the current study because of the failure of the participants to accurately answer the high amount of “Think and Search” and “Author and Me” questions on the pre- and posttest.

The length of treatment is a construct that produces some discrepancy. A 10-minute orientation has been found to be sufficient for adult skilled readers (Raphael, 1981) and eighth-grade students (Raphael & McKinney, 1983). The length of treatment is a subject of some controversy for eighth graders. In 1981, Raphael suggested that elementary and junior high students needed a four-day treatment. In 1983, Raphael & McKinney discovered that although a four-day treatment increased performance of low and average ability eighth graders, it produced a negative attitude among many, decreasing eighth graders' performance overall. In 1985, Raphael & Wonnacott concluded that a four-day treatment was sufficient for fifth-grade students, but that fourth-grade students needed additional time. The length of treatment has some implications for this study. The participants in this study were "stuck" in the middle. Though maturity levels were at an eighth grade level, reading ability was not. Even though these students may need a longer orientation, their history of failure with literacy may have produced a negative attitude. There is a reasonable chance that the participants in this study had a history of failing the state standardized test, the same test where the pre- and posttest passages were acquired. In addition to the already negative attitude toward literacy instruction, participants may have had a preconceived negative attitude toward the FCAT.

Instructional methods during the treatment phase were developed based on the research of Ezell and Kohler (1992) and Graham and Wong (1993). Ezell and Kohler successfully utilized peer-assisted instruction, and Graham and Wong successfully utilized self-instruction. Peer instruction allowed students to assist and teach one another.

Self-instruction requires students to think-aloud as they guide themselves through the question-answering process. In the current study, students were allowed to work with a partner when answering questions, but the student think-aloud was not in place in this study. The student think-aloud may have assisted students in becoming more metacognitive when answering questions.

Recommendations for Educators

As students enter secondary grades, they are challenged with more difficult text (Carnegie Council on Advanced Adolescent Literacy, 2010). This means that all students, including those of low, average, and high abilities need specific strategy instruction across a variety of texts. Results from the National Assessment of Educational Progress (NAEP) indicate that secondary students are in the most critical need of literacy skills (ACT, 2011). The population utilized in this study should be targeted in school literacy reform across the United States. The fact that this population did not see positive results in this study does not indicate that the strategy is inappropriate for low ability or unmotivated students. It does, however, indicate the need for deeper comprehension instruction that includes metacognition, strategy instruction, and practice reading a variety of texts across disciplines.

Although students in this population were not proficient readers, many of them will apply for entry to community colleges upon high school graduation. Many of these students will continue to take remedial courses in their college careers, and many of them will either fail or drop out of college. Under-performing students like these are often

destined to suffer through unemployment and lower income levels throughout their lives (Carnegie Council on Advancing Adolescent Literacy, 2010).

Participants in this study are already at least one grade level behind their peers. Once they enter ninth grade, they will have 1½ years until they must take the 10th-grade FCAT which determines high school graduation and future high school coursework. It is imperative that students in this population receive instruction that will help them succeed on standardized tests. Students must master several standardized tests prior to entering college, and these tests are proving to be more difficult each year with a decrease in the number of fact-focused questions and an increase in higher level thinking skills such as integration, interpretation, critique and evaluation (National Assessment Governing Board, 2004).

If educators are going to make a difference in literacy achievement in the United States, especially within the specific population of this study, they must provide effective literacy instruction across disciplines. Literacy instruction across disciplines should include teacher modeling, scaffolded instruction of literacy strategies and critical thinking skills, and repeated opportunities to practice literacy utilizing a variety of texts. Literacy reform should also include professional development for teachers and the means to integrate literacy into all content areas. Professional development for teachers should also include development of classroom management skills, corrective feedback, and management of small group instruction.

Although the population represented in this study was under-performing, it is imperative that educators continue to push these students to succeed. Educators across

disciplines can be of assistance by building students' prior knowledge base, teaching students to think critically, and motivating the unmotivated. Students in this population need an extended amount of time to work with a strategy before moving on, and they need to revisit "old" strategies. Literacy instruction for this population should be continuous and consistent between disciplines. This means that schools should develop Professional Learning Communities (PLC) that are managed in a way that allows teachers to discuss and implement the literacy needs of their students.

Limitations of the Study

There were several limitations associated with the various aspects of the research. Limitations associated with the various phases of the research and with the participants themselves could have influenced the results of the study.

The low number of participants in this study may have limited the statistical power of the results. The nature of the summer program is to keep class size to a minimum. This is due to the typical behaviors of struggling students and the need for more teacher contact with each student.

The length of treatment, although supported by previous research, became a limitation in this study. Four days of exposure to the strategy followed by a three-week maintenance phase was not enough time for the students in this population. Students in this population need an extended amount of time with the strategy that includes practice across a variety of texts.

In regard to the planning phase of the research, the planned training for the teacher was reduced from planning period discussions and one dedicated day to only one hour. Though there were several factors leading to this action, two major factors (time and expertise of the teacher) made the reduction in training time possible. The teacher, an expert of QAR and direct instruction, made her decision to participate just a few days prior to the start of the study. Because of the teacher's expertise, the researcher decided that the only appropriate training was a brief overview of the curriculum and a discussion of the study's protocols. The overview of the curriculum occurred after the teacher was able to review the curriculum on her own. The teacher indicated that she was very familiar and that the strategy instruction in the curriculum mirrored her typical instruction. The ESE facilitator was included in the one-hour training but did not receive additional training due to her late hire.

Throughout the study, the teacher participant expressed some concerns regarding the research. She initially was reluctant to participate, indicating that she did not want to damage the protocols of the study, and she seemed bothered by some aspects of the study, i.e., researcher's presence in the classroom, and maintenance of logs. When the teacher logs were introduced she indicated that this was a burden; thus, the researcher completed them with her. Because the logs were not subjective in nature, this did not pose a threat to bias or validity.

Because of the teacher's concerns regarding classroom behaviors, large group rather than small group instruction was used. This meant that small group instruction and involvement of the facilitator as an additional resource in the classroom was very limited.

There was a lack of scaffolded instruction throughout the study. During the treatment phase, which included instruction of the color-coded model for QAR (Hollas, 2008), the teacher followed the curriculum provided by the researcher; however, during the maintenance phase the teacher was given freedom of instruction with guidelines. Although the teacher received feedback from the researcher regarding which students were struggling, based on the maintenance passages, the teacher primarily circulated among all students and offered assistance to those who asked for it or who seemed to be struggling. Small group or individual instruction (Ezell, 1996) with the appropriate scaffolds would have been beneficial for these students.

The lack of guidelines for the maintenance phase may also have impacted the results of this study, as the researcher assumed that the teacher possessed knowledge of corrective feedback. The teacher was very careful to follow the exact plan during the treatment phase; and during the maintenance phase, the teacher successfully provided daily activities that included the QAR strategy. In keeping with the guidelines for the QAR maintenance phase, specific written instructions were not provided by the researcher. Though other researchers have found that teachers do not need ready-made materials for instruction during the maintenance phase (Raphael & Wonnacott, 1985), a plan that included a schedule for scaffolds and targeted instruction throughout the maintenance phase would have assisted the teacher and her students in this study (Ezell, 1996).

Recommendations for Future Research

From the analysis of the data provided by this study, several recommendations can be made to enhance future research of this topic. Suggestions for future research are made with special consideration for the population of students represented in this study.

Future researchers should consider utilizing a larger sample of students for this study. Because classroom management and focus can be problematic for this specific population, it may be necessary to conduct future studies in multiple classrooms with fewer students per class. Smaller class sizes would allow for easier management of small groups and targeted intervention for individual students.

Future researchers should consider conducting a survey of motivation prior to beginning instruction with this population. A motivational survey may assist in identifying students who struggle with motivation and provide guidance for the teacher and researcher in planning instructional activities.

Participants in this study did not practice creating questions based on the taxonomy. This instruction may have helped solidify their knowledge of the taxonomy. Future researchers should consider including this practice as part of their treatment.

Future researchers should consider the experimental setting prior to initiating research. Research in classroom requires collaboration of administrators, teachers, and the researcher focused on the best interests of students. All parties need to be in agreement and completely supportive of the research. In this case, the teacher followed the curriculum during the treatment phase and did a wonderful job of explaining and modeling but did not utilize small groups because of concerns for student behavior. This

negated the potential impact of the ESE facilitator and the teacher in providing specific feedback to struggling students via small group instruction.

Future researchers should, if at all possible, obtain reading ability levels prior to working with such a low but mixed group. It was difficult to determine the reading level of the students because of the timing of summer school and availability of student data. Many students in this study registered for the program on the first day of summer school, and it was impossible to obtain data prior to the start of the study. A better scenario would have been to gather this information in advance and group students accordingly, offering a pre- and posttest within students' reading ranges.

Future research for this population should more evenly distribute the question types or include instruction of prior knowledge needed for the content of the pre- and posttest passages. One suggestion would be to offer the same passage for both tests but teach the prior knowledge for the content of the passage during the maintenance phase of instruction. This may better address concerns as to whether problems are related to prior knowledge or other thinking skills such as inferencing.

Future researchers should consider a more careful selection of maintenance phase, progress monitoring passages. Although these passages were not intended for the final results of this study, they were used to track student progress. It was difficult to compare the passages because of the varying numbers and categories of the comprehension questions.

Future researchers should consider a focus on the "Think and Search" category of questions. This category of questions was problematic for the participants throughout the

study. Standardized tests contain many questions from the “Think and Search” category which require students to synthesize from multiple places in the text. Although the teacher in this study repeatedly instructed students that this type of question requires multiple responses, students continuously responded with a partial answer.

Future researchers should consider including a plan for targeted instruction during the maintenance phase of instruction. The teacher in this study followed the treatment phase to a “T” because she had a written script. Though it has been deemed unnecessary to provide scripted lessons throughout the maintenance phase (Raphael & Wonnacott, 1985), a plan or schedule for scaffolding and targeted instruction would have assisted in this case. Last, future researchers should consider timing of posttest implementation. Posttests in this study were administered during the last week of summer school. Students in any population would struggle with motivation to take a test during the last few days of school.

Future researchers should also consider including instruction of specific metacognitive strategies in their research in addition to QAR. The pilot study prior to the present study was conducted to examine the effect of Questioning as Thinking (Wilson, 2010) on students’ ability to ask and answer questions about text. The pilot study utilized the same population as the current study and indicated that four weeks of instruction was sufficient for students to learn the skill of self-questioning but insufficient to increase the ability to answer questions. Instruction under the Questioning as Thinking umbrella includes metacognition instruction through the use of student and teacher think-alouds, followed by instruction of the QAR taxonomy, and finally the metacognitive skill of self-

questioning as it can be linked to the QAR taxonomy. This umbrella of instructional strategies offers one way to deepen comprehension instruction for struggling readers.

Summary

This summer program utilized in this study is a special program for a group of adolescents who have had only limited academic success in school. It is to the district's credit that this kind of attention is being devoted to putting a fairly fragile group of students on a positive path at a critical point in their school lives. Such a program comes with multiple opportunities and challenges. The choices are many as to how the goals of the program can be best met in a relatively short period of time. The program is designed to increase the comfort level of this group of soon-to-be freshmen in the high school setting. Another goal is to provide instruction that will support students academically during the ensuing high school years and motivate them to become more successful in academic endeavors and eventually complete their high school education. Given the complexities and multiple goals of such a program, great care must be taken in selecting the structures and activities that comprise the program.

The structure of this study was aimed at a specific population and had direct implications for that group. The purpose of this study was to examine the effect of direct instruction of the Question-Answer Relationships (QAR) taxonomy, when embedded within summer school, on the ability of ninth-grade struggling students to accurately answer reading comprehension questions after reading.

First, the target population was a condensed group of ninth graders only available during summer school. During the regular school year, these students can be found in classrooms within a mixture of higher ability students. It was the intent of the researcher to reach as many students in this population as possible. Had the research been conducted during the regular school year in two classrooms, it is likely that fewer participants would have been from the target population.

Second, teacher availability during summer school is limited, and teachers are employed in the summer program based on seniority within the school district. Each high school in the county offers the transition program; however, many of the high schools utilize one teacher for all three subject areas: English/Reading, Science, and Mathematics. Only a few sites offer Reading as its own class and with a reading endorsed or certified teacher. Due to the immediate start of summer school at the conclusion of the school year, it is difficult to determine which sites will offer the Reading class as a stand-alone class. The site chosen for this study worked with the researcher in advance in order to ensure that the appropriate class would be offered at the chosen site.

Third, timing of instruction and research activities can become complicated during unique programs such as this. Some parents register their children for the program on the first day of school, and this requires students being moved to balance class size during the first two days. In hopes of establishing a positive pattern leading to academic success, this target group also receives considerable attention from educators and leaders in the school district. Students are exposed to multiple motivational speakers,

one field trip, motivational initiatives (rewards) to encourage positive behavioral support, and a holiday, all of which cause classroom activities to be postponed.

The importance of this study lies in the population that was utilized. Schools across the nation are struggling with standardized scores of struggling readers, and the tests are certainly not getting easier. Although target population, teacher availability, and timing of activities possible interacted with the results of this study, this study adds to its field of research by outlining the need for consistent and science-based comprehension instruction for struggling adolescent readers.

APPENDIX A
PILOT STUDY MATERIALS

PILOT STUDY: SCRIPT FOR PRE- AND POSTTEST INSTRUCTIONS

When you read a piece of text you naturally have questions that just pop into your head. Today, you will show your teacher these questions by writing them down on the page, or on a separate sheet of paper. (Show students a model of how they will write down their questions, maybe have them put just the number on the text, then write the number and question on a separate sheet of paper) Once you have completed reading and writing your questions, you will answer the comprehension questions at the end of the passage.

QaT PILOT STUDY: THINK-ALOUD TEMPLATE (POSTTEST ONLY)

Ask Questions	Why did you ask the question?	Was your question-answered? Not all questions will be answered.

RESEARCHER-CREATED QUESTIONS FOR PRE- AND POSTTESTS: QaT PILOT STUDY

PRE-TEST - NIGHT HUNTERS: PLEASE REPLACE NUMBER 2 WITH THE FOLLOWING QUESTION:

10b. With which statement would the author of this article most likely agree? (Author and Me)

- a. An owl's size determines where it builds its nest.
- b. An owl's wing span determines how well it flies.
- c. Owls benefit people who live in a rural environment.**
- d. Owls are a nuisance to people living in an urban environment.

POSTTEST - AMERICAN ODYSSEY: PLEASE DO NOT ANSWER NUMBER 16 AND ADD NUMBERS 19, 20, AND 21 TO YOUR TEST.

19. According to the passage, how long did it take for the author to retrace Lewis and Clark's historic route? (Right There)

- a. 2 years
- b. 3 years
- c. 2 months**
- d. 3 months

20. According to the passage, whose grave site is located in South Dakota? (Right There)

- a. Sitting Bull**
- b. Lewis and Clark
- c. Chief Geronimo
- d. Thomas Jefferson

21. How do the lengths of time to complete the trip differ between the author and Lewis and Clark? (Think and Search)

- a. Lewis and Clark's trip took four months longer than the author's trip
- b. the author's trip took four months longer than Lewis and Clark's trip
- c. the author's trip took a year and four months longer than Lewis and Clark's
- d. Lewis and Clark's trip took a year and four months longer than the author's

QaT PILOT STUDY: QUESTIONS DEVELOPED FOR PRE- AND POSTTEST
BALANCING

Questions Developed by Research Team	Answer	Type	Notes
With which statement would the author of this article most likely agree?	C. Owls benefit people who live in a rural environment.	AM	Pre-test
According to the passage, how long did it take for the author to retrace Lewis and Clark's historic route?	C. 2 months	RT	Posttest
According to the passage, whose grave site is located in South Dakota?	A. Sitting Bull	RT	Posttest
How do the lengths of time to complete the trip differ between the author and Lewis and Clark?	D. Lewis and Clark's trip took a year and four months longer than the author's	TS	Posttest

Note. RT = Right There; AM = Author and Me; TS = Think and Search.

QaT PILOT STUDY: QAR CATEGORIES OF PRE- AND POSTTEST QUESTIONS

Question types	Pre-Test Night Hunters	Posttest American Odyssey
Right There	2	0
Additional questions	0	2
Think and Search	5	4
Additional questions	0	1
Author and Me	2	3
Additional questions	1	0
On My Own	0	0

Note. Additional questions were developed by the researcher and a reading expert to maintain balance between pre- and posttests.

FCAT STYLE QUESTION STEMS
USED IN CREATING ADDITIONAL QUESTIONS FOR PRE- AND POSTTEST
QUESTIONS IN QaT PILOT STUDY

FCAT 2.0 Test Item Specifications for Grades 9 and 10 (FL DOE 2010)

Benchmark	Content Focus	Difficulty	Question Stem
LA.9101.6.8	Analyze Words/Texts	Moderate	What is the meaning of the phrase _____ in this sentence?
LA.910.1.6.9	Multiple Meanings	Moderate	What would be another way of saying “ _____ ”?
LA.910.1.6.7	Analyze Word Structure	Moderate	In the word (<i>insert word from the text</i>), (<i>insert the prefix from the word</i>) probably refers to . . .
LA.910.1.6.8	Analyze Words/Phrases	Moderate	What is the meaning of the word _____ as used in this sentence from the (<i>insert number</i>) paragraph in the article?
LA.910.1.6.8	Analyze Words/Phrases	Moderate	What is the meaning of the phrase “ _____ ” as used in this sentence from the (<i>insert number</i>) paragraph of the article?
LA.910.1.7.3	Conclusions/Inferences	Moderate	From this article, the reader can tell that _____ require
LA.910.1.7.3	Conclusions/Inferences	Moderate	According to the article, why do _____ ?
LA.910.1.7.3	Conclusions/Inferences	Moderate	What did _____ find MOST fascinating about _____ ?
LA.910.1.7.3	Conclusions/Inferences	Moderate	What about the _____ is MOST surprising to _____ ?
LA.910.2.2.1	Text Features	Moderate	What topic discussed in the article is illustrated by this graph?
LA.910.1.7.7	Compare	Moderate	When the speaker in the poem says, “ _____,” to what is he comparing the _____ ?
LA.910.1.7.7	Compare	Moderate	How was _____ similar to _____ ?
LA.910.1.7.7	Compare	Moderate	How is _____ similar to _____ ?
LA.910.1.7.7	Compare	Moderate	The _____ is like _____ because _____
LA.910.1.7.7	Compare	Moderate	Based on this information, what is the “ _____ ” to which (<i>insert name</i>), is referring?
LA.910.1.7.7	Contrast	Moderate	How is (<i>Insert Name</i>) different from most of the other _____ in the story?

LA.910.6.2.2	Analyze/Evaluate Information	Moderate	According to the article, which of these _____ would be BEST to _____?
LA.910.6.2.2	Analyze/Evaluate Information	Moderate	What in the “(Insert name of article)” still applies to _____ today?
LA.910.6.2.2	Validity and Reliability	High	What indicates that the author has a bias favoring _____ as a _____?
LA.910.6.2.2	Validity and Reliability	High	What would be a good way to determine _____?
LA.910.6.2.2	Validity and Reliability	High	_____ is/are important today because _____
LA.910.6.2.2	Validity and Reliability	Low	Which statement is correct, according to the article?
LA.910.6.2.2	Validity and Reliability	Moderate	What action was (insert name of person) justifying when he said, “(Insert Quote)”?
LA.910.6.2.2	Synthesize Information (multiple sources)	High	How do the pictures help the reader understand the article?
LA.910.6.2.2	Synthesize Information (multiple sources)	High	In his response to (insert name), (insert name), wrote the following: “(insert quote from text)”
LA.910.6.2.2	Synthesize Information (multiple sources)	High	What was true of BOTH (insert name), and (insert name)?
LA.910.1.7.4	Cause/Effect	Moderate	Uncovering the meaning of _____ is difficult because _____
LA.910.1.7.4	Cause/Effect	Moderate	Why does Doug change his mind about _____?
LA.910.2.1.5	Character Development	Low	What would the speaker in the poem most likely do if _____?
LA.910.2.1.5	Conflict/Conflict Resolution	Moderate	What element of the poem’s setting creates the problem for _____?
LA.910.2.1.5	Conflict/Conflict Resolution	Moderate	What is the central conflict of this story?

Source: Florida Department of Education Office of Assessment. (2010). *FCAT 2.0 reading test item specifications*. Retrieved from Florida Department of Education Web site: <http://fcats.fldoe.org/fcat2/pdf/FL10SpISG910RWTr3gfinal.pdf>

APPENDIX B
QAR STUDY: CURRICULUM MATERIALS AND HANDOUTS

SUMMER SCHOOL CALENDAR (SIX WEEKS: MONDAY-THURSDAY)

SCHEDULED RESEARCH ACTIVITIES OF PARTICIPANTS

Week 1 (Tuesday-Thursday)

Tuesday was not included in the schedule for research in order to allow for the shifting and settling of students.

Wednesday was the first pretest day for experimental and control participants.

Thursday was the second pretest day for experimental and control participants.

Participants received posttest two on this day and the prior knowledge survey.

Week 2 (Monday-Thursday)

Monday was Day 1 of the Treatment Phase (overview and introduction of “in the book” strategies) for experimental group only.

Tuesday was Day 2 of the Treatment Phase (review and introduction of “in my head” strategies) for experimental group only.

Wednesday was Day 3 of the Treatment Phase. The emphasis was on independent follow-up and support provided by instructors of the formal instruction provided on Days 1 and 2.

Thursday was Day 4 of the Treatment Phase. The focus of the final day was to formally assess students’ knowledge of the strategy.

Week 3 (Monday-Thursday)

Continued independent follow-up and support by instructors

Week 4 (Monday-Thursday)

Continued independent follow-up and support by instructors

Week 5 (Monday, Tuesday, Thursday)

Continued independent follow-up and support by instructors;

Week 6 (Monday and Tuesday)

Posttest administration

TREATMENT PHASE--DAY 1, TUESDAY

Students arranged so that pairing is convenient when necessary.

Step 1: Explicit explanation of the strategy. The what, when, and how.

The teacher explained to students that 1) they will be learning about the Question-Answer Relationships (QAR) strategy, 2) QAR is a strategy that will help them locate the answers to questions that teachers ask, on any test they take, as well as on daily school work, and 3) learning about QAR means that they will be learning about what types of questions are asked and what they need to do in order to answer the questions.

1. General discussion about how students normally go about finding answers on a test. Where do the answers come from? How do students know where to look? Do students sometimes get frustrated when they can't find an answer? What makes some questions more difficult than others to answer?
2. The teacher distributed the QAR handout to students and explained that there are two main categories, "In the Book" and "In my Head." Under the two main categories, there are also two subcategories which students will learn about during the first week of summer school.
3. Think-Pair-Share. The teacher asked students to predict what they think the four categories mean. Which questions are easy? Which questions are more difficult? What types of questions do students think they typically see on teacher-made tests? Are they different than the questions they see on standardized tests, e.g., FCAT?

4. The teacher briefly explained the four categories using the picture of “Earth Song” (Hollas, p. 78) as an example.
 - a. The teacher displayed the CD cover on the LCD.
 - b. The teacher gave students the following examples of the four types of questions, explaining each of the labels.
 - i. In what year was the CD produced? (Right There)
 - ii. How many songs mention some form of water in their titles?
(Think and Search)
 - iii. What common theme do all the songs share? (Author and Me)
 - iv. If you could create a music concert for your friends, what performers would you include? (On My Own)
5. The teacher explained the color-coded model for visual learners (Hollas, p. 38) and reproducible on p.105 (Could also use colored paper plates for later activities)
 - a. Green is for “Right There”. Green is for go. A Right There question allows students to go right to the answer in a text.
 - b. Yellow is for “Think and Search” and means slow down and take caution. A yellow question requires the reader to slow down and look in more than one place in the text.
 - c. Red is for “Author and Me” questions. This type of question requires the student to stop and think differently. Students will have to figure

out the answers by looking for clues and evidence in the text and combine that information with what they already know.

- d. Blue is for “On My Own” questions. Students can imagine just staring at the blue sky and thinking. . . there is nothing to read. (Explain that except as a writing prompt, this type of question is not typically found on standardized tests).

Step 2: Teacher and/or student modeling of the strategy in action. In this component, the teacher took on the role of the reader and utilized the strategy as she read and thought aloud, allowing students to see and hear the process that they were being asked to follow.

1. The teacher distributed copies of “The Porcupine Necktie” and its accompanying questions.
2. The teacher read-aloud (students follow along): “The Porcupine Necktie” of the Grade 7 Student Activity Book (p. 3).
3. Teacher modeled her thought process as she answers and labels the “In the Book” questions.
 - a. What did Leo’s uncle give him as a going away present? (Right There)
 - b. Where does Leo currently live? (Right There)
 - c. Who put Leo’s name in the paper on his birthday? (Right There)
 - d. What surprise did Leo find on his front step on his birthday? (Right There)
 - e. How many neckties did Leo own (at the end of p.3)? (Think and Search)

- f. What do you know so far about Leo? (Think and Search)
- g. How are Leo's neckties similar? (Think and Search)
- h. How are Leo's neckties different? (Think and Search)

Step 3: Collaborative use of the strategy in action. During this component of instruction the teacher asked the students to try out the strategy along with her. This step makes for an easy transition to the gradual release of responsibility.

1. The teacher and students read-aloud (taking turns reading from pp.6-7 of "Porcupine Necktie" to keep students focused on the longer section of text).
2. Students assisted the teacher in answering and labeling the following "In the Book" questions based on pp. 6-7 of "Porcupine Necktie".
 - a. What grade is Leo in now? (Right There)
 - b. Who is everyone so interested in? (Right There)
 - c. Where did the new student come from? (Right There)
 - d. What are Leo and Kevin's roles on "Hot Seat"? (Right There)
 - e. What was the appearance of the new student? (Think and Search)
 - f. What did Stargirl do in the cafeteria? (Think and Search)
 - g. What were people's reactions to the performance? (Think and Search)

Step 4: Guided practice using the strategy with gradual release of responsibility.

1. The teacher distributed copies of "The Good Daughter" from Week 1 of the transition curriculum.
2. Students paired reading : "The Good Daughter"

3. Students worked with partners to answer and label the following “In the Book” questions. The teacher circulated around the room in order to guide students as needed in finding answers to the following questions.
 - a. What is Caroline’s native country? (Right There)
 - b. How was Caroline’s youth like the lives of other American teenagers? (Right There)
 - c. How long have Caroline’s parents lived in the United States? (Right There)
 - d. Why does Caroline feel uncomfortable in America? (Think and Search)
 - e. What bothers Caroline about her love life? (Think and Search)
 - f. How is life more difficult for children of immigrants than for Americans? (Think and Search)

Step 5: Independent use of the strategy. This phase of instruction happens when instructors believe students are ready to work alone with the strategy. The teacher reviewed the strategy with students and gave specific instructions so that students know exactly what to do.

1. The teacher distributed copies of “Oil Spills” (*Super QAR Student Activity Book*, 7th grade, p. 33).
2. Students read silently.
3. Students independently answered and label the following “In the Book” questions:

- a. How is oil transported around the ocean? (Right There)
- b. What was done in order to keep the *Exxon Valdez* from leaking all of its oil into the ocean? (Right There)
- c. What was similar about the causes of all three oil spills? (Think and Search)
- d. What consequences did all three oil spills have in common? (Think and Search)

TREATMENT PHASE--DAY 2, WEDNESDAY (English)

The focus of instruction was on the “In my Head” questions; however “In the Book” questions were utilized with the passages in order to elicit conversation, serve as a check for understanding, and provide a scaffold prior to the more difficult questions.

Step 1: Explicit explanation of the strategy (This step is a review since initial instruction occurred yesterday.)

1. The teacher reviewed the taxonomy with students. What do they remember?
What did the colors represent?
2. The teacher displayed the picture “Fairlawn Recreation Department” (Hollas, year, p. 80) and asked the students the following questions, explaining the labeling of each:
 - a. Where are the games played? (Right There)
 - b. How many times do the Pirates play the Tigers? (Think and Search)
 - c. Why do you think there’s a break between each game on Saturday?
(Author and Me)
 - d. In your opinion, what sport is the most dangerous? (On My Own)
3. The teacher 1) explained that yesterday’s focus was on the “In the Book” category and that today will be focused on the “In My Head” category and 2)briefly reviewed the differences between the two main categories and explain the two subcategories in the “In my Head” category.

Step 2: Teacher and/or student modeling of the strategy in action. In this component teachers took on the role of the reader and utilized the strategy as they read and thought

aloud, allowing the students to see and hear the process that is being asked of them. The teacher modeled her answers and the process of categorizing the questions.

1. The teacher distributed copies of “Volcanoes” and its accompanying questions.
2. The teacher read-aloud (students follow along): “Volcanoes” in the Grade 7 Student Activity Book (pp. 41-42).
3. The teacher modeled her thought process as they answered questions.

Because initial instruction had already occurred, students assisted teachers in answering the “In the Book” questions but teachers modeled her thinking during the “In my Head” questions.

- a. Active volcanoes emit what substance? (Right There)
- b. What happened as a result of the Mount Saint Helens eruption? (Think and Search)
- c. How are volcanoes formed? (Think and Search)
- d. Compare the volcanic activity of Kilauea, Mount Saint Helens, and Pinatubo. (Think and Search)
- e. No one was hurt during the 1990 Kilauea eruption. Why? (Right There)
- f. What is one reason that scientists monitor volcanic activity? (Right There)
- g. What part of the United States is likely to be safe from volcanic activity? (Author and Me)

- h. What is life like for people who live in volcanic areas? How close to the volcanic area do you think people would live? (Author and Me)
- i. Different storms occur in different parts of the world. For example, in Florida and the Carolinas we worry about hurricanes. People who live in the Midwest worry about tornadoes. In California there are earthquakes. What other types of storms can you think of? In what parts of the world do the storms occur? (On My Own)
- j. If you were looking to buy a house and were basing your final decision on the weather, which part of the world would you live? (On My Own)

Step 3: Collaborative use of the strategy in action. During this component of instruction the teacher asked students to try out the strategy along with her. This step made for an easy transition to the gradual release of responsibility.

1. The teacher and students took turns reading aloud “Volcanoes” (p. 45).
2. Students assisted the teacher in answering and labeling the following “In the Book” questions based on “Volcanoes” (p. 41).
 - a. Why did so many people die in the 1985 volcanic eruption in Columbia? (Right There)
 - b. How do mudflows occur? (Think and Search)
 - c. Why have the Japanese developed mudflow control? (Right There)
 - d. What is one type of mudflow protection? (Right There)

- e. The Japanese have developed a system to control the flow of mud from a volcano. Why hasn't anyone developed the same system for the flow of lava? (Author and Me)
- f. Have you ever visited a mountain range? What types of recreational activities do people enjoy on mountain ranges? Have you ever had the opportunity to vacation in the mountains (e.g., ski trip, hiking) (On My Own)

Step 4: Guided practice using the strategy with gradual release of responsibility.

1. Students were given the option to read independently or with a partner "Volcanoes"(pp. 48-49). Students worked with their partners to answer the following questions. The teacher circulated around the room as needed in order to guide students in finding answers to and labeling the questions.
 - a. What are convergent plate boundaries? Explain how they are formed and name two types of convergent plate boundaries. (Think and Search)
 - b. Why do volcanoes form at convergent plate boundaries? (Think and Search)
 - c. Why do volcanoes sometimes form in the middle of plates (Hawaii)? (Think and Search)
 - d. How long has it taken the Hawaiian Islands to form? (Right There)
 - e. If the Pacific Plate stopped moving, what might happen to the island of Hawaii? (Author and Me)

- f. After viewing the diagram on page 49, which Hawaiian Islands are likely to be the most populated? (Author and Me)
- g. What type of emergency evacuation system is set up for the Hawaiian Islands? (Author and Me)
- h. Hawaii is a popular vacation spot for many people. What type of activities would you like to do if you took a vacation to Hawaii. (On My Own)

Step 5: Independent use of the strategy. This phase of instruction occurred when teacher believed her students were ready to work alone with the strategy. The teachers reviewed the strategy with students and gave specific instructions so that students knew exactly what to do. The teachers circulated around the room in order to assess any difficulties that students were having. Difficulties were further addressed on Day three.

1. The teacher distributed copies of “Sammy Sosa.” (summer curriculum selection)
2. Students read silently.
3. Students independently answered and categorized the following questions:
 - a. Explain Sammy’s life when he was a child. (Think and Search)
 - b. What is batilla? (Right There)
 - c. What might life have been like for Sammy if he hadn’t found sports? (Author and Me)
 - d. Why didn’t Sammy’s mother like the idea of Sammy becoming a boxer? (Think and Search)

- e. What was Sammy's attitude when he realized he could never be a boxer? (Think and Search)
- f. What two people were responsible for getting Sammy into baseball? (Think and Search)
- g. What was Sammy's relationship with his brother? (Author and Me)
- h. How did Sammy become a good baseball player? (Think and Search)
- i. Sammy's mother watches him play on TV. Why does Sammy blow his mother a kiss when he hits a homerun? (Author and Me)
- j. How can you identify with Sammy Sosa? (Author and Me)
- k. Have you ever worked hard for something you really wanted? If yes, what were you working for and what kind of work did it take? If no, what might you have to work hard for in life? (On My Own)

TREATMENT PHASE--DAY 3, THURSDAY (English)

At this point, the teacher had a pretty good idea as to which students were having trouble with the strategy. During this class session, the teacher provided targeted instruction to struggling students. During targeted instruction, the teacher had an enhanced idea as to those students who needed additional support. The teachers chose to provide extended instruction herself instead of utilizing the ESE facilitator.

1. The teacher displayed the picture of “The Groceries” (Hollas, 2008, p. 81).
 - a. Students answered and categorized the questions that were provided.
 - b. The teacher asked students why they categorized the questions the way that they did.
2. The students read “Rome--The External City” (Hollas, 2008, p.58)
 - a. Students answered and categorized the questions that were provided.
 - b. The teacher asked students why they labeled the questions the way they did.

Sources of selected reading materials:

Hollas, B. (2008). *Question answer relationships: A simple taxonomy of questions* (S. Taylor, Ed.). Peterborough, NH: Crystal Springs Books.

Raphael, T., & Au, K. (2005a). *Super QAR for test-wise students: Student activity book grade 8*. Chicago: Wright Group/McGraw-Hill.

Sammy Sosa (author unknown). A reading selection, Seminole County transition summer curriculum (2011).

APPENDIX C
QAR STUDY: SCRIPT FOR TEACHERS

Today you are going to take a reading comprehension test. Please read the passage, then take your time and think about each question before answering. You may use all the time you need to complete this task.

APPENDIX D
FLORIDA DEPARTMENT OF EDUCATION PERMISSION FOR USE OF
PASSAGES AND QUESTIONS

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October 28, 2011

Tammy Stafford
tammvrstafford@gmail.com

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Sincerely,

Jody T. Kent
Product Information Consultant

SK/jtk

SHARON KOON, Ph.D.
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October 28, 2011

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Ms. Tammy Stafford
October 28, 2011
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If you have further questions or need additional information regarding this matter, please contact the Office of Assessment at 850-245-0513, or by electronic mail at Assessment@fldoe.org.

Sincerely,


Judy T. Kent
Product Information Consultant

SK/jtk

SHARON KOON, PH.D.
ASSISTANT DEPUTY COMMISSIONER
ACCOUNTABILITY, RESEARCH, AND MEASUREMENT
OFFICE OF ASSESSMENT

325 W. GAMES STREET • SUITE 414 • TALLAHASSEE, FL 32399-0400 • (850) 245-0513 • www.fldoe.org

APPENDIX E
SURVEY OF PARTICIPANT BACKGROUND KNOWLEDGE

SURVEY OF BACKGROUND KNOWLEDGE

1. Have you ever heard the term “QAR”, or Question-Answer Relationships?
2. Have you ever heard the terms “in the book” or “in my head”?
3. Has a teacher ever taught you what a “Right There” question is? If yes, how would you describe where to find an answer to this type of question?
4. Has a teacher ever taught you what a “Think and Search” question is? If yes, how would you describe where to find an answer to this type of question?
5. Has a teacher ever taught you what an “Author and Me” question is? If yes, how would you describe where to find an answer to this type of question?
6. Has a teacher ever taught you what an “on your own” question is? If yes, how would you describe where to find an answer to this type of question?
7. Have you ever been in a reading class before? If so, in which grades?

APPENDIX F
INSTITUTIONAL REVIEW BOARD APPROVAL



University of Central Florida Institutional Review Board
 Office of Research & Commercialization
 12201 Research Parkway, Suite 501
 Orlando, Florida 32826-3246
 Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

**From: UCF Institutional Review Board #1
 FWA00000351, IRB00001138**
To: Tammy R. Stafford
Date: April 17, 2012

Dear Researcher:

On 4/17/2012, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
 Project Title: The effect of the question-answer relationships taxonomy on 9th grade students' ability to accurately answer comprehension questions after reading.
 Investigator: Tammy R. Stafford
 IRB Number: SBE-12-08374
 Funding Agency:
 Grant Title:
 Research ID: n/a

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in IRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 04/17/2012 10:26:47 AM EDT

IRB Coordinator



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1
FWA00000351, IRB00001138**

To: **Tammy R Stafford and Vassiliki I Zygouris-Coe**

Date: **April 05, 2011**

Dear Researcher:

On 4/5/2011, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	IRB Initial Review Submission Form
Project Title:	The Effect of Questioning as Thinking s on Student Ability to Ask Higher Level Questions During Reading
Investigator:	Tammy R Stafford
IRB Number:	SBE-11-07584
Funding Agency:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Kendra Dimond Campbell, MA, JD, UCF IRB Interim Chair, this letter is signed by:

Signature applied by Janice Turchin on 04/05/2011 02:45:45 PM EDT

A handwritten signature in black ink that reads "Janice Turchin".

IRB Coordinator

APPENDIX G
QAR HANDOUT/PERMISSION TO REPRODUCE FIGURES

In the Book QARs



Right There

The answer is in one place in the text. Words from the question and words that answer it are often “right there” in the same sentence.



Think & Search

The answer is in the text. To find the answer, readers need to “think & search” or put together different parts of the text. The answer can be within a paragraph, across paragraphs, or even across chapters and books.

In My Head QARs



On My Own

The answer is not in the text.
Readers need to use their own ideas and experiences to answer the question.



Author & Me

The answer is not in the text.
Readers need to think about how the text and what they already know fit together.

QAR Definitions for Study

1. Right There questions are questions whose answers can be found directly in the text. The answer must be found in only one place and the wording should be the same in the question and answer.
2. Think and Search questions are questions whose answers can be found directly in the text but are found in more than one place across the text.
3. Author and Me questions are questions whose answers require readers to put together information from the text and information from their prior knowledge to formulate the answer. An inference is required to answer the question.
4. On My Own questions will not be included in this study. This type of question relies solely on the reader's prior knowledge for its answer.



TO: Tammy Stafford

FROM: Tally Raphael
Taffy Raphael

Digitally signed by Tally Raphael
DN: cn=Tally Raphael, o=SchoolRise, ou=SchoolRise, email=tally_raphael@schoolrise.us
Date: 2011.10.19 22:51:11 -0700

RE: Permission to use Figure

DATE: October 19, 2011

I grant you permission to use the figure from QAR Now (Raphael, Highfield, & Au, 2006) on page 77 for use in your dissertation. This permission is limited to the dissertation use.

Headquarters: SchoolRise, LLC P.O. Box 802508 Chicago, Illinois 60680-2508
t: 312 203 1544 e: tally_raphael@schoolriseusa.com w: www.SchoolRiseUSA.com



Tammy Bryant <tammyrstafford@gmail.com>

permission for figures

4 messages

Tammy Stafford <tammyrstafford@gmail.com> Thu, Oct 27, 2011 at 3:00 PM
 To: "Taffy E Raphael, Ph.D." <teraphael@gmail.com>

Dr. Raphael,

There are two more figures in QAR Now, 2006 that I would like to use in my study as student handouts. These will go in the appendix. They are on pages 23 and 26. One is a description of the two In the Book QARs (Figure 1.5) and the other is a description of the two In my Head QARs (Figure 1.7). Is this OK?

Thanks again,
 Tammy

Taffy Raphael <teraphael@gmail.com> Thu, Oct 27, 2011 at 6:07 PM
 To: Tammy Stafford <tammyrstafford@gmail.com>

Hi Tammy,

Please use this email to confirm that you have permission to reprint the two figures (1.5 and 1.7) for use in your research project. Please insert the credit line at the bottom of all figures indicating QAR Now as the source, and that these are used with permission:

Used with permission from T. E. Raphael, K. Highfield, & K. H. Au, authors of *QAR Now*. Scholastic, 2006.

Best, Taffy

Taffy E. Raphael, Ph.D.
 University Scholar
 University of Illinois at Chicago
taffy@uic.edu OR
teraphael@gmail.com

[Quoted text hidden]

Tammy Stafford <tammyrstafford@gmail.com> Thu, Oct 27, 2011 at 8:59 PM
 To: Mary Ann Lynn <malynn@cfi.ir.com>

Dr. Lynn,

Here's the permission for two more figures that I am using as a handout for QAR.

Tammy

[Quoted text hidden]

Tammy Stafford <tammyrstafford@gmail.com>
To: Taffy Raphael <terapriael@gmail.com>

Thu, Oct 27, 2011 at 8:59 PM

Thanks so much!
(Quoted text hidden)

APPENDIX H
SEMINOLE COUNTY APPROVAL OF RESEARCH



SEMINOLE COUNTY
PUBLIC SCHOOLS

BILL VOGEL, Ed.D.
Superintendent

Educational Support Center
400 E. Lake Mary Boulevard
Sanford, Florida 32773-7127

April 11, 2011

Ms. Tammy Stafford
2584 Creekview Circle
Oviedo, FL 32765

Dear Ms. Stafford,

I am in receipt of the proposal and supplemental information that you submitted for permission to conduct research in the Seminole County Public Schools. After review of these documents, it has been determined that you are granted permission to conduct the study described in these documents under the conditions described herein.

Your school principal has the authority to decide if he wishes to participate in your study. Therefore, your first order of business is to contact Mr. Gaudreau and explain your project and seek permission to conduct the research. You are expected to make appointments in advance to accommodate the administration and/or staff for research time. Please do not use SCPS email or courier mail to disseminate your research information.

Please forward a summary of your project to my office upon completion.
Good Luck!

Sincerely,

Anna-Marie Cote, Ed.D.
Deputy Superintendent
Instructional Excellence and Equity

AMC/jr
cc: Mike Gaudreau

Visit Our Web Site
www.scps.k12.fl.us

APPENDIX I
TEACHERS' INSTRUCTIONAL LOG

Teachers' Instructional Log

Date	QAR Activity	Instructional Method/Student Grouping	Type of Assessment

APPENDIX J
MAINTENANCE PHASE ACTIVITIES

MAINTENANCE PHASE ACTIVITIES

Week/Day	QAR Activities	Additional Activities
WEEK 1		
Monday	Practice answering, categorizing, and providing evidence for passage questions.	Teacher think-alouds; Morpheme instruction
Tuesday	Brief review of taxonomy	Morpheme Review.
Wednesday	Super QAR passage grade 8: Read, answer, provide evidence, categorize	Annotate passage and underline and define unknown words.
Thursday	Discussed QAR categories for questions that ask students to find details and main idea	Vocabulary test; Determining important details; Main Idea; Whole-class novel with teacher think-aloud and note-taking strategy.
WEEK 2		
Monday	Practice answering, categorizing, and providing evidence for passage questions.	Morpheme instruction; Teacher think-aloud;
Tuesday	Review of Quiz questions using taxonomy Super QAR Passage Review of yesterday's questions and writing activity and discussion of taxonomy (poor performance lead to a re-do).	Writing based on QAR activity Novel quiz; Independent novel reading
Wednesday	Practice answering, categorizing, and providing evidence for passage questions.	Review of good writing.
Thursday	Brief review of taxonomy and her expectations for answering questions. Practiced using taxonomy with questions based on class novel.	Vocabulary Quiz; Independent reading of novel.
WEEK 3		
Monday	Brief review of taxonomy Practice answering, categorizing, and providing evidence for passage questions.	Morpheme Instruction; Discussion about metacognition and prior knowledge; Discussion about study habits; Review of Independence Day history.
Tuesday	Super QAR passage and oral review of student responses	Morpheme instruction ; Review of Independence Day history; Review of novel events.
Wednesday	HOLIDAY	
Thursday	Brief review of taxonomy	Morpheme review Novel review

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