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Expert Elementary Readers: A Profile of Reading Proficiency

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I am submitting herewith a dissertation written by Shelley Watson Burton entitled "Expert Elementary Readers: A Profile of Reading Proficiency." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

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Expert Elementary Readers: A Profile of Reading Proficiency

A Dissertation Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Shelley Watson Burton

May 2017

Dedication

This dissertation is dedicated to my incredibly supportive and flexible family, and to J.J., who made this work possible.

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I am fortunate to have numerous people in my life who have supported and encouraged my graduate work at UT. To my husband, Tim and my son, Jacob, thank you for your flexibility, encouragement, and willingness to go with the flow. You always made hard days easier and exciting days even more fun. To my parents, thank you for your support, your encouragement, your editing skills, and your willingness to always be on-call. To my teacher colleagues, thank you for cheering me on, for tolerating my overworked, forgetful brain, and for loaning me your students to record.

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Abstract

This study examined, through think-aloud protocols, the metacognitive processes that proficient fourth-grade readers use while they read to explore what types of thinking are present in successful elementary-school readers. Using an embedded mixed methods design, I studied the reported thinking processes of 12 proficient, fourth-grade readers to determine what these readers reported thinking as they read informational texts and what types of patterns were evident in their thinking. Several common themes emerged from the analysis of the students' think-alouds and the findings indicated that the participants applied multiple, similar reading strategies while reading to aid their comprehension.

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Chapter 1 – Introduction

Each day in classrooms everywhere, teachers are charged with the task of knowing what their students can do, cannot do yet, and what each needs to proceed to the next level of performance in any given area. This can be a daunting task, considering there are approximately 90 reading and language arts standards and substandards in Tennessee's third grade curriculum (Tennessee State Board of Education, 2010). We do not need any more information about what students *can't* do. It can be easy to tell when a student does not understand a concept, and it can also be easy to tell when a student *does* understand a concept. Many teachers describe their excitement when that moment of understanding "clicks" for a student. It's why many of us teach. However, it can be much more difficult to tell when a student *almost* understands a concept. How close *is* close? How will we know when we get where we are going if we aren't really sure how far away our goal is or what it really looks like? What does proficiency look like and how will we recognize it when it happens?

For reading teachers, this can be a gray area of concern. At the elementary level, we do our best to teach our students how to read and send them off to middle school prepared to grapple with complex, academic texts. What should preparedness really look like? It was once widely repeated that students first learn to read, then they read to learn. We know now that this is untrue; that all readers should be learning while they read, and that they continue to learn to read throughout their development as readers. If there is not a magic point at which learning to read ends and reading to learn begins, how do we successfully judge our students' proficiency in strategic reading as they develop? In writing about reading comprehension classroom instruction, Duke, Pearson, and Strachan (2011) stated that we "…must understand how skilled comprehenders construct meaning so we can help students learn to construct meaning in the

same way" (p. 52). This study is a step toward this understanding. If teachers are truly to know best how to help all students, especially those who struggle with reading comprehension, it would be beneficial to have a clear understanding of what proficiency looks like at various levels.

Statement of the Problem

In one study, Wyatt, Pressley, El-Dinary, Stein, Evans, and Brown (1993) examined the reading behaviors of skilled readers to discover what types of metacognitive processes they used when reading. The researchers asked college professors to read aloud an article related to their field of study and to think-aloud while reading. This process was recorded and the researchers later analyzed and categorized the readers' think-aloud responses, which resulted in a list of critical reading behaviors that participants commonly used as they read and processed the text. Predicting and verifying those predictions, summarizing, seeking clarification, and monitoring comprehension were several of the pervasive strategic reading behaviors observed in nearly all readers who participated in the study. It is important to note that even though participants in this study represented a wide range of areas of expertise according to their fields of study and each read a different, self-selected text, there was a high degree of similarity in the reading strategies the participants used while reading (Wyatt et.al, 1993). Although research examines what expert adult readers are capable of, few studies examine expert readers of varying experience levels. This lack of research on developing reader expertise prompts the question: what might expert reading look like at various levels of competence as students develop as readers?

Instructing readers on the use of metacognitive strategies has been shown to be beneficial and to increase reading performance (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007). Even expert readers depend upon an extensive schema on the topic of the text and possess the

necessary content-specific vocabulary. Students in the Boulware-Gooden, et. al (2007) study who engaged in a variety of modeled higher-order thinking activities related to vocabulary exploration demonstrated increased reading comprehension over students who did not receive the instruction. Afflerbach's (1990) study also affirmed that expert readers (in this study, doctoral students who read material on topics in their fields) who often appear to process information automatically, at times, find it necessary to use strategic thinking processes to negotiate and comprehend a text concerning a topic that is less familiar to them. How might we see evidence of these proven reading behaviors in students who are developing readers? What might that evidence explain about the nature of developing reading proficiency?

Purpose Statement

As the researchers in the Wyatt et al. (1993) study sought to investigate and determine the various metacognitive processes utilized by proficient adult readers, I intended to replicate the purpose of their study by examining proficient fourth-grade readers. The purpose of this study was to examine, through think-alouds, the metacognitive processes that proficient fourth-grade readers use while they read to explore what types of thinking are present in these successful readers. Specifically, this study seeks to add to the existing body of knowledge regarding readers and their thinking. What does proficient reading look like? What do proficient readers think while they read? Teachers need answers for these questions. When state mandates and district requirements require schools to use certain assessments to evaluate student reading skills, I believe it is important for teachers to pause and ask: what does this assessment really tell us about readers? In this study, metacognitive processes are defined as the various forms of reading comprehension processes exhibited by students through think-aloud protocols. Fourth-grade students scoring in the 80th percentile or above on the STAR reading assessment in the targeted

school were prospective study participants. The aim of the study was to examine the metacognitive processes of these high-achieving readers. With this information, teachers may be able to determine which reading behaviors could separate the academically successful students from those who struggle with reading comprehension. That knowledge may ultimately further teachers' understanding of proficient reading and assist them in guiding readers who are not yet as successful.

Research Questions

Two research questions will guide the study:

1. What types of thinking do proficient fourth-grade readers report using while they read informational texts?

2. What patterns of reading behavior do proficient fourth-grade readers most commonly report when reading informational texts?

Significance of the Study

Meeting the needs of a diverse group of readers is a daily challenge in elementary classrooms. Not only is it important that teachers know at what approximate level students can read successfully, but teachers also need to know what is next for those students. At what point might teachers consider readers proficient at a particular level? What types of reading behaviors could help students reach this level of proficiency? Discovering which comprehension strategies proficient readers utilize as they read could allow teachers to adjust their instruction approach to meet the needs of fourth-grade students who struggle with reading comprehension and assist those students in becoming more successful. By examining the results of the think-aloud data collected during the course of this study, I attempt to provide information for teachers regarding the types of thinking that proficient elementary readers report using as they read. If there are

commonalities in metacognitive processes among successful fourth-grade readers, teachers may be able to design explicit instruction on these processes for lower-achieving readers to help them to be more successful.

Definition of Terms

The following terms are defined in this section to clarify the meaning of terms used in this study:

1. metacognitive processes - Metacognitive processes encompass an array of reading comprehension processes that a reader consciously uses to construct meaning during reading (in this study, exhibited through think-alouds).

2. constructively responsive reading - An act of reading in which a reader interacts with the text thoughtfully, seeking to create meaning, is considered constructively responsive reading.

3. proficient readers - For this study, fourth-grade students scoring in the 80th percentile, or above, on the STAR reading assessment will be considered proficient readers at their grade level. The STAR reading assessment is the reading screening tool the target school gives to all fourth graders to identify students with an estimated readability level at or above grade level.

4. think-aloud(s) - In this study, a think-aloud is the thoughts readers share aloud with the researcher during and after reading.

5. STAR reading assessment - This is a computerized, adaptive reading assessment, which calculates an estimated word readability value for students who complete the assessment.

6. reading behaviors - Any type of thinking described by a participant during a think-aloud or any type of observable interaction with the text is considered a reading behavior within

the context of this study. Reading behaviors for this study are outlined in the Reading

Behaviors Inventory (Wyatt, et al., 1993) located in Appendix D.

Assumptions

This study was conducted under the assumption that the participants for the study have

been accurately identified as falling at the 80th percentile, or above, by the STAR reading

assessment, and that they are in fact, proficient readers at their current grade level. The

researcher further assumes that information on thought processes participants provide during the

think-aloud sessions is accurate and representative of the thought processes exhibited by the

reader during the reading session.

Organization of the Study

The aim of this study was to develop a profile of elementary reader proficiency by

exploring the types of metacognitive reading strategies and reading behaviors that are present in

proficient fourth-grade readers. In chapter two, I present the theoretical framework that guides

this study and examine literature related to constructively responsive reading, metacognition, and

reading comprehension. In chapter three, I describe the methodology for this study, including

the study structure, participant selection procedures, and data collection procedures. Chapter

four details this study's data analysis, and chapter five examines the summary and implications

of the results, as well as directions for future research.

Chapter 2 – Review of the Literature

For this study, I collected think-aloud data to examine the metacognitive processes of proficient elementary school-age readers. When examining students' reading processes, I referred to the constructively responsive reading model postulated by Pressley and Afflerbach (1995). This model incorporates the work of Rosenblatt (1938), Baker and Brown (1984), Anderson and Pearson (1984), and vanDijk and Kintsch (1983). In this section, I describe the constructively responsive reading model, outline the components of this model, and examine the constructivist foundation upon which the model was built. I also examine literature related to comprehension, metacognitive processes of reading, and reading studies involving think-aloud protocols.

Theoretical Framework

Constructively Responsive Reading

The theory of constructively responsive reading (Pressley & Afflerbach, 1995) emerged from a meta-analysis of think-aloud studies and a comparison of the aggregated results to previously existing theoretical models of reading. Pressley and Afflerbach (1995) determined that the results of the examined think-aloud studies provided evidence to support, in part, these theoretical models of reading, and provided data to extend beyond the existing theories to explain the complex nature of reading. While the results of the think-aloud study analysis provided evidence to support partially each reading theory examined (Anderson & Pearson, 1984; Baker & Brown, 1984; Rosenblatt, 1938; van Dijk & Kintsch 1983), no one existing model of reading processing could take all aspects reported through the think-aloud protocol reports into account as a stand-alone theory of complex reading. Constructively responsive reading (Pressley & Afflerbach, 1995) emerged from the meta-analysis as a theory to describe

the way in which "excellent readers are actively constructive as they interact with and respond to information in text while reading for a particular purpose" (p. 83). As a result of their examination of think-aloud studies, Pressley and Afflerbach (1995) concluded that constructively responsive readers approach a text with the intention of exploring the main idea, of making predictions about texts while reading using prior knowledge, of engaging emotionally with the text, and of comprehending a text's meaning based partially on previously existing knowledge of the content. Drawing on the paradigm of constructivism, the model of constructively responsive reading explains a reader's reaction to and interaction with a text. When examined through this theoretical lens, one can view constructively responsive reading as expert reading, as it includes multiple components of successful reading acquisition (Pressley & Afflerbach, 1995).

Reader Response Theory

One part of constructively responsive reading is the interaction between the reader and the text, which Rosenblatt (1938) explained through the reader response theory. Rosenblatt (1978/1994) proposed that each act of reading is an interaction between a particular reader and a particular text at a particular time, and it is therefore possible for each reader to arrive at an understanding of a text in a different way than other readers, because not all readers perceive a singular meaning within a text. The way in which a reader responds to a text depends upon the reader's attitude toward the topic of the text, the reader's level of interest in the topic of the text, the reader's level of maturity, and the reader's background knowledge on the topic in question. Each of these factors influences a reader's interpretation of any given text. Reader response theory (Rosenblatt, 1978/1994) states that the variance in reader interpretations of a text depends upon such factors. These variances of interpretation allow readers to experience, in their own ways, through literature, something that they might not have experienced otherwise, such as what

it is like to live in a vastly different location or life situation. Even a reader's purpose in reading has a tremendous effect on the reader's interpretation of a text, which Rosenblatt (1994) termed *aesthetic reading* and *efferent reading*. Efferent reading, which is to carry meaning out of the text, and aesthetic reading, which creates a strong, sometimes emotional connection with text exist along a continuum of possible approaches to reading and interpreting a text. This interaction between reader and text, a transactional theory, describes a reader's assimilation of reading skills and strategy employed when reading a text. Reader response theory is central to the theory of constructively responsive reading (Pressley & Afflerbach, 1995) in that responsive reading is not a fixed process. Rather, readers grow as responsive readers through their interactions with different texts, read for a variety of purposes.

Schema Theory

Another component of the constructively responsive reading model is the act of drawing on prior knowledge to understand new texts, which Anderson and Pearson (1984) explained with schema theory. To make sense of texts, to make connections among texts, and even to participate in an exchange with another student regarding a text, a reader must draw on his or her schema to understand new text (Anderson, 2013). A reader's schema is an organized mental cache of knowledge, which allows the reader to understand reading, to acquire new learning that connects with previous learning, and to remember certain topics by relating them to others. Schema theory states that readers draw on knowledge they already possess to make sense of new knowledge, and what is most critical to comprehension is the relationships between old and new knowledge. As schemata become activated during reading, strategic readers are able to make appropriate inferences regarding the text and use their schema extensively to link prior learning to new learning (Anderson & Pearson, 1984; Anderson, 2013). Afflerbach's (1990) study

affirmed that expert readers (in this case, doctoral students who read material on topics in their fields) who often appear to process information automatically, at times find it necessary to use strategic thinking processes to negotiate and comprehend a text concerning a topic that is less familiar to them. Even expert readers depend upon an extensive schema on the topic of the text and possess the necessary content-specific vocabulary. Both the top-down processing of schema theory and the bottom-up processing of word recognition are present in a constructively responsive reader, and using these processes readers seek to understand new material they are reading based upon previous learning and reading experiences (Pressley & Afflerbach, 1995).

Language Discourse Theory

Although not included in the original publication of the constructively responsive reading theory (Pressley & Afflerbach, 1995), Gee's language discourse theory and situated language theory offer a lens through which to view the language and discussion component of my study. Pressley and Afflerbach's (1995) theory included van Dijk and Kintsch's (1983) theory of discourse comprehension, which described how readers construct an understanding of a text's message based on what the words in the text represent. The theory of discourse comprehension was only a small component of constructively responsive reading theory, and one criticism of the inclusion of this component was that van Dijk and Kintsch's (1983) theory of discourse comprehension focused heavily on the bottom-up approach to text comprehension. I feel that Gee's (1999, 2001) work on situated language, which was published after Pressley and Afflerbach (1995) published the constructively responsive reading model, is the more appropriate model to use in framing my study.

Gee (2013) describes language as a representation of experiences rather than the oral or written representation of a particular idea. He posits that language exists for the exchange of

perspectives, not for conveying one particular piece of information. At some point, children begin to anticipate alternate ways in which others might perceive their language. They learn to think in relation to the perceptions of others and to realize that there might be multiple perspectives to a particular situation. This awareness is necessary if students are to engage in perspective-rich language exchanges, as strategic readers often do (Gee, 2013). In addition, educational practitioners frequently cite a deficit in word identification as the source of reading problems, but Gee refuted this claim and argued that decoding text on the page is not enough. Readers must also know the structure of the text, the style, and the vocabulary specific to the topic. Gee (2013) claimed that more readers experience trouble with this difficult aspect of reading than with the phonetic aspect of reading. Application of Gee's work in language exchanges is present when readers discuss their thoughts while reading during think-aloud protocols of reading. Think-aloud protocols of reading have been shown to be effective in collecting data regarding the constructively responsive nature of an individual's reading process (Pressley & Afflerbach, 1995).

Metacognition and Constructivism

Constructivists, such as Piaget and Vygotsky (Crotty, 1998), viewed knowledge as that which is built from within the learner as the learning takes place and is dependent upon the learning situation and the learner; the learning outcome is secondary to the learning process. In a departure from a focus on the behaviorist study of the individual learner and individual skills, sociocultural theorists, influenced in part by the work of sociocultural psychologist Lev Vygotsky, became interested in learning as a social interaction (Alexander & Fox, 2008). As social constructivism grew, focusing on and understanding the process of attaining knowledge became the goal rather than identifying the actual knowledge that was gained as a result of the

learning process. Vygotsky (1978) stated children first learn through interaction with adults, using language as a vehicle for learning. Over time, children begin to internalize learning and are capable of bearing some responsibility for the learning on their own (Unrau & Alvermann, 2013). The zone of proximal development (ZPD) is the theoretical area where learning is best situated, as it begins where a child can learn independently and extends to the point that reflects what a child could learn with scaffolding and support from a knowledgeable adult. The ZPD represents the distance between a child's actual learning and potential learning, given the proper scaffolding in instruction. In addition to his writings about the ZPD, Vygotsky also proposed that adults instruct initially, then gradually allow the student to take control of the learning as the student becomes more capable; thus the adult assumes the role of facilitator of the learning rather than principal instructor (Unrau & Alvermann, 2013).

Through his work on memory and recall, Flavell (1979) developed a model of cognitive monitoring, which incorporates metacognitive knowledge, metacognitive experiences, goals, and strategies. Flavell concluded, based on his research, that certain tasks require varying degrees of cognitive monitoring and that more monitoring was present in tasks that required careful and highly conscientious thinking. He also believed that metacognitive abilities change and grow as a child develops and that students can be taught to be increasingly metacognitively aware, which would be beneficial to students and improve their learning.

Although Flavell (1979), a behaviorist-oriented psychologist, coined the term *metacognition*, or self-awareness of thinking, during his work examining the memory capacity of young children, Vygotsky's writings on scaffolded instructional practices inspired the application of the concept of metacognition to reading instruction as cognitive strategies (Pressley, 2005). In one study comparing metacognitive strategy instruction with a more

traditional approach to reading comprehension instruction, Boulware-Gooden, Carreker, Thornhill, & Joshi (2007) found that after five weeks of instruction on metacognitive reading strategies such as thinking aloud while reading and summarizing after reading, students' reading comprehension scores improved by 20% from the pretest to the posttest. Third-grade student participants in the Boulware-Gooden, et al. (1997) study also demonstrated a 40% increase in vocabulary assessment score between the pretest and the posttest. The concept of metacognition, and the increased ability experienced readers have over time to apply metacognitive strategies to their reading in an increasingly automatic way, is central to the theory of constructively responsive reading (Baker & Brown, 1984; Pressley & Afflerbach, 1995). The concepts of metacognition and constructively responsive reading relate because they work together to describe the way in which readers attend to the text and adapt their understanding as necessary to comprehend the text.

<div align="center">**Related Research**</div>

Comprehension

Emerging from the predominately behaviorist pedagogy of reading instruction prevalent in the mid to late 20th century, schema theory (Anderson & Pearson, 1984), a translation of Soviet psychologist Lev Vygotsky's (1978) work on sociocultural learning theory, and a constructivist application of metacognition (Baker & Brown, 1984), which had previously been a predominately behaviorist idea, spawned a new era of reading research. During the next 15 or so years, research often maintained a focus on the comprehension and interpretation of texts, rather than an amalgamation of isolated reading skills that was meant to result in comprehension. However, beginning in the mid-1990's, and spanning approximately 10 years, research on reading comprehension seemed to fade from the forefront of research as reformers demanded a

return to the "basics" of reading. Legislation, such as the No Child Left Behind Act (NCLB) of 2001 (NCLB, 2002), placed an increased importance on high-stakes tests (Pearson, 2009). Within the last 10 years, more research on reading comprehension and comprehension strategies has begun to emerge again, with an increased focus on what students actually do while they read that makes them successful comprehenders of text.

In one early landmark study, Palincsar and Brown (1984) investigated the effects of reciprocal teaching to increase the reading comprehension of low-achieving seventh-grade students. The researchers found that after training students on the use of comprehension strategies such as summarizing, questioning, clarifying, and predicting through modeling and application of the strategies in a small group, all but one student in the treatment group scored at the same level as those students who were considered good comprehenders on quantitative reading comprehension tasks. Not only was the improvement in comprehension scores sizable, the effects of the improvement carried on for an eight-week period. During a second study using the same method, Palincsar and Brown (1984) found that the procedure carried over to the general classroom setting with no loss of effectiveness when the classroom teacher delivered the strategy instruction. In fact, all students in the second round of the study made significant gains in comprehension, providing evidence that reciprocal teaching with comprehension strategies was equally effective when conducted by the classroom teacher, rather than the researchers, which led the researchers to suggest that reciprocal teaching could be effective in regular school settings.

Following this work on reciprocal teaching, a number of studies in the late 1980's and early to mid-1990's focused on the instruction of reading strategies (Pressley et al., 1992; Pressley & Afflerbach, 1995; Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989; Raphael,

1986; Wyatt et al., 1993). Additionally, a number of more recent publications focused on reading strategies and their application (Allen & Hancock, 2008; Baker & Beall, 2009; Duke, Pearson, Strachan, & Billman 2011; Wilson, & Smetana, 2011), attesting to the enduring nature of an interest in and a need to understand the nature of strategic reading. As a result, a wide body of evidence supports the benefit of students learning to apply reading strategies as they develop as readers (Pressley, 2000). Over time, some findings have remained consistent. Readers who are more successful than others show evidence of higher levels of metacognitive knowledge and awareness about their reading and are more able to evaluate their own reading processes during reading than readers who are less skilled, which supports a link between comprehension and successful comprehension monitoring (Baker & Beall, 2009). In one longitudinal study, Cain, Oakhill, and Bryant (2004) studied comprehension monitoring in relation to working memory capacity and inference making. After testing students at multiple points throughout the length of the study, the researchers found that working memory capacity and verbal skills are not the only factors that contribute to comprehension. Comprehension monitoring accounted for variance in the outcome of the study, once working memory capacity and inference making were controlled. Even young children, researchers concluded, could improve their comprehension monitoring ability through intervention and potentially ease the effects of a less than ideal working memory capacity, which can be less responsive to remediation (Cain, Oakhill, & Bryant, 2004).

While studying comprehension monitoring through self-reporting, Griffin, Wiley, and Thiede (2008) concluded that metacomprehension monitoring accuracy is constrained by a reader's ability to monitor comprehension strategies during reading due to potential difficulties in processing text while self-evaluating comprehension monitoring concurrently. The

researchers posited that two potential reasons for poor comprehension monitoring could be the simultaneous need to process text and monitor comprehension at the same time while reacting to valid cues with which to predict comprehension. Monitoring of comprehension strategies may be most effective when done concurrently with reading, but this adds to the stress of the cognitive load and may impede process, causing comprehension monitoring to be less accurate. The researchers found that performing the think-aloud during a rereading session, rather than during the first read, produced better results. The first of their two studies found that concurrent metacognitive processing supported Griffin and colleagues' idea that concurrent processing was difficult for readers. The second study found that working memory capacity had an impact on participants' abilities to switch from one task to another, potentially affecting the effort needed to process texts. Study results suggested that rereading tasks had a slight effect on comprehension monitoring, demonstrating that rereading may relieve metacognitive processing constraints by allowing readers to process text during the first read and focus on their explanations of metacognitive monitoring strategies during the second read. The positive effect of rereading on comprehension, however, was only found in lower ability readers. Self-explanation of reading material, such as paraphrasing, had a much stronger effect on comprehension monitoring, which suggested that the higher cognitive task of self-explaining improved comprehension monitoring efforts in most readers (Griffin, Wiley, & Thiede, 2008).

A recent report of neuroimaging studies demonstrated that different areas of the brain show varying levels of activity when participants engaged in different types of reading tasks (Baker, Zeliger-Kandasamy, DeWyngaert, 2014). Functional magnetic resonance imaging (fMRI) scans show the location of neural activity in the brain. Scans using fMRI during reading tasks found more activity in areas of the brain that control executive functioning, such as

decision-making, when reading tasks required higher cognitive demands than tasks involving lower metacognitive tasks. Neural activity was also noted in other areas of the brain that are associated with building cohesion. While examining the use of specific metacognitive strategies, such as summarizing, paraphrasing, a multi-strategy metacognitive approach, and rereading, researchers found differences in neural activity among the strategies. The fMRI scans showed a higher level of activation in areas of the brain associated with higher processing functions when participants engaged in the first three strategy approaches, but rereading did not produce the same activity in these areas associated with executive functioning (Baker, Zeliger-Kandasamy, DeWyngaert, 2014). These findings echoed the findings on rereading in Griffin, Wiley, & Thiede's (2008) study. Participants also reported more frequent instances of their minds wandering during the rereading tasks in comparison with those tasks they felt were more cognitively demanding, which lent support to the findings of the fMRI scans (Baker, Zeliger-Kandasamy, DeWyngaert, 2014).

Reading strategies can be defined as those actions that are intentionally selected and strategically applied to aid in learning from a text. Reading *strategies* are often separated from reading *skills* by the purposeful nature of selection of a particular strategy when needed versus the automaticity inherent in a reading skill (Alexander & Jetton, 2000). Reading strategies, such as summarizing a text or deciphering the main idea, can eventually become reading skills as a reader matures depending on the level at which the reader is functioning and given that the rationale for the type of reading strategy instruction is theoretically driven (Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989). The root difference between skill and strategy lies in the application of a procedure, whether it is in an automatic way, or a strategic, purposeful way. One key component of strategic readers is the ability to be flexible and selective with their

approach to reading. Whereas strategic readers carefully select actions necessary to interpret or make sense of a section of text when it is required, there are also times when reading continues through a section of text automatically, in which the readers are unaware of their processing. Here lies the difference between skill and strategy; strategies are applied in a strategic fashion and skills operate many times without the knowledge of the reader (Afflerbach & Cho, 2009; Afflerbach, Pearson, & Paris, 2008).

Few may disagree that readers should be skilled, and the literature continues to support research on strategic processing during reading which leads to skilled reading (Afflerbach, Ruetschlin, & Russell, 2007; Duke, Pearson, Strachan, & Billman, 2011; Pressley & Harris, 2006), however, there has been some disagreement over the role of reading strategy use and instruction. One study designed to compare strategies instruction with a content-focused instructional approach found that the content approach was more effective than strategies instruction when measured with a recall task (McKeown, Beck, and Blake, 2009). In this study, six classrooms of fifth-graders were divided into three groups: strategies instruction, content instruction, and a control group that used the adopted basal text. After implementing a set of standardized comprehension lessons to each group, student outcomes were measured with a sentence verification technique, in which students determined whether a statement about a text was true, and a recall task in which researchers asked students to recall texts they read and scored each recall for length and content. Neither the strategies nor the content group produced a significant difference in scores on the sentence verification technique, but researchers found that the content-focused group fared better on the recall assessment than the strategies group. The authors posited that research does little to clarify which strategies teachers should teach and how that might look in the context of classroom discourse, which they contended is not enough

evidence to support strategies instruction (McKeown et al., 2009). Instead, the researchers favored a content approach based on a text processing prospective and sociocognitive approaches such as meaningful discussion. While McKeown and colleagues delineated between the theoretical underpinnings of a strategies approach and a content approach, many of the theories are quite similar and appear in research for both approaches (e.g. Kintsch & van Dijk, 1978; vanDijk and Kintsch 1983).

Much of the debate over strategies instruction seems to center around the study of singular strategy application or the misapplication of strategies instruction as it has been published in intervention materials, which stress a rigid, scripted approach to reading strategies instruction (Duke, Pearson, & Strachan, 2011). When reading strategies are applied in this way, they become further separated from their original intention, which is to guide readers to engage strategically with a text, and become more of a "hypothetical caricature of strategy instruction" (Pearson, 2011, p.250). The National Reading Panel (2000) reported that comprehension monitoring should be part of comprehension instruction, but provided little guidance on how that might look in classrooms, potentially prompting publishers to include reading strategy instruction in their published programs in a way that is inconsistent with the research on classroom strategy instruction (Pressley & Harris, 2006).

While strategies instruction may have been misapplied in scripted intervention programs in the past, it is a widely researched and supported method of comprehension instruction, which continues to be a topic of research. Keene (2013) noted that in the years since strategy instruction entered the research scene its use has been applied flexibly and with great success in classrooms. Yet strategies instruction has also been reduced to an overly sequenced and scripted process in which reading strategies become ends unto themselves rather than a means to strategic

reading as they were always meant to be. It may be worthwhile to examine the way reading

strategies are taught in the classroom, and ensure teachers are applying methods for strategies

instruction in the way practitioners such as Harvey and Goudvis (2007), Keene (1997), Tovani

(2000), and Beers (Beers & Probst, 2012/2015) have always championed, rather than the

restrictive lock-step approaches used by some intervention programs. Pearson (2011) claimed

that strategies instruction, in some cases, has suffered the same fate as phonics instruction. In an

effort to focus on something that research has proven to be beneficial, strategy instruction, much

like phonics instruction, has become an end in itself.

Although some published programs may limit strategies instruction to applying one

strategy at a time in a rigid fashion, research has demonstrated that reading strategies are most

effective for comprehension when readers apply a number of coordinated strategies as they

monitor their reading progress (Fox & Alexander, 2009; Pressley & Afflerbach, 1995; Brown,

Pressley, Van Meter, Schuder, 1996). Pressley et al. (1992) demonstrated that the application of

reading strategies in elementary classrooms looked quite different from the single-strategy

application often found in well-controlled research environments. Transactional reading

instruction (Pressley et al., 1992) described the real-world application of reading strategies

instruction in actual classrooms with actual children. One important component of transactional

reading instruction that differs from previous experiments involving a single-strategy application

is that groups of students interact with a text and each other to discuss their thinking as they read.

Ideally, this interactive support system will lead to internalization of coordinated strategy use for

each reader, who will then apply the concept independently. Brown, Pressley, Van Meter, and

Schuder (1996) found that a year of transactional strategies instruction improved low-achieving

second grade students' reading more than students in the comparison groups who participated in

the traditional second-grade reading curriculum. This study differed from previous comprehension strategy research in that the study focused on the coordination of multiple components of instruction rather than individual elements of strategy instruction in an isolated way.

At the Benchmark School in Media, Pennsylvania, struggling readers in grades one through eight learned to apply reading strategies in a flexible, comprehensive way to produce high reading gains (Pressley & Gaskins, 2006; Pressley, Gaskins, Solic, & Collins, 2006). Based upon the tenets of constructively responsive reading (Pressley & Afflerbach, 1995), students at the Benchmark School learned how to apply reading strategies as they read texts, one of the most frequently applied strategies being application of background knowledge, always focused on the goal of gaining meaning from the texts. The students learned to monitor their reading progress by applying strategies as needed to understand what they read. In the upper grades, students applied the same reading strategies to what they read, but they did so with increasingly complex texts. This practical and successful application of strategies throughout the curriculum at the Benchmark School supported Brown, Pressley, Van Meter, and Schuder's (1996) earlier findings that transactional reading proved successful with struggling readers.

Another component that may have increased the success of those at the Benchmark School is the rigorous professional development program for the faculty. With an apprenticeship program for teachers, multiple professional development sessions built into the school year, an emphasis on scholarly reading, and the faculty's participation in outside professional workshops and conferences, simply teaching at the Benchmark school is a professional development opportunity (Pressley, Gaskins, Solic, & Collins, 2006). The focus on teacher instructional development for teaching reading strategies was also emphasized in Pressley and Hilden's

(2007) case study of teachers who participated in professional development on teaching reading strategies to improve students' reading comprehension. Teachers in this study reported that their knowledge of teaching reading strategies and their confidence in their abilities to do so increased as the study progressed with professional development support on topics such as improving teachers' knowledge of their own use of strategies and modeling strategy use for their students. To support students who are learning to become strategic readers, teachers can model strategic reading behaviors for their students and can assess student strategy application and growth with such methods as using checklists, questioning students during reading, and assigning performance assessments of reading where strategic reading is required (Afflerbach, Ruetschlin, & Russell, 2007). Not only is it important that the strategic reading assessment in classrooms closely reflects the instruction that teachers give students, but it is also important that teachers receive appropriate professional development opportunities to apply these assessment techniques effectively.

Metacognition

Following Flavell's (1979) work on metacognition, researchers throughout the 1980's applied the concept of metacognition to reading research. In his examination of the research on student metacognition, Guthrie (1982) discussed the link between reading flexibility and the emerging research on metacognition. Guthrie referred to reading flexibility as the method readers use to adapt their reading to the text based on what the text requires. As text increases in difficulty, readers must adjust their reading to compensate for the increased demand from the text. Successful readers have increased reading flexibility, allowing them to adapt to various reading situations. As metacognition includes not only the concept of one's awareness of what is known, but also includes the concept of one's ability to choose flexibly from a variety of known

strategies necessary in differing situations, Guthrie (1982) posited that the metacognitive processes allow reading flexibility to occur. In support of the connection between metacognitive strategy use and reading flexibility, Guthrie presented the results of one study of fifth-grade readers in which readers who were more proficient demonstrated metacognition during a reading task, whereas readers who were less proficient did not exhibit self-regulation, a mark of metacognition, during the reading task. Guthrie (1982) stated that essentially less-proficient readers do not realize when they have not understood a piece of text and therefore do not apply metacognitive self-regulation strategies to adjust their understanding of a text.

As part of their participation in the Informed Strategies for Learning (ISL) research project at the University of Michigan, Jacobs and Paris (1987) designed a study to gauge the effectiveness of metacognitive strategy instruction in elementary-school classrooms. The goals of the project were: to increase children's understanding of the reading process by explaining how certain strategies apply to reading, to provide an assessment of the relationship between reading performance and metacognitive strategies, and to provide an instructional method to guide classroom teachers in this work. At the beginning of the school year, the researchers administered a pre-assessment to 71 third and fifth grade classrooms, which consisted of a standardized reading comprehension test and the Index of Reading Awareness (IRA), developed by the researchers associated with the ISL project. The IRA is a multiple-choice metacognition test designed to provide information about students' knowledge of reading strategies related to planning, evaluation, and regulation that teachers can administer to large groups of students at once and score easily.

After administering the assessments to all students, 46 classrooms engaged in ISL modules designed to teach children how to apply independently metacognitive strategies to

reading tasks, specifically focused on meaning construction and comprehension monitoring. At the end of the school year, the students took the assessments again to determine the effectiveness of the treatment. Researchers found that while all students showed some improvement at the end of the school year on the reading comprehension assessment, the students in the third-grade treatment group, after one year of metacognitive strategy instruction, outscored the control group by nearly one standard deviation. Fifth grade students demonstrated similar results. Jacobs and Paris (1987) noted that not only did the results of their study support the idea of teaching students how to apply metacognitive reading strategies, but it also indicated that good readers are more aware of variables that affect reading than poor readers. Bonds and Bonds (1992), who suggested that differences in reading might be the result of discrepancies in metacognitive awareness, later supported this work in their review of metacognitive reading strategies. Bonds and Bonds (1992) further advocate for instructional strategies that focus on metacognitive development in children, which they believe aids in comprehension monitoring.

In 1990, Swanson examined the metacognitive awareness of high and low-achieving fourth and fifth-graders. In this study, the researcher divided the 56 participating students into two groups: 31 high-aptitude students and 25 low-aptitude students, as determined by an aptitude assessment and a multi-subject academic skills assessment. Each student answered a 17-question questionnaire designed to examine a student's metacognitive abilities. After answering the questions, participants engaged in two problem-solving tasks that required them to talk as they completed each task. The researcher found that students with a high degree of metacognitive awareness fared better on tests of problem solving than those students with less metacognitive awareness. More importantly, Swanson (1990) found that an increase in problem-solving performance reflected increased metacognitive awareness, rather than a higher

intellectual aptitude. Students with less intellectual ability and a higher degree of metacognitive awareness outperformed students with higher intellectual ability and lower metacognitive awareness, suggesting that metacognitive awareness is independent of intellectual abilities. Swanson (1990) also speculated that a lack of aptitude overall could be augmented by high metacognitive abilities in students.

Based on the findings of previous research that metacognitively aware learners are strategic and high achieving, Schraw and Dennison (1994) created the Metacognitive Awareness Inventory (MAI) for use with adults to examine the relationship between knowledge and metacognition. Psychometrics indicated that the self-reported MAI is reliable when assessing knowledge of cognition, or students' self-awareness, and awareness of cognition, or students' knowledge of planning and adjusting during learning, and that these two components of metacognition are highly correlated, which supports Flavell's (1979) dual component model of metacognition. Study results also demonstrated that a high degree of knowledge of cognition correlated with academic success, as measured by a reading achievement test (Schraw & Dennison, 1994). MAI results could provide diagnostic information on underperforming readers, and thus identify adult students who need additional support in reading. Schraw and Dennison postulated that cognitive awareness might be prevalent in complex tasks, such as reading comprehension.

Drawing on Pressley and Afflerbach's (1995) work on constructively responsive reading, Mokhtari and Reichard (2002) created an instrument to assess adolescent students' awareness of metacognitive strategies. The Awareness of Reading Strategies Inventory (MARSI) is a self-report inventory developed for use with sixth through twelfth-grade students. The MARSI is designed to measure students' perceived ability to use metacognitive reading strategies while

reading school-related informational texts. Mokhtari and Reichard (2002) constructed the MARSI using the 15 skilled reading strategies outlined in the work of Pressley and Afflerbach (1995), which described the metacognitive strategies skilled readers use as they approach the task of reading. This study, resulting in the development of the MARSI instrument, found that students who rate their reading ability as high use reading and problem solving strategies more often than those who rate themselves as average or lower ability readers. Factor analysis and other psychometric measures indicate that the MARSI is valid and reliable for students reading at the fifth through twelfth-grade level. Although the MARSI is a self-reporting assessment of student perceptions, not performance, the instrument could be beneficial to students in creating awareness of the metacognitive reading strategies they use while reading school texts and could inform teachers of the range of reading strategies their students use (Mokhtari & Reichard, 2002).

One study investigated the effects of pairing Question Answer Relationships (QAR) (Raphael, 1986), in which students examine the type of information needed to answer the question, and think-aloud strategy, in which teachers model their thinking and reasoning during reading for their students, who later emulate and adopt the strategy (Wilson & Smetana, 2011). After a pilot study, which monitored instruction using QAR and instruction using think-alouds, researchers developed the Questioning as Thinking (QAT) metacognitive framework for use with expository text. Rather than focusing on a model in which a teacher initiates a question which results in a student response, the QAT framework merged the think-aloud comprehension process during reading with the QAR process, which has traditionally aided in comprehension after reading rather than before or during reading. The researchers found that students who participated in the target instructional model made significant gains in comprehension. In fact,

out of the 29 percent of students whose end-of-year assessment scores indicated gains in comprehension, 47 percent of those students' scores indicated more than two years' worth of growth in the area of comprehension. Additionally, researchers reported that 46 percent of students who scored below grade level before instruction scored two grade levels above expectation at the end of the year in vocabulary, even though the focus of the QAT framework is comprehension improvement, not vocabulary (Wilson & Smetana, 2011). Researchers noted that the increase of effectiveness in teacher instruction and student performance was due to the metacognitive integration of the QAR and think-aloud strategies, combined to create the QAT framework, and allowed students to monitor their comprehension and question the text.

In an attempt to link executive functioning and metacognition with the academic outcomes of young children, Roebers, Cimeli, Röthlisberger and Neuenschwander (2012) administered a variety of assessments related to academic achievement, executive functioning, and metacognitive monitoring to end-of-year second-grade students. The results were examined with previously collected data from the same students the year before to examine the results longitudinally. The researchers found a significant link between students' executive functioning, metacognitive monitoring processes, and academic achievement. Further results showed that underdeveloped executive function in children is likely related to decreased metacognitive control and that metacognitive monitoring in young children was predictive of academic success, especially in literacy (Roebers et al., 2012). This study is significant in that many studies of metacognition focus on adults or older students, such as those in high school and college, and very few studies explore the metacognitive processes of young children.

In order to contribute to the relatively limited body of research on cognitive abilities during reading comprehension in schools, Allen and Hancock (2008) studied the effects of

metacognitive process instruction in fourth through sixth-grade language arts classrooms. The purpose of the study was to evaluate the likelihood of an increase in students' achievement as a result of instruction on metacognitive strategies and reflection on their awareness of the strategies' usage in the classroom. Over 10 weeks, students in the experimental group took part in metacognitive systematic inquiry developed by one of the researchers during their language arts instructional block. The researchers used multiple measures for assessment both pre and post treatment. This was supported by recommendations related to triangulation of measures found in Pressley and Afflerbach's 1995 work on verbal protocols and was designed to assess student achievement. They found that the students in the experimental group who received instruction significantly outperformed the control group on a standardized achievement test (Allen & Hancock, 2008). It is important to note that the metacognitive systematic-inquiry process took very little time during instruction and required only a small amount of feedback from an adult, yet students who received the instruction made significant gains in reading achievement during the 10-week treatment period. This finding suggests that even a small amount of instruction on metacognitive strategies could have a large effect on student achievement in literacy.

One study of fifth through eighth-grade students examined the students' comprehension monitoring and the students' perceived usage of reading strategies (Kolić-Vehovec & Bajšanski, 2006). Researchers used multiple assessments to evaluate 526 students' reading comprehension and levels of metacognitive awareness. The reading comprehension assessment consisted of a reading passage followed by 11 open-ended questions, which was the same for all participants, regardless of their grade level. To evaluate their comprehension monitoring, students also completed a cloze task and a metacomprehension test, which assessed comprehension

monitoring through text corrections. Researchers also asked participants to complete a strategic reading questionnaire, in which students indicated the frequency of their reading strategy usage on a five-point Likert scale.

Kolić-Vehovec and Bajšanski (2006) found that the students' strategy usage reporting did not line up with their comprehension scores until eighth grade. Students in fifth grade seemed to overestimate their use of reading strategies, which the authors concluded could be due to their underdeveloped metacognitive knowledge. Researchers also hypothesized that younger students may be more aware of their own strategy use because those strategies are less likely to be used automatically during reading since these younger students are still developing as strategic readers. Older students, they surmised, might apply certain reading strategies more automatically than younger students, as they are typically stronger readers. Kolić-Vehovec and Bajšanski (2006) also noticed that the more complex the reading strategy such as making inferences, the more likely students were to report active use of the strategy at all age levels; possibly indicating that complex reading strategies were not yet automatic for even the oldest readers in the study.

As part of the San Diego Striving Readers' Project (McDonald, Thornley, Staley, & Moore, 2009), teachers used the researchers' Strategic Literacy Instruction in the Content Areas (SLIC) curriculum to focus on instructional practices that the researchers had previously identified were instrumental for student success in literacy, as well as the content areas, when reading grade-level instructional texts. The curriculum focuses on instructional approaches that center on the following areas: surveying the text layout and structure before reading, establishing a focus for reading based upon the assigned task, taking notes while reading, questioning the text, discussing the text with peers, focusing on the reading processes which resulted in gained

knowledge, and writing according to the assigned task with instruction to support the writing (McDonald, et al., 2009). During an examination of the study data collected during the third and fourth years of this five-year project, researchers found that 10 teachers in the study spent considerably more of their instructional time focusing on metacognitive strategies than other teachers in the study, who mainly focused their instructional time on skill instruction (McDonald, Thornley, Ciriza, Behumi, & Staley 2011). Although students across all classrooms in the study made gains in achievement, the students of the 10 teachers who focused more of their time on teaching the students how to think metacognitively made the highest gains. Through focused instruction, reflective student journaling, and precise and relevant teacher feedback, these 10 teachers saw significant gains in their students' achievement on standardized measures over those of their peers who did not focus on metacognitive strategy instruction (McDonald, et al., 2011). These results lent support to the researchers' beliefs that a focus on metacognitive strategies within the context of sound pedagogical instruction is beneficial to students' achievement.

Think-Aloud Studies

Pressley and Afflerbach's (1995) analysis of verbal protocol studies revealed that verbal protocols have the ability to demonstrate the processes that competent, adult readers use to make sense of text. These strategies, such as previewing, pausing to think or discuss at multiple points during a reading, and attention to text and graphic features allow expert readers to read with high levels of comprehension. It is evident that these readers intentionally make inferences as they read using the contents of the text and their schema on the topic by examining the author's intent or mentally filling in missing information. By using all of these strategies, expert readers are able to monitor their comprehension as they read (Hilden & Pressley, 2011). Verbal protocol

studies provide in-depth information about strategic reading processes and this methodology allows us to understand more accurately a reader's meaning-making process.

During verbal protocol studies, researchers ask participants to respond either concurrently with the text by volunteering their thoughts while reading as they feel is necessary, or they ask participants to respond retrospectively by stopping at a predetermined point at the cuing of the researcher. Hilden and Pressley (2011) suggested that either can be effective, but that the level of proficiency of the reader will determine which method is more effective. They stated that concurrent think-alouds are better when readers are capable and the text is not too challenging. However, when readers struggle, providing stopping points during a retrospective think-aloud might yield better results. Hilden and Pressley also recommend allowing readers to respond without prompting to allow the participants to demonstrate their natural thinking process without interference from the researcher.

Schellings, Aarnoutse, and van Leeuwe (2006) employed think-aloud protocols to examine the reading processes of proficient and struggling third-grade readers who read expository texts. Pursuant to Pressley and Afflerbach's (1995) recommendations, these researchers collected multiple data points including a vocabulary assessment and reading accuracy assessment in addition to the think-alouds during their study in an attempt to triangulate their findings. Although their coding scheme was informed by earlier research, Schellings et al. (2006) developed an alternative coding system separate from that used by earlier researchers to represent more accurately represent the reading processes of the young readers who participated in the study. The study found that the third graders exhibited a wide range of text-processing strategies similar to those shown by adult readers in other think-aloud studies.

Since reading is an invisible process, learning to read, even from an expert, can be somewhat tricky since it is something that one cannot watch first, and then imitate. Think-alouds can be a critical instructional tool, which allow students to see a model of good reading (Fisher, Frey, & Lapp, 2012). By hearing an expert reader model the thought process that should be happening inside the mind of a reader, students can replicate the kind of thinking that is expected of them. After using think-alouds as a modeling technique, students are able to think deeply about their reading and to have more quality conversations with others about what they were reading (Fisher, Frey, & Lapp, 2012). In a think-aloud study of middle school students who read selections from high school textbooks (Caldwell & Leslie, 2004), the researchers found that the level of the text and the text structure greatly influenced the quality of a student's thinking and responding to text. Students who were able to answer a high number of questions about the lower and middle-level text without looking back at the text were not able to do so with the most difficult text. This indicates that using think-aloud strategies might be useful to students when they are reading a moderate-level text, but the same strategy may not be useful when reading a more complicated text with an intricate structure. The think-aloud strategy seemed to have the most influence on students' answering questions associated with the easiest of the three texts and had less of an impact as the text increased in difficulty (Caldwell & Leslie, 2004).

When working with English Language Learners (ELLs), McKeown and Gentilucci (2007) found that while think-alouds improved the comprehension of intermediate ELLs, it impeded the comprehension of beginner and advanced ELL students. One possible reason for this is that early level ELL students are more focused on bottom-up processing and focus all of their cognitive capacity on decoding. The think-alouds seemed to be more intrusive to their work because it interrupted their decoding process. With respect to the advanced ELLs, the

think-alouds surprisingly seemed to interfere with their comprehension due to the interruption of the flow of reading. Since pausing to make personal connections interrupts the thought process of readers and is not especially helpful when reading expository text, it did not prove to aid in their comprehension processes.

More recently, researchers have used think-aloud studies to explore students' use of digital literacies and online vocabulary acquisition (Coiro & Dobler, 2007; Ebner & Ehri, 2013). Coiro and Dobler (2007) found similarities between the processes skilled readers use to comprehend printed text and the processes skilled readers used to read digital texts online. The sixth-grade participants in the study also exhibited complex reading strategies in searching for information online as previously observed in studies of skilled readers reading paper-based texts. Ebner and Ehri's (2013) study supported Coiro and Dobler's (2007) earlier findings and further demonstrated that a structured think-aloud approach yielded significantly higher results in vocabulary acquisition during online reading than an unstructured think-aloud approach.

In their seminal study, Wyatt, Pressley, El-Dinary, Stein, Evans, and Brown (1993) examined the reading behaviors of college professors who chose to read an article on a topic from their fields of studies. After recording the participants' think-alouds during reading, the research team coded each response. These responses, which were surprisingly similar despite the variance in text and topic the participants chose to read, were analyzed and from this process the researchers developed a list of behaviors that were commonly used. Many of the same processes were observed in all readers in the study. The Reading Behaviors Inventory that emerged from the study provided one of the most in-depth accounts of expert reading processes at the time (Wyatt et.al, 1993).

This Research Study

Pressley (2006) suggested that if one wants to explore metacognitively skilled reading, it is best to ask a reader to choose a text on a familiar topic, read it aloud, and report thought processes during reading. Readers who read actively or thoughtfully are constructively responsive readers, and generally, these readers are proficient adult readers who are motivated to read and are experts on the text they choose to read (Pressley & Afflerbach, 1995). While much of the research on metacognitively skilled, or constructively responsive readers, has involved adult participants presumably because it is expected that this population is where to find such readers; there remains a dearth of information regarding the path readers take on their way to becoming constructively responsive readers as adults.

It would be beneficial for teachers and researchers alike to develop a clear understanding of what constructively responsive reading looks like at multiple developmental points during the growth of a reader. By continuing to expand the research available on metacognitive strategy use and constructively responsive reading in school settings with young children as participants, we can learn much about the development of metacognitively skilled readers. Perhaps, as suggested by Pressley (2006) constructively responsive reading is found only in mature, adult readers. However, as constructively responsive readers presumably do not develop suddenly at the point of adulthood, there must be a path of reading development providing a continuum of development for constructively responsive readers. To describe this development, there is a need for examining which aspects of constructive responsivity exist in young readers. As we learn more about what aspects of metacognitive awareness and constructively responsive reading are present in school-age children at each level, we gather powerful information about what strategic reading looks like at all ages.

Instruction in metacognitive strategies has proven beneficial for students (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007), and once elementary teachers know what expert, strategic reading looks like at each grade level, they could potentially improve and implement instructional strategies based on metacognitive literacy strategies, such as those in use at the Benchmark School (Pressley, 2006). However, before instruction in appropriate metacognitive reading strategies can take place, teachers must know what strategies are necessary to facilitate reading growth in students. The use of information found in verbal protocol studies, such as the one proposed here, could further inform the development of instruments which determine a student's stage of metacognitive strategy development and their position within the spectrum of constructively responsive reading development.

This study was a step toward understanding what metacognitively skilled reading looks like at all stages of reading development. The purpose of my research was to study the most proficient readers in an elementary school to determine what those proficient readers do well as they read and which comprehension strategies they employ during reading. I anticipated that the teachers in my school could benefit from the information discovered through this study by gaining a more complete picture of what skilled reading involves at the elementary level. In their writing on reading comprehension instruction, Duke, Pearson, and Strachan (2011) stated "If learning to read effectively is a journey toward ever-increasing ability to comprehend texts, then teachers are the tour guides, ensuring that students stay on course, pausing to make sure they appreciate the landscape of understanding, and encouraging the occasional diversion down an inviting and interesting cul-de-sac or byway" (p.51). If one is to be a tour guide of reading comprehension, one must understand the landscape. Through their research of teachers' knowledge of reading comprehension, Kucan, Hapgood, and Palincsar (2011) found that the

majority of elementary reading teachers in their study did not identify accurately the important themes in texts that would lead to student comprehension. Additionally, the majority of the teachers did not engage effectively in text-based discussions that lead students to an increased level of text comprehension, suggesting an overall misunderstanding or misapplication of teacher knowledge on strategic reading. If our teachers have a clear understanding of which strategies skilled elementary readers use successfully while reading, they might be able to adjust their instruction to meet the needs of less strategic readers, which is the ultimate goal of reading teachers. Discovering commonalities among skilled elementary-school readers could show which metacognitive processes are most critical for reading acceleration at any particular point along the path to reading proficiency, which could positively influence reading instruction.

Chapter 3 – Methods

In this chapter, I describe the research methods I employed to complete my study, including the overall design, participant selection, data collection procedures, and analysis of both qualitative and quantitative portions of the collected data. I have chosen this methodology to address the following research questions:

1. What types of thinking do proficient fourth-grade readers report using while they read informational texts?

2. What patterns of reading behavior do proficient fourth-grade readers most commonly report when reading informational texts?

Research Design

The design used in this study was a type of mixed methods research, which is a pragmatic approach to research, utilizing the best of both qualitative and quantitative methods. Mixed methods research designs also attempt to minimize the weaknesses found in qualitative and quantitative approaches to present more than one way to examine the problem addressed in the research (Creswell, 2015; Teddlie & Tashakkori, 2009; Teddlie & Tashakkori, 2012). Using mixed methods research as the methodology for this study supports examining the research questions by attempting to provide an explanation of students' thinking processes during reading using qualitative methods and reporting the frequency of specific reading behaviors using quantitative methods.

As the Wyatt and colleagues' (1993) original study was published before mixed methods research methodologies became widely accepted, the study essentially quantified the collected qualitative data during part of the analysis and discussion phase. In the spirit of the original study, I chose to include both qualitative and quantitative components in the research design;

however, unlike the original study, I designed the study using a mixed methodology. By using

this mixed methods design, I was able to add a bit of quantitative data to enhance the narrative

data, which provided extra information to support the qualitative findings. An embedded mixed

methods design was best suited for this study as it reflected the timing and point of integration

that would be most effective when addressing the research questions. The embedded design

allows for one point of data collection and two analyses, one qualitative and one quantitative, for

the collected data (Creswell & Plano Clark, 2011). There was one point of data collection in the

form of student think-aloud recordings, qualitative and quantitative analysis of the collected data,

and findings from both analyses were integrated during the discussion of findings (see Figure1).

Data Collection

think-aloud
recordings
(QUAL)

think-aloud recordings
(quan)

Data Analysis

Student
explanations of
their thinking
processes
(QUAL)

Frequency of
reading behaviors
(quan)

QUAL:
Explanation of student
awareness of strategies
and thinking processes
used while reading

Integration

quan:
descriptive statistics of
frequency of reading
strategy use

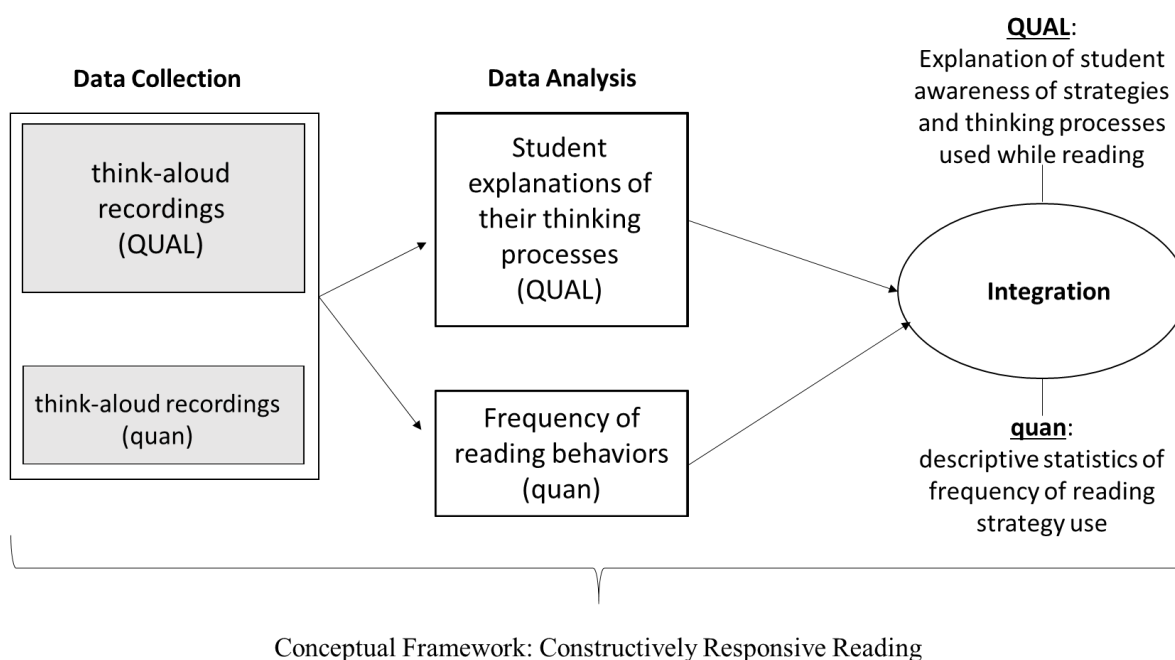Conceptual Framework: Constructively Responsive Reading

Figure 1. Embedded Mixed Methods Study Design

Context, Sampling, and Access

This study took place in a K-4 elementary school in a small urban area of east Tennessee. This Title I elementary school has an estimated 72% students who qualify for free and reduced-priced lunch. The sample for this study consisted of a criterion sample (Creswell, 2007) of fourth-grade students in the target school who scored either between the 80th and 86th percentiles or at the 90th percentile or above according to the STAR assessment and had parent consent to participate in the study. It was necessary to include only those students who demonstrated strong reading proficiency, as this study sought to examine the metacognitive processes of expert readers.

The STAR assessment is a timed, twenty-five question computer-based adaptive reading assessment that establishes a reading level for each student based on his or her answers to the questions. The adaptive, computerized test determines the next question based upon the time it takes a student to answer and whether that answer is correct. The STAR assessment produces reports that include scale scores, criterion-referenced scores, and norm-referenced scores. Renaissance Learning, which publishes the STAR assessment, reported the test-retest reliability coefficient for fourth-grade students is 0.77 and the external validity correlation is 0.75 (The Research Foundation for STAR Assessments, 2014).

Although all students scoring in the 80th percentile and above are considered proficient readers, I chose to separate the two groups into levels of proficiency, between the 80th and 86th percentile and the 90th percentile and above for comparison purposes. According to the STAR Technical Manual (Renaissance Learning, 2015), there is no set standard error of measurement (SEM) for the assessment due to the adaptive nature of the computerized test. The manual states that there is an individual SEM for each student's assessment session. However, the manual

does give an average SEM of 50 in scale score units for the assessment. Using this estimate and comparing the correlation of scale scores and percentile charts provided by the testing company (Renaissance Learning, 2015), I estimated prior to collecting student data that separating students into the aforementioned groups, students scoring between the 80th and 86th percentiles and those scoring in the 90th percentile and above, ensured that there is no overlap in groups when taking the SEM into account. After identifying potential participants for the study, I verified that the two groups were truly separate, with no possibility of overlapping scores based on each student's individual scale score and the average SEM provided by Renaissance Learning. By stratifying this sample, I hoped to enhance the analysis of quantitative data points and further support the qualitative data.

Since I did not yet have parent permission to examine the fourth-graders' STAR assessment scores to identify participants, I asked fourth-grade teachers to use the school's existing data from the STAR assessment to identify grade readers to participate in the study. I requested participants who fell into one of two groups: students scoring between the 80th and 86th percentile and students scoring in the 90th percentile and above. The teachers were willing participants in my search for student readers who qualified for my study. I gave each teacher consent forms to send home after identifying students who fit the pre-established criteria.

Data Collection

Data for this study were collected using verbal protocols. Pressley and Afflerbach's (1995) analysis of verbal protocol studies showed that verbal protocols have the ability to demonstrate the processes that competent, adult readers use to make sense of text (Pressley & Afflerbach, 1995). Strategies such as previewing, pausing to think or discuss at multiple points during a reading, and attention to text and graphic features allow expert readers to read with high

levels of comprehension. Proficient, adult readers intentionally make inferences as they read using the contents of the text and their schema on the topic by examining the author's intent or mentally filling in missing information. By using all of these strategies, expert readers are able to monitor their comprehension as they read. Verbal protocol studies provide in-depth information about strategic reading processes and this methodology provides a detailed understanding of a reader's meaning-making process (Hilden & Pressley, 2011).

During verbal protocol studies, participants are typically asked to respond either concurrently with the text by volunteering their thoughts while reading as they feel is necessary or they are asked to respond retrospectively by stopping at a predetermined point at the cuing of the researcher. Hilden and Pressley (2011) suggested that either can be effective, but that the level of proficiency of the reader will determine which method is more effective. The researchers stated that concurrent think-alouds are beneficial when readers are capable and the text is not too challenging. However, when readers struggle, providing stopping points during a retrospective think-aloud might yield better results. Hilden and Pressley (2011) also recommended allowing readers to respond without prompting to allow the participants to demonstrate their natural thinking process without interference from the researcher. To follow this methodology, I marked stopping points in the text to indicate where participants should pause and discuss their thinking. Participants also had the opportunity to describe their thinking at any point they felt was necessary if they wanted to share their thinking at other times during the think-aloud session.

I chose to use the level four passages from the Qualitative Reading Inventory (QRI-5) (Leslie & Caldwell, 2010) to collect think-aloud data. Each fourth-grade text in the QRI-5 is of a sufficient level of complexity to allow for careful thinking, but not so difficult that it was too

difficult for the students to decode or incomprehensible, as suggested by Hilden (2006) in her study of verbal protocols of second graders. Students who struggled to decode the words would not have had cognitive processing space to devote to comprehension, and texts that were overly simplistic would not have provided enough material with which to make connections or think deeply. Since all participants qualified for this study by scoring above their estimated grade level readability according to the STAR Reading assessment, it was unnecessary to select a wide range of texts. The QRI-5 texts not only represented an appropriate readability level for the students, but also contained academic content that aligned with fourth-grade content-area reading topics, which allowed for sufficient student background knowledge on the topic. I asked students to choose one of the narrative texts, either "Amelia Earhart" or "Tomie dePaola," and one expository text, either "Early Railroads," "The Busy Beaver," or "Plant Structures for Survival" to read and discuss. It was my hope that allowing the participants to choose the text they read would afford students the chance to apply their prior knowledge on a particular topic to their reading, in a way that an assigned reading might not. I also hoped that the ability to choose the text would make the students more comfortable during their sessions since choice in reading topics is typically considered motivating for readers (Gambrell, 2011).

Procedures

In its design stage, this study went through The University of Tennessee's Institutional Review Board (IRB) process. In addition to receiving IRB approval for the study, I obtained approval to collect data from the school district and school principal. After obtaining approval for the study, I requested that the two fourth-grade language arts teachers examine their students' fourth-grade STAR assessment scores and identify the students who scored between the 80th and 86th percentile and students who scored in the 90th percentile and above on this assessment. I had

not obtained parent permission to view the student data from each child in the fourth grade before selecting participants, so I relied on the fourth-grade teachers to identify students who met the criteria and send home informed consent forms (Appendix A) with those students, pursuant to the IRB's request. Since I did not personally identify students who fell in the target score range as participants for this study, I do not know how many consent forms the teachers sent home; however, I received 12 signed permission forms from the fourth-grade teachers. Five students fell within the 80th to 86th percentile range and seven students fell within the 90th percentile and above range. This resulting sample of 12 students consisted of seven Caucasian students, three Hispanic students, and two African-American students. After receiving the signed parent permission forms, I arranged a time to read with each student. Some students stayed after school to read with me and some students were able to read to me during the school day at a time that their teachers assured they would not miss anything that students could not make up afterward.

At the beginning of each data collection session, I read the student assent statement (Appendix B) to each participant, explaining the directions, requesting his or her help with my study, and requesting permission to record the session. Then, I explained to the participants that I would like them to read aloud and to explain his or her thinking during reading because I was interested in hearing what they had to say about their thinking while they read. Before the students chose their texts, I modeled a think-aloud for them using the text "Johnny Appleseed" from the QRI-5. During my think-aloud model, I paused to describe my thinking at each pre-marked stopping place in the text and one other time at a point in the text that was not marked, demonstrating how to stop any time the reader chose to stop. I could tell that the students

seemed a bit more confident about what they were going to do after listening to the model think-aloud, than when I read the assent statement to them.

I conducted the recording sessions using a semistructured interview format, which is appropriate for this study because the structure of a few pre-determined, open-ended questions allows the interviewer to focus on the purpose of the interview while allowing leeway for the participants to say what they feel is important (Merriam, 2009). Hilden and Pressley (2011) recommended that researchers avoid prompting specific reading processes during think-aloud protocol data collection. Although participants were asked to simply explain their thinking while reading since the purpose of this study is to examine what types of thinking exist without influencing participants' responses, an interview protocol (see Appendix C) was developed in the event students might need prompting or probing to understand what I asked them to discuss. However, to achieve the most pertinent information, prompting and probes were also composed on-site during think-aloud sessions as needed. Since the participants were elementary school children, some needed little to no prompting to discuss thoroughly their thinking at each stopping point, while a few needed a great deal of prompting to elicit a thorough response. Each think-aloud session was audio recorded, with participant consent, for the purposes of accurate content analysis. By establishing informed consent, providing a low stress environment, protecting data using pseudonyms rather than participant names, and using secure file storage, participants were treated ethically throughout the study in accordance with all University of Tennessee IRB guidelines.

Analysis

Qualitative Data Analysis

During the qualitative phase of data analysis, I took an interpretive approach to examining the data. Miles and Huberman (1994) identified interpretive analysis as one of three major approaches to qualitative data analysis, which allows researchers to use transcribed text as a vehicle for analyzing human activity. After recording each student's think-aloud session, I typed a transcript of the session, creating a document that I used to perform a content analysis of the students' communications regarding their reading. Content analysis is a method through which researchers examine communication, and Holsti (1968, p. 608) described content analysis as "any technique for making inferences by systematically and objectively identifying special characteristics of messages." Although there has been much debate over the use of content analysis in qualitative research versus its use in quantitative research, Berg (1998) provided support for the use of content analysis in both types of research. When conducting qualitative research, content analysis can be used to examine themes, thoughts, and similar phenomena while connecting these themes back to the collected data (Berg, 1998). Since I designed this study using a mixed methodology, content analysis was an appropriate vehicle with which to examine the data. I separated the students' reported thinking into separate statements when preparing the transcripts to facilitate thorough content analysis of each statement.

After preparing transcripts of each student's think-aloud session, I first examined each transcript through open coding. Merriam (2009) defined open coding as a process by which researchers examine qualitative data for relevant points and portions of data that might be useful in addressing the research questions. Open coding is the first step toward constructing categories within a data set (Merriam, 2009). As I examined the students' responses, I started noticing

certain themes emerging. Several initial themes I discovered through the open coding process

were chitchat and procedural talk, actions with the text, making connections, use of school-only

words, and questioning. Instances of chitchat and procedural talk occurred when I interacted

with the student in a way that was not part of my questioning or prompting. Many of the

procedural statements were moments when I gave or clarified directions and did not represent

any student thinking about the texts they read, and therefore did not need to be coded. Some of

the chitchat-type statements were instances when I asked a student a follow-up question to his or

her statement that did not facilitate the research goals. For example, after one student discussed

at length a personal connection that she had made between the content of a text about plants and

a tree she had cared for at her house, I asked her if she still had the tree. Since the student had

already given her response to the text, and her next statement was an answer to my

conversational question rather than an extension of her thinking, I marked the exchange as

chitchat and did not code the statement for thinking. After removing extraneous statements and

exchanges from the typescripts, I noticed several themes appear in student responses, such as

using the text to respond, making connections between the text and other experiences, using

language generally used only at school, and asking questions during reading. I noted these initial

themes and marked these areas in the text for further review during later rounds of coding.

Next, I examined the data through axial coding. Axial coding, which occurs after a

researcher completes open coding, consists of sorting components that emerged during the open

coding process into more specified categories and themes (Strauss, 1987), which is a type of data

reduction technique. Miles and Huberman (1994) explained data reduction as the first in three

steps of data analysis. After reviewing the data through open coding, I found several themes

evident in the students' thinking. Through the process of axial coding, I reviewed the transcripts

in light of these newly emergent themes. While during open coding I may have noticed student questioning apparent in several transcripts, during axial coding I specifically examined each transcript for this type of thinking and the other themes that had emerged. During this process, I further refined each theme and category by naming each theme that emerged and combing the transcripts for instances of each one. Through this process, I realized that the students were making two main types of personal connections: connections to previous learning and connections to their personal experiences. I also noted that the occurrence of questioning while reading was less frequent than I initially thought during my open coding sessions.

Following the initial coding process, I used the Reading Behaviors Inventory (Wyatt, et. al, 1993) (Appendix D) to examine the student think-aloud transcripts for themes previously established in the inventory using a pirori coding (White & Marsh, 2006.) First, I removed all items from the Reading Behaviors Inventory that were not pertinent to this study. Since the study that produced the Reading Behaviors Inventory involved adult readers who read research studies as participants, several of the reading behaviors listed in the inventory were not observed during this study, such as interactions with the references, highlighting the text, or use of expletives. A list of the removed items is located in Appendix E. After removing unnecessary items from the inventory, I analyzed each statement, compared the statements with what was listed in the Reading Behaviors Inventory, and coded each one accordingly, examining each transcript for one reading behavior at a time before moving on to the next behavior. Following this analysis, I created codes for statements that were not represented by any item in the original Reading Behaviors Inventory, including two themes originally noted during open coding: questioning and use of school-only language. I expected that these themes would tell the story of what proficient readers think while they are reading informational texts.

Quantitative Data Analysis

Wyatt and colleagues' (1993) study, which resulted in the design of the Reading Behaviors Inventory, explored the metacognitive processes of proficient adult readers. This study utilized the frequency method (Bordens & Abbott 2013) to categorize and record the readers' thinking processes. The researchers from that study recorded proficient, adult readers thinking aloud as they read. Each think-aloud was recorded and, after all results were analyzed, the researchers created categories for the participants' think-aloud responses and noted the frequency with which each type of thinking occurred (Wyatt et al., 1993). For example, to note when a participant skims for relevant information, the frequency of "reads selectively in linear fashion (skips some information, then reads closely)" might be marked. Each of the reading behaviors listed in the inventory was first observed in expert adult readers who participated in the Wyatt et al. study.

In a similar fashion, I conducted a content analysis of the participants' transcripts using the frequency method to analyze the transcripts, quantitizing (Miles & Huberman, 1994; Teddlie & Tashakkori, 2009.) the think-aloud data. Smith (1975) stated that content analysis is appropriate in quantitative research as well as qualitative research because qualitative content analysis examines themes and common forms and quantitative content analysis examines duration and frequency. As there was only one point of data collection for this study, quantitizing the think-aloud data allowed me to use the frequency method to analyze the data in a different way. It was my hope that content analysis of frequently-occurring types of statements would assist me in drawing conclusions based on the content of the think-alouds within the context of the reading session (Hoffman, Wilson, Martinez, & Sailors, 2011; White & Marsh, 2006). After coding the frequency of each occurrence into the categories presented in the

Reading Behaviors Inventory, I employed descriptive statistics (Schuh, Biddix, Dean, & Kinzie, 2016) to present the data that emerged from the content analysis to support the qualitative themes and lend support to the discussion of analysis and implications.

Following the coding of each student statement in the transcripts, I counted how many students discussed each type of thinking and tallied instances of each code, including newly created codes, resulting in the reading behaviors frequency distribution table, located in Appendix F. Next, I examined the most frequently-occurring codes and noticed that several of these frequently-occurring codes represented similar types of thinking. I then calculated the average frequency of occurrence for all statements, and grouped the most frequently-occurring codes into themes. These seven themes are discussed in detail in the next chapter. Once I identified the seven most frequent themes, I calculated the percentage of each of these themes in relation to the total number of statements, which represents the proportion of student thinking represented by each of the main themes. These calculations were the basis for the organization and discussion of chapter four.

Mixed Methods Analysis

After coding the transcripts during the qualitative analysis phase and charting the frequency of occurrences of different types of thinking using the Reading Behaviors Inventory during the quantitative analysis phase, the results of both analyses merged in the discussion of results in chapter 4. Merging the qualitative and quantitative analyses provides completeness and enhancement to the results of the research (Greene, Caracelli, & Graham, 1989). Using the second of Holsti's three categories of content analysis, "describing and making inferences about characteristics of a communication" (Hoffman, Wilson, Martinez, & Sailors, 2011, p. 31), through this analysis, I sought to make inferences concerning the connections between the

content of the participants' think-aloud explanations and the frequency of each type of thinking coded. By discussing both the student's explanations of their thinking strategies and discussing the frequency with which each theme of reading behaviors occurred, I hoped to provide a more complete account of the findings than would be possible when using only qualitative or quantitative descriptors to examine the research questions.

Inference Quality

Teddlie and Tashakkori (2009) defined inference quality as the examination of the conclusions drawn by the researcher. To ensure inference quality, I used peer debriefing. I enlisted another individual, who is familiar with the content and procedure of this study, to review the coding scheme to ensure inter-rater reliability. Disagreement among reviewers, although minimal, was resolved through discussion to determine the proper coding, and it was not necessary to engage a third party to examine the think-aloud recording. After coding each think-aloud session by theme and noting frequency of reading behaviors, I examined all data, both qualitative and quantitative, to identify possible commonalities among the student explanations of their thinking and the most frequently-occurring codes.

Positionality

As a classroom teacher with a love of reading and a fascination with the way children think about their reading, I have focused on teaching students thinking strategies in my own classroom. While I feel that this is a necessary component of reading instruction and an instrumental aspect of reading for all proficient readers, I do not believe that all teachers instruct this way, and therefore it is possible that not all students who participate in this study have practiced explaining their thoughts as they read. When I asked students questions in relation to their reading, it was difficult at times not to guide the student through the thinking processes and

not to take advantage of that teachable moment, as I have so often done in my role as a classroom teacher. Although I was able to avoid teaching during my data collection sessions overall, there were a few statements that I decided to exclude from the coding portion of my analysis because I asked a leading question or had an occasional conversation with the students over something in their reading. I discovered that it is hard to stop being a teacher when reading with students.

I also found it difficult to exclude students from the study who did not score in the percentile range outlined for this study, as I am sure many of the other fourth-grade students are also excellent readers and capable of demonstrating their expert thinking during reading. As a teacher in this school, and the former teacher of a few of these students, I felt that the students were familiar with me and felt comfortable talking to me. While that may have made the recording sessions run more smoothly and put the participants at ease, it made the reality of participant selection difficult. It is likely that several of the participants mentioned "reading with Mrs. Burton" to their classmates because they were excited about the idea, and several of the participants even approached me at school to ask when we would read together because they were eager to help me. In each of these cases, I was glad the participants were excited about the project, but by the end of the data collection period I was worried that many of my former students, and others, felt excluded.

Limitations

Limitations to the study include an inability to generalize findings to a larger group, a small sample size, and a lack of previous research on the topic as it applies to elementary-school students. Additionally, any standardized assessment is a snapshot of what students accomplish at one moment in time and may not provide a comprehensive picture of their abilities. The STAR

reading assessment may not accurately identify all potential participants for this study if a student who is taking the test does not perform to his or her highest potential on the day the assessment is given. Further, one assumption for this study is that the think-aloud data provided by participants is accurate. One limitation this imposes on the study is that participants may apply reading strategies automatically and neglect to share aloud what thinking occurred during reading, since readers are less aware of automatic processing.

Delimitations

Delimitations to this study include the chosen reading assessment and the chosen target school. The target school was chosen based on ease of gaining access to the data, access to the student population, and proximity to the researcher, which further reduces the potential study participants. Since the STAR reading assessment is the screening tool that the school in question gives to all fourth graders, and teachers in the school routinely form groups and make instructional decisions based on that data, the STAR assessment is the method used to identify students with an estimated readability level at or above grade level. This particular assessment is pertinent to the school in which the research occurred because the school in question has already chosen to use the STAR assessment to evaluate fourth-grade readers.

Chapter Summary

In this chapter, I described the methodology used for this study and my rationale for choosing a mixed methods design. I detailed my procedures for participant selection, data collection, and analyzation of the student think-alouds. In the next chapter, I explain the results of the data analysis process.

Chapter 4 – Results

In an attempt to provide a profile of successful elementary-school readers, I collected audio recordings of proficient readers reading aloud and describing their thinking. The purpose of this research study was to explore the types of thinking that successful fourth-grade readers use while they read a nonfiction text, and was designed to answer these questions:

3. What types of thinking do proficient fourth-grade readers report using while they read informational texts?

4. What patterns of reading behavior do proficient fourth-grade readers most commonly report when reading informational texts?

As detailed in chapter 3, I analyzed and coded the student recordings according to the Reading Behaviors Inventory and calculated the frequency of each occurrence. In this chapter, I explain the results of my data collection procedures. During the analysis phase of the research, I separated each student's response to the text into separate statements and assigned a code to each one. After dividing the participants into two categories according to their STAR assessment scores, those falling between the 80th-86th percentile and those scoring at the 90th percentile and above, I listed the number of statements each student made and the number of different codes demonstrated by each student's thinking. Figure 2 shows the total number of statements and the variety of codes for each participant, separated into subgroups by percentile.

80th – 86th percentile			90th percentile and above		
Student	**Statements**	**Code variety**	**Student**	**Statements**	**Code variety**
Veronica	41	10	Stacy	27	6
Xixi	20	7	Kyle	45	9
Caleb	32	8	Edgar	24	4
Shelbie	21	4	Nelson	48	13
Gabe	30	9	Eric	19	7
			Maggie	85	16
			Alice	21	12

Figure 2. Total Student Statements by Subgroup.

In the remainder of this chapter, I present the themes that emerged from data analysis, explain patterns of student responses, and provide examples of the thinking students reported during their reading. This discussion is organized in the following sections, which represent the patterns that emerged from the data: major themes, which include elaboration, prior knowledge, and evaluation, and secondary themes, which include use of the text, self-reports of reading behaviors, questioning, and use of school terminology. Each with a total occurrence rate higher than the overall average of 13 occurrences, these themes represent 89% of the total statements and therefore represent the bulk of thinking students demonstrated during the study.

Major Themes

Elaboration

Instances in which statements represented elaboration of the text's content was the highest frequency of occurrence noted through the coding process. The Reading Behaviors Inventory (Appendix D) lists two reading behaviors related to elaboration: constructs conclusions or summary interpretations beyond information provided in the article and

constructs paraphrases/explanations of what is in the text or gives examples. Of the 429 coded

statements included in the data, 150 statements, 75 occurrences of each type of elaboration, fell

into these categories, which made up 35% of the total statements. Not only was this the highest

occurrence of a certain type of thinking, but it was also the only type of thinking that every

participant used. All 12 participants expressed statements that fit within the categories of both

constructing conclusions outside the text and constructing summaries of the text's content. This

is the most frequent type of thinking noted during the coding process, the only type of thinking

discussed by each participant, and is separated from the next highest occurring type of thinking

by 54 occurrences. By these calculations, elaboration appears far more frequently than any other

type of thinking coded, as a range between four and 34 separates the other most frequently-

occurring code types. A comparison among the most frequently coded themes is noted in figure

3.

Theme	Frequency
Elaboration	150
Prior knowledge	96
Evaluation	58
Use of Text	24
Self-Report of Reading Behaviors	19
Questioning	19
School Terminology	15

Figure 3. Frequency Distribution Table of Major Themes

It is important to note that, while all students made statements showing elaboration of the text, and both constructing conclusions beyond the text and constructing paraphrase summaries of the text are represented by equal frequencies of occurrence, many students did not employ these strategies equally. One student constructed paraphrased summaries of her reading twice as often as she constructed conclusions outside of the text. Stacy paraphrased when she paused, unprompted, to discuss her reading eight out of 13 times during her entire think-aloud session. Further, while reading the second text, "Early Railroads," Stacy paused four times to think aloud about the text and each time her response was a paraphrase of the text's content. She stated:

> [*at stop one*] I think that is about how the railroads started to get invented and how all
> the steam – how, uh, they got the things going over it.

> [*at stop two*] So, that is about how pe- what people thought of it, and what it was called.
> And it was about something, like a debate almost.

> [*at stop three*] That is about the race and what happened in it. And how people still liked
> it, even though it lost the race, it would just need improvements.

> [*at stop four*] It was talking about as it progressed on, how it got better and better and
> soon it was starting to beat stuff, so that it was faster.

Stacy's thinking represents a pattern of text summarization while reading. The only time she deviated from using paraphrasing as her think-aloud was when, after she finished paraphrasing the last section of text on her own, I asked her what she thought the author really wanted her to know. She responded by saying, "I think the author wants us to know that even though things aren't the best at that time, if you just keep on progressing with it, it can get better." This statement demonstrates a different type of evaluation: that of constructing conclusions beyond

what is in the text, because she applied the information in the text to a broader situation in life, one of perseverance. Stacy later reported that one of the things that she typically does when she reads on her own to keep track of her thinking is to stop, think about what she read, and summarize it in her mind. This information matches with her reading and think-aloud performance on the day I conducted her recording session.

Conversely, another student-constructed conclusions outside of the text in his reading nearly twice as often as he constructed paraphrased summaries of the text after reading. I coded 12 out of 42 of Kyle's total statements as this type of thinking during his session. While reading the text "Amelia Earhart," he stopped unprompted four times to think aloud about his reading, each time making statements that were conclusions beyond the text, which made up 88% of his think-alouds for this text. Kyle discussed his reading about Amelia Earhart by saying:

> [*at stop one*] I think that that was where Amelia Earhart got her inspiration to fly and be the first person, first girl, woman, to travel the world in a plane.

> [*at stop two*] I think that was her first step forward to becoming [*changes to dramatic voice and adds hand motions in a "ta-da" motion*] the greatest pilot in history! All the inspiration payed off. And that's why in school, you should always listen to your teacher. Life lesson.

> [*at stop three*] I think that that is true, and women should always try the same thing men are because they are practically the same. There is no difference whatsoever. Other than… men might be a little bit tougher.

> [*at stop four*] So, I think she might have crashed into the ocean and either got eaten by a shark, or died of starvation, drowned, anything could have happened. When you're, you

know, in the ocean and you're in all kinds of salt water and you can't drink the water, or you'll just get more thirsty, so… I think that's how she might have died.

Kyle's and Stacy's think-alouds represent a pattern of thinking beyond the text during reading. The high occurrences of elaboration across texts and readers during this study supports Griffin, Wiley, and Thiede's (2008) conclusion that self-explanation by way of paraphrasing indicates successful comprehension monitoring in readers.

Using Prior Knowledge

The second highest frequently-occurring theme noted through the coding process was the awareness of and use of student prior knowledge, which represented 22% of the total number of statements coded. The Reading Behaviors Inventory lists three reading behaviors related to prior knowledge: notes when something in the text is already known or not known to him/her, reacts to information based on own knowledge, and reacts based on very personal prior knowledge. The most common occurrence of these, at 49 times, or 51% of the statements related to prior knowledge, was noting when something in the text is already known or not known to the reader. After coding all 49 instances of this reading behavior, I realized that there were actually two distinct ways that the participants noted their prior knowledge, or lack thereof. Many times students were specific about what they did or did not know prior to the reading, and other times students gave vague, blanket-like statements. For example, when I asked Edgar if he had heard any of the information from the reading passage before, he responded with, "No, it's new," and "No, new learning," without clarifying what part of the specific information in the text was new.

This contrasts with other students' think-alouds, such as Shelbie's, who had the highest instance of reporting specific information that was new or previously known to her, versus

merely stating that she did or did not already know something. Shelbie explained while reading the text "The Busy Beaver,":

> [*at stop one*] Oh, that part I see that I actually learned that beavers are busy. I mean, I knew that, but I didn't know that they spent most of their life near water.

> [*at stop two*] I learned in that part that beavers may endanger lives of another thing."

> [*at the end of the text*] "And I knew that the beaver's lodge, or house, was um, like in the middle of the pond.

Veronica also reported specific information that was new or previously known to her during her think-alouds. While reading the text "Plant Structures for Survival," Veronica noted:

> [*at stop two*] I did not know that, uh, that pine trees have, like, a waxy texture to it. Cause I've never really felt.

> [*at stop three*] And, uh, this is new information for me, learning about the cactus. And it does not look like it has a waxy covering at all. It just looks like a plain plant.

These instances of students specifically noting which information was new learning and which information they already knew demonstrates a pattern of awareness of the students' prior knowledge.

Another reading behavior related to prior knowledge that emerged from the recording sessions was instances of students reacting to the information in the text based on their own knowledge, representing 27% of all statements coded as related to prior knowledge. This type of thinking seemed to be a particular strength of Maggie and Veronica, both of whom had more

statements coded as reactions based on their own knowledge than their peers. Maggie related her reading of the text "Tomie dePaola" to other things she had learned in school by commenting:

> [*at stop two*] With Mrs. S------- [*Maggie's language arts teacher*] we just did a, for homework, we did a paragraph, read a paragraph, about Walt Disney, and he was like, very famous.

> [*at the end*] I started thinking, Tomie DePaola… I started thinking – "I think he must be an artist." Cause I've heard names like that with Mrs. H------. [*the art teacher at Maggie's school*] She's like 'This guy's an artist' and stuff, and it sounds like an artist name.

Additionally, while reading the "Early Railroads" text, Maggie commented on the size of the first steam-powered engine by saying, "That's like 2,000 pounds and some animals can weigh more than that. His train barely weighed that? That – that's really small then."

Veronica also reacted to the text based on her own knowledge in her think-alouds. When she selected her second text, "Plant Structures for Survival," she indicated that the reason she chose that particular text was that her class was learning about plants and animals in science class. She continued to discuss her knowledge of this topic throughout her reading by stating:

> [*at stop one*] And that it's true that they do need water, wet and dry.

> [*at the end*] You know how cactuses normally live in, like, deserts or something, even if they're little…. I've heard that deserts only rain about like once a year. Yeah, once or twice a year.

These think-aloud statements demonstrate the students' use of prior knowledge to increase their comprehension of the texts they read during our sessions and, in Veronica's case, the use of prior knowledge to select the text she wanted to read.

The third type of statement related to prior knowledge is a reaction to the text based on very personal prior knowledge, representing 22% of all codes related to prior knowledge use. Fewer participants expressed this type of prior knowledge use through their think-alouds than participants who reacted to the texts based on their own knowledge, as discussed in the previous section. However, this type of thinking represented one of the most frequently-occurring reading behaviors for two of the students. Alice and Eric each made four statements, which occurred equally with two other categories as the highest occurrence of thinking for each student, during their think-alouds that reflected this type of personal prior knowledge connection. Eric made several connections between his reading of the "Tomie dePaola" text and his own life experiences by explaining:

> [*at stop one*] He likes to draw, like me.

> [*at stop three*] So…actually that… drawing on the walls with chalk, that kind of reminds me that I have this big wall that's a chalkboard, that's literally, like, a wall. It's just chalkboard and magnetic paint. I usually draw on it.

> [*at the end*] Um…I guess that just makes me think about, that, today me and my teacher were actually just looking at books, like she had just told you that we were looking at stuff, books that I would be interested in, like Harry Potter, cause I really liked that series.

Alice related the content of one section of the text "Plant Structures for Survival," concerning how pine trees survive in the winter, with her personal experience with plants by saying:

[*at stop two*] Cause we had a Norfolk pine… and… if we left our pl- we had peppers outside and marigolds, I think. If we left them outside and we had very cold weather or we had the first frost or a bad frost, they would just die. But um, we never actually put our Norfolk pine out, but sometimes it would get super cold in the house when we weren't there, cause we didn't have the heat on, and the Norfolk pine was always fine."

[*at the end*] "One time when I was really little … we got the Norfolk pine when we first moved here, which was like 6 years ago, when I was 3. So when I was like 5 maybe? ..or so… I cut off a little piece of the tree, and then I put it outside and it grew a tiny little pine tree, and then we had winter, and we had a lot of snow that year. I think it was the year that we had freezing rain and then we had snow. And then when I came back to check on it, in the summer, it was… it had lost a little bit of it and it looked kind of brown, but like, most of it was still green. It had grown. Cause when I first put it in the dirt it was about that big, [*used hands above table to show how tall*] and then when I checked on it after winter it was about that big [*used hands to show height*].

In Eric's case, he made a personal connection to the subject of the text because it seemed that he felt he shared a common interest with Tomie dePaola. Alternatively, Alice made a connection with her personal experience with the information presented in the text, plants. These statements demonstrate that the students' thinking about the topics in the texts included reflection on how their own experiences aligned with the subject or topic of the texts, which supports the application of schema theory (Anderson & Pearson, 1984; Anderson, 2013) during these students' think-alouds.

Evaluation

The third most frequently-occurring theme (59 total instances) that emerged from the students' think-aloud sessions was evaluation, which represented 14% of all student statements. Similar to the participants' discussions of elaboration and prior knowledge, the students expressed evaluation of the text in several different ways. The theme of evaluation encompassed the following reading behaviors from the Reading Behaviors Inventory: evaluates the text, expresses interest, and expresses surprise. The most commonly coded of these three instances was student evaluation of the text, which represented 55% of the codes that made up the evaluation theme. To evaluate the text, students may have given their opinions on the topic of the text or the text itself. Alice evaluated a quote from Amelia Earhart in the text by commenting, "That's a good thing to say." Xixi evaluated a particular event in the text by saying, "That is scary!" when referring to Amelia Earhart's disappearance.

Nelson demonstrated several examples of evaluating the text. Second only to elaboration, the most frequently-occurring theme in his reading, evaluation of the text was the second most frequently-occurring theme in Nelson's think-alouds. Most students interspersed evaluative comments with other comments, such as elaboration, using them at different times during their think-alouds without an apparent pattern; however, Nelson seemed to use elaboration to support his evaluative statements. After reading the first section of the Amelia Earhart text, he made an evaluative statement, followed by elaboration statements, a paraphrase statement and a conclusion statement, by commenting, "I think it's cool that she's an adventurer and pioneer, and, um, I think it's helpful of her to be a nurse. And …. she wanted to become a pilot…. She's probably gonna become the first woman pilot."

Kyle also seemed to use evaluation in conjunction with elaboration. After reading a section on pine trees in "Plant Structures for Survival," he followed an elaboration statement with an evaluative one, explaining:

> I think that paragraph was very informational on how some plants conserve water for the winter, or when it gets really cold, like fall. And I think pine trees are excellent things that really need to be recognized, more than just for Christmas.

Additionally, Veronica combined evaluation and elaboration in her discussion of "Amelia Earhart" by inserting an evaluative statement between two elaboration statements:

> [*Elaboration – conclusion outside text*] I think that she was like still brave, and that she was like… Its like she acted like she didn't care, and that, uh, if she died or something, cause really really brave flying, uh, flying new airplanes.

> [*Evaluation – judgement of text content*] And that it's sorta scary because she just disappeared ….somewhere in the huge pacific ocean.

> [*Elaboration – paraphrase/gives example*] And it's like she was flying, I mean, not flying, she was um riding on a boat or, and um, she like sinked, like she crashed into something and sinked, but instead it was like a plane.

Expressing interest or surprise was another way that students demonstrated evaluation of the text during their think-aloud sessions, representing 26% and 19% of total evaluative statements, respectively. Maggie's think-alouds provided the most examples of expressing interest, as her statements alone comprised 47% of all statements coded as "expresses interest" on the Reading Behaviors Inventory. After she finished reading "Early Railroads," Maggie

began her unprompted discussion of the text by stating her interest in the topic. She proceeded to make several other statements about the text, but continued to state her interest by discussing:

> That's interesting. That was a faster way to travel. So he was – who? Cooper… Peter Cooper got an idea. Wonder… I want to learn more about him. Cause all it says is "Peter Cooper…" It says some of the years – 1830, 1840, but it doesn't really say much about him. It's interesting….yeah. It's cool. That's crazy, though.

Maggie followed this discussion on her interest in the text by searching through the other texts she had read during the session and comparing the people discussed in each text. This prompted her to make connections concerning the information she learned about each person in the text I read to her as a demonstration text, as well as the two texts she read independently. Maggie's expression of interest in the topic and her immediate search through other texts for relevant information demonstrated an application of her evaluation of the topic, which in this case was a search for further information; a quality that was absent from other students' think-aloud data.

Gabe's comments during his think-aloud session provided an interesting example of expressing surprise. Not only did he express surprise on a particular topic during his reading, which six out of 12 students did not do, he was the only student to return to the content of the text that surprised him more than once. After reading the first part of "Plant Structures for Survival," which describes the giant water lily, with a photo of the giant lily beside the text, Gabe exclaimed, as he pointed to the photos on the page, "Geeez! There's a picture of the giant lilies. Those things are big." Gabe continued to read the text, and after reading the next section, which was about pine trees, he returned to the previous topic, saying, "I can't believe how big those things are. Like, look at that!" After reading the remainder of the text, he referred to the

giant water lilies again, mentioning that topic as something he did not know before reading this text.

Gabe was one of only a few participants who interrupted his reading to discuss his thinking at a point in the text that was not a predetermined stopping point; he stopped on his own occasionally during our think-aloud session to explain what he was thinking as it occurred in the text. Gabe later reported that when he reads on his own he makes notes about important things he wants to remember. His think-alouds on the day I recorded him supported this statement. Gabe's connection between his surprise at new information, his close attention to the subject of that surprising information, his acknowledgement of learning new information about giant lilies as a result, and his claim that he records important information as he reads appeared to be mutually supportive. These types of evaluative interaction with the text support the interaction between a reader and a text, as outlined in Rosenblatt's reader response theory (1978/1994.)

Secondary Themes

Use of Text

Unlike the previous themes that emerged from the coding process, the fourth most frequently-occurring theme, use of text, is represented by a single code from the Reading Behaviors Inventory: backtracking, or rereading a portion of the text for clarification. However, after coding all student statements, there were three instances where a student used the text in a way that did not align with that code. Since no other behavior from the inventory represented the students' thinking in these cases, I added a new code: references text as proof of statement. These combined codes represent a theme of using the text while reading, which occurred 24 times and represents only 6% of the total statements coded. However, since this rate is higher than the overall average frequency of 13 coded statements, it is still noteworthy and pertinent to

the discussion of types of reading behaviors exhibited by students during their think-aloud sessions. Gabe specifically referenced the text to provide support for statements he made during his think-aloud session. While reading "Amelia Earhart," he noted:

> I'm knowing that she's kind of trying to inspire people right there. [*referring to place in text*] She's trying to get people inspired, because of where she's saying like, "I want to do it because I want to do it." When they fa-….ush… [*mumbles trying to get the quote right, then goes back to the page and rereads*] "Women must try to do things as men have tried."

Maggie demonstrated the most interesting example of using the text to clarify her thinking by referencing multiple texts to make connections among each one. After reading "Early Railroads" and expressing her interest in Peter Cooper, as described in the evaluation section of this chapter, she immediately began flipping through the texts, asking questions about the people discussed in each one, and making connections to their places on the historical timeline. Maggie explained:

> It says, "Such a trip took a day and a half by horse drawn wagon?" That must have been a real help to a lot of people who was trying to move, go different places. What – what year was Johnny Appleseed? [*flips page back in book*] He was 1797. Oh, he was born in 1774. So…97…those are the only two dates we have in here. So, if he was born in 1774 [*flips page to Tomie dePaola text*] and he [*referring to Tomie dePaola*] was born in 1934, they've got almost, like, a 200 year difference in between them.

At this point in her discussion, I asked her how Peter Cooper fit into her thinking, since reading about Peter Cooper spurred her search through the other texts. She replied, "He fits right in the

middle of them. I think. [*skims text*] It doesn't say what year he's born. It says the year when

he built a steam powered engine. So, he must have been an adult during that time." Maggie's

frequent use of the text within a short amount of time demonstrates an ability to use the content

of a text to explain her thinking, confirm her thinking, and make connections across texts.

Self-Reports of Reading Strategies

Self-reports of reading strategies is the only frequently-occurring theme that is related to

only one point of coding on the Reading Behaviors Inventory: talks about things "I typically do

when I read." It is also the only theme that emerged solely from prompting rather than naturally

from student think-aloud and discussion. Pursuant to my interview protocol, I asked participants

what they typically did to keep track of their thoughts while they read. A few students

maintained that they did nothing special to track their thinking or stated that they "just read."

However, most students explained what they usually do when they read. Stacy reported that she

rereads certain parts of a text and summarizes as she goes by explaining:

> While I'm reading I like to stop. And sometimes I'll think about what I've read, and then
>
> I'll go on with it. I'll reread some things, like if I forget about it, and I'll just try to think
>
> – sometimes I'll sort of summarize it in my mind. I think, this has happened so far in the
>
> story.

Her self-report of stopping and summarizing a text as she reads corresponds to the types of

thinking she expressed during her think-aloud session, demonstrating an awareness of her habits

as a reader.

Three students mentioned that they typically write down things as they read. Xixi mentioned that when she is reading she would "ask the teacher or write it down" if she needed to keep track of something. Gabe explained his notetaking strategy by saying:

I have little post it notes that I write down important stuff. Sometimes if it's my book, I write on the opening page cause there's nothing there. I just write little notes down about what I like about this book so I'll know if this is one of the books that I may want to read again.

Alice also discussed taking notes as she reads on her own so she can explain her reading to her dad, stating:

I think it was maybe last night, or the night before, I got down *Pete Nelson: Be in a Treehouse* from my bookshelf…it had a bunch of different treehouses so I ran through it and I named all the treehouses and I put a few bullet points under it and I wrote different things about it. And then on the part I read after that was choosing a tree to build a treehouse. I wrote the heading and then I wrote a bunch of other bullet points when I did that.

These three students, from both percentile categories, discussed note taking and made several statements during their think-aloud sessions that fit within the elaboration or prior knowledge categories at a higher rate than their other types of thinking. This combination of elaboration or use of prior knowledge and their reports of notetaking while reading could indicate that the patterns of thinking demonstrated here are typical reading behaviors for these students.

Other students mentioned focus and selective attention as their typical thought processes while reading. Nelson demonstrated focus on reading material saying, "Mostly I just [read] the

words and I just get my mind to ignore everything else. I'm reading, so um, I just mostly just

focus on reading words in the book I'm reading." Eric also claimed to focus on the reading

material, but expanded his explanation to include what is and is not worth his focus, explaining:

> Um, well I just, like, I don't really, like I read it, but like, jokes and stuff that aren't
>
> important. Like, I don't really forget about them…its just…I just don't really think about
>
> them as much as important stuff in the book. Like what they have. Cause if I were to
>
> forget that stuff, and just remember the jokes and stuff that weren't important, then I
>
> wouldn't know what they had, what they were doing, and then just mess me up.

Another student who reported an intentional focus on important parts of a text at the exclusion of

other things was Edgar. He disclosed his thought process by telling me:

> Like I think in my head, like, what do I have to do? And find different books, and the
>
> books that I read, and I think how I can make it, like, for the person, like one person, like
>
> "I", or the name of the place, "I," like, what they're saying.

Caleb also mentioned that he focused on certain aspects of the text and added that one particular

focus for him was word identification, stating:

> I like read it, and I think about what it's talking about, like it says a quote or something.
>
> And say, I can't say a word, I'm like, how do I say that? And I just say it. I try to say it
>
> out. There was a word on our STAR test today, and I couldn't really read it. …. I try to
>
> figure it out and I was like…just reading…and boom!   I'm just like ….I'm gonna guess
>
> that means something like – let's say it's about fishing- I'm gonna say it's probably
>
> something about hooks cause I could infer.

The majority of each of these students' think-aloud statements fell in the categories of elaboration and use of prior knowledge, which may relate to their selectivity in attention to certain parts of a text. It is possible that their reported focus on parts of a text and awareness of importance was reflected in their tendencies to explain their learning as they read and discuss what parts of the reading were new or previously known pieces of information.

Though most students who reported their typical reading behaviors exhibited some signs of the application of these behaviors through their think-alouds, Kyle's reported independent reading behaviors did not align with his think-aloud session. When discussing what he usually does as he reads, Kyle mentioned that he keeps a reading log and then explained that he thinks about, "Where am I in the book? And what is happening? What has happened in the past that I need to link to what I'm reading right now?" Kyle's think-aloud session did not support his claim that he typically asks questions while he reads. None of his statements represented questioning or wondering. Perhaps he did ask himself these questions as he read the text and chose not to share them with me aloud, or perhaps it was unnecessary to ask himself questions while reading the texts he selected, which would account for the absence of questioning statements. Kyle was the only student whose think-aloud statements did not connect in some way to his self-report of typical reading behaviors.

Questioning

One type of thinking that was noticeably present in several students' think-aloud explanations but absent from the Reading Behaviors Inventory was questioning, which was one of the first themes I noticed as I coded the transcripts of the participants' thinking. As I reviewed the transcripts further, I realized that the few instances of predicting the content of a text and then testing that prediction was a type of questioning, but represented only three occurrences of

questioning. Sixteen questioning statements were not represented by any other reading behavior on the inventory, so I created a new category for questioning statements.

Questioning was the most frequently-occurring statement from Caleb's think-aloud session, representing 19% of his statements. After reading the first section of "Amelia Earhart," Caleb asked, "Why weren't women allowed to fly planes back then?" I asked him what he thought, and he replied, "Um, cause they probably thought boys were more capable of doing it than women, flying a plane across the Atlantic and stuff like that. And then she proved herself." After reading the next section of text, he was able to answer his own question, explaining, "So I was right about that they thought only men could do it. Cause it said it in the text."

Other questions Caleb asked during his discussion were questions that he could not answer based on the reading that day, such as:

> [*after reading about Amelia Earhart's disappearance*] How, like, did her plane crash?… Or she ran out of fuel, and it just [*mimes plane crashing with hand, makes falling sound effect*]. Why did they give up?

> [*after reading about how beavers change the land as they cut down trees*] Um, couldn't they tell if there was animals living in that tree? Are they predators to some of those animals? …. So that would mean like, groundhogs, worms, things like that would have to move?

Caleb's examples of questioning during reading may support his use of prior knowledge, which was the second most frequently-occurring theme in his discussion. Perhaps his method of questioning the text represents a pattern of prior knowledge awareness.

Nelson also had a higher occurrence of questioning than other students. Questioning represented 10% of his total statements, his third highest occurring type of thinking following elaboration and evaluation. He demonstrated several different types of questioning. In one instance, he asked a question related to a conclusion he had just drawn from the text by saying, "She wanted to become a pilot. She's probably gonna become the first woman pilot. Was she?" Later on, while reading the same text, Nelson asked a question the vocabulary in the selection by asking, "Um….wait, so pioneer meant like uh… pioneer in the field of flying meant that she flew a plane? Is that what pioneer…?" While reading "Early Railroads," he wondered what information might come next, "I bet the train will beat the horse. But I'm gonna find out." Nelson continued to read on in the text and noted when he found the answer, "Uh, so… guess the horse won." Nelson also asked questions that were beyond the scope of the text, wondering, "Wait…I'm wondering if Peter Cooper's idea about steam engines…. Wait. Was there already cars in the 1880s?"

Not only did he exhibit a pattern of questioning while reading, he asked multiple types of questions while discussing his reading with me. Nelson generally asked questions immediately preceding or following a paraphrased summary statement or a conclusion drawn beyond the text, suggesting that his pattern of questioning the text may be used as a clarification technique. He seemed to ask questions in conjunction with elaboration statements, possibly to clarify his thinking about the elaboration or to make connections to other elaboration statements.

Use of School Terminology

The participants' use of school terminology was the only frequently-occurring theme emerging from the data that was not represented by any part of the Reading Behaviors Inventory. After noticing a large amount of conclusions and questions in student responses as I coded the

transcripts, certain words such as main idea, summarize, and infer caught my attention and I realized that most students were referring to their reading and thinking using school-based vocabulary. Since this reading behavior was not included on the Reading Behaviors Inventory, presumably because the inventory developed following a study of adult readers who had no reason to discuss their thinking using these types of words, I created a code for this emergent theme and reviewed the transcripts with this new code in mind. Ten out of 12 students used school-related reading terminology as they discussed their thoughts, comprising 3% of total participant statements.

Although 3% does not represent a large proportion of student thinking when compared with other themes outlined in this chapter, the use of school terms occurred 15 times during the think-aloud sessions, which is higher than the overall average frequency of occurrence for each code of 13. All other items on the Reading Behaviors Inventory, and the additional codes I created to describe student statements that were not represented by the inventory, occurred less than 13 times. Of the remaining categories, the most frequently-occurring type of thinking was coded eight times, which was seven fewer instances than use of school terminology. For the purposes of this discussion and the analysis of student thinking in this study, I define school terminology as words students use that are unlikely to be used by adult readers or readers outside the school setting in the same way that students used them during this study. It has been my experience, as an elementary teacher, that these terms often appear in curriculum materials, state standards, test preparation materials, and are common in academic classroom discussions. Although some of the words I have identified here as "school terminology" could arguably be classified otherwise, each student uses the term(s) in a way that suggests it was learned from, and used in, school situations.

The majority of students who used school terminology to discuss their reading did so following their think-aloud session when participants described what they typically do while they read. Although many of the students mentioned school-related reading terms, none of them mentioned the same one. Alice used the terminology when she discussed her notetaking, saying, "I wrote the *heading* and then I wrote a bunch of other *bullet points* when I did that." Stacy used school terms as she explained her independent reading habits, reporting, "Sometimes I'll sort of *summarize* it in my mind," which aligned with the types of thinking she demonstrated during her think-alouds. Kyle claimed that he keeps a *reading log* to keep track of everything he reads, which "helps him a lot." Caleb's use of school terminology appeared during his explanation of how he deciphers unknown words by saying, "I'm gonna guess that means something like – let's say it's about fishing- I'm gonna say it's probably something about hooks cause I could infer." Edgar also reported focusing his attention as he reads, specifically on "the *main idea*, the *key details*, the *vocabulary*."

Unlike the other participants, Gabe and Maggie used school terminology during their think-alouds of the text, rather than during our discussion of typical reading behaviors. Gabe used a school term to support one of his conclusion statements as a way of explaining how he knew something was true saying, "I'm knowing that this is her words herself because of the *quotations*." After reading "Tomie dePaola," Maggie also used school terminology to explain her conclusions by stating, "It didn't talk much about his family. That's how I can tell he's the *main character*." After reading "Early Railroads," Maggie engaged in a lengthy discussion regarding the birth year of each of the famous figures from the demonstration text and the first text she selected to read aloud. Then, she noted that Peter Cooper's birth year did not appear in the railroad text. This discussion prompted a thorough review of the birth years of each person

and the location of the birth years within the text, which she noted appeared at the beginning of the first two texts. "It usually says it at the beginning of the story," she said, referring to the person's birth date. "That's usually where you find the *main idea*, too, but you usually find it at the beginning of the story." Maggie went on to conclude that the reason Peter Cooper's birth year did not appear in the text was that the text was focused on the railroads rather than Cooper's life. The variety of thinking and discussion related to these secondary themes supports Brown, Pressley, Van Meter, and Schuder's (1996) findings that successful elementary-aged readers apply multiple strategies when they read, aiding in their comprehension.

Chapter Summary

In this chapter, I have described my analysis of the recorded think-alouds of 12 students who scored at or above proficient levels on their school's screening assessment. In order to create a profile of reading behaviors, or types of thinking, exhibited by readers who are considered "proficient" by their teachers, I asked the following questions:

1. What types of thinking do proficient fourth-grade readers report using while they read informational texts?
2. What patterns of reading behavior do proficient fourth-grade readers most commonly report when reading informational texts?

By using the Reading Behaviors Inventory to analyze the students' statements and calculating the frequency of occurrence of each theme, I have attempted to provide examples of types of student thinking and to show the patterns of student thinking that emerged from the think-alouds. In the next chapter, I will provide a discussion of the analysis, as well as implications of this data and opportunities for future research in this area.

Chapter 5 – Discussion

In this study, I examined the metacognitive processes of proficient fourth-grade readers. I hoped to learn what types of thinking processes these successful readers utilized while reading. More specifically, I wanted to begin constructing a profile of what proficient reading looks like for elementary school-aged readers. Based on my teaching experience, I feel strongly that many practicing classroom teachers do not have enough information about what proficient reading really is, how to recognize their students' reading proficiency, and how to cultivate constructively responsive reading in students who are not yet successful readers. I propose that developing a deeper understanding of students' reading habits and thought processes would benefit teachers and their students. I collected recordings of fourth-grade students reading and thinking aloud and analyzed their discussions by theme. In chapter 4, I presented the findings from my analysis by theme. In this chapter, I summarize and discuss the major themes outlined in the previous chapter, followed by implications and opportunities for future research.

Discussion

Findings

The results of student think-aloud sessions in this study demonstrated several connections to the relevant theories and literature outlined in chapter two and to previous studies of student reading. The students' discussions of how they think about the text, of what information was new or previously known to them, as well as the support they provided as proof of their conclusion statements, demonstrates a level of participants' metacognitive awareness during reading (Pressley, 2005.) One strong example came from Stacy's think aloud session. As she read, Stacy frequently paraphrased the text and provided concrete examples from the reading,

and after reading, she explained that she generally pauses to summarize what she is reading. The connection between what she demonstrated during our session and her description of her reading habits lead me to believe that it is possible that Stacy reads this way on a regular basis, and is aware of her own reading behaviors and tendencies. Shelbie also demonstrated metacognitive awareness by stating what information in "Busy Beavers" was new and what she already knew on the topic and paraphrasing her learning from the text. She also explained how reading the text filled a gap in her prior knowledge about the topic because she had been wondering about the connection between beavers cutting down trees and other animals in that habitat. Further, students demonstrated evidence of metacognition through thinking that represented transactional reading, awareness of schema, and awareness of language, which I discuss in the following section.

Reader response theory (Rosenblatt, 1978/1994) was particularly evident in the students' thinking. Although four students chose "Early Railroads" as their second text, each student explained their thinking differently concerning this text. Stacy summarized at each stopping point and then concluded at the end that the point of the text was for people to realize that perseverance makes things better eventually. Edgar frequently related points in the same text to his personal experiences and ended his discussion on the text by supporting the text's claim, using his personal knowledge, that rail travel was faster and cheaper than horse and wagon travel. Nelson made varied statements throughout his reading and ultimately concluded by explaining the evolution of railroads and contemplating their relationship to the invention of cars. Maggie focused her attention on the person mentioned in the text, Peter Cooper, rather than the railroads themselves and explained that the purpose of the text was to describe Peter Cooper's accomplishment. These student responses support Rosenblatt's (1978/1994) theory of

transactional reading, which results in multiple meaning constructions among several readers when reading a common text.

Another aspect of reader response theory (Rosenblatt, 1978/1994) apparent in the students' thinking was the difference between aesthetic and efferent reading stances. For example, when Kyle read "Amelia Earhart," a narrative-style text, 88% of his think-alouds consisted of conclusions beyond the text. However, when Kyle read his second text "Plant Structures for Survival," an expository text, the think-alouds that represented conclusions beyond the text only made up 30% of his unprompted think-alouds. The majority of his think-alouds during the second text were evaluative statements about the information the text provided on the topic. Given this difference in thinking among texts, it is possible that Kyle thinks about narrative-style texts, such as "Amelia Earhart" differently than descriptive expository texts, such as "Plant Structures for Survival." Although Kyle did not begin his think-aloud session by declaring he would be reading with an aesthetic or an efferent stance, the statements that he made while reading each text, which fell into distinctly separate categories, led me to infer that Kyle most likely approached each type of text differently, indicating a difference in stance for each reading.

Students' application of schema theory (Anderson & Pearson, 1984; Anderson, 2013) was evident in their explanations and applications of their prior knowledge. As the second most frequent type of statement coded overall, the students' acknowledgement or admission of missing prior knowledge, specifically pertaining to what knowledge is gained from a text and what is not, suggests their use of prior knowledge in reading comprehension. During his reading of "Plant Structures for Survival," Gabe expressed surprise over a new piece of information in the text about the giant water lilies. He closely attended to the new information throughout his

reading and returned to that idea after finishing the text, demonstrating one way he learns new information from text and adds to his prior knowledge, a potential strength of his reading practices. Maggie's study of multiple texts to make connections among them after she finished reading "Early Railroads," suggest that she might be adept at building her prior knowledge on a topic while reading. She specifically indicated before reading the text that she did not know anything about railroads. Maggie's think-aloud about this text may demonstrate one method she uses when adding to and applying her schema, which may strengthen her reading comprehension.

Several students demonstrated an awareness of situated language (Gee, 1999 & 2001) and possible interpretations of language by explaining their statements, unprompted, to clarify their thoughts. Alice demonstrated her awareness that language can have multiple interpretations several times by elaborating on her statements without being asked, and by giving examples and personal anecdotes to support her thinking. Edgar also followed most of his unprompted conclusion statements with reasons or evidence to support his thinking, appearing to clarify his words before a misinterpretation could occur. Overall, the student participants were adept at explaining their thinking when prompted, as well. They all seemed to understand that other people might not interpret their use of language the same way they intended. This flexibility in thinking where language is concerned could aid these readers in extrapolating multiple possible interpretations of a text and supporting the inferences with text information or previous learning.

Concurrent with Griffin, Wiley, and Thiede's (2008) conclusion that self-explanation of text by paraphrasing improved comprehension monitoring in many readers, each of the successful readers participating in this study utilized paraphrasing as a method of explaining the text while reading. Paraphrasing and constructing conclusions as a means of self-explanation

were the only codes assigned to statements made by all study participants. If this type of thinking is indeed an indicator of successful comprehension monitoring, the participants' method of paraphrasing text while reading may serve to enhance their overall reading comprehension. Another strength all students demonstrated through their think-alouds was that of combined reading strategy use. While some students displayed a wider variety of thinking than others did (see figure 2), all students demonstrated use of multiple types of thinking while reading. Brown, Pressley, Van Meter, and Schuder (1996) found that multiple strategy instruction improved low-achieving second-grade students' reading scores after one year. The evidence of multiple strategy use among the readers who participated in this study further supports a connection between the application of multiple reading strategies and successful reading performance in elementary school-aged readers.

After dividing the participants into two categories according to their STAR assessment scores, those falling between the 80th-86th percentile and those scoring at the 90th percentile and above, I listed the number of statements each student made and the number of different codes demonstrated by each student's thinking (see figure 2). Students who scored between the 80th and the 86th percentile accounted for 35% of the total number of student statements made during think-aloud sessions and demonstrated an average of 38 different types of thinking. Students who scored at the 90th percentile and above accounted for 65% of the total statements and demonstrated an average of 67 different types of thinking. While, as a whole, the higher scoring group made a larger portion of the total statements, examining each student individually proved this trend did not hold true. Alice, who scored at the 99th percentile, and Shelbie, who scored at the 85th percentile, both made 21 statements. Eric, who scored at the 97th percentile, made only 19 total statements, while Veronica, who scored at the 83rd percentile, made 41 statements. As

there is not a clear pattern of increase in number of statements according to increase in STAR assessment score, it does not appear that the students' score is related to the number of thoughts shared during the think-alouds.

Collectively, the students who scored at or above the 90th percentile also exhibited a wider range of thinking types than the group of students scoring between the 80th and 86th percentiles. However, when each student in the 90th percentile and above group was compared individually to each student in the 80th - 86th percentile group, individual comparisons did not show a wider range of thinking types than each student in the other group. Shelbie and Edgar, who are in different groups, each described four different types of thinking during their sessions. Veronica, who scored in the 83rd percentile, demonstrated 10 different types of thinking, which is higher than Stacy, Kyle, Eric, and Edgar, who all scored above the 90th percentile. The difference between the average of types of thinking recorded, 38 types of thinking shown in the 80th-86th percentile group, and 67 types shown in the 90th and above percentile group does not present sufficient evidence to infer that higher-scoring students may demonstrate a wider range of thinking than others. However, these averages are far enough apart to warrant further investigation into the relationship between estimated reading level and range of thinking demonstrated through think-alouds.

Implications and Opportunities for Future Research

The findings of this study have the potential to contribute to teacher learning, expand teacher thinking, and inform teacher practice at the target school and possibly beyond. As teachers are charged with increasing responsibilities and are held accountable by new forms of student data, it becomes increasingly important for teachers to develop and maintain a clear understanding of what constructively responsive reading looks like at multiple developmental

points during the growth of a reader. As a practicing classroom teacher, I recognize that teachers have an abundance of information regarding their students' achievement levels. However, not all achievement data represents the kinds of information that teachers need to make instructional decisions for their students, especially their lowest readers. If we are to meet the expectation of bringing readers to grade level, we must first understand what expert reading looks like at grade level. It is surely more than a readability estimate.

The results of this research study represent a small amount of information regarding the abilities of proficient elementary school-aged readers. In analyzing the results of the participants' think-aloud data, I see the need for further research in this area. One possible avenue for furthering this research is to record the same students reading a text estimated to be at the reader's instructional level. All students in this study read texts estimated at the fourth grade level, which is below their estimated instructional levels. By comparing the types and frequencies of thinking shown through a think-aloud at each student's instructional level, I might understand better the students' reading strategies when encountering a text they may not consider easy to read and comprehend. What strategies do these readers employ most often when reading a new and challenging text? This question may best be answered by asking these readers to read and think-aloud about a text more challenging than the texts they read during this study.

Another opportunity to create a more complete profile of proficient elementary readers may come from recording readers who are estimated to be on grade level and readers who struggle with grade level texts. In the same way that I suggest recording the participants from this study reading texts on their estimated instructional level would add to the data presented here, I feel that analyzing recordings of on-level readers reading grade level texts and texts on their instructional level, should it be different, would be a logical next step. In addition to above

grade-level readers and grade-level readers, analyzing recordings of below-level readers reading grade-level texts and texts at their instructional levels would also add to the data presented as a result of this study. Are the frequencies of thinking types different when readers read on grade-level texts different from occasions when they read texts at their instructional levels? Do readers employ a wider or narrower range of thinking types when reading on grade-level texts versus texts that are on their instructional levels? Collecting data to explore these questions would further my goal of developing a profile of proficient elementary-school readers.

Conclusion

The purpose of this study was to examine, through think-alouds, the metacognitive processes that proficient fourth-grade readers use while they read in order to explore what types of thinking are present in successful elementary school-aged readers. Specifically, my goal in designing this study was to add to the existing body of knowledge about readers and their thinking practices among my colleagues and other elementary-school teachers. What does proficient reading look like for successful elementary-school readers? How will we know when we have developed successful readers at the elementary school level? I would argue that teachers do not have enough information about reading proficiency at various stages of reading development to answer these questions, yet teachers need answers to these questions. While this study does not provide complete answers, it is the beginning of one avenue of research that may fill a need among elementary reading teachers.

In conclusion, I return to the words of Duke, Pearson, and Strachan (2011): "If learning to read effectively is a journey toward ever-increasing ability to comprehend texts, then teachers are the tour guides, ensuring that students stay on course, pausing to make sure they appreciate the landscape of understanding, and encouraging the occasional diversion down an inviting and

interesting cul-de-sac or byway" (p.51). Our job, as teachers of reading, is to guide students toward effective reading, assisting them as they stay on course. We teachers must strive to be worthy and knowledgeable tour guides.

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Appendices

Appendix A – Informed Consent

EXPERT ELEMENTARY READERS: A PROFILE OF READING PROFICINCY

INTRODUCTION
Your child _____ is invited to join a research study to look at the reading and thinking of successful readers. In this research study, I am examining the types of thinking that fourth-grade readers use while they read. I hope this will help me to understand better what successful readers do while they read that makes them so successful. I also hope that this information will help teachers guide struggling readers.

WHAT IS INVOLVED IN THE STUDY?
If you decide to allow your child to participate, he or she will be asked to read a passage or two aloud and to discuss his or her thoughts while reading. I will record the reading and thinking session. I would also like ask your child's teacher how well your child did on his/her last STAR reading assessment. This score will help me understand how well your child is reading at this time.

This reading session will take approximately 30 minutes. I will work with your child's teacher to arrange a time for your child to read to me during a time of the day when your child will not miss classroom instruction. Any independent classwork completed while your child is out of the room can be made up during the school day. I can also meet with your child after school if you prefer.

BENEFITS
As a result of this study, teachers may have a better understanding of what successful readers do while they read. By examining your child's reading and the thinking they discuss with me, we could learn a lot about successful reading that might help other readers who struggle.

RISKS
Children who do not participate in the study will not lose any benefits as a result. There are no expected risks for participating in this study.

CONFIDENTIALITY
All information gained during the course of this study, including student name, test scores, and study results will be kept confidential. Your child's name will **not** be used in the study. Only I will have access to the recordings. You will be able to view all results for your child upon completion of the study if you would like to see the information. All information will be reported as a group, not by individual students.

YOUR RIGHTS AS A RESEARCH PARTICIPANT?
Participation in this study is voluntary. You have the right not to participate at all or to leave the study at any time. Deciding not to participate or choosing to leave the study will not result in any penalty or loss of benefits.

CONTACTS FOR QUESTIONS OR PROBLEMS?
Contact Shelley Burton by phone at (423) 282-5630 or by email burtons@jcschools.org (or my advisor at UT, Richard Allington by phone at (865) 974-1920 or by email rallingt@utk.edu) if you have questions about the study. If you have questions about your rights as a participant, you may contact the University of Tennessee IRB Compliance Officer at utkirb@utk.edu or (865) 974-7697.

CONSENT

I have read the above information. I have received a copy of this form. I agree to participate in this research study.

Student's Name (printed) _____

Parent's Signature _____ Date _____

Appendix B – Student Assent Statement

Researcher: Hello, my name is Mrs. Burton. Your mom (or dad, grandma, name of guardian who signed the consent form) and your teacher say that you are willing to help me. All you have to do is read something to me and talk to me about it. I'd like to know what you are thinking about while you are reading and after you finish reading. It is really easy, and I am sure that you will do a good job. Before we get started, I would like to read to you and tell you what I am thinking so you can listen to me read, too. I think that what we will learn from your thoughts will help other readers. Are you willing to help with this project? (*Child's response*). Great! I think you will find that these things are easy and fun to do. If you decide that you don't want to do this anymore, all you have to do is tell me. You can just say, "I don't want to play this anymore." Okay? (*Child's response*).

I really appreciate your help! This is our special room where we're going to do these things I just told you about. You will sit on this chair at this table with me, so I will be sure to hear you well. I would like to read to you a little bit first. Are you ready? Let's begin.

II. The examiner will use the following procedures during the course of test administration:

- Maintain a pleasant facial expression.

- Give general reinforcement by means of these example comments:

"You're really working hard."

"Good work!"

"I can tell that you are thinking carefully."

"You are really reading well!" (Child's first name), I'm proud of the hard work you are doing."

"You did turn your eyes and ears on, didn't you?"

III. The examiner will use the following procedures at the end of test administration:

- If the child wishes to stop during the testing, the examiner will maintain a neutral expression, close the book, and say, "All right, thank you for helping me again. Let's go back to the classroom."

- When the testing is completed, the examiner will say, "Thank you for helping me again. You have really worked hard today. Here is a special bookmark for all your help. Let's go back to the classroom."

IV. These behavioral management guidelines will be followed during test administration:

- Prompts will include phrases such as:

  "Remember to speak clearly so that I can understand you."

  "Please listen carefully as I read to you and describe my thinking."

  "Please stop at the sticker and tell me what you are thinking about this text."

  "Keep reading carefully."

  "Please continue reading to the end of the page."

  "Please don't touch the (tape recorder)."

- If the child is unable to be conditioned to take the test, administration will be discontinued.

Appendix C – Interview Protocol

Q1- Readers have lots of thoughts when they read. I would like to hear what thoughts you have while you are reading. Please read this text out loud and stop when you see the colored dot on the page. When you get to the stopping point, please explain to me what you have been thinking while you were reading that section. Do you know what to do? (Hopefully, the participant will say "yes" – if not, interviewer will clarify instructions. I will not provide an example of a response as part of the clarification because that might influence the response the student gives.) Please begin reading when you are ready.

* participant reads pre-selected text orally and stops when he/she comes to the colored dot I have marked on the page, about halfway through the text*

Q2- (if participant does not begin explaining without prompting) Please explain what you were thinking when you read that section of text.

Possible probing questions related to Q2 (needed if participant seems reluctant):

- How does this relate to something you have read in the past? (for fictional text)/How does this information relate to something you already know? (for informational text)

- What information do you, as a reader, have at this point in the text?

- What do you think the author wants you to know?

- What do you think will happen in the next part of the text? (for fictional texts)/What do you think will need to be explained in the next part of the text? (for informational texts)

Q3- Please finish reading the text out loud to me. When you get to the end, you will see another colored dot. I would like you to describe your thinking as you read the end of the text.

* participant reads pre-selected text orally and stops when he/she comes to the colored dot I have marked at the end of the text*

Q4 - (if participant does not begin explaining without prompting) Please explain what you were thinking when you read the rest of the text.

> *Possible probing questions related to Q4 (needed if participant seems reluctant – if probes were necessary after Q2, the reader may be more forthcoming without probes after finishing the text)*:

- How does this relate to something you have read in the past? (for fictional text)/How does this information relate to something you already know? (for informational text)

- What information have you gained after reading this text?

- What do you think the author was trying to tell you?

- Are there any parts that were confusing? If so, what do you think the author needed to do to explain it better?

Q5 – I know you do a lot of different kinds of reading at school for a lot of different reasons. What do you usually do to keep track of the thoughts you have while you are reading?

Q6 – What types of discussions do you usually have with your classmates or your teacher after you finish reading a text at school?

after student has finished answering questions - Thank you so much for reading to me and talking with me today. I really enjoyed hearing the thoughts you had as you read!

Appendix D – Reading Behaviors Inventory

Reading Behaviors Inventory

Linearity and Nonlinearity of Reading

Y   N   Surveys text before reading it.

Y   N   Generally reads article from front to back.

Y   N   Reads large section of article in a linear fashion.

Frequency   Jumps forward (Jumps ahead to another section, staying at least 30 seconds) or looks forward in text for particular pieces of information (e.g., footnotes, results, references) and returns.

Frequency   Jumps back (Jumps back to another section, staying at least 30 seconds) or looks back in text for particular pieces of information and returns.

Frequency   Reads selectively in linear fashion (skips some information, then reads closely)

Frequency   • abstract

Frequency   • introduction

Frequency   • methods

Frequency   • results

Frequency   • discussion/conclusion

Frequency   • references

Goal Awareness

Frequency   Highly aware (before reading) of specific information being sought from the article and looks for such information.

Frequency   Looks for information relevant to personal and/or professional goals (own research, writing, teaching, bibliography).

Awareness

Frequency   Reads aloud (and reports would do this if reading alone).

Frequency   Exploits personal strengths (e.g., says can understand tables better than text, so more attention to tables, or *vice versa*).

Frequency   Closely attends to tables/figures.

Frequency   Talks about things, "I typically do when I read."

Frequency   Varies reading style according to relevance of text to reading goals. (Style includes slowing for careful reading, skimming, and very fast skimming.)

Frequency   Expresses own biases/expectations toward text.

Planful

Frequency   Watches for particular information throughout reading.

Frequency   Decides whether to continue reading (based on the abstract or something other than abstract).

Frequency   Intends to read section in specific order.

Frequency   Adjusts attention to material depending on relevance to reading goals.

Frequency   Notes parts of text (e.g., references) to read later or to remember for future reference.

Monitoring

Frequency   Backtracks. (Rereads a sentence for clarification or backtracks for stated purpose of clarification.)

Frequency   Explicitly notes how difficult the text is to read (reading is easy, difficult, she/he does not understand the text, something in text is puzzling).

Frequency   Explicitly notes when something in text is worth or not worth noting.

Frequency   Explicitly notes when something in text is already known or not known to him/her.

Frequency   Explicitly notes when something is taken from another source (e.g., from a named researcher's work).

Relating Information to Prior Knowledge Base

Frequency   Reads reference list to activate prior knowledge.

Frequency   Anticipates/predicts information that will be presented; tests predictions.

Frequency   *Reacts* to information based on own knowledge (including reactions to the author being read, other authors cited in the text, methods, analyses, content, discussion, or text structure of the paper).

Frequency   *Reacts* based on very personal prior knowledge (e.g., own theories, own writing, knows author personally).

Frequency   Notes that text contradicts a belief held by the reader.

Evaluative Reactions

Frequency   Evaluates relevance to goals.

Frequency   • Evaluates whether what is being read is the specific information being sought from the article.

Frequency   • Evaluates whether information is relevant to personal and/or professional goals (own research, writing, teaching, bibliography).

Frequency   Evaluates the text (including reactions to literature review, particular citations, theoretical perspectives, methods, analyses, results including the novelty of findings, conclusions, discussions, implications, writing/editing style, and biases of the author).

Going Beyond the Information Given (Elaborations)

Frequency   Constructs conclusions or summary interpretations beyond information provided in article. (Comes up with summary interpretation of results, tables, or discussion/conclusion.)

Frequency   Constructs paraphrases/explanations of what is in the text and/or gives examples.

Integration

Frequency   Goes back and forth in text (to go to table or figures or to guide further reading in this article). Goes back and forth between figures/tables and text or compares figures/tables with one another to integrate.

Frequency   Explicitly gets information from text on figure or information from figure on side of text or side of figure.

Frequency   Verbally relates material from different parts of text.

Frequency   Summarizes the whole paper after reading it.

Frequency   Indicates she or he will be looking at other materials later with eye to relating to what is in this text.

Elucidation of Discourse Structure

Frequency   Mentions division or relations among different parts of a section or marks major divisions of an argument (e.g., by writing brief title for division, numbering steps).

Written Responses

Frequency   Highlights (Frequent marking of text to highlight, including underlining, check marks, arrows, brackets, boxes) and marks references/terms to find later.

Frequency   Elaborates (Makes brief summaries of text including marginal notes); sketches the design of the experiment in writing; relabels figures/tables; adds more information to figures/tables; rewrites some information in clearer, more memorable form.

Frequency   Write notes on separate piece of paper or computer.

Affective Reactions

Frequency   Expresses positive affective reactions.

Frequency   Expresses negative affective reactions (including anger, tired, or bored).

Frequency   Expresses interest.

Frequency   Expresses lack of interest.

Frequency   Expresses surprise.

Frequency   Uses expletives or slang.

Nonverbal Responses

Frequency   Laughs, looks puzzled, gestures, gives raspberry, scratches chin, puts hands on forehead.

Appendix E – Reading Behaviors Not Applicable to this Study

Jumps forward or looks forward in text for particular pieces of information and returns
Reads selectively in linear fashion (skips some information, then reads closely)
Reads aloud (and reports would do this if reading alone)
Decided whether to continue reading (based on abstract or something other than abstract)
Intends to read section in specific order
Notes parts of text (references) to read later or to remember for future reference
Goes back and forth in text (to go to table or figures or to guide further reading in this article). Goes back and forth between figures and tables and text or compares figures/tables with one another to integrate
Indicates she or he will be looking at other materials later with eye relating to what is in this text
Mentions division or relations among different parts of a section or marks major divisions of an argument
Highlights (frequent marking of text)
Elaborates (makes brief summaries of text including marginal notes) sketches the design of the experiment in writing
Uses expletives

Appendix F – Reading Behaviors Frequency Distribution Table

code	kids	freq.	Reading Behaviors
			Linearity and Nonlinearity of Reading
1	0	0	Surveys text before reading it
2	12	12	Generally reads article from front to back
3	12	12	Reads large section of article in linear fashion
4	0	0	Jumps back or looks back in text for particular pieces of information and returns
			Goal awareness
5	1	1	Highly aware (before reading) of specific information being sought from the article and looks for such information
6	1	1	Looks for information relevant to personal and/or professional goals (own research, etc.)
			Awareness
7	0	0	Exploits personal strengths (says can understand tables better than text, so more attention to tables, etc.)
8	2	3	Closely attends to tables/figures *(here, photos)*
9	9	19	Talks about things, "I typically do when I read"
10	2	2	Varies reading style according to relevance of text to reading goals (style includes slowing for careful reading, skimming, and very fast skimming)
11	0	0	Expresses own biases/expectations toward text
			Planful
12	1	2	Watches for particular information throughout reading
13	0	0	Adjusts attention to material depending on relevance to reading goals
			Monitoring
14	8	21	Backtracks (rereads a sentence for clarification or backtracks for stated purpose of clarification)

15	1	1	Explicitly notes how difficult the text is to read (reading is easy, difficult, she/he does not understand the text, something in text is puzzling)
16	1	1	Explicitly notes when something in text is worth noting
17a	9	30	Notes when something in text is already known or not known to him/her *(specific knowledge mentioned)*
17b	8	19	Notes when something is or is not known *(general comment)*
18	0	0	Explicitly notes when something is taken from another sources (from a named researcher's work is taken from another source)
Relating information to prior knowledge base			
19	0	0	Reads reference list to activate prior knowledge
20	2	3	Anticipates/predicts information that will be presented: tests predictions *(total cycles coded –ie. anticipates, then tests prediction is counted as 1 occurrence)*
21	10	26	Reacts to information based on own knowledge (including reactions to the author being read, other authors cited in the text, methods, analyses, content discussion, or text structure of the paper)
22	7	21	Reacts based on very personal prior knowledge (own theories, own writing, knows author personally)
Evaluative reactions			
23	0	0	Evaluates relevance to goals
24	1	4	Evaluates whether what is being read is the specific information being sought from the article
25	0	0	Evaluates whether information is relevant to personal and/or professional goals (own research writing, teaching, bibliography)
26	7	32	Evaluates the text *(here, gives opinion on text or topic)*
Going beyond the information given (elaborations)			
27	12	75	Constructs conclusions or summary interpretations beyond information provided in the article (comes up with summary interpretation of results, tables, ,or discussion/conclusion)
28	12	75	Constructs paraphrases/explanations of what is in the text or gives examples

			Integration
29	1	2	Explicitly gets information from text on figure or information from figure on side of text or figure Verbally relates material from different parts of text
30	0	0	Summarizes the whole paper after reading it
			Elucidation of discourse structure (none)
			Written responses (none)
			Affective reactions
31	3	8	Expresses positive affective reactions
32	0	0	Expresses negative affective reactions (including anger, tired or bored)
33	6	15	Expresses interest
34	0	0	Expresses lack of interest
35	5	11	Expresses surprise
36	1	1	Uses slang
			Nonverbal responses
37	3	4	Laughs, looks puzzled, gestures, gives raspberry, scratches chin, puts hands on forehead
			New Codes (not accounted for in inventory)
38	5	16	Asks question while reading
39	1	1	Claims to think of nothing
40	10	15	Use of school terminology
41	5	6	Imaginative speculation/comment
42	2	5	Wondering/musing (that is not a specific question)
43	1	1	Predicts while reading
44	2	3	References text as proof of statement
45	1	4	Agrees with text
46	1	2	Mentions learning more about the topic

Vita

Shelley Burton was born and raised in East Tennessee. As the child of two teachers, reading was always an important part of her life. She earned a bachelor's degree in elementary education from East Tennessee State University in 2003 with a certification to teach kindergarten through eighth grade, and began teaching first grade in a nearby school system. After a year of teaching, it became clear that reading instruction was her particular area of interest in education. She returned to East Tennessee State University to attend graduate school and graduated in 2006 with a Master of Arts in Reading and a prek-12 reading specialist endorsement. Upon completion of this dissertation, Shelley will have earned a PhD in Teacher Education with a concentration in Literacy Studies from the University of Tennessee. She has taught elementary school for 13 years and currently teaches third grade. Shelley also serves as an adjunct instructor at East Tennessee State University, teaching undergraduate and graduate courses on reading instruction. Her primary research interests include reading comprehension strategies and student thinking processes during reading.