Sources Of Missed Understanding: A Framework For Diagnosing Comprehension Breakdown

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SOURCES OF MISSED UNDERSTANDING:
A FRAMEWORK FOR DIAGNOSING COMPREHENSION BREAKDOWN

Jennifer Tarr
Teaching and Learning: Reading, Language and Literacy

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of the requirements of
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[Signatures]

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ABSTRACT

This research sought to understand how a formative assessment framework created by the researcher (called the Sources of Missed Understanding construct) would be used by teachers to diagnose students’ reading comprehension challenges during authentic reading instruction, and to understand the context and supports teachers needed to use the tool effectively. A design experiment methodology was used to follow the diagnostic processes of five reading specialist candidates, each working one-to-one with an upper elementary or middle school reader during a five week summer university-based tutoring setting, resulting in five case studies and cross case analysis. This study shows that teachers who used the Sources of Missed Understanding construct and received support were successful at formatively assessing causes of student comprehension breakdown and adapting instruction accordingly. It also revealed that teachers needed two levels of support to use the tool effectively. First, teachers needed knowledge building about the common categories of comprehension breakdown and where they fall in the comprehension process illuminated by the construct. It was this knowledge that enabled teachers to analyze what meaning their readers were (or were not) gleaning from a text and hone in on the cause. Second, teachers needed “thinking-partner” support to become aware of their own diagnostic processes. With support, teachers became attentive to what they observed, and how to set up instruction to detect and ultimately address sources of missed understanding.
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CHAPTER ONE
INTRODUCTION

This study stemmed from my own experiences as a reading specialist working with elementary Tier 2 and Tier 3 students (which, in my school, were students who perform in the bottom 25th percentile of local norms on standardized and classroom assessments). I admit I felt ill equipped when it came to helping students who struggled with reading comprehension, particularly those in upper-elementary grades. Year after year my school’s RtI process identified several relatively fluent readers, with reasonable vocabularies and background knowledge, who failed to draw meaning from texts. I puzzled to figure out why. Comprehension involves multiple invisible interacting mental processes: units of language, inference, reference, conceptual knowledge, background knowledge, memory, reasoning, etc. While there is a myriad of important research on how people comprehend, how to teach reading comprehension, differences between good and poor comprehenders, (which will be reviewed in Chapter Two), it had simply been hard for me to determine precisely where meaning broke down and why for a specific student during the natural course of reading instruction.

Teaching students to decode, on the other hand, was straightforward to me. Word level processes are well researched, and quality teaching methods and learning continuums are broadly recognized (e.g., Adolf, Perfetti, & Catts, 2011; NICHD, 2000). Perhaps most importantly, there are formative assessments—from running records and miscue analysis (Goodman, 1969) to developmental spelling analysis (Baer, Invernezzi, Templeton & Johnston, 2003; Ganske, 2000). These tools not only help teachers identify a readers’ point of development on a learning continuum, they make transparent a
student’s strategies for cracking the code. Armed with this rich knowledge about a specific student’s thinking a teacher can devise instructional plans to systematically correct misunderstandings, balance cueing strategies, and develop decoding skills.

I often wished for myself, that there might be an analogous framework for categorizing and analyzing comprehension “missed-understandings” as there is for word reading miscues. A framework that could be used in the course of regular classroom reading instruction and discussion, just as miscue analysis or observations of developmental spelling in writing samples can be gleaned during classroom reading and writing activities. One that could help teachers deduce the incomplete reasoning or misguided strategies that are the source of the missed-understanding, which could then inform instruction, differentiated to a student’s specific comprehension gaps.

So, I set out to find such a tool. When I could not find one, I started to draft one.

**Statement of Problem**

For a very long time, many reading researchers believed that achieving accurate word reading by grade three was the key to reading success. As a result, children’s word processing had been more thoroughly researched than children’s comprehension (RAND Reading Study Group (RRSG), 2002). With struggling readers, the emphasis on word recognition and phonological development persisted. “Until recently, the bulk of research investigating sources of reading difficulties focused solely on word reading” (Adlof & Perfetti, 2012).

As of the turn of the century, reading comprehension had become accepted as a critical component of reading instruction, and explicit, well-designed instruction in comprehension recognized as needed for all students throughout their schooling (National
Reading Panel (2000); RAND Reading Study Group (RRSG), 2002). Educational policy confirmed this through the Common Core State Standards (Council of Chief State School Officers & National Governors Association, 2010), which made comprehension a primary focus of upper elementary grades even phasing out foundational word-level standards by grade three, leaving the meaning-making Reading Literature and Information anchor standards. Yet, in the most recent Handbook of Research on Reading Comprehension (2017) Susan Israel and D. Ray Reutzel report “a paucity of [comprehension] research” (p. 7) in the recent decade, resulting in practitioners lacking an “adequate understanding of text processing models and processes” (p. 10).

Furthermore, in research on reading difficulties, it has only recently become clear that some children and adults display specific problems with comprehension (Perfetti & Adlof, 2012). Researchers have identified a segment of struggling readers with specific comprehension difficulty (SCD), meaning they exhibit age appropriate word recognition and phonic skills, yet fail to comprehend (e.g., Adlof, Perfetti, & Catts, 2011; Cain & Oakhill, 2006; Spear-Swerling, 2011). SCD is sometimes referred to as late emerging reading problems as they are often first revealed in upper elementary years in children with no history of early decoding issues. There are also students with mixed reading difficulties, involving both word recognition and comprehension. Students with mixed reading difficulties tend to be identified in the primary grades due to the child’s decoding, but their challenges persist even after remediation of word recognition and when the student fails to comprehend material they can decode (e.g., Adolf, Perfetti, & Catts, 2011; Leach, Scarborough, & Rescorla, 2003; Spear-Swerling, 2011; Valencia, 2011).
The size of the SCD population differs based on the specific measures used to assess reading related abilities. For example Catts, Hogan, and Adolf (2005) found the comprehension-deficient subgroup to be 16% of second graders, but approximately 30% of fourth and eighth graders. Leach, et al. (2003) found only 6% of students identified with reading disabilities in grade three or earlier was due to comprehension as compared with 33% of students identified in grades four and five. This pattern is consistent with Chall, Jacobs, and Baldwin’s (1990) findings nearly thirty years ago, that comprehension challenges become more prevalent in upper elementary grades, which they coined the “fourth grade slump.”

This rise in identified comprehension challenges is often attributed to the increase in volume, density and complexity (in syntax and meaning) of reading material and assessments in the intermediate grades (e.g., Adolf, Perfetti, & Catts, 2011; Stahl, 2016). Therefore, the term late emerging reading problems may be misleading—it is not that the comprehension gaps form later as much as they may not be recognized until texts and tasks become complex. As Leach and her colleagues (2003) note, primary grade texts and assessments are generally not conceptually challenging. In their study, the late-emerging fourth and fifth grade struggling comprehenders were not inadvertently overlooked in earlier grades; they appeared to be good readers based on early reading measures. It was not until comprehension assessed became more demanding that difficulties became apparent.

Research indicates that students with SCD are a heterogeneous group, requiring different interventions and instruction to address specific sources of struggle (e.g., Cain & Oakhill, 2006; Spear-Swirling, 2011). For example, some have an oral language
weakness, but not severe enough to warrant speech/language services; however, many exhibit good listening comprehension (Leach, Scarborough, & Rescorla, 2003; Spear-Swerling, 2011). Some poor comprehenders demonstrate weak monitoring skills or inferior inferencing ability, and others are average or even good at these relative to peers (Cain & Oakhill, 2006).

Many researchers (e.g., Duke, Pearson, Strachan, & Billman, 2011) argue that student instruction should be based on careful observation and assessment of their specific comprehension needs. Unfortunately, most comprehension measures do not help teachers pinpoint specific comprehension weaknesses in individual students, or tell why readers struggle (Duke, et. al, 2011; Spear-Swerling, 2011). As Afflerbach (2007) explains, most existing reading assessments focus on the products of reading (such as tests or quizzes), and not the process. As a result, when teachers examine test scores, they need to make “large retrospective inferences about what worked (or didn’t work) as students read,” which he likens to looking at a basketball game final score: “Certainly the final score is important, but it tells us little about the means by which it was achieved” (p. 270).

To be diagnostic, an assessment needs to examine the process and contributing factors to comprehension. Researchers (e.g., Duke, Pearson, Strachan & Bilman, 2011; Martin & Duke, 2010) point to a growing collection of classroom-based assessment measures aimed at helping teachers become more diagnostic instructors. The Qualitative Reading Inventory developed by Leslie and Caldwell (2017) and the Benchmark Assessment System by Fountas and Pinnell (Fountas, 2018), are two examples of improved reading inventories. Like past reading inventories, teachers using these
assessments determine reading levels based on word reading accuracy and after-reading comprehension questions or discussion prompts about a fiction or non-fiction text provided. Both have innovated beyond traditional reading inventories, by encouraging unaided re-telling of the text, including questions/prompts that are text- and inference-based, and which allow look-backs.

There has also been development beyond reading inventories such as the Concepts of Comprehension Assessment (COCA) (Billman, Duke, & Hildren, 2008), and the Informational Strategic Cloze Assessment (ISCA) (Hilden, Duke, & Billman, 2008), which test a student's comprehension abilities for informational text reading in four areas: comprehension strategy, vocabulary, text features, and comprehension of graphics. The COCA is intended for first and second grade, and the ISCA for first, second, and third grades. (Duke & Keene, 2009; Martin & Duke, 2010). The Diagnostic Assessment of Reading Comprehension (DARC) (Center for Applied Linguistics, 2002 based on the work of Hannon & Daneman, 2001) asks students in grades two through five questions designed to determine text memory, inferencing skills, recall of background knowledge and the ability to integrate background knowledge with text information. In this assessment, students not only answer questions after they read (or listen to) test passages, they also explain how they arrived at their responses.

A benefit of these newer assessments is that many are more process oriented. Instead of only asking solely end-of-passage questions or re-tells, several of these newer assessments engage students during the task of reading to determine where in the construction of meaning comprehension breaks down and why. However, they are administered with testing materials and protocols outside the natural context of reading
instruction so the aspects of comprehension they assess or illuminate may or may not align with what a teacher experiences day-to-day in the moment of student meaning-making.

Careful day-to-day observations by teachers as part of instruction are recognized as an important and potentially powerful, formative assessment (Black & Wiliam, 1998). Unlike planned and prepared assessments such as the ones listed above, observations provide a “responsiveness of assessment and instruction to individual needs at the moment of instruction...[and] specificity and immediacy of feedback” (Valencia, 2011, p. 393). Reading researchers imply, and in some cases describe (Duffy, 2002), the fact that teachers need to analyze student comments during instruction to infer their student interpretation and determine how to intervene in ways that foster learning. They assert that “at the heart of effective reading instruction is the teacher’s detailed knowledge of each student” and that through questioning-during-instruction “adept” teachers can determine if students are “getting” the lesson (Afflerbach, 2007, p. 273). However, comprehension research does not indicate how teachers are supposed to collect this data and conduct its analysis.

**Research Purpose and Questions**

This study aimed to test teacher’s ability to use a diagnostic formative assessment framework for identifying and categorizing sources of comprehension breakdown of upper elementary students during the course of instruction. The goal is for the framework to become as instrumental to understanding comprehension failures as Goodman’s (1969) miscue analysis is for print errors. Like Goodman’s study, this inquiry began with the premise that all readers are intentionally working to reason their way through a text; and
when a student makes an error, it creates an opportunity for the student and teacher to explore and categorize how the reasoning process miscarried. It also began with the premise that teachers are knowledge workers who strive to understand and address their students’ inability to comprehend texts, but may not yet have practical knowledge of the reading process and critical sources of comprehension breakdown during that process such that they can efficiently determine how and where a student’s understanding goes awry.

The hypothesis was that, when given a framework of sources of comprehension break down together with instruction to understand the framework, teachers (as knowledge workers who understand students, the text and comprehension) would be able to effectively probe students’ missed-understandings to identify and categorize the source(s) of comprehension failure. A collection of such observations would help teachers deduce individual student’s propensity to confuse, which could then be used to inform instruction. The focus was on detecting comprehension challenges in upper elementary students above the word level, and takes cognitive constructivist perspective.

This study embraced a conceptualization of reading comprehension as an act of cognitive constructionism where print on a page is negotiated into rich mental representations in the minds of readers through the active construction of meaning. It drew on the work of cognitive psychologists and neuroscientists Walter Kintsch (2004) and Paul van den Broek and colleagues (e.g., van den Broek, Young, Tzeng, & Linderholm, 1999) whose models argue that texts are processed and fused with schema during reading to create clear depictions of what they mean. It was also informed by research in metacognition, as applied to reading comprehension such as Linda Baker and
Ann Brown (1984), Gerald Duffy (2002) and colleagues (Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, M, Vavrus, Wesselman, Putnam, & Bassiri, 1987) and Michael Pressley (1998) and others (Pressley, El-Dinary, Gaskins, Schuder, Bergman, Almasi, & Brown, 1992) which describe the mental strategies successful readers use to build understanding of a text during the reading process and how less successful readers can be taught to intentionally deploy these strategies to better comprehend. The Sources of Missed Understanding construct used in this inquiry was influenced by van den Broek and Kremer’s (2000) synthesis of the sources of comprehension break down, and Perfetti and Adlof’s (2012) pressure point analysis, whose work analyzed the sources of comprehension break down for students with specific comprehension difficulty. Finally, this study sought what P. David Pearson (2001) coined “the radical middle” (p. 78). It aimed to moderate and reconcile strong views on reading assessment and what it means to comprehend a text.

The Sources of Missed Understanding framework used in this study was drafted in accordance with the scholarship on reading comprehension and informed by observations and experiences from my own practice as a Title 1 reading specialist working with fourth and fifth grade students during small group reading comprehension instruction. It evolved from my efforts to use prevailing scholarship and a growing understanding my own students’ thinking to discern and categorize what causes confusion of meaning in the minds of an upper elementary reader when he or she fails to comprehend a text. The diagnostic process used as a starting point in this inquiry was my own.
This study endeavored to take the next step, to move beyond my own practice, to observe other teachers use this tool as they formatively assess students challenged with reading comprehension in a one-to-one summer tutoring setting. Working collaboratively with teachers and using a research design experiment approach, this it sought to answer the following questions:

1. How do teachers use the Sources of Missed Understanding construct during the course of five-week one-to-one reading instruction?
   a. What is the diagnostic process in which a teacher engages as he or she uses this tool to determine the causes of meaning break down for a student?
   b. What kinds of prompts, interactions or conditions encourage students to make their thinking or confusions known?
   c. How is this information used to inform instruction?

2. What training, preparation, and/or ongoing coaching support do teachers need to understand how to understand use the tool effectively?

**Defining Terms**

This study adopted the view that reading comprehension is an active, cognitive, constructivist endeavor. It embraced the RAND Reading Group Study’s (2002) definition of reading comprehension as “the process of simultaneously extracting and constructing meaning from written language” (p. 11) that involves dynamic interaction among many variables: knowledge, abilities, motivation and experience the reader brings to the reading event, the demands of the text, and the purpose, processes and consequences of
the reading activity. All these components, the authors acknowledge that all these components take place in a larger socio-cultural context.

This view is not new. Of the many definitions of reading comprehension, most from the past quarter century support the constructivist nature of the process of reading comprehension (McLaughlin, 2008). Where there is debate is the result of that process: What constitutes successfully making meaning? What meaning is deemed correct? Who gets to decide if meaning is correct?

For example, reading comprehension is defined by Harris and Hodges (1995) in *The Literacy Dictionary* as:

The construction of meaning of a written or spoken communication through a reciprocal, holistic interchange of ideas between the interpreter and the message in a particular communicative context. Note: The presumption here is that meaning resides in the intentional problem-solving, thinking processes of the interpreter during such an interchange, that the content of meaning is influenced by that person’s prior knowledge and experience, and that the message so constructed by the receiver may or may not be congruent with the message sent. (p. 39)

For this study, *meaning-making* or *understanding of text* were defined as a reasonable approximation of the author’s intended message. This stance breaks with the definition of Harris and Hodges in that it re-balances the essential roles of both the reader and the author and seeks to find the middle ground. It acknowledges that there is often not one purely correct meaning, but asserts the responsibility of a reader to work toward determining the meaning an author envisioned. For this study and with this assessment, a
student was successfully *comprehending, making meaning, or understanding* when they conveyed sensible interpretations of a text that their teacher or assessor deemed reasonably congruent with the author’s intentions.

In this study, errors in comprehension were referred to as *missed-understanding* and were valued. This study began with the premise that all readers are actively attempting to construct an author’s intended meaning from the words they read. When a probe into meaning revealed a student’s understanding of a text was different than a range of acceptable interpretations, it created an opportunity for the student and teacher to explore the details of missed-understandings, to note and categorize them, such that they collectively illuminate what Pellegrino, Chudowsky and Glazer (2001) call a student’s “tendency to confuse” (p. 38). It is not enough to know that students do not understand, teachers need to understand how and why a student’s constructed meaning is awry, in order to adapt instruction to meet their needs.

Pellegrino, Chudowsky and Glazer go on to define assessment as the “process of drawing reasonable inferences about what students know on the basis of what they say, do or make in selected situations” (p. 112). In some of the literature about assessment and reading assessment, the terms *classroom assessment* and *formative assessment* are used interchangeably in that they are in contrast to large standardized tests, and in the fact that both could, conceivably, be used to inform instruction. However, for this study there is a distinction. Classroom assessment, in many classrooms, is simply summative, end of unit tests, quizzes, or exams given for the purpose of giving a grade. Formative assessments, on the other hand, support instruction and learning, not grading. Definitions of the term formative assessment vary. Black and Wiliam’s (1998) definition of formative
assessments as the many inputs and activities that are used by teachers and students to inform, modify or differentiate teaching and learning activities to meet students’ needs. Valencia (2011b) concurs stating, “it is not the frequency of the assessment, speed of receiving results, location of implementation specific assessment strategies or even the purpose that make an assessment formative; it is the use of the information” (p. 388).

This study aimed to adapt a formative assessment that may be used in the natural course of classroom instruction for the purpose of informing instruction. In this study it was referred to as a formative classroom assessment.

Finally, this study used the terms diagnostic listening or inquiry listening to describe the active, analytical listening and prompting the assessor engages in during a formative assessment conversation with a reader. These terms stem from Judith Lindfors (1999) and Carmen Martin-Roldan’s (2005) work on inquiry acts of children. Inquiry acts, as these authors define them, are language acts in which participants elicit help from one another to deepen understanding. Lindfors describes,

the demands of inquiry go beyond a courteous kind of listening to an active, co-constructing kind … [where the] teacher moves in response to a student’s inquiry (e.g., seeking clarification, agreeing, countering), but in each response the teacher [joins] the inquirer in his inquiry place. (p. 224-225)

Significance

Scholarship has identified a population of students with specific comprehension difficulties (SCD) whose issues often become apparent in upper elementary grades when text and task demands become more complex (e.g., Adlof, Perfetti, & Catts, 2011; Cain & Oakhill, 2006; Spear-Swerling, 2011). “Despite the recognition of late-emerging RD
[reading difficulties] more than 25 years ago, there have been relatively few empirical investigations of these reading problems” (Catts, Compton, Tomlin, & Bridges, 2012, p. 166).

Researchers estimate students with SCD to amount to as much as 30% of students with reading difficulties in upper elementary grades (Catts, Hogan, & Adolf, 2005; Leach, Scarborough, & Rescorla, 2003). Scholarship also identified students with mixed difficulties, meaning they have both word-based and comprehension challenges. Students with mixed reading difficulties are estimated to be another 30% of upper elementary students (Adolf, Perfetti, & Catts, 2011; Leach, Scarborough, & Rescorla, 2003; Spear-Swerling, 2011; Valencia, 2011). Together, students who struggle with comprehension challenges could account for two-thirds of upper elementary students identified with reading difficulties. This is a sizeable segment of readers whose needs are only recently becoming the focus of deep investigation.

Scholarship recognizes that students with reading comprehension problems struggle with a range of skill deficits. For example, Cain and Oakhill (2006) note, “Of interest to both theoretical models of reading development and educational practitioners [is] the substantial heterogeneity within this population” (p. 692). Researchers investigating students with SDC in particular (e.g., Spear-Swerling, 2011, 2016) and those researching comprehension more broadly (e.g., Duke, Pearson, Strachan, & Bilman, 2011) highlight the need for diagnostic assessments of different related abilities in order to focus instruction to the specific needs of students.

Reading researchers also recognize that current comprehension assessments are inadequate to pinpoint a student’s specific comprehension weaknesses and the underlying
causes of the comprehension failure (Afflerbach, 2007; Duke, Pearson, Strachan, & Bilman, 2011; RAND Reading Study Group, 2006; Spear-Swerling, 2011). They point to a need for many types of assessments with multiple measures and procedures to provide a thorough understanding of students’ comprehension. This study endeavored to contribute in a small but important way to the “more adequate system of instrumentation for assessing reading comprehension” that the RAND report calls for (RRSG, 2002, p. 52).
CHAPTER TWO

REVIEW OF THE LITERATURE

The objective of this research was to develop a framework for categorizing and analyzing missed understandings in reading comprehension that occur during the course of authentic reading instruction that could be used by classroom teachers in a way similar to Goodman’s (1969) miscue framework for print errors. The classroom formative assessment instrument drafted for use in this study is grounded in the scholarship of reading comprehension and the scholarship of formative classroom assessment discussed in this chapter.

The RAND Reading Group Study (2002) defined comprehension as “the process of simultaneously extracting and constructing meaning from written language” (p. 11) that involves dynamic interaction among many variables: knowledge, abilities and experience the reader brings to the reading event, the demands of the text, and the purpose, processes and consequences of the reading activity. All these components, the authors acknowledge, take place in a larger socio-cultural context. By this account, comprehension is an exceptionally active, complicated endeavor where changing one element—such as altering a text, posing a question to a reader, improving reader skills or varying a task—changes the interplay between a reader, text and activity and therefore, the meaning constructed (Harrison, 2004; Wilkinson & Son, 2011). This definition speaks simultaneously to the powerful possibilities of comprehension instruction and assessment. It also illuminates the daunting complexity of such an undertaking.

This may be why, over time, researchers have employed a variety of frameworks to organize the complex elements of reading comprehension and to define their focus of
study. These include discussion of what occurs “in the head” versus “out of the head;” activities before, during, and after reading; and processes that occur at word level and above word level. The objective of this study (and ultimately the formative classroom assessment construct employed) is to help educators understand what happens in the head, during reading, above word level for readers attempting to make sense of a text.

However as the RAND definition implies, factors of comprehension are interrelated thereby making it hard to completely carve out an area of focus and disregard the omitted aspects. A brief discussion of what is excluded from the focus of this study and its assessment construct will follow so as to acknowledge the important role they play in influencing what happens in the minds of readers as they grapple to make sense of written word.

**Outside the Scope of this Study**

“Out of the head” considerations include text characteristics and measures of text complexity. The centrality of managing text demands for developing readers (such as controlled vocabulary) and the leveling of books according to difficulty were first introduced to American reading instruction in the 1830’s with the McGuffey Readers (Pitcher & Fang, 2007). Since then, Betts’ (1946) landmark framework for organizing reader-readability pairings into three categories—inddependent, instructional and frustrational—based on word reading accuracy and comprehension measures to assess readers and match them with “just right” books has become a bedrock of literacy instruction (Halladay, 2008). Many contemporary scholars continue to support this view as evidenced by the work of Allington (2006), Clay (1993), and Fountas and Pinnell, (1996).
The importance of text complexity garnered renewed attention with the Common Core State Standards (Council of Chief State School Officers & National Governors Association, 2010) and an ACT study (2006) on which the standards are based. The study showed that the ability to comprehend complex text was overwhelmingly the differentiator of those students who met college ready benchmarks from those who did not. The degree of text complexity differentiated student performance more than did level of comprehension (literal or inferential), or the textual element tested (main idea, supporting details, cause and effect and other relationships, vocabulary, or making conclusions and generalizations). This held true across gender, racial/ethnic groups and family income levels. While text complexity is not the focus of this review, this research highlights the importance of helping students to comprehend challenging texts, rather than simply providing them accessible texts.

Considerations of before-reading activities and reader-characteristics include reader background knowledge, vocabulary, reader motivation and purpose for reading. Considerable scholarship has explored the schema a student brings to a reading event, including topical knowledge, knowledge of text structures and word knowledge, in terms of its function in comprehension (Anderson & Pearson, 1984; Kintsch, 2004) and how it can be improved. The majority of studies that examine the effects of background knowledge demonstrate that increasing such knowledge before reading improves comprehension, and that those improvements span grade levels from primary through high school (McKeown, Beck, & Blake, 2009; Trabasso & Brouchard, 2002). Similarly, scholarship shows the more extensive a reader’s vocabulary, the stronger their

Reading research also provides strong support for a connection between motivation and reading achievement (Baker & Wigfield, 1999; Guthrie, Wigfield & You, 2012; Guthrie & Wigfield, 2005; Pintrich, 2003; Taboada, Tonks, Wigfield, & Guthrie, 2009). These studies reveal that students who are engaged in reading and motivated to persist when it becomes challenging demonstrate achievement in reading. Less research has explored the impact of setting a purpose for reading. Still, instructional strategies ranging from Paris, Lipson, and Wixson’s (1983) *Becoming a Strategic Reader* to Donna Ogle’s (1986) KWL graphic organizer routine emphasize the benefits of setting an objective as a way to inspire purpose and self-direction with a reader. Thus the related knowledge, relevant vocabulary, motivation, stamina and focus readers bring to a reading event are comprehension enablers, and influence a student’s meaning-making processes.

After reading activities typically involve students responding to questions, retelling or engaging in a form of reflective discussion about a portion, or all of the text previously read (McKeown, Beck, & Blake, 2009). There is some debate as to whether after-the-fact questions, as opposed to questions inserted during reading, promote comprehension or merely assess it, as Doris Durkin (1978-1979) determined. Still, considerable research has been conducted on effective questioning strategies including those that ask about the most important information (Beck and McKeown, 1981; Richards, 1976), application questions (Richards & Hatcher, 1977-1978), and high-thinking questions (Yost, Avila, & Vexler, 1977). Trabasso and Bouchard (2002) analyzed 17 research studies related to after-reading questioning and determined that the
value of answering questions after reading include reprocessing of relevant text, increased memory for information read, and facilitated reasoning through “how” and “why” prompts.

Similarly, several approaches to reflective discussions after reading have also been researched with the goal of developing interpretive and critical thinking skills about a text. Many methods have goals beyond comprehension such as expanding classroom discourse and valuing student voice. Examples include Junior Great Books (Great Books Foundation, 1987); Collaborative Reasoning (Anderson, Chin, Waggoner, & Nguyen, 1998); Book Clubs (McMahon & Raphael, 1997); and Grand Conversations (Eeds & Wells, 1989). These differ in the degree of teacher- versus student-control of managing the discussion, and the centrality of the text as opposed to a focus on student response. While comprehension improvement was not always the primary goal of text discussion research overall, discussion appears to improve reading comprehension (Applebee, Langer, Nystrand, & Gamoran, 2003).

Another consideration outside the scope of this review is word level processes, or decoding. Efficient word level decoding is largely recognized as an enabler to the comprehension process (Adams, 1990, Pressley, 1988). This is attributed to capacity constraints in short-term memory (Miller, 1956). Since both recognizing and comprehending words occur simultaneously within limited short-term memory, the more mental attention required to figure out a word, the less mental “bandwidth” available for meaning-making (LaBerge & Samuels, 1974). In addition, there is data to support the view that training in word recognition to the point of automaticity improves comprehension (Breznitz, 1997; Tan & Nicholson, 1997). This concept that upper-level
comprehension processes rely on effecting lower level word/decoding processes endures (Perfetti & Adlof, 2012).

Some researchers, such as Gough and Tunmer (1986), believe that if students can decode the words in books read, they will understand them (decoding + listening comprehension = reading comprehension). The problem with this “simple view” of comprehension is that training children to read words to the point of automaticity has not always improved comprehension (Fleisher, Jenkins & Pany, 1979; Yuill & Oakhill, 1991). Several researchers have found that a segment of students with specific comprehension difficulty also have age-appropriate word recognition and phonological skills (Adolf, Perfetti, & Catts, 2011; Leach, Scarborough, & Rescorla, 2003; Spear-Swerling, 2011; Valencia, 2011). This group comprises a larger percentage of the struggling-reader population in upper grades than in primary grades. This trend is attributed to the increased complexity of texts in the upper elementary grades. Clearly, understanding text is more than just accurately decoding text.

In sum, reading comprehension is a complex, multi-faceted endeavor. A rich body of reading comprehension research, touched on above, is excluded from this study because this inquiry’s focus is on helping educators understand what happens in the mind, during the reading process, above word level for readers attempting to make sense of a text. However, as previously stated, factors influencing comprehension are intertwined, thereby making it impossible to disregard them completely. With this caveat, I will turn to the theoretical foundation of this study.
Theoretical Foundations

Several theoretical constructs influenced this study and the synthesis of the research about what happens in the head, during reading, above word level for readers attempting to make sense of a text and what educators can do in-the-moment to evaluate and support them.

First, it is grounded by the belief that reading comprehension is, at its heart, an act of cognitive constructionism where print on a page is negotiated into rich mental representations in the minds of readers through the active construction of meaning. My understanding of the comprehension process is drawn from the work of cognitive psychologists and neuroscientists Walter Kintsch (2004) and Paul van den Broek (e.g., van den Broek, Young, Tzeng, & Linderholm, 1999) whose models describe how texts are processed and fused with schema during reading to create clear depictions of what they texts mean. It is also informed by research in metacognition, applied to reading comprehension such as the works of Linda Baker and Ann Brown (1984), Gerald Duffy (2002) and his colleagues Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, M, Vavrus, Wesselman, Putnam, & Bassiri (1987) and Michael Pressley (1998) with other researchers (Pressley, El-Dinary, Gaskins, Schuder, Bergman, Almasi, & Brown, 1992). Taken together, these studies describe the mental strategies successful readers use to build understanding of a text during the reading process, and how less successful readers can be taught to intentionally deploy these strategies to construct meaning.

While my views on comprehension are anchored in cognitive sciences, I reject the information processing metaphor sometimes attributed to cognitive-based processes. My notions are tempered by Louise Rosenblatt’s (1938/1978/1995) wise reminder that,
“terms such as the reader are somewhat misleading….There is no such thing as a generic reader or a generic literary work” (p. 24). Like Rosenblatt’s work, this inquiry respects the concept that reading is a transaction between a uniquely human reader and a text written by a uniquely human author. It honors Rosenblatt’s extension of Schema Theory (Anderson & Pearson, 1984) by acknowledging the distinct background, culture, assumptions, vocabulary and individual response readers bring to the reading experience shape the range of reasonable approximations of meaning constructed. This study acknowledges that every learner brings a unique portfolio of skills and knowledge, or “Intra-Individual Differences,” to a reading event (RRSG, 2002, p. 23) and as a result, there is “no single way knowledge is represented by competent performers and no single path to competence” (Pellegrino, Chudowsky, & Glaser, 2001, p. 182).

The recognition of a reciprocal relationship between reader and text is perhaps most clearly seen with readers from non-majority cultures and from those learning English as another Language. In this study, I take the stance that the underlying mental construction/integration processes are alike for all readers, but a reader’s characteristics, including cultural schemata and vocabulary, may shape the meaning constructed. Researchers investigating reading comprehension from a sociocultural perspective and focusing primarily on cultural schemata (Reynolds, Taylor, Steffensen, Shirey, & Anderson, 1982) report that when students read culturally familiar material, they read it faster, recall it more accurately, and make fewer comprehension errors. This implies, that when cultural schemata is controlled, comprehension is similar between students of majority and non-majority cultures. Similarly, Jimenez (1994) found that English Language Learners draw from the same portfolio of metacognitive comprehension
strategies that English speaking students use, but that the relative utility of some strategies are more important to English Language Learners monolingual English-speaking students. These examples illuminate both the commonalities of the mental comprehension processes of all readers, as well as important differences. The challenge for a diagnostic reading teacher, and the assessment tool employed in the current study, is to recognize when and how student characteristics such as culture and language are impacting meaning, but to not attribute all missed understandings of non-majority students to language and culture without consideration and reflection of the broader range of possible causes of missed understandings.

The tempering of cognitive theory with Rosenblatt’s Transactional Theory is apparent when considering what is accepted as making meaning. As described in chapter one, this inquiry defines meaning making as a reasonable approximation of the author’s intended message as determined by the teacher or assessor. In defining meaning making as a range of sensible interpretations of an author’s intentions, as opposed to one single correct meaning, I intend for the users of the Sources of Missed Understanding Construct to allow some room for personal background and cultural considerations to influence meaning accepted. But, it is not intended to honor any reader interpretation. In this study, I take the position that a reader has the obligation to first seek, within a reasonable approximation, the author’s intended meaning. I acknowledge that inherent in every reading transaction there exists a power relationship between author and reader over meaning. Furthermore, as Critical Discourse Theorists (e.g., Bloome & Talwalker, 1997; Gee, 1990) point out, written language can be used to promote a particular political ideology and sustain existing social hierarchies. So by seeking to understand the author’s
intended meaning, I am not implying that the author’s meaning is *rightful* or *truth*. Instead, I seek to dovetail with Paolo Friere’s (1985) critical view of reading and reading comprehension, which centers on using literacy to read, reread, write, and rewrite the world. Understanding the author’s intended message allows the reader to take a critical stance about what they are reading.

My view is that reading comprehension is fundamentally a solo cognitive activity. While the reader is shaped by culture or context (and the meaning they draw from a text is influenced by these), the ultimate objective for teaching reading comprehension is so that students will be able—either by choice or necessity—to understand text when reading alone.

However, I embrace the belief that *teaching* comprehension is social. The diagnostic process in this study is born from the Vygotskian (1978) principles that learning involves a student and a teacher and sometimes peers who serve as “more knowledgeable other(s)” and that the opportunity for learning occurs in a student’s Zone of Proximal Development (ZPD). The ZPD is the distance between a student’s independent level of understanding and what they could achieve with the support of a more knowledgeable other. This study aims to determine what teachers need to enact Bruner’s (1986) view of scaffolding. According to Bruner, the more knowledgeable other must have a “consciousness for two…and a monopoly on foresight,” (p. 75) to scaffold a reader. As such, the teacher (or in Bruner’s words tutor) must have a mastery of the task or problem, a theory of his or her student hypothesis, and an evolving plan for how to adapt the task’s size and complexity appropriate to the child’s ability.
While the primary focus of this study is to examine the cognitive scaffolding provided by a more knowledgeable other to a reader, I accept that tutoring is a social construct. Learning occurs as a result of interaction of two humans--who each bring their distinct personality, background, culture, customs, preferences and sometimes language or language patterns to a learning event. This inquiry does not address, but acknowledges the body of scholarship on culturally inclusive pedagogy (e.g., Au, 2009; Gay, 2010), and recognizes that a trusting relationship must be built between a teacher and a student for this formative assessment tool to be effective.

Finally, I grounded this study in what P. David Pearson (2001) calls “the radical middle” (p. 78) in that it seeks to moderate and reconcile the extreme views that have swayed reading comprehension research over the past 50 years. In taking a balanced view, this review accepts internal contradictions as Pearson highlights: top-down and bottom-up, reader and text, individual and social, text processing and metacognition. This study adds to Pearson’s list to include an attempt to recognize and balance cognitive coherent representations of text and readers’ personal interpretations, the authors’ role and the readers’ role in meaning making, psychometric assessment measures of validity and reliability and assessment of authentic (and often highly variable) classroom reading events.

**How We Comprehend: In the Head, During Reading, Above Word Level**

The RAND study view of comprehension as a dynamic process of simultaneously extracting and constructing meaning is well founded. Reading researchers and cognitive psychologists studying the nature of reading comprehension over the past 20 years have reached broad consensus that construction integration (C-I) models, such as Kintsch’s
(2004) Construction-Integration model, most completely describe how a person comprehends (Duke, Pearson, Strachan, & Billman, 2011; Pearson & Cervetti, 2017). As the name implies, the Kintsch model of comprehension involves two parts. During the construction process, a reader literally constructs or builds mental representations of what the text says. This involves the accurate reading of the text, with the reader processing how individual words and ideas in a text relate to one another for the purpose of acquiring a general perception of what a text says into working memory. In this text-based phase, readers draw on their knowledge of how language and texts work. They also make local inferences necessary to connect sentences and paragraphs (such as connecting pronouns and their antecedents) and ideas or events (such as cause and effect).

In the integration process, the text-based understanding in working memory is merged with relevant schema from a readers’ long-term memory to construct an emerging understanding or situation model of what a text means at each point in the reading activity. As readers construct a situation model, they draw more heavily on worldly knowledge and inference than when building the text-base. For example, readers may use their background knowledge about human nature to infer character motives or judge author bias. Furthermore, constructing a situation model enables readers to build knowledge structures by using what they read to modify or replace what is currently stored in long-term memory. This new knowledge is used to understand new texts creating a “virtuous cycle [where] knowledge begets comprehension, which begets knowledge” (Duke, Pearson, Strachan & Billman, 2011, p. 53).

The Construction-Integration Model shares some important commonalities with other prevailing cognitive-construction models of comprehension such as the Landscape
Model (van den Broek, Young, Tzeng & Linderholm, 1999), that also captures how a reader forms memory models based on meaningful relationships between text elements and background knowledge. However, the Landscape Model also considers the way that automatic, memory-based, strategic, and effortful construction-based cognitive processes interact in the minds of readers during the reading act, which is mediated by the principle of standards of coherence. Simply put, if the activations triggered by a reader as they proceed through a text using automatic, memory-based processes yield satisfactory coherence in their eyes, then the automatic processes are sufficient. However, if standards of coherence are not met, then strategic, effortful processes kick in until coherence is achieved or comprehension efforts are abandoned. Standards of coherence in the Landscape Model vary among readers and differ within a reader by reading situations such as when reading for different purposes or when reading different types or difficulty levels of texts. Effortful cognitive processes are also required as the demands of comprehension rise from text understanding to text interpretation (Yeari & van den Broek, 2011).

The Construction-Integration model builds upon earlier models of reading that focused on text processing, particularly in the text-based phase such as Rumelhart’s (1977) Interactive Model and Stanovich’s (1980) Interactive-Compensatory Model both of which involve readers simultaneously processing syntactic, semantic, orthographic and lexical knowledge to develop the meaning of words, sentences and passages. It also builds on earlier models of comprehension that valued the role of the reader, especially in the integration-phase such that of Schema Theory (Anderson & Pearson, 1984). Like the Construction-Integration model, Schema Theory recognizes the central role of readers’
prior knowledge and how that knowledge is brought to bear in building text comprehension and new knowledge structures. Rosenblatt’s Transaction Theory (1938/1978/1995) also highlights the unique background a reader brings to a text and like the Construction-Integration model, honors the concept of reading comprehension as a transaction between a reader and a text. Notably, Rosenblatt’s theory emphasizes the personal interpretive privileges of the reader in responding such that no two readers may be expected to interpret texts in exactly the same way whereas cognitive models generally emphasize comprehension as being coherent representations that capture the intended meaning of a text.

The considerable research on metacognition dovetails with Construction-Integration and related cognitive construction models. While Construction-Integration describes how a coherent representation of a text is constructed in the minds and memories of a reader, metacognition research describes the way successful readers use mental strategies during the construction-integration process to arrive at a situation model. Metacognition, or thinking about ones’ thinking, stems from a legacy of work in developmental psychology that examined the thinking and learning processes of children engaged in general learning tasks (Brown, 1974; Flavell, 1979). Brown, Bransford, Ferrara, and Campione (1983) note that the findings of this body of research are clear. More mature and successful learners use a variety of general strategies to support learning such as rehearsal, categorization, elaboration and retrieval mechanisms. Younger and less skilled learners, either did not know to or did not think to use these learning strategies to aid their learning. However, when trained, immature or less able learners performance significantly improved.
Yet, without specific instructions or prompting to use a strategy, younger and less able learners rarely used learning strategies intelligently even after extensive training. Thus, awareness of a learning strategy and remembering to use it independently are different. The failure of instruction to effect thoughtful and intentional use of learning strategies provided an impetus for Flavell and Brown to pursue research into children’s ability to become aware of and control their thinking processes—or metacognition (Pressley, 2000b).

When applying the concept of metacognition to reading, researchers determined that proficient readers use a variety of strategies during reading to assist comprehension. Pressley and Afflerbach (1995) analyzed over 40 verbal protocol (think-aloud) studies where mature readers read texts and verbally reported what they were doing and/or thinking while reading. This work illuminated the fluid, flexible and effortful actions successful readers take during the construction-integration process. Metacognitive reading strategies identified in their study include: selectively focusing attention on important parts (pausing, re-reading), making inferences, figuring out meaning of novel words especially if important to meaning of the text, making associations with prior knowledge, revising prior knowledge and/or rejecting ideas when they clash with prior knowledge, underlining/taking notes, paraphrasing and summarizing (also see Pressley, 1998; Pressley, 2000a, for a summary).

Thus, much of the processing that results in a coherent situation model is automatic for effective readers. Additionally, when comprehension becomes more taxing or understanding breaks down (what van den Broek would call standards of coherence
are not met), effective readers know how to exert more conscious control and employ metacognitive reading strategies (Pearson & Cervetti, 2015).

**Comprehension Instruction**

Much of the focus in reading comprehension research is on instructional methods developed in response to scholarship on how readers comprehend. “Content Approaches” are interventions influenced by the Construction Integration Model and are aimed at effecting the construction of a coherent representation of meaning as a reader works through the processing of a text. “Strategies Approaches” are focused on helping readers become more metacognitive—to instruct readers to monitor for meaning and to apply comprehension strategies that effective readers use. These approaches are similar in that both aim to promote active engagement with the text. They differ in that a strategies approach encourages students to think about their mental processes and determine specific strategies to guide their text interaction, whereas a content approach urges readers to attend to the text ideas and how those ideas connect to each other and the world, with no direction to consider specific mental processes (McKeown, Beck & Blake, 2009).

**Content Approaches**

Content-oriented interventions operate from the notion that comprehension can be developed by encouraging readers to continually strive to connect ideas, cumulatively constructing and integrating meaning, as they move through a text. Perhaps the best-known content-oriented intervention is Questioning the Author (QtA; Beck & McKeown, 2006; Beck, McKeown, Sandora, Kucan, & Worthy, 1996). Other approaches include inserted questioning techniques such as *causal questioning* (Trabasso, van den Broek &
QtA is a discussion technique that is built from the premise that books are simply someone else’s ideas written down. Since authors are human, and therefore imperfect, making sense of their ideas will take some figuring out on the part of the reader. During QtA, reading is stopped and discussion initiated at selected points where new information is introduced or confusion might occur for a reader. Teachers use “initiating queries” such as, “What is the author trying to say?” and “What do you think the author means by that?” to focus attention on intended text meaning. Then, they use “follow-up queries” such as, “Why do you think the author is telling us that?” and “How does that information connect to what the author discussed earlier?” to help connect ideas within a text and between the text and the world. Follow-up queries may also focus student attention to a particular quality of the text or its meaning. Through these practices, the authors of QtA endeavor to align with both the construction and integration phases of the Construction Integration model (McKeown, Beck & Blake, 2009).

QtA differs from other discussion formats because it involves conversation during reading, not after completing a passage. This is in response to the researchers’ observations that traditional end-of-passage discussion formats assume a text has been successfully and accurately processed or that students are able to hold all the pieces needed to explore and connect during the post-reading discussion in memory or students can articulate specific difficulties or confusions they found with the text. Often researchers note that students are not able to make sense on their own, resulting in “sparse responses to text, responses that are either very literal or are characterized by
misconceptions and inaccuracies,” (Sandora, Beck & McKeown, 1999, p. 181). QtA addresses this problem by stopping for discussion after portions of a text are read, and while the mental representation of the text is still being developed.

QtA was found to improve comprehension in a yearlong study of 23 inner-city fourth grade students who were predominately African American, and evenly split male/female in a small parochial school situated within a lower SES community in the center of a large city. The teachers used QtA in both social studies and language arts classes (Beck, et al., 1996). Researchers report that they selected this population because they were “at-risk,” (p. 387) and because as early-intermediate grade students, content-area reading becomes a stronger part of curriculum for the early-intermediate grades. Therefore building meaning from a variety of text types becomes more important by fourth grade.

The study examined the difference in student performance on an independent comprehension assessment and on classroom discourse patterns before QtA was implemented (after a traditional lesson), and again after the completion of four units that employed QtA. Although there was not a control group in this study, the pre- and post-comprehension tests indicated growth in students’ ability to construct meaning. In the pretest, two-thirds of the students demonstrated misunderstanding of text or low levels of understanding (such as isolated repetition of text segments). In the posttest, more than half of the students demonstrated higher levels of constructed activity with the ability to provide a clear description of the situation the text intended to present. The pre- and post-comprehension tests also highlighted strong growth in students’ ability to notice if and where their understanding broke down. In the pretest, three quarters were unable to
monitor their comprehension, while on the posttest, three quarters were able to monitor their understanding. Furthermore, analysis of transcripts of student and teacher talk revealed a shift toward exploration of text ideas in contrast to the previous talk purely for the purpose of checking student recall of text information.

Another study examined the differences in comprehension and interpretation of complex literature by students engaged in two different discussion techniques: QtA and Junior Great Books (Great Books Foundation, 1987) the latter of which is a post-reading intervention. In this study, researchers Sandora, Beck, and McKeown (2000) evaluated the difference in comprehension of sixth grade students using the QtA approach, and of seventh grade students using the Great Books approach. Forty-nine students participated in the study, namely, twenty-five sixth graders and twenty-four seventh graders with each group almost evenly balanced by gender. All but three students in the sample were African American, with the remaining three comprised of two white and one Latinex student all of whom attended a small inner-city school in a low SES community. Seventy-five percent of participants scored below the 50th percentile on the Iowa Test for Basic Skills.

For this study, students in both treatments read the same four stories but their discussion methods were specific to the treatment—QtA or Junior Great Books. Comprehension was assessed by evaluating oral retell and student responses to open-ended interpretive questions. Researchers found that students in the QtA treatment scored higher for recall (inclusion of story elements) and open-ended interpretation questions (having a coherent position justified with evidence with an explanation of how such justification related to their position). Further analysis of student responses showed
students participating in QtA had longer recalls with more complex story elements than
the students participating in the Great Books discussions.

Other, simpler content-oriented approaches include inserted questioning

techniques such as *causal questioning* and *why-questioning*. Causal questioning

techniques (Trabasso, van den Broek & Liu, 1988; also see van den Broek & Kremer,
2000 for a summary) derived from the observation that poor readers fail to make

necessary local inferences needed for comprehension in the construction-phase of the

Construction Integration process. Specifically, these readers fail to link referential

relationships (keeping track of people, objects and events) and to make causal/logical

connections (identify how different facts or events depend on each other). Causal

questioning involves stopping and prompting readers with “how” and “why” questions at

places in the text where inference is necessary or tricky. Causal questioning prompts

readers to focus attention on relevant information in the text to establish coherent mental

representations of it.

Researchers van den Broek and Kremer (2000) report the effectiveness of causal

questioning techniques in a classroom study with ninth graders, in which one-third

received inserted causal questions, one-third received causal questions at the end of the

passage, and one-third did not receive any questions and served as the control group. Two

hours later, students were asked to recall as much as they could about the text. Students

prompted with inserted causal questions remembered 30% more of the text than the

control group. In addition, students asked questions at the end of the reading fared no

better than the control group, suggesting that causal questioning techniques work when

they occur during reading.
However, when the same research and questioning techniques were applied to third grade readers, the results were quite different. With these younger readers, causal questions did not demonstrate increased recall in the treatment group over the control group. In fact, the authors suggest that inserted questioning may have diverted attention from the basic text and inferential processes the students were engaged in. This result points to a need to consider how much novice readers can manage in their limited working memory.

Why-questioning involves teaching students to ask “why” questions about facts as they are presented in a text. The objective of why-questioning is that students to pause and consider new facts in light of prior knowledge so as to render them sensible (Pressley, 2000a). Why-questions address the integration-phase of the Construction Integration process by having readers integrate new information with what they already know so as to create a situation model.

Wood, Pressley and Winne (1990) studied the use of why-questioning with elementary students learning science content by reading about different animals. For each animal, students read a paragraph describing the physical characteristics of the animal’s home, its diet, habitat, habits and predators. Some students were instructed to stop and ask themselves why each fact made sense, and to use their prior knowledge to help answer those questions. Students in the control group read and studied the text as they normally would. The researchers found that students who asked why-questions remembered more than the control group. Similar results were found with other elementary and middle school students, causing the researchers to suggest that why-
questioning helps makes fact-filled texts more sensible, and therefore more comprehensible and memorable (Pressley, 2000a).

In summary, content-approaches focus students’ attention on making meaning as they work their way through a text. They use inserted questions and discussion prompts to help a student build and evolve a mental representation of ideas as they proceed. A relatively small body of research suggests that content-approaches improve comprehension of and memory for content, as well as promote construction of more complete interpretations of text when compared to control or comparison treatment groups on researcher developed comprehension assessments.

**Strategies Approaches**

Strategy-oriented approaches focus on building student metacognition through the teaching, modeling and practicing of the self-regulated strategies skilled, adult readers use while constructing meaning. The scholarship on reading strategies is much larger than content approaches as evidenced in Pearson and Cervetti’s (2015) 50 year summary of reading comprehension which counts hundreds of correlational and intervention studies related to reading strategies. These studies largely show that students can be taught to use strategies and can transfer strategy use to new texts, which leads to improved reading comprehension. This is supported by the National Reading Panel Report’s finding that, “the past two decades of research appear to support the enthusiastic advocacy of instruction of reading strategies” (National Institute of Child Health and Human Development, 2000, p. 4-46). Under the heading of comprehension instruction, the report included seven strategies validated as having sufficient research: comprehension monitoring, cooperative learning, constructing graphic and semantic
organizers, question answering, question generation, using story structure, and summarizing.

Pressley (1998, also see Wilkinson & Son, 2011) described three waves of strategy research: 1) Research of individual metacognitive strategies; 2) research of a portfolio of strategies, and 3) research on how teachers conduct strategy instruction authentically in classrooms.

The first wave, conducted in the 1970’s and early 1980’s, studied the effects of teaching students a single strategy. The first strategies studied were general learning strategies such as rehearsal for improved memory, note-taking, and underlining. Then, researchers turned their attention to applying strategies to reading comprehension. These laboratory- and classroom-based investigations typically involved researchers instructing an experimental group on a strategy while a control group did not receive such instruction. The investigated populations ranged from adults to college students to elementary students. Outcomes were measured on experimenter-developed text comprehension assessments specific to each experiment. Results pointed to positive effects in comprehension of the experimental groups, which were collectively interpreted to mean that students could be taught to use a strategy, and that its use would result in improved reading comprehension. Strategies shown to be effective include: activating prior knowledge, generating questions during reading, visualizing, and analyzing stories using story parts. These studies were reviewed by Tierney and Cunningham (1984) and Pearson and Fielding (1991), among others.

The second wave of research, conducted during the 1980’s, investigated the impact of multiple comprehension strategies instruction. Three of the more influential
methods that emerged in the second wave include Reciprocal Teaching (Palinscar & Brown, 1984), the Direct Instruction Approach (Duffy, Roehler, Sivan, Rackliffe, Book & Meloth, 1987), and Informed Strategies for Learning (Paris, Cross, & Lipson, 1984).

In Reciprocal Teaching (Palinscar & Brown, 1984), students are taught to apply four strategies—summarizing, clarifying, questioning and predicting—following a fairly strict process. Students and the teacher read an expository passage one paragraph at a time. At each paragraph stop, they practice the four reading comprehension strategies. The teacher models and explains strategy use at the start; then, a student is assigned to be the “teacher.” After the next portion of text is read silently, that student teacher poses a question for classmates to respond to, summarizes the portion read, and then either makes a prediction or seeks clarification. At that point, the group is invited to join the conversation by posing questions, commenting on summaries, requesting clarification or making predictions. If the student teacher falters, the adult teacher steps in to scaffold strategy use posting prompts such as, “What question might a teacher ask?”, re-phrasing “I see what you are getting at. I might have said it….”, or instructing (e.g., Remember, summaries are short). Over time, reciprocal teaching shifts from a strict procedure to become a natural dialogue, with students conducting most of the discussion.

Rosenshine and Meister (1994) summarized the results of 16 quantitative studies of reciprocal teaching. They note that over time, researchers, modified the original Reciprocal Teaching (1984) method, with some using more or fewer strategies in the repertoire. Others, including Palinscar, Brown and Martin (1987), included more explicit instruction about the strategies and how they could be used before initiating the reciprocal teaching dialogues. Rosenshine and Meister’s analysis consistently
demonstrated strong positive effects for students participating in Reciprocal Teaching as compared with control groups on experimenter developed tests of comprehension with an effect size of .88 and smaller, but statistically significant gains on standardized comprehension measures with an effect size .32. Students receiving Reciprocal Teaching also improved in their ability to summarize and generate questions. There was no difference in findings based on the number of strategies taught, although there was a positive difference when explicit instruction occurred before reciprocal dialogue began. This finding is consistent with the premise of the Direct Explanations approach (Duffy, et al., 1987) discussed below.

According to Duffy (2002), explicit teaching of comprehension strategies rose from concern for struggling readers. He observed that the relatively subtle cues and prompts about what successful readers do from prevailing methods of the time, namely, Guided Reading (Fountas & Pinnell, 1996), and Reciprocal Teaching (Palinscar & Brown, 1984) were not enough for some students. “Many struggling readers cannot, simply by watching a teacher guide their reading, figure out what they are supposed to do on their own. Consequently, they remain mystified and do not achieve the desired ‘inner control’” (Duffy, 2002, p. 31).

In the Direct Explanation approach, prior to the reading of a passage, teachers instruct students of the strategy they would need to use (declarative knowledge), when it would be used in the upcoming selection (conditional knowledge), and what the student must attend to in order to successfully use the strategy (procedural knowledge). Teachers then conduct a think-aloud when using the strategy. Next, students receive scaffolded practice during which teachers respond to students’ restructuring of their understanding
of the strategy and how it is used. The teacher then has students re-read the passage for text content and application of the newly learned strategy. Finally, the lesson ends with an explicit statement about the strategy, application to other texts, and ways to implement it (Duffy, 2002).

Two, yearlong experiments compared the Direct Explanation intervention to a control group (basal instruction) with low-reading group elementary students (Duffy, Roehler, Meloth, Vavrus, Book, Putnam, & Wesselman, 1986; Duffy, et al., 1987). Each Direct Explanation study was conducted in an urban school district in the Midwest, and included 20 teachers 10 in the treatment group and 10 in the control group. The earlier study involved fifth graders, and the later study involved third graders. Low-reading students in the second study were described as “representing the typical range of reading difficulties associated with low reading groups in urban centers. Mainstreamed special education students, immigrant students with severe language problems, and students with behavioral disorders were all included” (Duffy, et al., 1978, p. 350). Each study quantitatively measured and statistically analyzed teacher effectiveness in explicitly teaching comprehension strategies, student awareness of strategies taught and student achievement using standardized and non-traditional measures, as in the percentage of audiotaped student verbal accounts that focused on mental processing.

The results of the two studies found that students instructed in the Direct Explanation method groups were more aware of how to use strategies than the basal control group. In the earlier study, comprehension was not significantly better than the control group; however, the experimental group outperformed the control group in the
later study on one of two standardized sub-tests and on the state reading assessment administered five months later.

Informed Strategies for Learning (Paris, Cross, & Lipson, 1984) methods, like Direct Explanation methods, include the teaching of multiple reading strategies, direct instruction about reading strategies (declarative, conditional, and procedural), and facilitated practice in using these strategies as an adjunct to their regular reading curriculum. Informed Strategies for Learning also adds are efforts aimed at convincing young readers of the importance and value of using strategies and making them aware of the benefits of being a successful, self-directed reader are worth their effort. Informed Strategies for Learning includes 14 strategy lessons that use metaphors like, “road repairs” for resolving comprehension failure or “round up your ideas” for summarizing main points. These metaphors were used on bulletin boards, worksheets, class discussions and teacher prompts. According to the researchers, the concrete metaphors were created to facilitate the understanding of abstract concepts for young students.

Paris, Cross and Lipson (1984) conducted an experimental study of four, third grade classes and four, fifth grade classes. Half of the classes in each grade utilized Informed Strategies for Learning and the remaining half served as control groups. The classrooms were roughly even in gender, and had approximately 65 percent white students, with the remaining 35 percent a mix of African-American, Asian and Native American students.

The entire project included a dozen different tasks to assess children’s reading awareness, comprehension and attitudes. Comprehension assessments involved standardized comprehension assessments and researcher constructed cloze and error
detection tasks. Test results were quantitatively analyzed. In pre- and post-tests, classes that received Informed Strategies for Learning instruction scored higher than control classes in regards to their knowledge of strategies and the two researcher constructed assessments. However, the two groups showed no differences on two standardized tests of reading comprehension.

Studies conducted during the second wave of reading strategies research solidified the position that a repertoire of strategies could be taught to students. They demonstrated that a gradual release of control process (Pearson & Gallagher, 1983) starting with teacher-driven direct explanation and moving to modeling, guided practice, and student independent reading comprehension strategy use was an effective way to teach metacognitive reading strategies. Together, this combination of multiple strategies taught through a gradual release of control was found to produce reading improvements on teacher created and standardized comprehension assessments some of the time (Pressley, 1998).

Pressley and his colleagues launched the third wave of strategy research in 1989 to understand teacher-devised comprehension instruction. This wave stemmed from the realization that the strategy instruction practitioners were implementing in classrooms looked very different from the instructional interventions created by researchers. Pressley, El-Dinary, Gaskins, Schruder, Bergman, Almasi and Brown (1992) called this Transactional Strategies Instruction because it involved simultaneous transactions: transactions between students and their teachers, transactions between a reader and a text, and shared, negotiated meaning transactions. Pressley (1998) described these transaction strategies by stating that, “Interpretations [were] constructed by readers thinking about
the texts together, and teachers’ and student’s reactions to the text were effecting each other’s individual thinking about the text” (p. 120).

While the details of each teacher-devised comprehension discussion differed, researchers noted they share important commonalities. First, descriptive studies of Transactional Strategies Instruction showed that strategy instruction is expected to be long-term, often over a number of school years (Pressley et al., 1992, see also a summary in Pressley, 2000a). Additionally, it occurs largely in a small group setting where any number of strategies may be taught in any order. Direct instruction and modeling are then followed by guided practice, generally consistent with the Direct Explanations approach. Strategies are discussed, modeled and used flexibly in the context of authentic reading. Students are reassured that it is acceptable to use different strategies than their peers, and that their predictions, images and interpretations might vary. Teacher coaching is the most prominent mode of instruction here; however, students are prompted to model and explain strategies as well. Transactional Strategies Instruction involves lively interpretive discussions about reading passages, as students are encouraged to respond to texts and react to one another’s interpretations.

Transactional Strategies Instruction is validated by three studies, with the first being that of Brown, Pressley, Van Meter, and Schuder (1996), who conducted a year-long quasi experimental study that compared 10 low-achieving second grade reading groups in 10 different classrooms. Five of the classrooms were utilizing Transactional Strategies Instruction methods and five were control groups. In the control groups, students received instruction typical of that provided by their district. Students identified as “low-achieving” were reading below grade level at the beginning of the year, a
determination based on the previous year’s grades, assessments associated with those outlined in Chapter one of this study, and informal assessments by the second grade teachers. At the end of the year, students receiving Transactional Strategies Instruction performed better than control students on standardized assessments of comprehension and word attack skills. Furthermore, experimental groups showed strong results on researcher-made strategy measures and interpretive measures.

Pressley pointed to two other studies as evidence of Transactional Strategies Instructions. First was the work of Collins (1991) who conducted an experiment with fifth and sixth grade students that provided them strategy instruction for a semester. The second by Anderson (1992; see also Anderson & Roit, 1993) involved a three-month investigation with students identified with reading disabilities in grades 6-11. Both saw similar results with Transactional Strategies Instruction students outperforming control group children on standardized test performance (Pressley, 1998, 2000a, 2002).

In summary, Strategy Approaches aim to enable students to emulate the strategic thoughts and actions of skilled readers. Research on strategy instruction has grown from teaching individual strategies to teaching small repertoires of strategies. Strategy instruction pedagogies have moved from very strict constructs to more flexible forms and collaborative contexts. A large body of research, as demonstrated in this review, demonstrates that a Strategies Approach can result in the increase in student awareness of reading comprehension strategies, stronger comprehension on researcher based assessments as and often improved achievement on standardized reading assessments as compared to control groups.
Together, both content approaches and strategies approaches endeavor to increase student involvement with a text during reading. Content approaches focus on constructing meaning without regard to specific strategies; whereas strategies approaches focus on accessing meaning through the explicit use of reading strategies. Nearly all the content and strategy approaches researched were compared to a control group receiving classroom-instruction-as-usual (which in most cases was assumed to be basal centered), and nearly all outperformed the control group on measures of reading comprehension achievement.

Both Content and Strategies Approaches consistently provide a view of teaching reading comprehension as a dynamic, adaptive, and cumulative process between a student (or students), a teacher and a text. The goal of both approaches is that students will be more able to comprehend lesson passages, and ultimately be better able to transfer that comprehension process to new texts. Finally, both approaches either explicitly or implicitly describe a gradual release of control (Pearson & Gallagher, 1983) process where teachers reduce supports as students more independently demonstrate skills and knowledge.

Comparing Content and Strategy Approaches

At the time of this review, only one study compared a during-reading Content Approach and a Strategy Approach, namely, that of McKeown, Beck and Blake (2009). These researchers conducted a two-year inquiry comparing the content-oriented method of Question the Author (QtA) with a multiple strategies approach. The control group received a modified basal treatment. The researchers described the participants as fifth graders from six intact classrooms in a small, urban district that was identified as “in need
of improvement” by the Pennsylvania System of School assessment. Of these, the researchers noted only that 49 percent qualified for free or reduced lunch, 48 percent scored at or below basic in reading, and 58 percent were African American.

In this study all three groups read the same texts in a teacher-directed, whole class instruction format. Portions of the text were read, mostly aloud, and primarily by students. The reading was interrupted by the teacher with questions that prompted discussion, and the stops for the two treatments were similar. For the control group, appropriate comprehension-based questions were chosen by the researchers from the basal teacher guide and inserted in their associated stopping points. Thus, the basal group was not a traditional basal lesson, because the researchers removed questions related to word recognition or grammar, etc., that normally would have been part of a standard basal lesson. For the content group, the prompts were consistent with the QtA approach (Beck & McKeown, 2006; Beck, et al., 1996) in which teachers provided an initiating question such as “What’s going on here?” and followed with a prompt to connect ideas such as, “How does all this connect to what we read earlier?” Most stops included an additional probe to help students focus on important parts of a text.

For the strategies group, the strategies selected for inclusion were summarizing, predicting, drawing inferences, question generation and comprehension monitoring. Students were explicitly taught to use the strategies, and then during stops, the teacher used a strategy to initiate discussion and remind students of how to apply it. The strategy to be used at each stopping point was pre-determined based on what best fit that place in the text. Because the expertise of the researchers was related to the Content Approach,
they sought feedback on their scripted strategies lesson plans from the research community and from reading specialists/practitioners and made revisions accordingly.

The results were consistent across Year 1 and Year 2, with all three treatments demonstrating improvements in the Sentence Verification Test, (SVT; Royer, Hastings, & Hook, 1979) which requires recognition of text content. This suggests that all during-reading treatment participants achieved adequate comprehension of texts. In addition, all three treatments showed improvement in pre-post comprehension monitoring assessments, with no single approach showing significant improvement over the others. However, students who participated in the content approach group outperformed the multiple strategies group on open-ended or probed recall of the lesson text, and demonstrated a small, but not significant performance preference in the length and quality of the recall on the transfer task. Interestingly, the students who participated in the control/modified basal comprehension question group performed nearly as well as the content group on most measures. The researchers suggested the interspersed reading and comprehension-focused-discussion format supported reading comprehension for this group. In this reviewer’s view, the inserted comprehension-focused-basal-question method, in essence, is a Content Approach.

Analysis of lesson discourse shows that students who participated in the content group had significantly higher text-based comments than the strategies group. The control/modified basal had fewer student text-based comments than the content group, but also significantly more than the strategies group. This is not surprising, as the transcripts show strategies lesson discourse split between discussion of strategies and discussion of text. McKeown, Beck and Blake (2009) point out, “students do what is
asked of them” (p. 243). If students are prompted to comment about text ideas, they will focus on text ideas; if they are prompted to access text though a particular strategy, their focus will be on both the strategy and the text. The question is whether or not the explicit focus on strategies is a necessary step toward metacognition, or whether it undermines comprehension by diverting cognitive resources away from the meaning of the text (Sinatra, Brown & Reynolds, 2002).

While the results of McKeown, Beck and Blake’s (2009) comparison study show a Content Approach significantly outperforming a Strategies Approach on one measure, it does not suggest that one during-reading-approach is superior to the others. More research would need to be conducted to conclusively determine advantages to a Content Approach; however, it does raise a question about the imbalance between the proportion of research on strategies as compared to content approaches given the lack of clear benefit of one over the other.

Furthermore, the underlying effect of the different approaches may arguably be more similar than different. Kintsch and Kintsch (2005) highlight that a feature of all strategies is that they encourage active construction of meaning and the relating of text to prior knowledge. McKeown, Beck and Blake (2009) note that the act of focusing on text content and how it connects may cause readers to use mental strategies such as summarization or inference, even if they are not taught outright. Wilkinson and Son (2011) offer yet an alternate explanation, arguing that a real benefit is that they engage students in dialogue throughout the text. What all the explanations have in common is that teacher-supported, active engagement with the text during reading helps students comprehend.
Instructional Choices and Adaptive Instruction

Content and Strategies Approaches both place the teacher in the crucial role of an instructional agent, prompting and coaching the student as they grapple with making meaning from a text. Yet, this impressive body of research does not point clearly to one superior during-reading method, nor does it offer clear direction as to how a teacher should proceed instructionally. In fact, most methods do not provide for more than a repertoire of suggested strategies to be taught or possible discussion prompts for initiating and sustaining dialog on a text. A weakness in both the existing Strategy and Content Approach research noted by McKeown, Beck & Blake (2009), is that they offer little structure to, “what teachers tell students, what students do, and how the interactions proceed…thus the research provides little guidance on what in the instruction was responsible for the outcomes,” (pp. 221-222).

The reason for this lack of clear instructional direction is that “good comprehension instruction is too interactive and dynamic to be captured easily in an abstract set of directions written for some hypothetical teacher working with a hypothetical set of students” (Pearson, 1985, p. 27). Duffy (2002) concurs, “The technique itself is not as important as the teacher’s ability to be thoughtful and sensitive in making adaptations that account for the multilayered and situational nature of comprehension instruction” (pp. 35-36).

The concept of “adaptive teaching” (Duffy & Hoffman, 1999; Fairbanks, Duffy, Faircloth, Ye, Levin & Rohr, 2010; Vaughn, Parsons, Gallagher & Branten, 2015) where teachers make instructional decisions in response to their observations of student successes and challenges – often in the moment of authentic teaching—is not new. It is
what Wood, Bruner and Ross (1976) called scaffolding. Such coaching is intended to help to provide support tailored to an individual child on their way toward self-regulation of a particular strategy and task. It is related to the Vygotskian (1978) concept of a students’ Zone of Proximal Development and the ability of a child to grow beyond their current level of development under the guidance of a caring adult.

Bruner (1986) characterized the teacher’s role in an effective scaffolding interaction as having the “consciousness for two…and a monopoly on foresight” (p. 75). In his view, the teacher needs to have mastery of the task or problem, a theory of their student hypothesis, and an evolving plan for how to adapt the task’s size and complexity appropriate to the child’s ability. This makes the instruction a transactional event, where the teacher’s scaffolding evolves in response to a student’s growing understanding and competence.

More recent research on characteristics of adaptive teachers echoes Bruner’s insights. For example, Vaughn, Parsons, Gallagher and Branan (2015) observed literacy instruction in Kindergarten through seventh grade classrooms in different regions across the United States to identify patterns in characteristics of teachers who were adaptive. They found adaptive teachers: (a) continuously and informally assessed their students, (b) reflected on their practice, (c) had deep knowledge of their students, and (d) had a vision or direction for their instruction.

A missing piece from the body of research reviewed in this chapter is how a teacher is supposed to develop (what Bruner terms) a theory of his or her student’s hypothesis or (what Vaugh, Parson, Gallagher and Branan describe) to informally assess a student’s reading comprehension. Researchers imply, and in some cases state that
teachers need to analyze student comments during instruction to infer student interpretation and determine how to intervene based on pedagogical expertise and understanding of students (Afflerbach, 2007; Duffy, 2002, Vaughn, Parson, Gallagher & Branen, 2015). Furthermore, teachers need to analyze instructional situations across lessons to see trends in conceptual understanding. However, the approaches do not indicate how teachers are supposed to collect this data and conduct its analysis. Without ongoing, formative classroom assessment of what tends to cause meaning to break down, it is difficult to piece together the evolving plan for which instructional methods will promote learning, as well as ways to facilitate the meaning-construction task.

**Reading Comprehension Assessment**

Perhaps because of Dolores Durkin’s (1978-1979) oft quoted criticism that little that went on in classrooms could rightfully be called comprehension instruction, much of the scholarship in reading for the following 20 to 30 years had been focused on comprehension pedagogy. However, more recently, some research has begun to shift to consider reading comprehension assessment. The Rand Reading Study Group’s (2002) declaration that “a more adequate system of instrumentation for assessing reading comprehension…is a prerequisite to making progress with all aspects of [reading comprehension] research” (p. 54), established the case. Since that time, researchers have been grappling with how to effectively measure a reasoning process as complex as reading comprehension for a variety of purposes and in a variety of settings.

**Recent Developments in Reading Comprehension Assessment**

Policy decisions such as No Child Left Behind (NCLB, 2001) and the Common Core State Standards have influenced the reading comprehension assessment research
and assessment development of the past two decades. As a result, the “current context of reading comprehension assessment is marked by imbalance,” (Afflerbach, 2007, p. 265). Much of the imbalance has been due to the disproportionate attention on high stakes standardized assessment instead of classroom assessment. NCLB required students in grades 3-8 to be assessed annually and once in high school. In addition, schools and teachers were made accountable for adequate yearly growth. At this time, assessment research was focused around development of value added and growth models, and cost-efficient testing formats such as multiple choice (Valencia, 2011).

As Common Core State Standards replaced NCLB, the need for accountability and growth remained, but there was also a call to measure the rigor the new standards were touted to have over old expectations. As a result, research shifted to improve the quality of standardized reading assessment by innovating multiple choice (e.g., Evidence Based Selected Response), including open ended items (e.g., Technology Advanced Constructed Response) and written response as seen in the CCSS aligned assessments of Smarter Balance (Smarter Balanced Assessment Consortium, 2012) and PARCC (Partnership for Assessment of Reading for College and Careers, 2013) (Kapinus, 2013; Wixson, 2014). While newer standardized assessments may be an improvement over the older versions, a disproportionate attention to standardized assessments continues. The use of “single-test scores to judge students’ reading achievement and teachers’ accountability skews schools reading assessment agendas and funding,” (Afflerbach, Cho, Crassas & Kim, 2015, p. 318).

Another source of imbalance is that most existing reading assessments focus on the products of reading as measured on tests or quizzes, not the process (Afflerbach,
These after-reading tools are useful at measuring student achievement in relation to specific reading goals or curriculum standards. However, they provide little insight into what students did (or did not do) as they reasoned through a text to achieve such results. As Afflerbach and his team note, teachers looking at tests and quizzes to inform instruction need to make large retrospective inferences about what a student might (or might not) have been thinking. In contrast, classroom-based assessment of reading comprehension, completed during the course of reading, could provide more detailed information about how a student processes a text and constructs a meaningful representation of what it means.

Despite these imbalances, researchers point to a growing collection of assessments aimed at helping teachers become more diagnostic instructors (Duke, Pearson, Strachan & Bilman, 2011, Martin & Duke, 2010). As mentioned in Chapter One, Leslie and Caldwell’s (2017) Qualitative Reading Inventory and Fountas and Pinnell’s Benchmark Assessment System (Fountas, 2018), are two examples of improved reading inventories. Like past reading inventories, teachers using these assessments determine reading levels based on word reading accuracy and after-reading comprehension questions or discussion prompts about a fiction or non-fiction text provided. Both have innovated beyond traditional reading inventories by encouraging unaided re-telling of the text, including questions/prompts that are text-based and inference-based, and by allowing students to refer back to the text.

Additionally, several assessments have been developed to measure specific aspects of comprehension. The Concepts of Comprehension Assessment (COCA, Billman, Duke, & Hillden, 2008), and the Informational Strategic Cloze Assessment
(ISCA, Hilden, Duke, & Billman, 2008) test a student's comprehension abilities for informational text reading in four areas—comprehension strategy, vocabulary, text features, and comprehension of graphics. The COCA is intended for first and second grade, and the ISCA for first, second, and third grades. (Duke & Keene, 2009; Martin & Duke, 2010). The Diagnostic Assessment of Reading Comprehension (DARC, Center for Applied Linguistics, 2002) asks students grades two through five questions designed to determine text memory, inferencing skills, recall of background knowledge and the ability to integrate background knowledge with text information. In this assessment, students not only answer questions after they read (or listen to) test passages, they also explain how they arrived at their responses (Hannon & Daneman, 2001).

These newer assessments are more oriented toward the comprehension process. Instead of only asking end-of-passage questions or re-tells, several newer assessments engage students during the task of reading to determine where in the construction of meaning comprehension breaks down and why. However, they are administered with testing materials and protocols outside the natural context of reading instruction. Thus, while they may offer insights to inform instruction, they do not meet the need adaptive teachers have for ongoing formative classroom assessment as students engage in daily reading for the purpose of continuously informing instruction and scaffolding learners. Still, their design might provide a model for the kinds of “in-the-moment” questions or discussion prompts that induce disclosure of student thinking and understanding for teachers to use during every-day classroom instruction. They may also provide a model for the types of analysis a teacher could conduct.
The impact of these assessments is not well known. As Duke, Pearson, Strachan, and Billman (2011) note, virtually no research has yet determined the effect of these or other comprehension assessments on either the nature of teachers’ comprehension instruction or on students’ comprehension growth. And while many researchers agree that classroom assessment should describe and support student reading development (Afflerbach & Cho, 2011; Calfee & Hiebert, 1991, Duke et al., 2011, Snow, 2003), there are only pieces of scholarship about how it does, or might work theoretically.

**Formative Classroom Assessment During Authentic Learning**

Formative assessment has received growing attention in the past 20 years in large part due to the publishing of Paul Black and Dylan Wiliam’s (1998) review of 250 studies in the United States and England. They found significant improvement in student test scores (effect size 0.4-0.7) when classrooms used forms of formative assessment. Furthermore, their study showed that low achieving students benefited even more than other students, thereby, helping to close an achievement gap. While some have questioned the methodology of this study (Dunn & Malvenon, 2009), its promising results and those on which is was built (Crooks, 1989), sparked interest in both the United States and England about formative assessment. Although the studies mentioned above are not specific to reading, they generated interest in reading formative assessment as well (Afflerbach & Cho, 2011; Valencia, 2011b).

The Black and Wiliam study defined formative assessment broadly, encompassing all activities that provide teachers information with which to differentiate learning activities to meet student needs. As Valencia (2011b) notes, “it is not the frequency of the assessment, speed of receiving results, location of implementation
specific assessment strategies or even the purpose that make an assessment formative; it is the use of the information” (p. 388). Wiliam (2006) describes this use of classroom information as “the pedagogy of contingency” (p. 6), meaning that instruction and student feedback be dependent on student responses during instruction.

To do this well, Pellegrino, Chowdusky and Glazer (2001) assert will require “radical changes in the ways students are encouraged to express their ideas and the ways teachers give feedback to students” (p. 227). Teachers will need to orchestrate discussions, questions, interactions, and tasks that evoke aspects of student thinking, understanding and perhaps more importantly, sources of misunderstanding (Black & Wiliam, 1998, 2000; Pellegrino, Chowdusky, & Glazer, 2001; Valencia, 2011b). Engineering “assessable moments” in the course of classroom instruction requires teachers to be both purposeful and flexible.

Black and Wiliam (2000) together with colleagues in the King’s College Assessment for Learning Group (Black, Harrison, Lee, Marshall & Wiliam, 2003) embarked on a project to examine the “radical changes” to which Pellegrino and his colleagues refer. They studied the classroom formative assessment practices of 24 math and science teachers from secondary schools teaching English school years 7, 8 and 10 (students aged 11-15) in a project that became known as the King’s Medway Oxfordshire Formative Assessment Project (KMOFAP). This work revealed three areas where the teaching and learning processes were significantly re-engineered to encourage students to expose their thinking: the expectations and actions around answering questions; the preparation of questions; and the elimination of grading from the feedback process.
In this project, the raising of hands to answer questions was eliminated. Anyone could be called upon. Wait time was increased and it became customary for teachers to give students think time, often asking them to discuss their ideas in pairs before engaging them in responding. The teachers did not label answers as correct or incorrect, instead they asked students to explain their reasoning, after which other students were asked to respond as to whether they agreed or disagreed and why. Even wrong answers could lead to rich discussions. Over time, students realized that teachers were interested in knowing what they thought, and not simply evaluating if they were right or wrong. As a result, teachers asked fewer questions because students spent more time discussing each one. This caused the teachers in the project to more carefully consider which questions to pose. They also began crafting questions more intentionally, considering what aspects of student thinking it might provoke and explore.

The KMOFAP study highlights how purposeful preparation and structural changes to classroom interactions can provide a context that encourages students to disclose their thinking. However, eliciting and capturing evidence of a student’s evolving understanding is just the start. In order to be truly formative, teachers have to be able to use the information acquired to differentiate instruction. Research on adaptive teaching reminds of the importance of flexible in-the-moment teaching so as to seize learning opportunities as they present themselves in the course of instruction. “Adaptive teachers listen to students in the moment…quickly reflect and analyze, and determine a student’s needs based on pedagogical expertise and their knowledge of their students” (Vaughn, Parsons, Gallagher & Branen, 2015, p. 543). While this sounds good, such ability to respond effectively during instruction has been consistently cited as a challenge for
teachers in and outside the field of reading, noting that it is easier to notice errors than to
distinguish the cause. (Black & Wiliam, 1998; Block & Duffy, 2008; Duffy, 2002; El
Dinary, 2002; Sandora, Beck, & McKeown, 2000; Wylie & Wiliam, 2007). Wiliam
(2006) describes that he observes “formative intention but little informative action” (p. 7)
in many classrooms. In other words, teachers collect data or make observations, but there
is no follow-through—instruction proceeds, as it would have, without consideration of
the evidence collected.

This could be due to challenges in interpretation. Calfee and Hiebert (1991) note
that unlike standardized tests that provide some summary index or normed measure for
teachers to use, classroom data is subjective and multifaceted. To interpret data, teachers
need to look for and document patterns, glean underlying reasoning, and notice shifts in
performance over time and conditions. In addition, Pellegrino, Chowdusky and Glazer
(2001) find that when formative assessment has been implemented well, teachers become
acutely mindful of their own assumptions about how students learn.

Interest is swelling to correct the imbalance in reading assessment to allow for
more classroom formative assessment, in part because this has been shown to be effective
(Black & Wiliam, 1998). While there is a growing list of more process-based reading
assessments that can be administered by teachers to individual students in a classroom
setting, none is designed for use in the natural course of small group or one-to-one
reading comprehension instruction. Research outside the field of reading have
demonstrated important ways instruction can be re-engined to encourage students to
express their thinking. Studies of adaptive teachers describe characteristics that make this
responsiveness possible. Still, many teachers in and out of the field of reading remain
unsure of how to systematically elicit, collect, and analyze the underlying causes of a
student’s understanding (or missed understandings) observed in the classroom.

**Determining What to Assess: Sources of Comprehension Breakdown**

In their seminal publication, *Knowing What Students Know*, Pellegrino, Chudowsky and Glazer (2001) note that, “deciding what to assess is not a simple as it
might appear” (p. 178). Through the course of reading comprehension research, scholars
have attempted to determine the contributors to reading comprehension success and
failure. The content- and strategy-based instructional methods discussed earlier in this
chapter were developed in response to the field’s evolving understanding in this area.
Assessments that aim to evaluate the process of reading and not simply the results of
reading must do likewise.

van den Broek and Kremer (2000) synthesized research conducted primarily in
the 1980’s and 1990’s, distilling factors affecting reading success and failure as
understood at the turn of the century. Their schematic in Figure 2.1 and the discussion
that follows captures an array of factors influencing the cognitive processes involved in
reading comprehension. More recently, Perfetti and Adlof (2012) evaluated the research
further in an effort to determine what factors of reading comprehension might be truly
important to assess. They developed the concept of “pressure points” (p.5), which are
defined as factors of comprehension determined to have face value validity as an intrinsic
component of comprehension and not just a correlate which show robust variation among
individuals associated with overall comprehension skill, and with all else being equal, are
skills amenable to instruction. A skill that is deemed a pressure point, according to the
authors, is worthy of consideration in reading comprehension assessments.
van den Broek and Kremer’s model. van den Broek and Kremer’s (2000) view of comprehension, like the RAND model, describes multiple simultaneous processes of successful meaning making that successful readers whether readers are conscious of it or not. As van den Broek and Kremer describe,

Good readers are adept at the higher-order processes needed to identify relations within a text. Their processes have become so automatic that frequently they are not even aware of the individual steps they have taken to achieve comprehension. For beginning readers, readers with learning difficulties, and advanced readers confronting novel and complicated materials, the application and outcome of these processes are much less certain. One or more components may fail, resulting in complete and erroneous mental representations of the text. (p. 8)

The parts in the van den Broek and Kremer model of causes of comprehension failure that are most aligned with the “in the head, above word level, during reading” focus of this study are Reader Characteristics above Basic Skills. These include Attention and Memory, Attention Allocation including Strategies and Standards of Coherence, Inferential and Reasoning Skills, and Background Knowledge (all discussed below).

However, as stated earlier, the components are interrelated and often invisible, so it is impossible to completely disregard all the other factors.

Research on adaptive teaching reminds of the importance of flexible in-the-moment teaching so as to seize learning opportunities as they present themselves in the course of instruction. “Adaptive teachers listen to students in the moment…quickly reflect and analyze, and determine a student’s needs based on pedagogical expertise and their knowledge of their students” (Vaughn, Parsons, Gallagher & Branen, 2015, p. 543).
While this sounds good, such ability to respond effectively during instruction has been consistently cited as a challenge for teachers in and outside the field of reading, noting that it is easier to note errors than to distinguish the cause. (Black & Wiliam, 1998; Block & Duffy, 2008; Duffy, 2002; El Dinary, 2002; Sandora, Beck, & McKeown, 2000; Wylie & Wiliam, 2007).

In this model, van den Broek and Kremer describe attention and short-term memory “as the bottleneck in comprehension” (p. 8). The ability to attend selectively and intentionally to relevant information may improve with instruction and maturity, but
some students with attention deficit disorder, memory challenges, or even low motivation for reading may have difficulty attending enough to develop a rich mental representation of the author’s message.

Attention-allocation skills help students focus on relevant information, thereby increasing the likelihood of developing a coherent representation. According to the authors, metacognitive mental and behavior strategies regulate how attention is allocated. With each new sentence, a reader needs to decide if the new information is likely significant or not. They determine if they must integrate information from a previous sentence or paragraph, or from background knowledge. They also determine if adequate comprehension has been attained, or if they need to slow down or re-read and re-consider. These decisions, whether made consciously or not, are related to reading strategies and metacognition. The authors state that good and poor readers within an age group differ in their acquisition and use of reading strategies.

These researchers also describe the conscious application of strategies as requiring a student to have “standards of coherence” (p. 10), which are defined as subjective standards self-applied by the reader as they render comprehension adequate or inadequate, thereby requiring additional efforts. Standards of coherence may be situational. For example, they may be high for information related to a test, but lower when reading for entertainment.

Attention allocation/reading strategies that focus readers on relevant information make these inferential and reading skills more efficient. Although strategies are necessary, they are also insufficient without reasoning (p. 11). Inferential and reasoning
skills are essential to develop rich and meaningful representations of a text. These skills systematically link words and ideas within a text and with background knowledge.

The authors describe two important categories of inferences: referential inferences and causal/logical inferences. Referential relations allow readers to keep track of elements such as objects, events, and people mentioned in several places in a text. These can be as simple as understanding a pronoun and its antecedent in a sentence to coordinating numerous pieces of information that may disappear from focus and re-appear across many pages or chapters. Causal/logical inferences allow readers to reason how different textual facts or events depend on one another. Successful causal/logical inferences are related to a student’s growing sophistication of what drives meaning in a text, and may develop over time. For example, the authors note that it is important for students to recognize goals within a text, and not just events, as goals often provide the rationale for actions or decisions. Successful comprehenders also realize that events may have multiple causes, and if they focus on only a single cause, their understanding may be incomplete.

van den Broek and Kremer describe how metacognitive strategies and inferential reasoning go hand-in-hand. Students with effective reading strategies and metacognition are able to allocate cognitive resources to select the most relevant information for making meaning in a text. The information on which they focus is most likely to be causally/logically important to the next section or previous sections, and thereby create an efficient, seamless, evolving, and coherent representation of the text. However, less skilled readers may choose irrelevant information or jump to conclusions beyond what the text can justify, causing their representation to be misguided. Finally, less skilled
readers may be inefficient in that they may need to invest significant attention retrieving information from earlier in the text, or unwinding incorrect representations.

According to van den Broek and Kremer, extensive background knowledge offers two advantages. First, the more information a reader accumulates about a topic, the richer their internal representation is. Second, the more interconnected a readers’ background knowledge is, the more accessible it is to retrieve from memory.

**Perfetti and Adlof’s pressure points.** As previously noted, Perfetti and Adlof (2012) introduced the concept of “pressure points” to identify those factors integral to reading comprehension. They assert that not all components of comprehension are “equally important for variability in overall [comprehension] skill, equally independent, and equally measurable with conventional assessments” (p. 5). And while any of the three – variability, independence and measurability—would be a reasonable criterion for inclusion in an assessment, they contend that variability is of primary importance. These researchers analyzed factors of comprehension that have a body of research on individual differences to determine if the component had face validity as an intrinsic component of comprehension rather than a correlate, showed robust variation among individuals in the component and were associated with overall comprehension skill. If so, the component would be considered a pressure point that affects a difference for overall comprehension, is worthy of consideration in comprehension assessment.

Perfetti and Adlof (2012) acknowledge the fundamental importance of word-identification to comprehension but focused on higher-level comprehension processes, looking at research of children and adults with comprehension challenges despite adequate word reading skills. The research they reviewed included participants who
exhibited Specific Comprehension Difficulties (SCD) meaning their participant selection criteria required that individuals demonstrate low reading comprehension skills relative to word skills, and in some cases people who were considered “less skilled comprehenders,” meaning participants’ word reading ability may not have been explicitly controlled.

In their 2012 report, Perfetti and Adlof found inference making and comprehension monitoring to be pressure points in higher-level comprehension skills. They did not find other comprehension strategies, beyond these, to be pressure points. They also found elements of vocabulary and text integration to be pressure points (similar to van der Broek and Kremer’s (2002) referential inferences). Finally, the authors refer to the ability to more-or-less recite a section of text verbatim as related to working memory, and the capability of recognizing similarities in syntactic strings and sentence parsing as being pressure points, but not discussed in their study.

In their discussion, Perfetti and Adlof conclude that skilled readers make inferences necessary to bridge elements for the purposes of creating a coherent representation as opposed to purposes such as prediction or elaboration, and that children with SCD are less able to do so. Background knowledge was found to be an aspect of inference making, but not a pressure point in and of itself. The authors cited several studies where skilled and less skilled comprehenders had equally sufficient background knowledge required for making an inference, students with SCD were less able to infer than skilled readers (Cain & Oakhill, 1999; Cain, Oakhill, Barnes & Bryan, 2001).

The authors define comprehension monitoring as the ability of a skilled reader to “verify his or her understanding and make repairs where this understanding fails” (p. 7). They also note that comprehension monitoring is not a single skill, but that it is
dependent on the reader’s ability to construct an accurate representation of the sentences in a text, retrieve information from memory or background knowledge, and to know if it makes sense according to reader’s standard of coherence, for, a student can only monitor for meaning if they expect the text to make sense and it does not. Although most studies on comprehension monitoring do not control for lower level skills, the authors cite a few studies (Oakhill, Hartt, & Samols, 2005; van der Schoot, Vasbinder, Horsely, Reijntjes & van Lieshout, 2009) that find that children with SCD are less effective than skilled comprehenders at monitoring their own comprehension. As a result, children with SCD may glean less knowledge from text, be less aware of inconsistencies within it and less aware of times when they fail to understand.

Perfetti and Adlof conclude that comprehension strategies are not pressure points, aside from comprehension monitoring. They reviewed National Reading Panel (2000) research of the seven strategies identified by the as having sufficient evidence that direct instruction supported comprehension improvements, which included: comprehension monitoring, cooperative learning, use of graphic and semantic organizers, question answering, question generation, story structure and summarization. According the Perfetti and Adlof’s pressure point criteria, the remaining six “do not correspond to comprehension per se, but to comprehension outcomes (e.g. summarization, question generation) or supports…these kinds of explicit strategies may be helpful to the reader in enhancing comprehension….but not intrinsic to it” (p. 9).

Perfetti and Adlof also found research related to vocabulary to be particularly powerful pressure points. Within this category, the authors found lexical quantity (breadth of work knowledge) to be a pressure point and lexical quality (depth of
understanding of word meanings and relationships) to be a pressure point. They reviewed studies related to lexical quality that ranged from those with tasks that explored depth of word meaning like the ability to provide synonyms and ability to use in a sentence, to studies that examined word to text integration or the ability to link a word to a referent previously mentioned in a text when the word and the reference have an identical lexical stem and when they do not. The word to text integration is similar to van den Broek and Kremer’s (2000) referential inferences. Perfetti and Adlof recommend further research in these elements of word meaning and comprehension, but conclude that SCD and less skilled comprehenders show “less detailed, less flexible, and/or less connected representations even for words they know “(p. 13).

Since the publishing of Perfetti and Adlof’s research, others have used the pressure point criteria to evaluate variables hypothesized to be causally related to comprehension in order to determine if the size of influence is large enough to be of practical significance for assessment and instruction. For example, Barnes, Stuebing, Fletcher, Barth, & Francis (2016) analyzed suppression activities related to a reader’s ability to efficiently determine which pieces of background knowledge are relevant to making an inference or coherent representation during a reading event and to dismiss, or suppress irrelevant or erroneous information. They conducted a regression analysis on what is called an extreme group study—comparing students grades 6-12, who were mainstream, non-English language learners, and who demonstrated comprehension challenges unrelated to word reading or non-verbal IQ reasons. They found that suppression is uniquely related to reading comprehension, but the size of the relation was not large
enough to be of fundamental importance to reading comprehension assessment or instruction. Therefore, suppression was not considered to be a pressure point.

Compton and Pearson (2016) used Perfetti and Adlof’s pressure point criteria to evaluate three studies related to comprehension. One was the suppression study (Barnes et al., 2016) discussed above and they agreed with the author’s findings. Another was LaRusso, Kim, Selman, Uccelli, Dawson, Jones, Donovan, and Snow’s (2016) correlation analysis on academic language, perspective taking and complex reasoning on what the authors termed deep reading comprehension. Next, they reviewed Arthur and Davis’s (2016) quasi-experimental study of double dosing vocabulary instruction on young students (pre-kindergarten to grade three). Neither study met the criteria of a pressure point. They were found to be related to comprehension, but not to a magnitude to be considered a pressure point. However, Compton and Pearson warn that decontextualized analysis may underestimate importance of certain reader characteristics with certain texts.

Over the course of reading scholarship history, researchers have been interested in understanding which of the many cognitive processes, skills and behaviors that successful reading comprehenders consciously or subconsciously deploy and how those differ from those who are less successful. More recently, however, Perfetti and Adlof’s (2012) pressure point analysis spurred other researchers interested in assessment to take a sharper view in order to determine which of these differences are truly integral to comprehension and whether they are of a magnitude to be worth assessing. The scholarship on reading comprehension acknowledges the complexity of the task.
Conclusion

The objective of this review was to synthesize the scholarship related to what happens in the head, during reading, above word level for readers working to comprehend written language and what educators might do in the classroom to formatively evaluate and support them. There is broad agreement on what happens in the minds of readers making sense of written word. Kintsch’s (2004) Construction-Integration model is recognized among cognitive psychologists as the most complete description of how a person comprehends text. In the Construction-Integration model, a reader actively constructs and re-constructs a mental representation of what a text means as they work through a passage (Duke, Pearson, Strachan, & Billman, 2011). This model dovetails with the research of developmental psychologists on metacognition and its application to reading (Baker & Brown, 1984, Pressley & Afflerbach, 1995), which describes the conscious strategic choices and behaviors of mature readers in their effort to build a coherent mental representation from text.

Much of reading scholarship has been dedicated to instructional methods created in response to this scholarship on how students comprehend. Content Approaches are interventions influenced by the Construction Integration Model. They are aimed at effecting the construction of a coherent representation of meaning as a reader works through the processing of a text by inserting meaning-focused questions or dialogue prompts. Strategies Approaches are focused on helping readers become more metacognitive—to instruct readers to monitor for meaning and to access texts more effectively and meaningfully through the use of comprehension strategies. Nearly all the Content and Strategy Approaches researched were compared to a control group receiving
classroom-instruction-as-usual, which in most cases was assumed to be basal centered, and nearly all outperformed the control group on measures of reading comprehension. This suggests that both Strategy and Content Approaches are an improvement over traditional instruction. One study indicates some benefits to a Content Approach over Strategies Approach (McKeown, Beck, & Blake, 2009); however there is not overwhelming evidence to conclude that either approach is better.

What both the Content and Strategies Approaches share is a view of the teaching of reading comprehension in which teachers play an important role as an instructional agent, coaching students as they grapple with constructing meaning from a written work. While both approaches offer a framework for what might be taught—be it possible strategies or content-oriented prompts or questions—none provide direction for how to analyze student comments during instruction to infer student interpretation and then determine how to intervene in ways that foster learning. Without a framework for understanding what tends to cause meaning to break down for an individual student during authentic reading events, it can be difficult for a teacher to piece together the evolving plan for which instructional methods will promote learning, as well as ways to facilitate the meaning-construction task. The National Reading Panel (2002) identified the challenge of teachers implementing effective adaptive comprehension instruction as a “major problem” (p. 4.47) requiring further research and professional development.

To be adaptive, teachers need to observe, analyze and categorize student responses to identify underlying causes of understanding and misunderstanding. A growing repertoire of formative assessments is being developed to help teachers become more knowledgeable about students’ abilities on different aspects of comprehension.
While they may be conducted in a classroom, they are administered with test materials outside the natural context of reading instruction. One of the challenges for teachers assessing comprehension is that multiple invisible mental processes must be engaged and coordinated to develop rich mental representations of text. So there are a myriad of possible reasons a student’s comprehension may be awry. However, Perfetti and Adlof’s (2012) pressure point analysis suggests some may be more important than others. Research outside the field of reading has demonstrated important ways instruction could be re-engineered to encourage students to express their thinking. Studies of adaptive teachers describe behaviors that make this responsiveness more possible. This study asserts that a missing piece to these efforts is a roadmap or framework for teachers to guide their exploration of student missed understandings. With the help of this framework, teachers can infer the incomplete reasoning or misguided strategies that are the source of the missed-understandings, and use these insights to provide instruction differentiated to a student’s specific comprehension gaps.
CHAPTER THREE
RESEARCH METHODOLOGY

This study aimed to examine the use of a diagnostic formative classroom assessment framework, called the Sources of Missed Understanding construct, developed by the researcher for the purpose of helping teachers identify and categorize sources of comprehension breakdown for students during the course of reading instruction, and to understand the context or supports teachers need to employ it effectively. The intent was that this framework could be instrumental for analyzing reading comprehension challenges as Goodman’s (1969) miscue framework is for understanding print errors. Thus, the end result of this research was not merely to be an assessment printed on a piece of paper. Instead, the goal was to study the teacher’s diagnostic process as they used the tool to analyze and address their student’s comprehension difficulties.

A design experiment methodology was best suited to test this formative classroom assessment framework’s use because it endeavored to contribute to a theory of practice, namely that of formatively assessing comprehension during reading instruction, rather than a theory that could later be translated into practice (Sandoval, 2004). Modeled after procedures in design science fields like aeronautics, design experiments involve both “engineering” innovative learning interventions and studying the learning that occurs in the context of the learning environment (Brown, 1992; Cobb, Confrey, diSessa, Lehrer & Schauble, 2003; Collins 1992). In this study, the learning intervention “engineered” is the formative reading comprehension assessment during the natural course of reading instruction and the supports teachers need to understand and use it. The process studied was how a teacher discovered a student’s reading comprehension breakdown, the
reasoning process they employed to diagnose and address the source of missed understanding, and how the Sources of Missed Understanding construct facilitated their understandings.

**Research Premise and Questions**

Like Goodman’s study, this research began with the premise that most readers are intentionally working to reason their way through a text; and when a student makes an error, it creates an opportunity for the student and teacher to explore and categorize how the reasoning process miscarried. It also began with the premise that teachers are knowledge workers who strive to understand and address their students’ inability to comprehend texts, but may not yet have practical knowledge of the reading process and of the critical sources of comprehension breakdown during that process such that they can efficiently determine how and where a student’s understanding goes awry.

The hypothesis was that, when given a framework of the sources of comprehension break down, together with the instruction to understand the framework, teachers, as knowledge workers who have understanding of their students, the text, and of comprehension, would be able to effectively probe student missed-understandings to identify and categorize the source(s) of comprehension failure. A collection of such observations could help teachers deduce individual student’s propensity to confuse, which would then be used to inform instruction.

This hypothesis likens the Sources of Missed Understanding construct to a map. Teachers recognize when students are metaphorically lost, or do not understand, when reading a text. The challenge is that teachers do not always know where or why the student took a wrong turn. They need a map to locate where a student becomes stuck in
their comprehension reasoning process. Often there is more than one path to reach a location on a map. Similarly, there is often more than one way for a teacher to find the student’s reasoning glitch—and each teacher’s probing may take a different path. As such, this hypothesis acknowledges that this formative classroom assessment framework is not a set of prescribed directions, or a script. Rather, it is a map. This conjecture asserts that when enabled by a good map and with training for how to use the map, teachers will both locate where and why the student got lost and help them find their way to better understanding.

As a starting point, a draft Sources of Missed Understandings construct (see Figure 3.1) was sketched from the scholarship on reading comprehension and refined by my own practice as a Title 1 reading specialist supporting fourth and fifth grade elementary students with comprehension challenges in a small group setting. In particular, the draft taxonomy was developed in accordance with Kintsch’s (2004) Construction Integration Model and it’s representation of a student’s comprehension process. It was informed strongly by van den Broek and Kremer’s (2000) synthesis of the sources of comprehension break down and Perfetti and Adlof’s (2012) pressure point analysis.

By refining this scholarship about cognitive processes, I intended to make it practical for me to use in the course of my teaching. The setting where I refined my draft is a suburban public school on the edge of a major U.S. city. The school’s population is racially and ethnically diverse: 38% White, 33% Asian, 14% Hispanic, 6% Black, and 8% Multi-racial, with 35% of the population qualifying as low-income as defined by the state’s board of education. The students in my fourth and fifth grade reading intervention
groups during the years that this tool was developed generally reflected the demographics of the school overall. My refinements largely involved re-considering the scholarship from a teacher’s perspective, as opposed to that of a understandings and confusion expressed by my 8, 9 and 10-year old students and connected them to the reasoning categories outlined in the research.

Figure 3.1. Sources of Missed Understanding framework overview

This study endeavored to take the next step, and move beyond my own practice, to observe other teachers use this tool as they formatively assessed students challenged with reading comprehension in a one-to-one summer tutoring setting. Working collaboratively with teachers and using a research design experiment approach, this study sought to answer the following questions:
1. How do teachers use the Sources of Missed Understanding construct during the course of five-week one-to-one reading instruction?
   a. What is the diagnostic process in which a teacher engages as he or she uses this tool to determine the causes of meaning break down for a student?
   b. What kinds of prompts, interactions or conditions encourage students to make their thinking or confusions known?
   c. How is this information used to inform instruction?
2. What training, preparation, and/or ongoing coaching support do teachers need to understand how to understand use the tool effectively?

   **Design Experiment Approach**

   Design based education research was established by Ann Brown (1992) and Alan Collins (1992) in response to their desires to affect change in classrooms. In her seminal article on design experimentation, Brown (1992) argued for the value of conducting research in more naturalistic contexts. She described how theoretical knowledge of an intervention developed and studied in a controlled lab is often underspecified with respect to how it might work in a dynamic classroom environment operated “by and for average students and teachers, supported by realistic technological and personal support” (p. 143). Edelson (2002) added that design based research can develop theories on the context of learning, not just the intervention alone.

   This research methodology has become increasingly popular among educational scholars interested in generating change in learning settings or in understanding the obstacles to change. It has been especially prevalent in research on technology used to
support learning in classrooms, but, has also been used more broadly when a study focuses on the design of some form of instructional intervention (Reinking & Bradley, 2008, Sandoval, 2004), as is the focus of this study.

Cobb, Jonfrey, diSessa, Lehrer and Schauble (2003) drew on their collective experience in conducting design experiments for a variety of purposes when describing design experiments as having both a pragmatic bent (“engineering” forms of learning) and a theoretical orientation (developing domain specific theories through the study of the forms of learning and the factors that supports them). “Design experiments ideally, result in greater understanding of a learning ecology...by designing its elements and by anticipating how these elements function together to support learning” (Cobb et. al, 2003, p. 9). The authors identified five crosscutting features of design experiments:

1) The purpose of design research is to develop a class of theories about the process of learning and the means to support that learning.

2) Design studies are highly interventionist; they involve engineering forms of learning being studied, and differ from purely naturalistic studies in that the research team has more control in specifying the environment. However, they differ from classical experiments in that learning environments are complex, so this precludes complete specification of ancillary factors.

3) Design studies are at once prospective and reflective. Prospectively, they are conceived conjectures of a possible learning process and the means necessary to support them. The conjecture is framed, stated and exposed to scrutiny during the study. Reflectively, researchers observe and remain open to other potential pathways to achieving a learning goal as the study unfolds.
4) Design studies may be iterative. The prospective/reflective aspects of design experiments allow for researchers to respond if a conjecture is refuted, revise and test revised conjectures. To design iteratively requires attention to evidence on learning and evidence of the changing ecology of learning.

5) Design research studies are pragmatic in nature. They are grounded in theory, but that theory must do real work in practical educational contexts.

**Designing Research for Methodological Rigor**

All research should be held to standards of methodological rigor. Design based research poses unique challenges, which Ann Brown noted on her shifts between laboratory to classroom settings, stating that “making this shift involves and increasing trade-off between experimental control and richness and reality” (p. 152). Sandoval (2004) added, that it can be “challenging to trace observed effects back to the conjecture… [or] attribute causality to one aspect of the designed intervention because the pieces do not operate in isolation for each other” (p. 215). The scholarship on design experiments point to methodological steps that ensure rigor.

**Prospective design.** Design experiments begin with a prediction or what Sandoval (2004) calls an embodied conjecture, “about how theoretical propositions [about instruction and learning] might be reified within designed environments to support learning” (p. 213). The aspects of the learning environment that are part of the embodied conjecture, or what Cobb et al. (2003) referred to as a learning ecology, include tools and materials, the learning task or problem, and participation structures such as participation and discourse norms. According to Sandoval, a key characteristic of an embodied
conjecture that it is to be stated at a level of specificity that allows it to be refuted or refined empirically.

In addition to the initial conjecture, scholarship on design experiments (Cobb, et al., 2003; Sandoval, 2004) describes the need for researchers to predict prospective endpoints, or innovation outcomes, plus a path of the intermediate outcomes and a trajectory to reach those endpoints. These conjectures about the predicted shifts in learning and the likely means of supporting the shifts serve to focus the research and to increase the likelihood of noticing discrepancies. If an anticipated outcome is not observed during the course of the study, then an element of the conjecture is wrong or incomplete and in need of refinement.

**Data collection.** “One of the distinctive characteristics of the design experiment methodology is that the research team deepens its understanding of the phenomenon under investigation while the experiment is in progress,” (Cobb, et al., p. 12). As such, researchers must generate data that support the systematic understanding of both the learning and the means by which that learning was generated, including being open to data on factors not anticipated as part of the initial conjecture. They may also document evolving conjectures or observations supporting or questioning a conjecture. This often requires the collection and coordination of an array of data sources. Like all researchers, those who conduct design research have the responsibility to disclose findings in ways that are open to public scrutiny (Cobb, et al., 2003).

**Conducting retrospective analysis.** A challenge of retrospective analysis is to provide a trustworthy account of how a series of events may produce a pattern. Cobb and his colleagues (2003) assert, “as part of this process, it is important to be explicit about
the criteria and types of evidence used when making inferences so that others researchers can monitor, understand and critique the analysis” (p. 13). They also note that it is advantageous to have diverse viewpoints represented on the research team to offer alternate interpretations.

**Limitations of Design Experiments**

One of the shortcomings commonly noted for design research is that it might be overly optimistic or predisposed to find explanations for why an intervention works (e.g., Collins, 1992, Sandoval, 2004). Sandoval counters that design research focuses on the shortcomings of an intervention design and the incorrect conjectures behind it, in effort to develop possible solutions.

Another concern frequently expressed is related to the generalizability of results. The goal of design experiments is not simply to perfect a design as “Design theory explains why designs work and suggest how they may be adapted to new circumstances,” (Cobb, et al., 2003, p. 9). Thus design research findings may be useful for future studies for the purpose of replication, and may also be helpful for teachers looking to implement the studied intervention in their classrooms. Furthermore, Reinking and Bradley (2008) argue that “generalizations in scientific experiments treat variability as a collection of random factors. In formative and design experiments, generalizations are derived from a careful consideration of that variability” (p. 42).

Design experiments are also largely limited to the instructional design conjecture and the people, typically teachers and students, which are directly related to the designed context. Such research does not recognize that there are influences outside the control of the study, for example, institutional or community levels (Sandoval, 2004).
**Research Design**

This study employed a design experiment methodology in order to evaluate the use of a formative assessment intervention employed by reading specialist candidates (the tutors) with upper elementary and middle school students (the tutees or students) in a one-to-one university-based summer tutoring setting. It also sought to understand the training and supports tutors needed to use this formative assessment.

This study was analogous to a beta test in software development. The first phase, or *alpha* development, was conducted by me, through an iterative process of reviewing the scholarship on comprehension and connecting it to my own experience with students struggling to comprehend in my classroom. As with any alpha-phase product development, the researcher/developer is dedicated to making the innovation work, and that it is successful in that limited, highly supported environment (or there would be no need for further phases). During the next *beta* phase, the intervention try-out is expanded to a carefully selected environment with less support, but still considerable scaffolds. This current study was that of a beta phase, where the Sources of Missed Understanding construct was tried by a limited number of experienced teachers, each tutoring a single student, in a university reading specialist practicum setting, with me, the intervention developer, on-site providing support. It is hoped that the Sources of Missed Understanding construct will evolve to a *gamma* phase following this study, in which a broad adoption occurs requiring less intense, individualized support.

**Participants**

Participating tutors included five licensed elementary teachers participating in their required reading specialist practicum during one summer. All were nearly finished
with graduate level coursework in a Reading and Language degree program at a suburban University of a major Midwestern city in the U.S. Their teaching experienced ranged from two to ten years of classroom instruction. During the regular school year, three taught primary grades (K-2) and two taught upper elementary grades (3-5). All three of the primary grade teachers had some past experience in the upper elementary grades as teachers or teaching assistants. One of the upper elementary school teachers had experience teaching middle school. One tutor taught in an urban public school, three in suburban public schools, and one in a suburban parochial school. All five tutors identified themselves as female and four of the five reported they were Caucasian and one reported she was of mixed race/ethnicity.

Tutors were recruited following an informational presentation about the Construction Integration Model of comprehension, the Sources of Missed Understanding construct, and the study itself. This session was provided to the entire cohort of reading specialist candidates during one of their pre-practicum classes. It occurred after they had received their tutoring assignment, but before they had met and pre-assessed their student-tutees. The five participating tutors were initially selected because they volunteered and because they had been assigned a tutee in an upper elementary or middle school grade. They were confirmed once assessment data showed their tutees had comprehension challenges.

The child tutees became involved in the study as a result of their tutor’s interest. One of the tutees was entering fourth grade, one was entering fifth grade, two were entering seventh grade and one was entering eighth grade. All were drawn from public and private schools in the area. While neither this researcher or the University summer
reading program paperwork requested the tutees’ race and ethnicity, three of the students self reported Asian/Pacific heritage, one African American/Black heritage and the fifth European background. Four spoke English at home, and the fifth spoke primarily English and some Flemish. Tutor and tutee participants were informed of study expectations and signed consent forms (see Appendix A).

**Setting/Practicum**

The setting of practicum and this study was a University campus in the suburbs of a major U.S. city. The duration of the practicum and the study was four days per week, for five weeks. Each tutor was assigned two students to tutor. They saw their first student from 8:30-9:30 am and their second student from 10:00-11:00 am. Twice a week, tutors participated in a whole group seminar after their students finished for the day. Participating tutors also attended a research meeting in lieu of the seminar one day per week they.

As part of practicum, tutors pre-assessed students using the *Basic Reading Inventory* (BRI, Johns, 2012), a Developmental Spelling Inventory from Bear, Invernizzi, Templeton, and Johnston (2012), and a writing sample. The results of these assessments were analyzed and informed initial lesson plans created. The assessments were also given at the end of practicum to evaluate progress.

Each tutoring session lasted one hour and covered a range of student reading issues including phonics/word study, fluency, vocabulary, writing and comprehension. Tutors developed daily lesson plans and wrote daily reflections. Practicum professors reviewed and commented on these lesson plans and reflections every-other-day. Tutors were observed four times with each of their tutees for a total of eight observations,
followed by discussions between the tutor and the professor to allow for feedback, idea generation and support.

Two professors oversaw the practicum: a lead professor and myself as an adjunct professor. We were each assigned to oversee each tutor and one of their tutees. I was matched to the five participating tutors when they were tutoring the focal study students. At that time I held the dual role of adjunct professor and researcher.

**Role of Researcher**

During the study and the practicum, I was a participant observer “participating in activity onsite” (Creswell, 2013, p. 166). As adjunct professor I simultaneously supported all of the reading specialist candidates while also providing specific ongoing coaching to participating tutors on how to use the study formative assessment, as well as collecting data. Some of the data collected included artifacts directly from the practicum, while other data was in addition to that generated during the practicum.

Throughout the study and beyond, I viewed this dual role to be mutually beneficial for the tutors and the study. The Sources of Missed Understanding framework served as a means for imparting my personal diagnostic process for comprehension failures to fellow teachers, and the study structure provided extra time for tutor participants to collaborate on, and be coached about comprehension challenges. In return, the participant observer stance allowed me “insider views and subjective data” (Creswell, 2013, p. 167) about the practical and intellectual challenges of using this assessment tool.

Ethically, however, I was conscious of how my participation as both adjunct and researcher might have influenced the ecology of the tutoring session or the effect of the intervention (Reinking & Bradley, 2008). I attempted to be mindful of my dual role,
balancing: a) my dedication to support the participating tutors’ instructional growth while they scaffolded their tutees’ development of a full range of literacy skills (not just comprehension); a fair commitment to the entire cohort of tutors; and c) a thoughtful exploration of the Sources of Missed Understanding framework during practicum time when discussing a student’s comprehension challenges, or saving such a focus for research team sessions or coaching meetings when requested by a tutor or myself. It should be noted that university rubrics used to evaluate reading specialist candidates were unrelated to the Sources of Missed Understanding construct or to the study, and that the lead professor, who not involved with the research, and I shared the responsibility for determining all of the practicum teacher course grades, including those involved in the study.

**Description of Intervention: Planned (and Unplanned) Components**

A characteristic of design experiments is that the intervention includes both a conjecture about a learning process and the means to support that learning process (Cobb et al., 2003; Sandoval 2004). The initially conceived intervention included 1) draft Sources of Missed Understanding construct, 2) training and support provided for tutors to understand and use the tool effectively, and 3) a context that would allow tutees to reveal his or her missed understanding. The planned training and support included:

- **Initial Information/Training Session:** The initial training session was presented to the entire cohort of reading specialist candidates prior to the practicum. It lasted 1.5 hours and consisted of group presentation followed by some individual question and answers. This presentation involved a professional reading about the Construction-Integration Model of comprehension, a presentation overviewing the
Sources of Missed Understanding Construct and my Diagnostic process and some mock scenarios for tutors to practice using the construct to think-aloud a diagnosis (see Appendix B).

• Weekly 45-minute Research Meetings: During these sessions the participating tutors met as a group with me to share constructive feedback about the tool and their diagnostic process use it. The expectation was that we would provide support for one-another. Select pages from the original training presentation were provided for tutors were provided at the first pre-practicum research meeting and tutors referenced these papers throughout. These included: the Sources of Missed Understanding framework summary and detail pages, a diagram of my diagnostic process and copies of the Sources of Missed Understanding recording sheets (see Appendix C).

• One-on-one coaching sessions initiated by the participating tutors or myself.

Some of these occurred in conjunction with feedback sessions following observations and others were separate.

The initial conjecture presumed the Summer Reading Program/practicum would provide a suitable context for tutee comprehension challenges to be revealed for tutors to diagnose. Elements in the summer practicum learning ecology related to the tutor’s authentic teaching of reading comprehension played a role in this study were not be specified by the researcher included: tutor selection of reading material in the student’s zone of proximal development to provide opportunities for confusion, tasks that provided occasions for tutors to diagnose errors in reading comprehension (discussion, Q & A,
short answer responses, assessment errors, etc.), and a collaborative tutor-tutee interpersonal dynamic such that students were willing to risk exposing their confusion.

**Adaptations to the Research Design**

One of the hallmarks of design-based research is to be able to be responsive, and include “cycles of invention and revision” (Cobb et al., 2003). During the research, three adaptations were made to the support provided to teachers. First, was the mapping and sharing of each tutor’s diagnostic process as they proceeded through the summer session. The second was providing more opportunities for thinking-partnering in lieu of group experience sharing. Third was accommodating shift of tutor diagnostic notes from the Sources of Missed Understanding recording forms to other means such as lesson reflections and diagnostic maps.

**Mapping individual diagnostic processes.** During the first two weeks, tutors expressed concern about the research and use of the tool. Nearly all asked, “Am I doing this right?” Some expressed they felt a bit lost. I realized that I could see their diagnostic journey, but that they could not see it for themselves. So, I made it visible to them. I had been sketching each tutors’ diagnostic process, and had intended to share them with each tutor at the end of the summer so as to member-check my findings. However, during week two I realized it would be beneficial to share what I had already documented, and then co-document the remainder of each diagnostic process with each tutor.

For each tutor, I drafted their diagnostic map on chart paper (see Figure 3.2). The map showed the iterative process of diagnosing comprehension challenges—namely that the tutors were using data/observations to stir their thinking which resulted in instructional choices. Tutors then used observations from instructional outcomes to begin
the process again. The sketch was my synthesis of information from observations, tapes, discussions, comprehension reflection sheets, practicum reflection sheets, lesson plans, and one-to-one coaching meetings usually following an observation.

![Figure 3.2. Diagnostic map](image)

Each tutor responded to her own map, providing clarification and her edits were made to the chart. We continued to co-construct the map through the remaining weeks. This diagnostic mapping process provided self-awareness and clarity for tutors. At a research meeting, one of the tutors, Beth (all names are pseudonyms), stated, “I liked it when you drafted it [the diagnostic map]. Now I see that it does reflect what I did, but I didn’t see myself this way. I didn’t see my whole process.” These maps also provided a vehicle for member checking.

**Thinking-partnering.** Tutors found our individual one-to-one discussions and coaching sessions about their particular student most helpful to their diagnostic journey.
They reported that it was moderately interesting to hear others’ experiences, as they could imagine generalizing to other students and other situations. But with time pressures, most simply wanted to address her tutee’s needs. As a result, I trimmed research-meeting time, and invested more in one-to-one time.

**Accommodating shift away from official recording forms.** Tutors were asked to submit a Sources of Missed Understanding recording form when they used the construct to diagnose a possible comprehension challenge. Over time, however, they also referred to comprehension challenges and language from the Sources of Missed Understanding construct in their reflections, on the diagnostic maps, and in our meetings. Sometimes these forums were used to express their implementation of this formative assessment tool in lieu of the official recording forms. In this way, the research tool fused with their approach to thinking about comprehension and the challenges their students’ faced. Their choices were less about the research project and more internalized views shaping their own diagnostic teaching. This internalization was unplanned, and embraced.

**Data Sources**

This study, as is true of most design research studies, involved an array of data sources. Some were part of the existing practicum program requirements. For example, practicum students submitted daily lesson plans and reflections as previously noted. I conducted artifact analysis on the submissions of participating tutors, focusing on the reading comprehension related sections. Practicum students also conducted an Informal Reading Inventory before the tutoring session began and at the end of the program. They provided an analysis of their findings for professors and in the end, for parents. I
reviewed these as part of this study as well. Finally, as an adjunct, I observed 4-5 lessons of the participating practicum students during which I kept research notes and captured some verbatim exchanges as the lesson was occurring. I also kept notes from follow up meetings with each tutor.

Tutors involved in this research project provided additional research data. In addition to the Sources of Missed Understanding recording forms discussed above, all five tutors completed short pre- and post- study surveys to obtain demographic information, grades taught, and their understanding of reading comprehension assessment (see Appendix D). Four of the five tutors submitted two audio-recordings of the comprehension portion of their tutoring session per week, along with a brief explanation for why they selected those lessons. The fifth tutor and I experienced technical difficulties saving and retrieving recordings. Participant tutors were requested to send the lesson they thought best uncovered a reading challenge or the strongest example of their using the tool to diagnose, and a lesson where they were challenged to figure out why a tutee did not understand or when they felt the tool was weakest. If, during the week, none were especially strong or weak, tutors were asked to simply send me two lessons. Practically speaking, most tutors sent two tapes, not always capturing the “best” or “most challenged” moment, but authentic interaction all the same.

Tutors participated in weekly group meetings to share experiences and provide constructive feedback toward the improvement of the tools. In addition, tutors and I sought out one another to meet on a one to one basis in order to explore a particular student’s comprehension challenges and/or how to use the tool to forward understanding of that challenge. As discussed above, these individual coaching sessions or thinking
Partnering sessions were often seen as more valuable than larger group sessions for the participating tutors. I kept research notes on both research and individual meetings.

Finally, all five tutors were e-mailed 4 months after they had completed practicum and returned to their regular teaching positions to learn if they had used the Sources of Missed Understanding construct in their classroom. Four of the five tutors responded to this inquiry.

All of the data collected provided information for triangulation in relationship to the research questions as indicated in Table 3.1.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Sources</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do teachers use a Sources of Missed Understanding Construct during the course of five-week one-to-one reading instruction?</td>
<td>• Observations • Audiotapes of comprehension sessions • Sources of Missed Understanding recording sheets • Lesson plans • Tutor reflections • Research notes • Diagnostic Maps • Student BRI comprehension improvement pre-post including tutor/participant analysis</td>
<td>Case Studies</td>
</tr>
<tr>
<td>• What kinds of prompts, interactions or conditions encourage students to make their thinking or confusions known?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What is the diagnostic process in which a teacher engages as he or she uses this tool to determine the causes meaning break down for a student?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• How is this information used to inform instruction?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What training, preparation and/or ongoing coaching support do teachers need to be able understand use the tool effectively?</td>
<td>• Research notes • Diagnostic Maps • Sources of Missed Understanding recording sheets • Tutor reflections • Tutor pre-post survey</td>
<td>Cross Case Analysis</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

Note: BRI is an abbreviation for Basic Reading Inventory (Johns, 2012).
Outline of Implementation

This research study was conducted in three phases. Phase one took place before the summer tutoring practicum began. Phase two occurred during the five-week summer practicum where tutors used the tool while working directly with their tutees. Phase three, occurred after the summer program ended and involved analysis of all the data collected. Table 3.2 provides an outline of the implementation of these phases.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Timing</th>
<th>Goals</th>
</tr>
</thead>
</table>
| 1a    | May 2018 | • Provide Initial Training  
|       |         | • Recruit Tutors Participants |
| 1b    | May-June 2018 | • Obtain baseline data on Tutors via Pre-Survey  
|       |         |   - Grades and years taught  
|       |         |   - Demographic data  
|       |         |   - Understanding of Comprehension Assessment  
|       |         | • Obtain baseline data on tutees  
|       |         |   - BRI and tutor analysis of reading concerns  
|       |         |   - Demographic data of student  
|       |         | • Confirmation of Tutor/Tutee participation |
| 2a    | June-July 2018  
|       | Summer Practicum (5-weeks) | • Study implementation of the Sources of Missed Understanding Construct and support for teachers  
|       |         |   - Observe tutor/tutee interaction in person or via audiotape  
|       |         |   - Review Sources of Missed Understanding recording sheets  
|       |         |   - Understand tutor diagnostic process through tutor reflections, Sources of Missed Understanding recording sheets, research and individual meetings, and diagnostic maps  
|       |         |   - Note lesson plans adjusted to Sources of Missed Understanding recording sheets and reflections  
|       |         |   - Note coaching and support tutors pursue.  
|       |         |   - Refine support and supporting materials in response to tutor feedback |
## Data Analysis Procedures

Throughout the study, qualitative data was reviewed. Two adaptations to the original conjectures—diagnostic maps and increased thinking-partner time (discussed previously in this chapter)—were added to the intervention in-the-moment to achieve the pedagogical goal of helping tutors diagnose the sources of comprehension failure of their students. This analysis occurred while the experiment was in process as the tutors and I deepened our understanding of the assessment, the diagnostic process, and the teacher support required. Additionally, a retrospective analysis of the data collected was conducted after the summer reading program closed. A description of this analysis follows.

**Individual case studies.** The data discussed in this chapter was woven into “within case analysis” (Creswell, 2013, p. 101), which includes a description of each of the five tutor/tutee cases along with themes for each case. In these case studies I endeavored to represent the diagnostic process of each individual tutor/tutee pair and how each used of the Sources of Missed Understanding construct. I sought to connect the actions (prompts, questions, instructional choices) observed with the reflections and

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>July 2018</td>
<td>• Note tutee progress from post IRI data and tutor analysis</td>
</tr>
<tr>
<td></td>
<td>• Note changes in tutor understanding of comprehension process or assessment from final research meeting and tutor post survey</td>
</tr>
<tr>
<td></td>
<td>• Obtain tutor recommendations for changes to Sources of Missed Understanding support or materials</td>
</tr>
<tr>
<td></td>
<td>• Member check diagnostic maps and findings to date.</td>
</tr>
<tr>
<td>August 2018-April 2019</td>
<td>• Analysis of data</td>
</tr>
<tr>
<td></td>
<td>• Writing of findings</td>
</tr>
<tr>
<td></td>
<td>• E-mail to tutors to learn use of construct in their classrooms</td>
</tr>
</tbody>
</table>

Note: BRI is an abbreviation for Basic Reading Inventory (Johns, 2012).
intentions tutors disclosed in writing or in personal interactions with me as a researcher. I noted the specific challenges each tutor faced, and the support each needed with the intervention and her diagnostic process. This was completed so as to understand and illustrate not only what tutors said/did not say and did/did not do, but also why they did so, and what support they needed.

**Cross-case analysis.** In addition to mapping each individual tutor’s journey with this intervention, I conducted “cross-case analysis” (Creswell, 2013, p. 101). The objective of the cross-case analysis was to identify themes common among the tutors’ experiences using the Sources of Missed Understanding construct to diagnose and address their tutee’s comprehension challenges. I also looked for themes in the times and types of support tutors needed from one another or from me.

**Coding.** To understand the tutor experience with the assessment tool, I employed a process of coding on my research notes from the initial training, each research team and individual meeting and the post assessment comments related to the Sources of Missed Understanding construct. According to Creswell (2013), coding involves “aggregating the text or visual evidence into small categories of information, seeking evidence for the code from different data sources being used in the study and then assigning a label to the code,” (p. 184). I then classified codes into themes with an eye to being able to generate interpretations or findings from the data.

**Comparisons.** Scores on participating tutees’ reading inventories were used to make comparisons of beginning and ending comprehension scores and reading levels. Tutor pre- and post- surveys were compared to identify any change in feelings of competence in identifying comprehension struggles and growth in their consideration of
reading comprehension tools. This analysis will be used to complement other qualitative data collected rather than to establish causal relations.

**Bounding**

For the purposes of this study, the case was bounded by the topic of comprehension and the Sources of Missed Understanding construct. While tutors worked with their tutees on a full array of literacy skills, this inquiry only sought to describe data directly related to diagnosing and addressing comprehension challenges. Both participating tutors and I had assignments and expectations beyond this project, however, the case studies are limited to activities directly related to the research project including assignments, expectations and experiences that overlapped with the practicum and the research project.

**Verification: Member Checking**

Two types of member checking were used to verify the findings of this research project. First, a description of each tutor’s diagnostic process was mapped by me and periodically shared either during either research team meetings or individual meetings with a tutor. At those times the tutor provided feedback, elaboration, and corrections for her own process map. Second, themes related to the tutor experience were shared in the final research meeting with all the tutor participants for response and input. That session proved to be collaborative, with participants actively involved in helping to crystalize their individual experiences, identifying commonalities across experiences and providing powerful, practical suggestions for how the tools and support for the Missed Understanding Construct could be improved.
CHAPTER FOUR

FINDINGS

This formative design experiment examined how the Sources of Missed Understanding construct was used over the course of a five-week Summer Reading Tutoring program by five different reading specialist candidate tutors and their upper elementary or middle school tutees during one-to-one reading instruction. It also sought to understand the support the tutors would need to use the tool effectively.

This chapter describes the journey of each tutor/tutee pairing in five case studies, conveying each tutor’s individual experience using the Sources of Missed Understanding framework. The cases answer the first research question, explaining the diagnostic process each tutor engaged in as she used the tool to determine the cause of her student’s break down in meaning. The case studies share the prompts, interactions and conditions that encouraged the tutee to make his or her thinking or confusions known. They provide a window into each tutor’s mind as she used the Missed Understanding construct to wrestle to the heart of her tutee’s faulty comprehension. Each case depicts the instructional choices tutors made in response to each diagnosis.

The cross-case analysis addresses the second research question, and reveals learning about the circumstances and support tutors collectively needed to successfully use the Sources of Missed Understanding tool. This includes the training and procedural clarifications required for using the formative assessment framework. It also captures the individual coaching needed based on the philosophies, attitudes, and background knowledge about teaching and assessment each tutor brought to the study. It also
highlights the adjustments required given the range of beliefs, experiences, strengths and challenges of each student/tutee to which the assessment framework was applied.

**Case Studies**

In chapter three, this study was described to be analogous to a beta test in software development. In this phase, I endeavored to take the Sources of Missed Understanding construct beyond the alpha development of my own classroom “laboratory,” to learn if and how it might work for a handful of different highly qualified teachers (tutors) completing graduate work toward reading specialist certification by working one-to-one with struggling readers (tutees) in a University’s summer tutoring setting. While this beta test was a relatively controlled environment, each case tells an individual story of how a tutor used the Sources of Missed Understanding to find where her tutee’s understanding broke down, and the choices she made to bring her student to stronger comprehension.

**Amy: Dogged Diagnostician…and the Need for Explicit Instruction**

Amy embraced her role of diagnostician. During the school year, she was a third-grade teacher, who as part of her teaching responsibilities, worked with Tier 2 and Tier 3 students in small groups. Perhaps because her experience with such struggling readers was similar to my own experience, the concept of the Sources of Missed Understanding tool clicked for her. Of all the tutors, Amy most systematically and frequently cycled through the diagnostic process. She listened acutely to her student’s responses and analyzed what they revealed about his understandings. She reflected on what might be the underlying cause of missed understanding using the Sources of Missed Understanding
construct, developed hypotheses, tested those hypotheses and began the cycle again continually trying to hone in on the heart of her students’ comprehension issues.

Her student, Peter, had been a participant in the summer reading program in the past and was entering eighth grade. During his pre-summer assessments, Amy administered the Beginning Reading Inventory (BRI, Johns, Elish-Piper & Johns, 2017) and found his instructional reading level to be at the seventh grade level. Peter scored above grade level reading on graded word lists, and read at a very fast speed, which she suspected was too fast to support deep comprehension. He scored well on a reading inventory’s higher-level questions, but less so on the lower-level, fact-based questions. Amy identified reading speed as a possible cause of comprehension breakdown and planned fluency lessons to encourage him to regulate his speed. It should be noted that although this is not part of the Missed Understanding Construct, it was certainly supported as an instructional priority in this case. For an overview of the unique qualities contributing to Amy and Peter’s case, see Table 4.1.

Amy began her diagnostic listening at the very beginning—the pre-session BRI assessment. Unlike some of her tutor peers, she analyzed the types of fact-based questions he missed, considered how he chose to answer the questions, and reflected on how he discussed the fiction and non-fiction reading inventory passages. Using the Sources of Missed Understanding construct as a guide, she went beyond the analysis directed by the BRI, which categorized questions as fact, topic, evaluation, inference and vocabulary, to develop an initial hunch as to what might be causing him to miss important factual details from the text. Her hunch was that he was Misjudging
Table 4.1.

Case 1 Participant Overview

<table>
<thead>
<tr>
<th>Amy</th>
<th>Peter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background:</strong></td>
<td><strong>Background:</strong></td>
</tr>
<tr>
<td>• Experienced 3rd grade teacher (previous experience with Middle School)</td>
<td>• Entering 8th Grade</td>
</tr>
<tr>
<td>• Worked with Tier 2/Tier 3 students in small groups</td>
<td>• Previously been a Summer Reading Program tutee</td>
</tr>
<tr>
<td>• Caucasian</td>
<td>• Overly fast reader</td>
</tr>
<tr>
<td><strong>Distinctive Qualities:</strong></td>
<td>• Asian/Pacific heritage</td>
</tr>
<tr>
<td>• Most analytic; comfortable with diagnostic process</td>
<td>• Knowledgeable about many topics</td>
</tr>
<tr>
<td>• Challenged with finding the instruction to address Peter’s comprehension situation</td>
<td>• Extracts some meaning from text</td>
</tr>
<tr>
<td>• Examined the similarities and differences of comprehension skills fiction and non-fiction</td>
<td>• Needed instruction and convincing</td>
</tr>
</tbody>
</table>

Importance. In her Diagnostic Testing Report submitted for her Reading Specialist program, she wrote, “Peter missed the purpose each text was attempting to convey to the audience…” and “these small details represent some purpose that the author was trying to convey as important. Peter may not have felt these facts were important, but rather focused on facts such as the main idea or the topic of the story.” Based on these findings, Amy identified Three Important Words as a starting instructional method for Peter.

For the summer, Amy planned for comprehension instruction of fiction to be focused around a novel, and in non-fiction to be focused around a research project on a topic Peter. While Peter’s comprehension of fiction and non-fiction are discussed in this case study sequentially, the genres were read concurrently from week three on, and
Amy’s ongoing formative evaluation of Peter’s comprehension challenges was influenced by her observations of both.

Amy and Peter settled on the novel *Kick* by Walter Dean Myers and Ross Workman (2011). By chapter four, Amy confirmed her hunch that Peter’s comprehension was hindered because he did not attend to important parts. She wrote on the Sources of Missed Understanding recording sheet,

*Today he gave ‘coffee shop,’ ‘principal and gym teacher,’ and ‘loses temper’ [as his three important words]. I would agree that temper was important, but the other words are not important. His main idea statement was more of a summary of the re-tell he gave me prior to completing the activity. I think Peter is having a hard time focusing on the important details that the text is giving.*

Amy’s reflection forms show that she was listening to what he did and did not value. She noticed and named this for him. She shared with Peter that she observed he placed importance on naming the people and places, and he concurred. According to Amy, Peter responded, “yes, I thought the places might mean something since they [the characters] weren’t somewhere else.” Amy’s plan was to continue to have him recount the chapters (so she could hear what he absorbed from the text) but that she would select the three important words as a think-aloud so he could observe how she determined importance. Peter would then connect the three words to compose a summary statement, and after a few days, would try to select the three words himself.

Amy continued to reflect on Peter’s responses and came to another discovery. He never articulated insights from dialogue. As she described in a conversation with me, “He will tell who went where, that they talked and then what they did next. The important
parts are what is revealed in the conversation and he is glossing past it.” She wondered if his reading speed and disregard for punctuation was causing him to not understand the dialogue, and if this was contributing to the fact that he was not gleaning meaning from this part of the text. (See Figure 4.1 for a summary of the Sources of Missed Understanding Amy considered for Peter.)

Knowing how to read dialogue is part of the Missed Understanding Construct category Understanding How Text Works and is a precursor to being able to draw accurate meaning from text.

![Figure 4.1. Sources of missed understanding considered by Amy for Peter](image)

Amy decided to develop a lesson about how to read dialogue by copying portions of the chapter and highlighting the punctuation and dialogue shifts. This hunch was quickly disproved. Peter understood how dialogue worked although he admitted he sometimes did not choose to slow down to be careful of who is exactly saying what.
Amy continued to zero in on dialogue. She pondered: Did Peter recognize that what is conveyed in dialogue is important to the plot? Can he infer insights from dialogue? Amy continued to direct Peter to dialogue and now planned instruction to further his ability to infer meaning from character conversations and descriptions. She planned close readings of conversations or paragraphs of important character decisions. She modeled her thinking aloud. She added writing prompts to her lesson plans asking Peter to consider the main character’s motives or feelings. Through this process, Amy discovered that Peter’s inferential skills as they related to characters were inconsistent and somewhat underdeveloped. For example, after asking Peter to close read a section she said:

Amy:  What is the author telling us here?

Peter:  He’s getting away. [true, but focused on action]

Amy:  Eyes—get wide; darting side to side. Biking faster …. What does this mean? [re-focusing him to underlying character feeling/motive]

Peter:  He is nervous.

Or another example:

Amy:  What is something Kevin [character] said that gave glimpse of him as a protector?

Peter:  [read a quote]

Amy:  I agree with you, explain….  

On a reflection after a writing prompt, Amy stated, “Peter had a hard time naming the feelings of the character. He kept saying nice and thoughtful. This could be a new hunch, Causal/Logical Inferences missing.”
Amy was growing increasingly exasperated that despite all of the coaching she was doing to coax him into comprehending the feelings and motives of the main character, the summaries he expressed orally and in writing failed to include them. At this point she was growing quite concerned about Peter’s inability to, or simply not thinking to, make Causal/Logical character inferences without support. In completing the Sources of Missed Understanding recording sheets for chapters seven, eight and nine of the novel she noted these concerns. For example, she recorded, “An oral retell included only the simplest of ideas…. ‘the guys talked, he told a story, they got cake.’” On another sheet she noted, “I think Peter is not understanding the consequences that are being [implied] in the text.” She went on to say that Peter’s written summary fails to mention some important stated facts from the novel, as well as some important implications that would need to be inferred. He was not realizing an important part of the plot line.

This was a pivot point for Amy as both a diagnostician and a practitioner. As a diagnostician, she felt that Peter needed support in both Misjudging Importance and Causal/Logical Inferences, and wrote Sources of Missed Understanding sheets on both. However, when we discussed the two causes of missed understanding she felt Misjudging Importance to be his primary concern. She believed that even when supported in making accurate character inferences, Peter did not value them when considering the meaning of the plot. As a practitioner, Amy and I discussed that she may need to be more direct and explicit with Peter. He seemed to be stuck in the belief that actions were the most important part of the novel, when this story was really about the choices and temperament of the main character and about this protagonist’s relationship with his mentor. Since Amy was not able to nudge him into realizing that this was a character
driven novel, nor get him to discover how the main character’s actions and motivations were at the heart of the plot, she might need to re-frame it explicitly for him, offering him a different interpretation of the chapters he had read so far.

This was a bit of a surprise to Amy, and possibly a bit uncomfortable. But part of the Sources of Missed Understanding process is to zero in on where a student’s comprehension is stuck, pull that sticking-point out, and address it with instruction. Peter may not have ever considered that a plot could be character driven. Helping him find his way to understanding this novel may mean literally showing him the way. I used the analogy of an optical illusion where some people easily see the picture two ways, others only see it one way until the second is explicitly pointed out to them. Perhaps Peter was the latter.

Interestingly, when posed with the concept that *Kick* was a character driven novel, not an action driven novel, Peter only concede that it was “both.” In her reflections, Amy reported that he was resistant to this idea and needed a lot of support to see how character-related pieces fit into the plot line. Then one day, as he was writing a summary, Amy noted he was having trouble keeping track of what was important and raised the idea of *interesting vs. important*, which is one of the stated sub-categories under Misjudging Importance in the Sources of Missed Understanding construct. She said, “when I asked him if he thought certain elements were interesting vs. important to the plot, [he reviewed] his summary and was often able to tell.” Amy felt this idea of interesting vs. important resonated with him, and returned to it again and again. The story parts to which he was most drawn (the action) were not central to the plot.
Helping Peter to separate interesting vs. important, and showing him an alternate character-driven way of considering the plot began to have impact. By chapter 12, he was more accurately identifying what was important to the plot of the novel and more adept at completing character maps. Amy had hoped that the more Peter engaged with the main character, the more he would find that character interesting so as to be able to convince him of the value of understanding characters in novels. In the end, Amy shared that a conversation about a movie the two had both seen may have helped him crystalize how a character’s feelings and motives were underlying the action and important to understand, not the novel. But to help Peter get to this point, Amy needed to build his schema for a new way of thinking about fiction, and convince him that it was worth the effort to make inferences about a character.

In parallel to reading Kick, Peter embarked on a research project of his choosing. He composed his own research questions and was tasked with locating relevant information from non-fiction texts to answer them. As Peter read through non-fiction texts, Amy reflected that he struggled to keep focused on the specific research question, reverting to his background knowledge on the topic in general and not the specific area of inquiry. He went off on tangents and had difficulty drawing conclusions from what the text explicitly said. Amy related these observations back to the difficulty Peter had judging importance and making causal/logical inferences in fiction. In her view, he had trouble judging which facts in the nonfiction articles were important for answering a question. He was distracted by parts of the articles that were unrelated to the question, or that reminded him of something in his background knowledge. Once he was focused on relevant information, he also had difficulty marrying those facts with his background
knowledge to formulate an answer to his research question. Amy documented in her reflection that “bringing him back to only focusing on what the text says and how that answers specific questions is the bulk of our current work.” She reported that Peter even admitted to her that he preferred to answer questions based on what he already knows.

Still, Amy saw a connection herself, and tried to make one for Peter, that the critical reasoning he was doing in fiction to determine importance applied to non-fiction: the combining of text clues and background knowledge to make inferences and draw conclusions to answer research questions was the same process as the one he needed to make inferences and draw conclusions about a character. In both fiction and non-fiction, there was a need to focus on what is relevant, not just what he finds interesting. It was also valuable for Amy to clarify for herself and for Peter what is deemed important in different contexts. One way to determine what is important in literature is to consider what is significant to the plot. When doing a research project, what is important is determined by what is significant to the research questions.

To help Peter in this context, Amy created a visual process map. Peter would 1) read the article, 2) highlight evidence to relevant to question, 3) think about what he already knew, 4) use that text evidence and background knowledge to draw inferences/conclusions, and 5) Use inferences/conclusions to answer question. This proved to be successful. Amy reflected, “Peter is responding well to a visual of steps to go through the process of determining importance when focused on a question.” Amy noted that Peter sometimes seemed overwhelmed with where to start, so having a thinking-process helped him to focus. In a meeting with me, she shared that often a nonverbal gesture to the visual was all that was needed. As the summer session closed,
Amy gave Peter the process map and encouraged him to use it while answering questions in school.

In the end, Peter’s comprehension showed improvement as measured by the BRI. Amy’s final report to Peter’s parents stated that his comprehension score on a seventh grade passage had gone from a pre-summer score of 85% to 100%. In our closing research team meeting, Amy reported that she felt she had gotten to the source of Peter’s comprehension challenges. However, she was unsure if their work together would have a lasting impact. In just five weeks of instruction, she was unsure he had changed his patterns of thinking.

The experience working with the Sources of Missed Understanding construct did have a lasting impact on Amy. She is the only tutor actively currently using the construct in her own classroom. She reported by e-mail that she uses it to formatively diagnose comprehension challenges of her Tier 2 and Tier 3 students. Her growth is also indicated in her pre- and post-surveys. On a scale from 1 to 5 where 1 was strongly disagree to strongly agree, Amy reported her understanding of the factors that impact her student’s comprehension and her ability to assess their comprehension needs grew from a rating of 4 to 5, and that her ability to differentiate instruction grew from a 3 to a 4. She stated in her post-survey she better understood the “symptoms that were given on the breakdown [of the Sources of Missed Understanding construct.] I now understand what to look for when students are struggling with comprehension.” Amy also described having a stronger grasp of the comprehension process as the Missed Understanding framework is depicted as a comprehension continuum.
Amy and Peter’s case revealed important elements of using the Sources of Missed Understanding construct. Amy grappled with how to respond when a student has multiple sources of comprehension breakdown. She chose to prioritize, focusing on Misjudging Importance as she felt that was Peter’s most pressing challenge while continuing to scaffold his inferring. Amy connected for her student which underlying skills and thought processes he was missing and how practicing those skills manifested in his ability to better comprehend both fiction and non-fiction. The parallels she drew led to rich conversation among the research team about how Sources of Missed Understanding look similar and different between fiction and non-fiction comprehension. Finally, my work supporting Amy highlighted that teacher support was not only needed to reach a diagnosis, but also to effectively respond and bring their student to understanding. In working with her, I recalled Duffy’s (2002) research resulting in the Direct Explanation Approach—comprehension strategies need to be explicitly taught, and take a long time for students to internalize.

**Beth: Sticky Issue, Tricky Student, and How Emotions Impact Comprehension**

Beth was a very capable, compassionate tutor and experienced teacher, having taught fourth grade for the past two years and second grade for five years previously. Her student had many capabilities as well. In fact, based on pre-summer test scores, it was not initially clear to Beth why her tutee was recommended to the summer reading program. Daniel was going into fifth grade, which is the instructional reading level Beth placed him in after completing the Jerry Johns Basic Reading Inventory (BRI), during a pre-summer session assessment. Beth noted that he could accurately read and comprehend above grade level passages when reading aloud. His main areas for improvement were
identified as silent reading comprehension because he was unable to answer any fact-based questions when reading silently, and as improving his decoding of multi-syllabic words. These were grade-level appropriate needs.

Beth noted that Daniel’s BRI comprehension scores were strong overall. However, his higher-level comprehension scores were stronger than his lower-level fact-based scores. Daniel missed only 14% of the questions related to topic, evaluation, vocabulary and inference questions, but 29% of the fact-based questions.

In reflecting beyond the numbers in her initial diagnostic report, Beth noted that Daniel’s “advanced background knowledge on many topics aid his reading abilities,” contributing to his strong higher-level comprehension. She also noted that Daniel “did not consistently pay attention to key details when reading more complex texts, leaving out important terms when answering comprehension questions.” As evidence she recounted the following example:

**Question: How small can a plant be?**

**Daniel: An inch.**

**The answer from the text: “Smaller than a period at the end of a sentence.”**

Based on this initial testing, Beth’s starting plan for Daniel was, in her words, “instruction to aid factual comprehension.” This diagnosis is in line with the BRI instrument. However, Beth’s careful diagnostic listening to precisely how he answered the questions to glean insight into the possible source of the missed understanding went beyond the BRI tool. She decided on Question Answer Relationships (QAR) (Raphael, 1986) as her instructional method. This method teaches students how to approach the task of answering questions by describing different types of questions and clarifies the source
needed to respond to each type as follows: In the text in one spot or *Right There*, in the text across several spots or *Think and Search*, inferring using text evidence and background knowledge *Author and Me*, or just reader knowledge *On My Own*. Beth chose to focus on *Right There* and *Think and Search* questions to “get him into the text” since she concluded Daniel already utilized his background knowledge well.

It was not until the first week of the summer session that Beth came to realize that Daniel's use of strong background knowledge was a crutch, not an aid. In situations where he had background knowledge, he made sole use of it. Beth reported in our first research meeting, “In a text about Australian dogs, [Daniel] didn’t mention any specific information from the book about the breed. He only discussed his own dog experience.” But when he encountered material where he did not have related background knowledge, he exhibited a lack of skills and became easily discouraged. While reading the text about Australian Shepherds, Beth asked him a *Right There* question about an unfamiliar term.

Beth: What is merle, from what I just read?

Daniel: I don’t know.

Beth: What could you do to figure it out?

Daniel: I’m not sure.

Beth: Let’s go back to where it talked about merle.

Daniel: I don’t know.

Beth: Well here, let me help. Oh, right here. It talks about blue and red merle.

Daniel: What color? Eye color?
Beth: Well, let’s read. Here it says merle. So sometimes we can find the word in the…

Daniel: It’s a pattern.

Beth: It’s a pattern?

Daniel: Made up of dark color patches on a lighter background.

Beth: Yeah so that’s part of what they look like.

Daniel: Right there.

Beth: Right there. Good job by identifying the right there question.

Awesome. Okay, your turn, next page.

Daniel: Can I just count…[counting pages, redirecting the conversation to when they can be finished.]

Because of Daniel’s fondness toward dogs and his experience with his own dog, Beth introduced the book *Shiloh* (Naylor, 2000). Daniel was quickly confused by the vernacular in which the dialogue was written and even when appropriately scaffolded by Beth, Daniel had no patience for it. Despite the fact that Daniel could read the words fluently, and that Beth offered to read much of the book aloud, Daniel grew increasingly frustrated, fixating on the unusual language instead of trying to understand it. During one 12-minute lesson Daniel voiced:

This makes no sense.

I don’t get it because … they speak in like this different accent.

Hardly got … this is so hard.

I just don’t want to read the book. It’s way too hard.

This book is still bad.
I hate this language.

This book is so boring. I don’t like it.

Using the Sources of Missed Understanding construct, Beth’s diagnosis of Over-Reliance on Background Knowledge was straightforward. However, Daniel’s emotional response of escaping, getting de-railed or simply shutting down in situations which required him to persist with texts and topics for which he had little existing schema contributed to his comprehension breakdown and necessarily factored into her instructional plan. In order to help Daniel engage with information that a text is conveying to him, Beth knew she needed to both develop his text skills and build his disposition toward unfamiliar reading. For a snapshot of key characteristics of Beth and Daniels, refer to Table 4.2.

Table 4.2  
*Case 2 Participant Overview*

<table>
<thead>
<tr>
<th>Beth</th>
<th>Daniel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background:</strong></td>
<td>• Experienced teacher</td>
</tr>
<tr>
<td></td>
<td>• 4th grade 2 years</td>
</tr>
<tr>
<td></td>
<td>• 2nd grade 5 years</td>
</tr>
<tr>
<td></td>
<td>• Caucasian</td>
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<tr>
<td><strong>Distinctive Qualities:</strong></td>
<td>• Compassionate – necessarily considered whole child concerns</td>
</tr>
<tr>
<td></td>
<td>• Pushed the research team’s thinking about non-cognitive reader characteristics impacts on comprehension and instruction</td>
</tr>
</tbody>
</table>

Beth’s experience with Daniel also led to a thread of conversation and reflection between Beth and me about the strengths and limitations of the Sources of Missed
Understanding construct. Beth correctly pointed out that the Sources of Missed Understanding construct addresses “just one part of teaching comprehension--this is just the thinking part. I have a whole tricky child [to formatively assess]…. Is it that he can’t do something or won’t do something on a given day.” In a research team meeting, she shared she had a hunch her “student had many strengths in fiction, but it is hard to tell because he is resistant.” We discussed that comprehension breakdown is not always flawed thinking. Non-cognitive attributes such as emotions or attention can impact a cognitive process, as she was finding with Daniel. Similarly, a struggle with a cognitive process can trigger strong emotions, as she was also finding with him. To help Daniel become successful in the cognitive process that is comprehension and move beyond relying solely on background knowledge, she would need to help him move past his emotions.

She did so by adjusting his Zone of Proximal Development. Starting with high comfort, non-fiction articles about which he had schema, Beth chose to continue with QAR. As Daniel became more comfortable going back to the text, she folded in high interest material about which he had less background. In fiction, Beth and Daniel agreed that she would read aloud *The City of Ember* (DuPrau, 2003), a post-apocalyptic science fiction novel of his choosing. This served as a reward for his hard work comprehending non-fiction pieces, and allowed Beth to explore his fiction listening comprehension skills that she intuited were strong in a genre that would not allow him to solely rely on background knowledge. Non-fiction comprehension became the focus of her exploration with the Sources of Missed Understanding construct.
Beth quickly noticed that when Daniel attempted to go back to the text to answer a *Right There* question, he did not know where to look to answer text-based questions. So, she began several mini-lessons to help him be successful when he dug into a text. She taught him to look for key words in the question and skim for those words in the book or article. She taught him to notice sub-titles, to consider what information was organized under a sub-title, and to use the subtitle to help phrase his questions. Daniel quickly picked up these skills. Soon he was confidently asking and answering *Right There* questions from the text.

Gently, Beth deepened Daniel’s skills by asking him to focus on asking *Right There* questions that were important to the story (as opposed to less relevant) and by showing him how to orally cite text evidence as part of his answer. She moved into asking and answering *Think and Search* questions and began to have Daniel summarize what the text was saying in his own words as the lesson closed. As he practiced these new skills, Beth observed that Daniel was getting stronger at identifying question types and answering many kinds of text-based questions. However, he had trouble asking questions other than *Right There* and his summaries tended to “over-value or over include background knowledge.”

Beth inferred that when Daniel participated in the QAR routine, he understood that the expectation was that he would go back into the text to answer certain types of questions. However when asked to do something beyond QAR, such as a summary, Daniel reverted back to his comfort-zone of relying on background knowledge. He either had not generalized that adept readers go back to the text to respond to all types of
prompts (including summarizing), or the anxiety of an unfamiliar prompt caused him to regress to his old habit.

When directed to only use information from the text, Daniel’s summary became a list of details, placing importance on everything while not ever circling around to the main point the author was making. These observations reinforced her diagnosis of Over-Reliance on Background Knowledge and caused her to develop a hunch that Daniel may also be challenged with Misjudging Importance. (Figure 4.2 illustrates the Sources of Missed Understanding Beth considered for Daniel.)

**Figure 4.2. Sources of missed understanding considered by Beth for Daniel**

At this point Beth and I met, and we discussed what she really wished to know to help this student. Now that Daniel was more open to going back into the text, she wanted to discern what Daniel needed to successfully learn from a text. To do that, she first wanted to figure out what he understood about the relationships between ideas in a text,
separate from his background understanding. We brainstormed several ideas such as a concept map, a KWL chart, and a main idea and details hierarchy as ways to pull that out. Beth decided to focus on determining main ideas and details. To assess what Daniel understood, she chose to write key facts and concepts from the next day’s reading selection onto index cards as they were raised during the planned QAR process. Then, she had Daniel manipulate cards into main idea and details, and discuss other relationships he saw among them like cause and effect, similarities and differences, and change over time.

Beth found this to be an effective way of making his thinking visible. In her reflection she wrote,

The exercise of organizing ideas with Daniel gave me more insight into his comprehension abilities. He could categorize most information into main idea/supporting details. With support he saw how ideas connected. When stepping back and considering main idea, Daniel provided examples.

This made Beth believe that Daniel had, or could easily develop, many of the high-level comprehension abilities on the Sources of Missed Understanding construct such as Judging Importance, but that he lacked the knowledge, and possibly the confidence, about how to begin to be text based. Her instructional choices included sentence starters for Think and Search questions to help him find words for how ideas are related in a text. She also decided to teach GIST (Cunningham, 1982), which is an acronym for Generating Interactions between Schemata and Text. GIST is a summarizing technique where the student selects words from the text as a basis for crafting a 10-20 word statement that captures the main idea. Beth thought this technique would help Daniel
focus more on text than on background knowledge when consolidating his thoughts. This proved to be a useful instructional decision. Beth reflected:

Sentence starters helped generate questions….Trying out GIST for the first time was interesting. While I’ve noticed Daniel had trouble organizing thoughts in the past, he was able to tell about the main idea with little prompting. On one section, he wanted to go into more detail, but I explained we just wanted the ‘gist.’

During one of my observations, I wrote, “Daniel asks and answers his own QAR questions, so he is monitoring his own understanding. Nice hand-off of control [of his learning].”

There were bumps in the road. For example, one day Daniel was distracted by an itchy arm, and only wanted to talk about his background knowledge. Another day, Daniel was attempting QAR and GIST from a video, not a text, and he struggled when he could not refer back to the words. Another text was a bit too far from his schema as evidenced by the fact he could not ask questions about the content, and only produced questions more generically about the text structure. But overall, Daniel was reading, questioning and summarizing his texts.

Beth then grappled with the question: When do you know the student “has it?” She raised this in a research team meeting, remarking about how far Daniel had come, but remembering his first foray away from QAR. She remembered, “to listen to Daniel talk about QAR, he is deeply in the text. But when asked to summarize, he reverted back to background knowledge. Is it when you can show you have the underlying cause of
comprehension failure shored up using multiple instructional situations?” The research team agreed.

As the summer session was came to a close, Beth wanted to be sure Daniel’s ability to go back into the text would generalize beyond a QAR or GIST activity. She decided to transition instruction from QAR/GIST to non-fiction text structures. She decided on this path because although Daniel seemed inclined to understand text structure during the lesson mentioned above, he did not do so on a different day. Here he correctly identified the stated problem during a QAR question, but offered a solution from his background knowledge, rather than the one stated in the text. Beth wanted Daniel to learn that authors who articulate a problem often follow it with a solution, and that readers should look at what is written next in a text to understand what the author is stating. Right up until the end, every time Beth introduced a new aspect to comprehension, she had to redirect Daniel away from his background knowledge and into the text.

Still, Daniel demonstrated comprehension growth over the summer. In Beth’s final report to Daniel’s parents, she noted that his silent reading comprehension on a fifth grade passage in the BRI grew from 40% to 75%. She described how Daniel had developed skills for finding information in the text, but might need to be reminded to use those skills.

In our final research meaning, Beth stated she had grown as well, learning more about comprehension from her participation in the study. This is supported by her responses to the pre- and post-surveys. On a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree, Beth reported that her understanding of the factors that impact student comprehension challenges and her ability to effectively assess her
students’ comprehension needs had improved from a score of 3 to a score of 5. She felt more able to identify student comprehension challenges. However, she did not feel any more able to differentiate instruction to meet the needs of her students as a result of this study. That score remained a 4.

Beth also remarked on her post-survey that the Sources of Missed Understanding construct had helped her “pinpoint her student’s comprehension breakdowns.” Although, when asked directly if she could have determined the source of Daniel’s comprehension breakdown without the construct, she admitted she thought she might have—Daniel’s reliance on background knowledge was obvious. Nevertheless, Beth found the construct and diagnostic process valuable for struggling readers. At the end of the summer she wrote:

…I definitely plan to use [the Sources of Missed Understanding framework] as a guide to figure out why my students below grade level are [not] comprehending text. I will use the breakdowns and the examples to pinpoint an area of focus. I will also take notes using the trend/hunch format to ensure my ideas of missed understanding are true for multiple texts.

Beth and I traded e-mails during the fall to learn if she did, in fact, use the Source of Missed Understanding construct in her classroom. She replied that she had moved to a high-achieving fifth grade class, but would use the framework if she had struggling readers.

Beth’s case was particularly unique compared to the other tutors. Whereas the others iterated to determine the cause of their tutees’ comprehension breakdown, Beth spotted her student’s comprehension problem immediately. Her experience with Daniel
stretched the research team to think beyond a cognitive diagnosis, which highlighted essential matters not previously specified in the Sources of Missed Understanding framework. The first was the role of emotions on the cognitive process of reading. Since emotions/anxiety and reading struggles often go hand in hand, Beth and Daniel’s case raised the question of whether or not student emotions or anxieties should be explicitly part of the Missed Understanding Construct or factored into the teacher/tutor training.

Second, Beth pushed the research team to consider how a teacher is to know when a student’s comprehension glitch is fixed. She suggested the Sources of Missed Understanding framework specify parameters for teachers such as having a student demonstrate the source of comprehension failure is shored up in multiple instructional situations and multiple texts. Finally, Beth’s departing words about the tool’s value with below-grade-level readers provoked my own wondering about whether or not the tool had value to teachers with at- or above-grade-level readers working at their Zone of Proximal Development.

**Holly: Balancing Wait Time and Pressure to Get Through Material**

Holly was a conscientious tutor with high expectations for herself and her seventh-grade student Eva. However, Holly was also the most tentative user of the Sources of Missed Understanding Construct in the study. This is possibly due to the fact that she was the least experienced of the tutors participating in the study with just two years teaching Kindergarten. The Sources of Missed Understanding construct is works off the assumption that the teacher is a knowledge-worker who can use the framework as a map. Holly was not as confident as other tutors in her role as a knowledge worker who
could adapt instruction flexibly in response to her growing understanding of her student’s comprehension needs.

In meetings and in her reflections, Holly expressed concern about teaching “correctly,” especially with her Middle School grade tutee. She frequently sought reassurance from her professors about proper execution of instructional strategies. She described in her early reflections a concern about teaching instructional strategies in a “purposeful” way and in the “right order [so] that they are building upon each other.” A challenge for Holly was accepting that struggling readers are not all alike, so there is no perfect method or “right order.” A second important lesson for Holly was that teaching a student why good readers use a strategy is as important as how they execute that strategy.

Her student, Eva, participated in the Summer Reading Program in the past. Unlike some of the other students participating in this research, Eva struggled with print, not just comprehension. Her instructional reading level was two years below grade level. Holly noted concerns that Eva did not monitor for meaning as she read words in her pre-summer assessment report: in BRI word lists she inserted nonsense words for actual words, and in running records, her self-correction ratio was only 1 in 25 miscues. Holly concluded that this contributed to Eva’s comprehension. Holly included word and accuracy strategy instruction in her summer tutor plans, and although these are outside the scope of this study, accurate word reading does enable comprehension.

On the pre-summer BRI comprehension assessment, Eva was able to answer higher-thinking questions at her instructional reading level, but had trouble with fact-based questions. She missed 19% of the literal comprehension questions when reading orally and 40% when reading silently. To build Eva’s fact-based comprehension, Holly’s
initial instructional plan was to teach Question Answer Relationships, focusing on *Right There* and *Think and Search* questions with non-fiction. She also planned to do a Direct Listening Thinking Activity with a read-aloud novel to model and practice how readers continually evolve meaning through the course of a longer text.

During the summer reading program, Holly’s first challenge was getting Eva to disclose what she understood and did not understand. Eva was agreeable, but she was also seasoned in the use of coping mechanisms for hiding her reading challenges. Eva was silent, and often looked more at her instructor than at the book. When Holly commented, Eva agreed, but when pushed to add more, Eva shrugged. When Eva did talk, her comments were short phrases intonated as a question, inviting her tutor to jump in. (See Table 4.3 for a snapshot of characteristics related to Holly and Eva’s case.)

Table 4.3

*Case 3 Participant Overview*

<table>
<thead>
<tr>
<th>Holly</th>
<th>Eva</th>
</tr>
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<tbody>
<tr>
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<td><strong>Background:</strong></td>
</tr>
<tr>
<td>• Least experienced teacher</td>
<td>• Entering 7th grade</td>
</tr>
<tr>
<td>• Kindergarten 2 years</td>
<td>• Previously been a Summer Reading Program tutee</td>
</tr>
<tr>
<td>• Some teaching assistant</td>
<td>• Significant print and comprehension challenges (reading level 2 years below grade level)</td>
</tr>
<tr>
<td>experience in upper</td>
<td>• African American/Black</td>
</tr>
<tr>
<td>elementary</td>
<td></td>
</tr>
<tr>
<td>• Caucasian</td>
<td></td>
</tr>
<tr>
<td><strong>Distinctive Qualities:</strong></td>
<td><strong>Distinctive Qualities:</strong></td>
</tr>
<tr>
<td>• Most tentative</td>
<td>• Avoided disclosing her understanding</td>
</tr>
<tr>
<td>• Procedural – concerned with what instruction she and student should do and doing it correctly</td>
<td>• Seasoned at drawing out tutor’s explanations</td>
</tr>
<tr>
<td>• Most challenged with creating diagnostic environment</td>
<td>• Required time, relationship building, and variety of ways to make thinking visible</td>
</tr>
</tbody>
</table>
My first observation of Holly and Eva occurred on the second day of the summer reading program. I noted the following on a feedback form:

Perhaps because of [Eva’s] quietness, you [Holly] are doing most of the thinking and talking. You are re-capping what happened and then saying, ‘So could X still be true?’ (Yes or No answer). Transfer more of the thinking to her.

Getting Eva to be responsible for her own thinking and willing to share her understanding was no easy task. Holly grappled with how much wait time to give Eva and how much to scaffold her.

Holly worried about not getting through her lesson plans because Eva took so long to respond. Holly reflected:

I tried to have [Eva] do more thinking and talking by me talking less and waiting more, but as a result it took a long time.

[Eva] took a long time to apply the strategy and work independently. Still thinking about the balance of waiting for her to think [and helping her]. I think she is used to waiting for the answer.

[Eva] was again taking a long time to think through things. I was trying to encourage her to talk through it as a way to add on to her thinking. [Eva] would say something but would not really add on. I want to get her to become more comfortable sharing her thinking, instead of having to share a polished thought. It is also hard to help of give guidance when she isn’t giving me anything to work off of.

I have scaled back on “thinking for her” or asking yes or no questions for her to answer. I am still trying to grapple with prompts and modeling I am giving her in
a way that will guide her and push her to make connections. The activities have taken longer … and I wonder if it would be better to focus on a few activities and do the rest the next day. So I might not do reading, writing, fluency and word work all in one day.

This led to conversations between Holly and me about the context necessary for both the Sources of Missed Understanding construct to work, and for comprehension to take place. Since neither can occur until the student actively attempts to make sense of a text and is willing to share it, I encouraged Holly not to succumb to the pressure of time and just tell Eva the answer or even continue to model her thinking while telling Eva the answer. Although it might have felt more rewarding or efficient for Holly to continue to feed Eva answers or aggressively lead her to the answer for the sake of getting on with a whole lesson plan, Eva would not actually be learning.

Holly agreed, and we brainstormed ways to encourage Eva to engage with a text and share her evolving understanding. This included wait time, but also talking to Eva about how the tutoring session was a safe place to try, different prompts Holly could use to draw her out like repeating back the phrase Eva offered and saying, tell me more…), various means of scaffolding other than modeling as in anchor charts or sentence starters, and ways for Eva to communicate other than verbally, like jotting on sticky notes or highlighting.

Holly’s second challenge was getting to the heart of Eva’s comprehension challenges. All the time Holly was wrestling with how to encourage Eva to talk and make her thinking known, Holly was developing her emerging diagnosis and shared it at the first research team meeting. She expressed concern that Eva was reading “superficially”
and her hunch was that Eva had Low Standards of Coherence. She observed that Eva could answer Right There questions by going back to the text and parroting back what it said. She described Eva as being less able to answer Think and Search questions adequately. Eva would be able to find two events or dates in a text, but was not able to discuss how they were related, and that sometimes Eva just mentioned the last thing that she had read. It seemed to Holly that Eva was not thinking through the text as she was reading it.

At this meeting, one of Holly’s peers suggested that her next step might be to test a hypothesis that Eva struggled with Causal/Logical Inferences because she had trouble seeing how dates and events were related. The peer wondered if Holly might teach non-fiction text structures because Think and Search questions often connect ideas in a text that show cause/effect, problem/solution, sequence, and similarity/difference. Dovetailing mini-lessons on non-fiction text structures and using that to answer Think and Search questions was a reasonable suggestion given the observations of this tutee and an example of how one teacher may have responded. However, Holly chose a different path, deciding instead to shift her instructional plan from doing QAR to the Three Important Word instructional strategy. As previously noted, the Three Important Word strategy has students select three words important to the author’s message and use them to compose a synthesizing statement. Holly wanted to eliminate the opportunity for Eva to recite verbatim from the text. She wanted Eva to discuss the text in her own words and this method required it. Holly thought this method would help make Eva responsible for thinking through a text.
Holly also began an Inquiry Project with Eva. To encourage Eva to engage more deeply with text, Holly asked her to find a topic about which she felt strongly, research it, and write an argumentative piece conveying her opinion. Eva chose to research why animals should not be kept in zoos. Holly found relevant articles at a variety of reading levels --Eva’s independent, instructional and grade-level--and a video on the topic.

Holly and Eva started reading articles about zoos utilizing the Three Important Word strategy. The good news: Eva was more engaged with the text, selected three words and composed her own sentence about the text. The bad news: Holly observed that Eva’s performance using Three Important Words strategy was spotty, and she was not sure why. Holly knew Eva’s word selection and summary sentences reflected only partial understanding of a text or article, even when an article was below Eva’s instructional reading level. Some important words were selected, but words from other important sections were omitted. While Eva was formulating a sentence in her own words, it did not capture the whole piece.

Holly was listening to her tutee and learning what Eva could not do, but Holly was not, in the moment (or in reflection), actively trying to diagnose the root cause of Eva’s incomplete understanding. Instead, she kept modeling three alternate words, explaining that she took words from all the sections, and her own synthesizing sentence. I believe this may be due to Holly’s procedural focus: She was so intent on executing the instructional method correctly that she did not think to ask Eva why she did not include words from whole sections of text.

Furthermore, Holly’s focus on the how of the task may have contributed to Eva’s performance. During an observation, and again in a transcript of a lesson a week later,
Holly asked Eva to explain the strategy. Eva described, “you have three words that stick out, and then we write them down, and then, with those three words, we make a sentence.” So, by those standards, Eva had successfully completed the task. She had identified three words and composed a sentence using them. Eva had not internalized the concept that we do this activity because good readers stop and think about all the important things the author wants readers to take away from the text and summarize that in our heads. Holly needed to be coached to put the instructional strategy in context for Eva—she needed to explain why a reader might reflect on Three Important Words, and why the words chosen and resulting sentence should capture the whole text.

For Eva’s Inquiry Project research, Holly had Eva underline relevant facts in the text and then decide if the facts supported or refuted Eva’s views about zoos. Having Eva underline gave Holly insight into what text Eva was processing without the constraints of having to select just three words. The pro/con categorization also gave Holly a view into how Eva was thinking about the meaning of those facts. Again, Holly found Eva’s comprehension inconsistent, observing that all the facts Eva underlined were important, but not all the important facts were underlined. Holly directed Eva’s attention to important facts she omitted to be sure those facts were included in the Inquiry Project research, but she never thought to simply ask Eva to explain why she omitted sections, or say “What is the author telling us here? Do you think we should include it?”

At this point, Holly’s wait time and limited scaffolding had successfully made Eva understand she would be responsible for understanding. Plus, Holly had found ways, (such as Three Important Words/summary sentence and underlining/categorizing facts) to draw out Eva’s thinking and make it visible. But Holly had not asked Eva to explain her
understanding beyond the narrow confines of the instructional strategy she had selected. As a result, Holly’s observations left her with more questions than answers. Several Sources of Missed Understanding were circulating in her mind: Does she Misjudge Importance and that is why she omits some parts? Is it Low Standards of Coherence? Does Eva understand all the text? There were a few occasions where Eva misunderstood pronoun references, so could it be she misses Referential Inferences?

When Holly and I met, we discussed how the Sources of Missed Understanding construct is based on the Construction Integration Model of comprehension. And, while it is not precisely linear, there are some parts that must occur before other parts. A reader needs to glean textual information and hold it in their short-term memory to determine what the text says before the reader can connect it to background knowledge and determine what the text means. Since Holly was unsure if Eva understood what all the text said, we decided she should start by asking Eva to retell what she had read. And, if meaning broke down, Holly should explore with Eva where and why it had.

Because Holly felt most comfortable using a specific instructional method, she agreed to try the instructional routine of Read, Cover, Remember and Retell (RCRR). After reading a section of text, Eva covered up the text and restated in her own words what the text said at the beginning, middle and end of the selection.

With RCRR, Eva could not revert back to parroting what was written in the text verbatim. Once Eva articulated what a text said, Holly then asked her to think more deeply and do a Three Important Word strategy. This proved to be effective. RCRR helped Eva notice when she did not attend or did not understand. In one case she confessed she had “spaced out the last paragraph.” Holly taught Eva to apply a fix-up
measure such as re-reading the section, or clarifying vocabulary. Holly noted that Eva’s ability to find three important words and summarize the text improved after she had first taken the time to retell it.

This is an important insight for this student. Holly confirmed her initial hunch that Eva had Low Standards of Coherence (see Figure 4.3). Eva needed to learn the necessary step of constructing what a text said, and develop the habit of re-capping it in her mind and self-monitoring her understanding. Once she understood what the whole section of text said, Eva was more successful in doing the higher thinking skill of determining importance.

![Diagram of text comprehension]

**Figure 4.3.** Sources of missed understanding Holly considered for Eva

Sadly, Eva had to leave the summer reading program in the last week due to a family illness. She left before Holly had the opportunity to administer an end-of-program BRI assessment. Overall, Holly expressed she had learned from participating in the study.
and by trying the Sources of Missed Understanding framework. On her pre- and post-surveys, Holly’s scores moved up one notch on a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree in all three areas: understanding of the factors that impact student comprehension challenges moved from a 3 to a 4, ability to effectively assess student comprehension needs moved from a 3 to a 4 and ability to differentiate instruction to meet specific comprehension needs of students moved from a 4 to a 5. Yet, through the process, Holly expressed the most concern of all the tutors. Some of this was due to the depth of Eva’s comprehension challenges and Eva’s initial evasiveness in expressing what she did or did not understand. Some of this was due to Holly’s desire for a structured, procedurally predictable tutoring process which made her the least comfortable, and possibly least efficient, tutor to use the diagnostic framework.

Holly and Eva’s case brought into sharp focus some foundational elements of the Sources of Missed Understanding framework. First, the framework is based on the premise that a reader works to make sense of a text. If that reader is willing to share what meaning (or missed understandings) he or she is constructing, a knowledgeable teacher who is armed with the Sources of Missed Understanding construct can determine where meaning goes awry. At first it was not clear that Eva was working to constructing meaning from text, or if she would be willing to share that meaning. Holly’s investment in wait time and relationship building was necessary to establish that Eva would be responsible for comprehending texts and share her thinking with Holly.

Second, the Sources of Missed Understanding construct is only a map. It is built on the premise that teachers, as knowledge workers would formatively use it to diagnose reading comprehension challenges during the course of reading instruction and flexibly
adapt instruction accordingly. Holly was knowledgeable, but her beliefs around committing to instructional choices, executing the instructional steps properly, and continuing instructional strategies with fidelity made it harder for her to use the tool flexibly and adapt instruction fluidly. It stretched my understanding as the Sources of Missed Understanding’s creator and researcher, and pushed me to see if the tool could be in a way that was within Holly’s range of comfort as a teacher. Holly raised important questions about how long a teacher uses an instructional strategy before deciding it is not effective. She also helped me consider what precise instructional practice might illuminate and ultimately address Eva’s core comprehension issues.

**Nina: Diagnostic Listening and Intertwined Sources of Missed Understanding**

Nina was a perceptive, purposeful tutor, and the most experienced teacher in the study having taught ten years. Currently a Kindergarten teacher, she had taught fourth and fifth grade in the past. Coming into the study, Nina expressed the most experience using classroom assessment, namely the Fountas & Pinnell Benchmark Assessment System to inform instruction (guided reading grouping and focus) in her Kindergarten and fourth grade teaching. As a tutor, Nina was especially intentional in her interactions with her student.

Nina’s student, Jae, was entering seventh grade, and his parents reported that Jae had an Individualized Education Plan for dyslexia and speech (articulation, disfluency, and word retrieval), and received academic and speech support in and outside the school setting. Jae’s struggles with reading were multifaceted: he was challenged with print, language and comprehension. Prior to the start of summer, Nina administered the BRI and determined Jae’s instructional reading level to be at the fourth-grade level. Like the
other students in the study, Jae’s comprehension scores were stronger for higher-level questions (topic, evaluation, inference and vocabulary) and weaker in lower-level fact-based questions. Jae missed only 13% of high-level questions and 39% of low-level questions. Nina noted on his initial assessment report, “Since he is able to answer higher-level comprehension questions with poor [decoding] accuracy and has difficulty answering factual questions, it may be that [Jae] is relying on background knowledge when answering higher-level questions.” Her initial instructional goals related to comprehension were to teach Jae to cite text evidence and self-monitor to ensure what is being read made sense. Nina observed that Jae had trouble organizing his thoughts and expressing himself. Jae’s mother said he was shy, and Nina described him as passive, willing to let her do all the talking. Nina knew she would have to draw him out. (For an overview of qualities significant to Nina and Jae’s case, see Table 4.4.)

Table 4.4
Case 4 Participant Overview

<table>
<thead>
<tr>
<th>Nina</th>
<th>Jae</th>
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<tbody>
<tr>
<td><strong>Background:</strong></td>
<td><strong>Entering 7th grade</strong></td>
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<tr>
<td>• Most experienced teacher with 10 years</td>
<td>• Significant print, language and</td>
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<tr>
<td>• Currently Kindergarten</td>
<td>comprehension challenges (IEP;</td>
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<tr>
<td>• Previous experience in 4th and 5th</td>
<td>instructional reading level 2 years</td>
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<tr>
<td>grades</td>
<td>below grade level)</td>
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<tr>
<td>• Experienced using published classroom</td>
<td>• Required by his school to read</td>
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<tr>
<td>assessments to inform instruction</td>
<td>specific summer novel (above his</td>
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<tr>
<td>• Caucasian</td>
<td>instructional reading level)</td>
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<tr>
<td>• Reflective and intentional with her</td>
<td>• Asian/Pacific heritage</td>
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<tr>
<td>prompts and instructional choices</td>
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<tr>
<td>• Saw how sources of comprehension</td>
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<tr>
<td>breakdown can be interconnected</td>
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<tr>
<td><strong>Distinctive Qualities:</strong></td>
<td>**Initially quiet, passive, and</td>
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<tr>
<td>• Initially quiet, passive, and</td>
<td>seemed he “could care less” about</td>
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<tr>
<td>seemed he “could care less” about text</td>
<td>text not making sense</td>
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<td>not making sense</td>
<td>As Nina helped him to see how to</td>
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<td></td>
<td>make sense of a text; his engagement</td>
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<td></td>
<td>and comprehension grew</td>
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</table>
Nina’s comprehension lesson planning was balanced between fiction and non-fiction. She noted that as a seventh grader, Jae would be expected to read more non-fiction than fiction. She was intentional at building capability in both genres. Her approach to each was two-fold: First she chose activities that required Jae to interact actively with the text and extract information or evidence. Second, he was asked to organize, synthesize or summarize what he had read to make meaning. While Nina and Jae’s experiences with fiction and informational texts are listed in succession in this case study, they occurred simultaneously.

In fiction, Nina selected the instructional strategy of Direct Reading Thinking Activity (DRTA) to show Jae how readers evolve their thinking as they read a story. In DRTA, a student makes a prediction, reads a portion of a text, and then confirms, discards or revises that prediction based on the information read. Then the student continues to repeat this process while reading the text. Nina’s selected a short novel at Jae’s reading level, *The Scary Day* by Jean Bennett (1999). She and Jae alternated reading pages to alleviate some of the print load, and give him opportunity to listen and comprehend.

Nina quickly discovered that Jae did not make reasonable, text-based predictions. She noted in her reflections on day one, that when Jae “was making predictions, he was not using any text evidence.” On day two she reflected, “[Jae] struggled to pull text evidence to revise his predictions.” Nina felt she needed to clarify how to make a prediction that combined clues from the text with his background knowledge. So, she introduced a graphic organizer with the headings: What the Text Said, What We Know, So What We Predict. She modeled using this format to make a prediction from his text,
and asked Jae to use it too. Nina completed a Sources of Missed Understanding recording sheet identifying both Low Standards of Coherence and missed Causal/Logical Inference as hunches. She wrote,

[Today] Jae made a reasonable prediction based on his background knowledge but couldn’t explain or state which part of the text helped him make that prediction. It doesn’t seem like he is making a connection that he can use what he knows and text evidence to help him make predictions to better comprehend the text. [He] also struggled to pull most important events.

Nina and I discussed needing to root-cause why he was not using text to make predictions—did he not understand the text, or was he unwilling or unable to use text to predict. Nina decided to engage Jae in discussing the story before beginning the DRTA process. She used a Plot Diagram to help him organize and record how the story was unfolding.

Discussions reinforced her initial diagnosis of Low Standards of Coherence. She reported her observations in a research team meeting. “He is not able to pull information from text; he is not able to organize the thought process in his mind of what is in the text.” When a peer questioned if his inability to make a text-based prediction might instead be due to Over-Reliance on Background Knowledge, Nina responded,

My thought process was: I don’t even know if he knew he was over-relying on background knowledge. He is not monitoring what he is thinking. He could care less that he is making sense of the text. He is not taking in important information.

Jae and Nina continued the process of discussing the story, recording important parts on the Plot Diagram to make visible for him how the story events were working
together to make a story arc. They also continued making predictions and adjusting their predictions using the graphic organizer. It took a lot of support and prompting from Nina, but by the last chapter, Jae knew he was responsible for making meaning from the text and that he had to raise his Standards of Coherence to effectively evolve predictions and provide textual evidence substantiating his thinking.

Nina: Okay, before you turn the page, let’s stop here; here’s our marker. Let’s look at our prediction. What did you say your prediction was going to be?

Jae: The parents are going to pick up the kids the next day and it’s going to be talked about what happened to Miss Mica.

Nina: So, what are your thoughts on that?

Jae: Take out this item and keep in that. [meaning take out one part of the prediction and keep in the other part.]

Nina: Can either of those be confirmed with what happened in the text?

Jae: What does the parents…are made to pick up the kids.

Nina: Show me where we can confirm this.

Jae: It said…there…because he was sleeping and the only way he can sleep is at home, kind of.

After they finished *The Scary Day* novel, Nina had him write a plot summary using Somebody (main character), Wanted (goal), But (conflict), So (how try to solve problem), Then (resolution) framework (SWBST). This summary scheme dovetailed with the story map used while reading the novel. Jae and Nina worked together to complete a (SWBST) graphic organizer, but when it came to writing the summary, Nina
reflected that Jae did not initially utilize it. Instead, he began to write about various parts
of the story. Nina taught him that these plot elements are the most essential parts of a
fiction story, and they revised the summary to include them. When Jae finished writing
his summary, Nina had him highlight each section a different color to reinforce the main
parts of a plot summary. She discovered he could identify the *Somebody* and *Wanted* but
not the other (*But, So, Then*) parts. This provided additional information about his trouble
identifying what information was important in fiction, and how that information fit
together to create a coherent story arc.

During this time, Nina and Jae were also reading informational texts. For non-
fiction, Nina selected books and articles related to soccer, one of his interests. She started
with texts for which he had background knowledge, but after the first week moved to
related topics (such as soccer injuries or other sports) where Jae could not rely on
background knowledge as much. During instruction, Jae and Nina identified facts, noted
them on post-its, highlighted them, or utilized graphic organizers (including Fact,
Question, Response or FQR). Nina and Jae organized the facts in a variety of ways:
interesting vs. important; more important/less important; main idea and detail, and
discussed their reasoning for categorizing facts. These instructional choices not only got
Jae actively involved in the texts, they provided Nina visibility into Jae’s thinking.
Overall, Nina concluded that Jae was stronger in his non-fiction comprehension than
fiction at least on focal topics. However, he still had comprehension gaps. She reported in
her reflection, diagnostic map and Sources of Missed Understanding recording sheet:
I learned when asked to go in and highlight important parts of a text Jae wasn’t sure where to start. He highlights sections and doesn’t gather information from text features.

[Jae] inconsistently was able to separate interesting from important on texts where he had some background knowledge.

Jae had to review the text to find details to share why concussions were more prevalent in girls. He found one right away ‘girls have less neck strength.’ The other detail was a little less obvious, maybe because it was in the middle of a sentence…’report it to their coaches.’ He could not pull this detail. Jae had difficulty thinking beyond head injuries.

Nina tried to find the cause of his inconsistency. He could find some important facts, but not all. Sometimes Jae would lock in on one fact (or detail), and miss the main point of a text. He was not using text features to help identify the main idea of a section or the purpose of the overall piece. Nina’s initial hunch was that Jae had Low Standards of Coherence in non-fiction like he had in fiction. But her ongoing observations caused her to wonder if it was related to him Misjudging Importance, or not knowing what was important for him to focus on. She reflected that the times Jae was most successful was when they had discussed the overall gist of a text first, then he could relay relevant details.

Discussed main idea of selection first—helped [Jae discuss why some facts were interesting or important].

Could transfer facts from FQR to answer [specific] questions.
Diagnostically, Nina’s hunch was that the root of Jae’s Low Standards of Coherence in both genres was that he was overwhelmed by too much information. Because he was unable to judge which information was most important, his working memory was overloaded and he could not see how pieces of information fit together. She wondered if this was why it was hard for him to express his thinking about texts, and found it challenging to summarize. (See figure 4.4 for the Sources of Missed Understanding Nina considered for Jae.)

![Diagram](image)

**Figure 4.4. Sources of missed understanding Nina considered for Jae**

To address this during their non-fiction reading instruction, Nina introduced the Three Important Word Strategy. With this strategy, Jae read a section of the text, selected three words he felt were most important to the author’s main idea, and then used those words to craft a main idea sentence. To be successful, Nina explained to Jae that he first had to develop a sense of the author’s central idea. Nina coached Jae to review titles,
headings and other text features to set an expectation of what he might learn from the reading. She taught him to notice what sections of text were mostly about. He began to choose important words, and synthesize them into a statement. Over time, this repeated practice of previewing titles and headings to set an intention for meaning making, reading to learn the important points, and summarizing the three key words into a statement helped Jae. He began to expect texts to be coherent, and was developing tools to help him to draw out and connect meaningful information from non-fiction texts.

In fiction, instruction got trickier. A couple weeks into the summer tutoring session, Nina learned that Jae’s school had required summer reading. The assigned novel, Projekt 1065, by Alan Gratz (2016) is written at a sixth/seventh-grade reading level which is his grade level, but two years above his instructional reading level, and thus very challenging for Jae. Beyond the decoding difficulty, the story had complex elements. It is a historical novel set in Germany during World War II, and the main character is a boy whose family served as spies for the Allies. There were lots of details in the story to sift through: Events related to the historical context, keeping track of “good guys” and “bad guys” when the main character was acting like a “bad guy” but actually a “good guy,” names, places and experiences for which Jae had little schemata. Zeroing in on important information so as to not get overloaded was going to be a challenge.

Jae’s parents asked for Nina’s support, and informed her that Jae had been reading the first few chapters independently at home. However, when she asked him about what had occurred so far in the story, he was unable to tell her very much. She knew they would need to get to solid ground, where he could understand. But she worried that Jae would be crushed if he had to start at the beginning again.
After a couple of days of reviewing sections of *Projekt 1065* with Jae and getting a sense for what little he had gleaned from what his reading, Nina made a plan. First, she determined that he needed to focus on the heart of the main plot line to avoid being overwhelmed. Using the Somebody-Wanted-But-So-Then framework, she summarized for him what had happened up to the point of the book where he left off independently. She explained how this story’s plot, just like his last book and most literature, follows a predictable pattern. The main character (Michael) wants to accomplish a goal of helping the Allies win the war, but there would be obstacles he would have to overcome such as the Nazi’s or being discovered as spies. As they read forward, Nina wanted him to focus on these Most Important parts of the plot.

Second, Nina created a chart with information about World War II to help Jae separate and organize information related to the setting (vocabulary, maps, main events). She hoped he would keep the WWII people and problems distinct from the fictional people and problems. They often referenced the graphic organizer to clarify the novel. After sharing both these supports with Jae, Nina reflected, “I feel like he has a more solid foundation and we were able to read a lot more today.”

Nina and Jae continued with DRTA while reading *Projekt 1065*. As they read, they stopped, discussed what happened, “bullet-pointed” [listed] main events and circled most important ones. To be important, the information needed to relate to the main character, and whether it helped or hindered his pursuit of his goal. At first, Jae had trouble distinguishing importance. For example, Nina reported that in a chapter that involved the Nazis burning books, Jae interpreted book burning to be the most important event. Nina and I conversed about how that was a common, understandable mistake.
Vivid, exciting, or compelling events capture a reader’s attention. However, Jae and other middle grade readers learn that some events are unimportant in and of themselves, but do create an opportunity for the main character to reveal, achieve, or lose something. The next step for Jae was to consider what impact the book burning had on the main character, Michael. Did it help him as a spy? Did it reveal him as a spy?

Keeping Jae focused on the Somebody-Wanted-But-So-Then of the main plot line started to create a virtuous cycle. Jae was more talking more coherently about the meaning of the text:

Nina: Okay, so let’s make a little plot diagram of this chapter, okay? Because it is important that we understand what’s going on before we move forward and read some more. They are at the dinner party…and then what happens?

Jae: Michael goes upstairs in this building.

Nina: Okay, so Michael goes upstairs—and why is that important?

Jae: Because there’s numbers where the next engine building is being built.

Nina: OK, good. Then what’s the problem that happens when he’s finding the code?

Jae: The butler comes upstairs.

Nina: Yep, and why is that a problem?

Jae: Because…he’s kind of scared, and interrupts kind of? Because Michael doesn’t want him to know.
Nina:  Ok, so Michael goes upstairs and finds the code for the factory. The butler comes upstairs—that’s the problem. How is it solved?

Jae:  He hides behind the curtains, then his mom comes upstairs.

Jae began to regularly make reasonable predictions based on the storyline that came true. Nina remarked how validated he felt when this happened. She reflected after an observation, “It has been fun to see Jae engage with this text and really develop as a reader.”

Jae still needed significant support to make sense of this text. In particular, he continued to have trouble making Causal/Logical Inferences. Nina and I discussed how challenging it is when a student has many comprehension challenges. It is not easy to disregard any, but it can be overwhelming for a student to fix everything at once. Nina made the conscious choice to scaffold Jae’s inferring, and not make it a teaching priority. She wanted him to become more adept at predicting, judging importance and summarizing/talking coherently about what he had read before adding in more comprehension concepts.

Jae’s comprehension grew over the summer as measured by his pre- and post-BRI scores. Nina stated in the final letter to his parents that Jae’s comprehension grew from 40% correct to 80% correct when reading and responding to questions on a fourth-grade passage, and that he had demonstrated adequate accuracy and comprehension on a fifth-grade passage. More importantly, his sense of himself as a reader grew. When his parent came to observe, Jae enthusiastically described and demonstrated how he used the Three Important Word Strategy, DRTA, and Somebody-Wanted-But-So-Then to make meaning of informational and fiction texts. He and Nina shared with his mother how to
focus on the most important part of the plot in Projekt 1065, as he would need to complete the novel at home with her support.

As with the other tutors in the study, Nina reported that she had learned from the experience. She also scored herself as more able to effectively assess her students comprehension needs and as having a better understanding of the factors that influence her students comprehension challenges on the post-test than on the pre-test, by scoring herself a 4 (up from a 3 on the pre-test). Interestingly, Nina reduced her score on her ability to differentiate instruction based on students comprehension needs. On this she went down from a score of 5 (out of 5) on the pre-assessment, to a 4 on the post-assessment. I believe this reflects how complicated it can be for a teacher to address multiple, interwoven comprehension challenges.

Nina’s experience with Jae demonstrated the importance diagnostic listening. She found it relatively easy to be able to identify that Jae had Low Standards of Coherence because he could not make a text-based prediction or answer a literal question. She knew early on that she would have to help him become an active reader. But what she kept coming back to in our meetings and in her reflections, was that Jae could not organize his thoughts when he tried to make meaning from a text. It was this noticing that helped Nina address Jae’s core comprehension need. She found that his inability to construct a coherent representation from a text was at least partly due to not knowing which information to direct his attention and how those important parts fit together. Once she was able to teach him the structure of fiction using a story map and the summarizing framework of Somebody-Wanted-But-So-Then, and taught him to use non-fiction titles
and text features to discern the central message an author wanted a reader to learn, Jae
was able to focus on the most relevant details and texts started to make sense.

Nina’s work with Jae also illustrated the mindfulness required to adapt scaffolds
to a student’s zone of proximal development. Nina was acutely aware of how her
instructional moves impacted Jae’s comprehension, and flexibly adjusted a variety of
supports based on the difficulty of text, task and Jae’s performance. She became
increasingly intentional in her word choice, saying, “I am learning that the way I frame
questions is important to his understanding.” This practitioner mindfulness and
preparation is consistent with the findings in the King’s Medway Oxfordshire Formative

Finally, Nina’s experience highlighted the fact that Sources of Missed
Understanding can be interrelated. A gap in one part of the comprehension process can
have implications on other parts. Sometimes a teacher can prioritize one at a time, as
Amy did with Parker and Nina did by not stressing inferences with Jae. Other times, a
teacher will need to address Sources of Missed Understanding simultaneously, as Nina
did with Standards of Coherence and Misjudging Importance.

Elena: Finding the Right Support for the Tutor and the Tutee

Elena was a very student-centered tutor. At the time of the study she had taught
two years of Kindergarten in a school that embraced a Progressive Education philosophy
and was expecting to teach first grade in the same school the next year. She completed
her student teaching at that school as well. In between, Elena had taught first and third
grade in different districts and schools. She came to practicum and the study with strong
ideas about creating opportunities for student discovery and keeping curriculum and lessons flexible to student interests.

Elena’s student, Leah, was entering fourth-grade. Like the other tutors, she administered the Jerry Johns Basic Reading Inventory (BRI) prior to the summer session. Elena determined Leah’s instructional reading level to be at third-grade overall, but noted that her ability to read and comprehend fiction was higher than non-fiction. She also determined that Leah’s reading fluency rate at this level was at the 35th percentile when reading aloud, in part because she was attempting to solve unfamiliar words. She also noted that Leah inconsistently self-corrected, often not addressing significant miscues.

Elena analyzed Leah’s responses to comprehension questions as categorized by the BRI tool, and stated in her diagnostic testing report that Leah’s “most common comprehension errors were fact-based (39% of total percent missed) and inference questions (44% total percent missed) while topic and vocabulary questions saw the fewest comprehension errors (3% of total missed).”

Elena was initially concerned about the impact of Leah’s fluency on her comprehension. She analyzed the BRI data to determine whether Leah’s print errors might be causing comprehension issues, and concluded “[Leah’s] comprehension errors did not follow a pattern with the number of words misread, indicating that she was not internalizing or not comprehending the words she was reading, even if she read them well.” The BRI analysis, coupled with Elena’s observations the first week of the Summer Reading Program, caused her to reframe her thinking about the fluency/comprehension link. Instead of disfluency contributing to Leah’s comprehension breakdown, Elena
suspected Leah’s “over-focus on decoding and fluency rather than on comprehension…” might be contributing to her superficial understanding of texts.

Elena noted that Leah’s self-selected goal for the summer was print-based, to pay attention to punctuation. Elena was more concerned with Leah’s inability to retell a text after a single read, and her unwillingness to ask questions when she did not understand. Elena reflected on day two of the Summer Reading Program, “her decoding could use support, but it is not interfering greatly with her reading…. [but] when I stopped her to check about a definition of a word, she often said she did not know. She did not ever initiate asking for a definition.” On day three she reflected, “my biggest noticing from today was Leah’s need to reread passages as she struggled to speak to text without a second read through.” As a result, Elena chose to emphasize meaning making instruction (vocabulary, comprehension and responsive writing) over direct decoding and fluency instruction in her lesson planning. (For an overview of Elena and Leah’s characteristics, see Table 4.5.)

To address Leah’s gap in fact and inference-based comprehension, Elena stated in her diagnostic report that she would use “strategies to help her stop and think about what she is reading, self-monitoring her understanding, and making a connection to what she is reading and why it matters.” In the first lesson, Elena explained to Leah that the point of reading is to understand the text, not just read it accurately, smoothly and quickly. She asked Leah to share what reading strategies she already uses. Leah reported that in school she does stop-and-think, post-its and partner-talks. Elena built on the stop-and-think strategy by having Leah ask her self the questions: “Was it clear? Was it fuzzy?”
Elena quickly learned that simply asking Leah if what she read was clear or fuzzy did not ensure that she was actually making sense of a text. In her reflections, Elena described Leah as “a people pleaser,” which is how Leah’s mother and teacher also characterized her. She wrote in her reflection “it was evident today that [Leah] was hesitant to ask questions and would default to agreeing with me…. I will address her comprehension skill building so she will not be able to default to ‘I don’t have any questions’ or ‘it all makes sense.’”

To be more direct, Elena started having Leah use the instructional method of Read, Cover, Remember, Retell (RCRR) when reading non-fiction. As mentioned previously, with this practice, a student reads a section of a passage, covers it, remembers what they just read, and retells it in his or her own words. When reading fiction, Elena tried asking Leah specific questions about inferring character feelings. During instruction in both genres, Elena was struck that Leah needed to read a section of text a second time
before attempting to respond to a comprehension prompt. She came to a research meeting a week into instruction reeling with possible causes: Attention issues; worries about short term memory; lack of vocabulary as Leah did not know many words in the texts they were reading despite the BRI scores, and Leah had scored lower on a different assessment, the San Diego Word Test; and Low Standards of Coherence because Leah did not seem to notice she was not understanding or ask for help.

Elena included Low Standards of Coherence as a possible diagnosis, even completing a Sources of Missed Understanding recording form, but she seemed to be troubled by the idea a student would settle for superficial understanding. It may have felt inconsistent with her belief that students seek discovery learning. At this juncture, Elena expressed that she was more inclined to hypothesize that Leah’s comprehension issues were outside of her control: attention, memory, and/or lack of vocabulary.

As a research team we suggested Elena have Leah complete retells using a text with simpler language to determine whether hers was a thinking concern, or a vocabulary issue. We acknowledged that both memory and attention are required for the comprehension process to occur as noted in the comprehension process portion of the Sources of Missed Understanding taxonomy, and that readers need to hold the information they pull from print into their short-term memory to build a coherent representation of what a text says.

Elena proceeded. She and Leah partner read sections of simpler non-fiction and fiction texts, stopping to have Leah retell what she had read or heard. Elena reported that Leah was able to retell inconsistently, stating “she at times would recall a good amount, other times just the first sentence, on other times nothing at all.” This was true across
fiction and non-fiction both when Leah read herself and when she listened. Because there were times Leah could retell, or recall more with prompts, Elena started to believe her issues were related to attention more than memory. Elena asked Leah if her mind wanders as she reads, and reported that Leah admitted she “sometimes is thinking/picturing another part in the story and sometimes she thinks about other things.” We discussed that Elena may need support allocating her attention and monitoring for meaning which we hoped, would raise her Standards of Coherence. (See Figure 4.5 for the Sources of Missed Understanding Elena considered for Leah.)

**Figure 4.5. Sources of missed understanding Elena considered for Leah**

Elena and I met to brainstorm how to accomplish this. We acknowledged that going back to re-read the text seemed to be Leah’s only strategy, and even then, her responses were surface level. We then set a goal to encourage Leah to focus on meaningful information and make sense of what she was reading as she was reading it the
first time. Elena wanted Leah to stop periodically and check for her own understanding (such as clear or fuzzy), but Leah did not seem to know what to check for. We considered what a reader ought to focus their attention on as they read. Elena felt strongly that Leah be part of developing a “metacognitive check-in list” so that she would feel ownership of her comprehension process, which they did. They brainstormed what Leah should know after having read a section. The list included items such as: What characters are there, and what is happening.

Elena and Leah used this list during Guided Reading and read-aloud. Elena reported that Leah was remembering more of what she reads, but is still very teacher dependent on when to stop, and on teacher prompts to drive to deeper thinking. During an observation I noted that Elena was largely driving the discussion. I used the term “pepperering her with questions,” and I jotted these notes to capture the Elena’s part of about a two-minute conversation verbatim:

Do our check. Do you know what’s going on?

He hates it, but why?

Where do we stand now? What is least favorite class?

Why do you think that is?

Let’s take those both…why do you think___?

Put yourself in that position. How would you feel?

Elena wanted Leah to “see” the meaning. When Leah was not doing so, Elena reacted by asking many questions in an effort to “line up the dots” so that Leah could produce meaning or at least answer the question. The problem, in my view, was that Leah
was not learning to comprehend a text. In fact, she was not even looking at the text. She was focused on Elena and trying to say the correct response for her.

At a follow-up meeting, Elena and I conferred about ways she could continue to help Leah to self-regulate her own meaning making. I reminded Elena that readers need to construct what a text says before they can delve into deeper meaning. Thus, Leah might need more time to digest what is going on, and get a clear picture of what the text is saying before jumping directly to inference and synthesis questions. Second, I shared a concern that Elena’s lessons were all oral. I explained that Leah might need a visual support—cards or an anchor chart of the “metacognitive list” of what she should remember. That way, instead of Elena doing all the talking, Leah could refer to the visual prompt and thereby be taking on more and more ownership.

Elena created both “check-in” and “think deeper” cards for Leah and let her draw pictures on them to visually capture what they meant for her to do. They agreed on stopping at the end of two pages, or the end of a chapter if it was less than two pages to pause and monitor for meaning. Leah could first select from the “check-in” cards to help her retell important events from the text. Then, she (or Elena) would select a relevant “think deeply” prompt. At first, Leah would not pull a card on her own, and Elena would have to nudge her. Leah especially resisted taking a “think deeper” card. Elena began to feel disheartened, writing in her reflection, “My current wondering is why or what is keeping her thoughts surface level and how I can support her becoming a more independently deep thinker. She is very capable, but [she] keep[s] her answers simple…”

I encouraged Elena to stay the course. I reminded her that what she was asking of Leah was new and difficult. Building comprehension skills takes time. A couple of weeks
ago Leah could not remember what she had just read. There are lots of steps to becoming a deep thinker. With practice, the process they created began to have an effect. Elena reflected that in fiction, Leah was better able retell the story and consistently answer literal questions. When drafting her diagnostic map, Elena added that Leah was becoming more independent at self-monitoring. She was asking for help when she did not understand. She was growing more capable in selecting the most appropriate card for the purpose, but still did not always remember to self-stop.

A couple of weeks later, Elena reported in her reflection that after Leah re-told a short fiction story section consolidating general understanding, they explored understanding characters more deeply. They not only questioned what happened, but why a character acted or responded a certain way. When Elena and I met, Elena described that she had felt Leah was now ready to move up the “comprehension continuum,” to not just understand what the text said, but discuss it more deeply. Soon Leah was not only becoming more capable of recapping what a text said, she was becoming more able to analyze characters.

In parallel to growing Leah’s fiction comprehension, Elena wanted Leah to apply self-monitoring skills to non-fiction. They discovered that the cards they created for fiction did not naturally transfer to non-fiction. So together they explored what information a reader should notice when reading non-fiction. They decided that a reader should focus on understanding what the author wants the reader to learn from the text. Elena taught Leah to use the titles and text features to set an expectation of the author’s central message. Over the next few days, they added to their non-fiction check-in list. For
example, when Elena realized that Leah was focusing on small details, she added “thinking about beginning, middle and end of text” to the list.

Soon, Leah was effectively stopping and retelling small sections of non-fiction text. However, when she attempted deeper thinking prompts—to make connections within the text, across texts on similar topics, or to background knowledge—Elena noted Leah frequently came up with “improbable answers.” As the summer was coming to a close, Elena was collecting hunches—Misjudged Importance, Missed Causal/Logical Inferences and Over-Reliance on Background Knowledge. She did not have enough time and experiences to determine the primary source of Leah’s propensity to confuse. However, Elena did engage Leah with discussions about interesting versus important information, and tried to get Leah to connect facts within a text.

Leah made great strides during the five-week summer program as measured by the BRI. She read the third and fourth grade BRI passages with 100% accuracy and 90% or above comprehension in both fiction and non-fiction. In Elena’s final letter to Leah’s parents she noted that Leah “worked hard to …self-correct and self-monitor for meaning … [and] to implement strategies and use text-based evidence to support her ideas…” but that “data from assessments and observations indicate [Leah] has greater difficulty comprehending and accurately reading nonfiction texts.”

Elena also reported growth in her own understanding of comprehension as a result of her experience with the Sources of Missed Understanding construct. In comparing her scores on her pre- and post-surveys, where on a scale from 1 to 5 where 1 is strongly disagree and 5 is strongly agree Elena scored herself higher at the end of the summer in her understanding of factors that impact student comprehension challenges, her ability to
assess comprehension needs and her ability to differentiate comprehension instruction with each score bumping from a 4 to 5. She explained in her post survey that the Sources of Missed Understanding construct “helped me understand how learning grows within [a student’s] own comprehension.” She elaborated that she viewed the taxonomy as a learning continuum. “As my student was higher along the construct, I knew she was ready for more complex prompts and texts…. I also used it as a guide to know when I needed to spend more time on a specific source of missed understanding.” That richer understanding of a reader’s comprehension process is what she brought back to her first-grade classroom. In an e-mail exchange, she shared “I have used [the Sources of Missed Understanding Construct] in professional knowledge and understanding, but not in current instruction due to the level at which my students are reading (units of study have focused on decoding and word solving strategies). I do plan to use it when we begin our focus on comprehension.”

Furthermore, Elena valued how the tool empowers teachers as knowledge workers. Elena wrote, “The [Sources of Missed Understanding] Construct was able to inform my understanding of the current performance and missed understanding of my student as well as guide my next steps while allowing me autonomy to choose how I instruct at that next step.” Elena’s case study highlighted two essential elements of support teachers need to use the tool successfully. First, teachers need to understand the reading process. The Construction-Integration Model of Comprehension, upon which the Sources of Missed Understanding framework was based, describes the progression of cognition that occurs as a reader makes sense of print. While the Sources of Missed Understanding construct tested was not precisely sequential, it had some qualities of a
comprehension continuum. As Elena learned, Leah needed to focus and construct a basic understanding of what a text said before she could consider deeper evaluation or synthesis of what it means. For Elena, understanding where in Leah’s comprehension process the miscarriage took place was at least as informative as the precise source itself. In fact, Elena recommended that future iterations of the Sources of Missed Understanding construct represent more clearly parts that are sequential.

Second, my experience coaching Elena, like that of Holly, brought into focus the variability of teacher philosophies, and the impact those views would have on what support the teacher might need. Elena joined the study with convictions about how students learn and how she should teach. While she was completely open to the Sources of Missed Understanding construct, dedicated to the study, and an insightful research team member, I found myself working to imagine the diagnostic process through her eyes, and view instructional options through her lens. This caused me to consider how the tool, language, examples or support might need to be enhanced to be inclusive of different teachers and teaching styles.

Case Study Conclusion

All five tutors successfully used the Sources Missed Understanding construct, and all stated they believed they had gotten to the heart of their students’ comprehension challenges. To do so, tutors used a variety of means to learn their tutees’ levels of understandings: Open ended questions, observations during instructional routines, post-it notes, index cards, written and oral responses, written and oral summaries. Tutors developed hunches based on those formative observations and made logical methodological choices to act on those hunches, sometimes to gain further data and other
times to respond with an instructional plan to address the source of missed understanding. Each followed a diagnostic path specific to their tutor/tutee situation, and sought coaching support at different points along the process.

**Cross-Case Analysis**

Cross-case analysis identified themes among the tutors’ experiences as they used the Sources of Missed Understanding construct. The learning shared in this section aims to address the second research question: To clarify the training, preparation and ongoing coaching support tutors needed to be able understand use the tool effectively. It also sought to describe circumstances that underlie adjustments in support.

Interestingly, all five tutees initially presented with similar comprehension strengths and weaknesses coming out of the BRI assessment. All were found to be less able when answering questions that required them to draw information literally from the texts. Yet each had a somewhat different path with the Sources of Missed Understanding construct. This is consistent with the conceived conjecture of the tool as being analogous to a map, allowing each user the flexibility to find their students’ path to better understanding. It is also in accord with the scholarship on students with Specific Comprehension Difficulties (SCD), which finds they are a heterogeneous group, requiring different interventions and instruction to address specific sources of struggle (Cain & Oakhill, 2006; Spear-Swirling, 2011). It demonstrates the benefits for teachers of having more finely grained tools for identifying students’ specific sources of struggle than is provided by a single reading inventory.

The case studies also illuminate how teachers are a heterogeneous group. Each tutor received the same initial whole-group training, Sources of Missed Understanding
support materials, and recording forms prior to the summer session. Each was provided the same diagnostic map structure to frame her diagnostic process. Still, each tutor brought her own interpretation of how to use this formative assessment tool that was consistent with her background, experience, beliefs and interactions with her tutee. Each required different coaching to be successful in her diagnostic process.

**Contextual Experience Counts**

Tutors most facile with the Sources of Missed Understanding framework had background that closely matched the tools use. Amy’s experience working with Tier 2 and Tier 3 third-graders in small groups mirrored the context in which I created the tool. She was the most comfortable participant throughout the study and she continues to use the Sources of Missed Understanding formative assessment in her regular job. Nina had significant experience teaching reading comprehension to upper elementary students. This experience likely informed her diagnostic listening, which helped her drive to the heart of Jae’s complicated comprehension challenges and systematically address them.

Beth was also an experienced upper-elementary grade teacher and she utilized the Sources of Missed Understanding construct well during the study, but reported she was did not to transfer the tool to her classroom of higher achieving readers because she did not see that it would apply. The context of higher performing readers was inconsistent with the context in which the Sources of Missed Understanding framework was developed and in which she used the construct this summer. One could argue that the tool could apply to any student working at his or her zone of proximal development. But Beth did not see the value outside the tool’s original context.
The tutor with the least contextual experience, Holly, needed the most support analyzing her student responses and diagnosing her missed understandings. The farther a teacher’s previous experience is from the context to using the Sources of Missed Understanding framework, the more support the teacher needed. This tool relies on teachers acting as knowledge workers. The more context they have for this diagnostic situation, the more effective this tool may be.

**Tutor Stance Matters**

Every tutor began the Summer Reading Program with a hypothesis about her tutee’s comprehension challenges based on a BRI pre-assessment and a corresponding instructional plan. They also arrived with personal philosophies about learning and teaching. Some tutors immediately embraced the diagnostic stance: “I’m going to learn how you think.” They easily engaged in inquiry listening and flexibly evolved their prompts or instruction to pursue hunches and hone in on comprehension mishaps. Other tutors remained in the teaching stance longer: “I’m going to get you to do/say/discover/know X.” These tutors had strong ideas about teaching and learning. Holly’s focus on instructional procedure and Elena’s persistence that her tutee Leah would discover meaning if Elena created discovery opportunities through leading questions), caused these tutors to have a longer diagnostic process. These tutors also stretched me, as their coach, to view their students and the tool through their lens, and to support their diagnostic probing and instructional choices in ways that were consistent with their perspectives. Despite their differences, all the tutors reported they felt they had successfully used the Sources of Missed Understanding construct to determine their tutee’s core comprehension need. This suggests that with support, the construct can allow
for different teacher stances. Still, these experiences cause me to consider if the training, support materials and future coaching preparation could be made more explicitly inclusive of different stances.

**Reader Characteristics**

Reader characteristics such as emotion, interest, culture, attention and short-term memory were raised as factors explicitly in three of the five tutees diagnostic processes, and while not directly discussed, very likely played a role for the remaining two. Daniel’s strong emotional response to having to dig into texts had to be addressed as part of Beth’s plan to improve his comprehension. Peter’s disinterest in and subsequent dismissing of in the human relationship part of his novel had to be brought to light for him to adequately comprehend. Amy helped him come to understand that part of comprehending literature is considering the human story, even if he finds it less engaging than the action. Elena’s work with Leah involved creating tools to help her allocate attention toward making and monitoring meaning in a text. Finally, Eva and Jae’s print challenges likely taxed their working memories making comprehension even more of a challenging, thus, they exhibited low standards of coherence. Tricky reader characteristics inevitably impact the comprehension process. Many of these characteristics were depicted in van den Broak and Kremer’s (2000) model, which together with Perfetti and Adlof’s (2012) pressure point analysis served as a basis for the Sources of Missed Understanding construct. Yet these reader characteristics were not meaningfully addressed as part of the training or the tool. This is an area for future improvement.
Diagnostic Processes Made Visible

As described in Chapter Three, all the participating tutors expressed insecurities about their use of the tool during the first two weeks. While they appreciated that the tool placed teachers in the driver seat as knowledge workers, they were worried about using the Sources of Missed Understanding construct “correctly” and expressed feelings of being “lost.” This insecurity was addressed by drawing a map of each tutor’s diagnostic process. The maps showed the iterative process of diagnosing comprehension challenges—namely that the tutors were using data/observations to stir their thinking which resulted in instructional choices. Tutors would then use observations from instructional outcomes to begin the process again. The sketches were a result of was my synthesis of observations, tapes, discussions, comprehension reflection sheets, practicum reflection sheets, lesson plans, and one-to-one coaching meetings.

The impact of sharing each tutor’s diagnostic process proved to be pivotal; it was moment their teaching became metacognitive. By making each tutor’s thinking concrete and visible, each could more clearly conceptualize her instructional moves in relation to her student’s thinking. Tutors became more aware of what they noticed, and how to set up instruction to notice. Sharing diagnostic maps gave tutors confidence in their diagnostic reasoning process, and made each process more intentional and strategic.

Following the initial sharing of each tutor’s diagnostic map, tutors helped co-record the remaining diagnostic iterations. This mid-study adaptation to the originally planned supports was essential to developing the metacognitive teaching necessary for this tool to be successful. While tutors expressed some interest in seeing other tutor’s processes, they communicated clearly that they appreciated mapping their own most.
This addition would be a necessary consideration for future research or implementation of the Sources of Missed Understanding construct.

**Thinking-Partner Preferred**

Also described in Chapter Three, was that tutors found the support of the group during research team meetings only moderately helpful. They preferred one-on-one support of a thinking partner on their diagnostic journey. I too, recognized that my ability to provide coaching was enhanced by the fact that I observed the tutors/tutees, listened to recordings of sample lessons, and benefitted from their reflections. I came to deeply understand each tutor/tutee pairing. This tool is about helping teachers understand what happens in the mind of a particular student as they read, and where the student’s thinking goes awry. It is a highly individualized formative assessment, and it stands to reason that teachers who use it would benefit from individualized support.

However, I noted an unexpected finding in that the tutors peer-coached practicum students outside the scope of this study. Practicum students (including the five participating tutors) videotaped a lesson, shared it with a peer, received coaching from the fellow-tutor, and reflected on their experience giving and receiving coaching. My colleague, the lead professor in the practicum, graded this assignment, and reported to me that several of the participants in the study referred to the Sources of Missed Understanding construct as they were coaching their peers. This caused me to wonder if networks professional learning communities could be developed where teachers experienced with the Sources of Missed Understanding framework could be paired with those new to the framework as thinking partners.
After the Diagnosis: Instructional Plan Support

A significant amount of coaching support was requested by tutors to determine and adapt the instructional plan for addressing their students’ flawed reasoning process. This was unanticipated at the start of the study. The Sources of Missed Understanding construct was developed as a diagnostic map to help teachers identify causes of comprehension breakdown. The assumption was that once the critical source of confusion was known, teachers would be able to adapt instruction to bring the student to understanding. The research showed that supporting the diagnostic process was important, but equally important was coaching to inform instruction. Some of this may have been due to the fact that the study was part of a practicum program within which tutors were still learning about reading comprehension pedagogy and how to adapt it to address student needs. It also may be due to the fact that adaptive teaching is tricky. I was reminded of Dylan Wiliam’s (2006) observations of “formative intention but little informative action” (p. 7) in classrooms. During this study, tutors needed support using the evidence they collected to take informative action.

Tutors learned there is not a simple cure to any category of missed understandings. Even with an accurate diagnosis, there is no single “right answer” for every student. Much of the thinking-partnering involved working together to identify possible instructional options, observing the tutee’s response to instructional choices, and evolving the instruction as needed. The Source of Missed Understanding construct was useful in this phase because it helped define what change in comprehension we were looking for. It brought focus to both the instructional options and the expected outcomes.
When observations did not yield expected results, we could then discuss how to further adapt the instruction.

**Training and Materials Utilized—and Improvements Suggested**

During research team meetings, tutors reported the initial training was necessary and effective. Before the first day of the Summer Reading Program, tutors received a notebook containing a subset of slides from that initial training. These included the Sources of Missed Understanding overview, which the tutors nicknamed “the continuum page,” and pages dedicated to each source of missed understanding with more detailed descriptions, which the tutors nicknamed “the breakout pages.” Tutors continually referred to their notebooks, bringing these materials to research and individual meetings, and were seen leafing through them as they analyzed their students responses to comprehension prompts so as to provide clarity to their diagnosis.

Through the course of the study, tutors provided feedback about the materials. Amy and Elena shared they found the continuum page particularly helpful. Amy noted, “some upper level skills may not be able to be reached without some lower level skills.” However, they also expressed some frustration that the vertical schematic made the process look completely linear, when it is not. They pointed out tutees from our study had multiple sources of missed understanding, at different points in the vertical scheme, and that is was not clear that one always had to address a lower level skill before an upper level skill, or that some could be interrelated or addressed simultaneously. The tutors suggested a revised, schematic, which Elena sketched with support from the others (see Figure 4.6). The tutors felt this more clearly depicted the parts that were linear and those that were not.
Tutors also used the breakout pages. In particular, Nina, Beth and Hannah described referring to those pages to help them diagnose where a student belonged. However all of the tutors expressed they struggled with the difference between fiction and non-fiction, and they felt the supporting materials needed to be clearer about genre. In research team meetings we had rich conversations about whether a reader’s comprehension process and reasoning was truly different in fiction and non-fiction, debating if the categories of sources of missed-understanding differed, and eventually deciding that for the most part, the thinking was similar. However, because of the different demands on the reader, the symptoms/descriptions on the break out pages could more clearly show how a missed understanding might appear different when reading informational text than fictional literature. This is an area of improvement.

**Middle Schoolers Are Complicated**

The Sources of Missed Understanding construct was conceived during my work with upper elementary Tier 2 and Tier 3 readers, but only two of the tutees in the study
were in upper elementary grades, with the remaining participating students were entering seventh grade and eighth grade. Despite this grade difference, tutors were able to use the construct to diagnose their middle school tutee’s comprehension challenges. Yet, the experience with middle schoolers was more complex, which may be due to a number of reasons: Ingrained reading habits, more complex texts, and the need for multiple weaknesses to be shored up, to name a few. It is unclear if the “sweet spot” for this assessment is grades upper elementary, or if it should be recommended for use through grade 8. This point is open to further research.

**Guidance for Unanswerable Questions**

Through the course of the study, tutors raised important questions such as, “Can two or more Sources of Missed Understanding be addressed simultaneously?” and “How do you know if a student’s reasoning is fixed and a Source of Missed Understanding is not longer a concern?” The answer to these questions is situation dependent, requiring professional judgment. Nina worked with Jae on multiple Sources of Missed Understanding because she believed his Low Standards of Coherence was directly linked to his Misjudging Importance. So in her view, the two needed to be considered hand-in-hand. Amy decided to prioritize Misjudging Importance for Peter, even though he also demonstrated need for support in inferring and drawing conclusions. She felt strongly that this focus was necessary to improve a major road-block to Peter’s comprehension. Both teachers made the choice they believed would help bring their student to improved understanding.

Similarly, teacher judgment is required to decide when a student’s reasoning patterns become solid and a Source of Missed Understanding is no longer a concern. Beth
suggested it be demonstrated in multiple instructional situations and texts so that a teacher is sure the reasoning is generalizable to comprehending overall, and not just to a particular instructional routine. While these important questions do not have simple answers, some guidance on these topics would make the Sources of Missed Understanding construct stronger.

**Cross Case Conclusion**

The observations across the five tutor/tutee pairings highlight learning about the contexts under which the Sources of Missed Understanding framework may be most effective. Teachers with experience similar to its use most naturally and effectively used the formative assessment framework. This suggests a target audience for this tool be experienced upper elementary school teachers/reading specialists who work with struggling readers (Tier 2 and Tier 3) one-to-one, in pairs or in small groups. Since this tool relies on teachers acting as knowledge workers—knowledgeable about comprehension, individual students, the tool and the texts—it stands to reason that the more relevant experience a teacher brings to the diagnostic events, the more effective they will be.

Tutors who most successfully used the tool were also most comfortable taking a diagnostic stance. This tool requires teachers to pause a planned lesson sequence and temporarily shift the focus away from trying to get a student to do or say a target learning in order to probe what the student did or did not understand. It required active listening. It required wait time. It required creativity and flexibility to find ways to elicit student thinking. Some tutors found this challenging.
The tutees in upper elementary grades were simpler to diagnose than the middle school students in this study. At the younger grades the texts were less complex and the issues were less layered. The Sources of Missed Understanding construct did work for middle school grade students, suggesting that it is possible to be used in this grade range. However, it may be most effective with upper elementary students.

Cross case analysis also illustrated training and supports teachers need to use the tool. The formal training informed tutors about the Construction Integration Comprehension Process and the Sources of Missed Understanding framework. This knowledge building helped make the invisible more visible. It enabled tutors to “see” and name what happened in the minds of their tutees as they worked to make meaning. They developed the capacity to notice where and why comprehension fails. Some of the thinking-partnering was directly related to use of the framework: We shared observations, categorized hypotheses of the sources of missed understanding and zeroed in on areas where tutees had a propensity for confusion. It was in these moments that tutors raised important questions and suggestions to enhance the Sources of Missed Understanding construct. The tool and the training were necessary for tutors to become metacognitive about their tutee’s comprehension. But this was only part of the power of this diagnostic tool.

The other part of the coaching and thinking-partnering was developing a tutor’s trajectory of diagnostic teaching. Key to unlocking the power of Sources of Missed Understanding framework is the ability of each tutor to become metacognitive of her own thinking, her instructional choices, and the direct effect of those choices on her tutee’s comprehension. The diagnostic maps were a vehicle for making that process visible, and
a launching point for a discussion of observations and options. Coaching at each phase of the diagnostic process was tailored to each tutor. However several predictable thinking-partner touch-points emerged across the cases, as did themes of the types of support tutors needed from a thinking partner to be successful (see Figure 4.7).

Figure 4.7. Touch-points for thinking-partnering
CHAPTER FIVE

DISCUSSION

This whole inquiry began with a wish, that there existed a framework similar to running records and miscue analysis that would enable teachers to diagnose gaps in students’ comprehension during the natural course of reading instruction. I believe there now is. Five individual teachers, working with five different students, successfully used the Sources of Missed Understanding construct during a five-week university summer tutoring session. While this study revealed opportunities for improvement in the tool itself and insights into the support teachers need to implement diagnostic teaching, it worked. Teachers were empowered, holes in readers’ comprehension processes were exposed, instruction was tailored accordingly, and student comprehension improved.

Research Premise and Questions

Like Goodman’s (1969) research that led to miscue analysis, this research began with the premise that when students makes an error and they are working to make sense of a text, it creates an opportunity for the student and teacher to explore and categorize how the reasoning process miscarried. This inquiry also began with the premise that teachers are knowledge workers who strive to understand and address their students’ inability to comprehend texts, but may not yet have practical knowledge of the reading process and critical sources of comprehension breakdown during that process such that they can efficiently determine how and where a student’s understanding goes awry.

The hypothesis was that, when given a framework of the sources of comprehension break down together with the instruction to understand the framework, teachers as knowledge workers who understand their student, the text, and
comprehension would be able to effectively probe student missed-understandings to identify and categorize the source of comprehension failure. A collection of such observations could help teachers deduce individual students’ propensity to confuse, which could be used to inform instruction.

Using a design experiment approach, this study sought to answer the following questions:

1. How do teachers use the Sources of Missed Understanding construct during the course of five-week one-to-one reading instruction?
   a. What is the diagnostic process in which a teacher engages as he or she uses this tool to determine the causes of meaning break down for a student?
   b. What kinds of prompts, interactions or conditions encourage students to make their thinking or confusions known?
   c. How is this information used to inform instruction?

2. What training, preparation, and/or ongoing coaching support do teachers need to understand how to understand use the tool effectively?

**Interpretation of Findings**

The findings of this research study largely bore true to the premise and were consistent with research on formative assessment (Black & Wiliam, 2000; Black, Harrison, Lee, Marshall & Wiliam, 2003; Pellegrino, Chowdusky, & Glazer, 2001; Valencia, 2011b) and adaptive instruction (Vaughn, Parsons, Gallagher & Branen, 2015). When armed with the Sources of Missed Understanding framework, training in the reading comprehension process, common reasons for meaning breakdown, and thinking-
partner support to develop diagnostic habits of mind, tutors were able to successfully identify their tutees comprehension challenges and make informed instructional choices to address the underlying causes of confusion.

This research showed the Sources of Missed Understanding construct, not unlike Goodman’s miscue framework, requires teachers to have two levels of understanding in order to impact student reading ability. First, teachers need the taxonomy to illuminate common categories of comprehension breakdown and where they fall in the comprehension process. It is this knowledge that enables teachers to analyze what meaning their readers are (or are not) gleaning from a text and hone in on the cause. Second, teachers need to become self aware of their thinking about their students’ thinking. Teachers must become attentive to what they observe, and how to set up instruction to detect and ultimately address sources of missed understanding. As tutors became more mindful, they begin to strategize each instructional move in relation to their students’ evolving learning.

An important finding of this study is that to use the Sources of Missed Understanding construct effectively, tutors needed support in both. The framework, support materials, initial training about construct and thinking-partnering developed the tutors’ practical knowledge of the reading process and critical sources of comprehension breakdown during that process. This was essential knowledge building, however, this was not enough. Tutors also needed significant, ongoing coaching to develop diagnostic thinking patterns and become mindful of how their choices shaped their students’ understanding. They needed coaching to adapt instruction.

Knowledge Building: Understanding Sources of Missed Understanding Framework
Training about the Construction Integration Model of comprehension, the Sources of Missed Understanding construct, and my personal diagnostic process were provided and handouts were provided for tutor reference as outlined in Chapter Three. These materials and training proved necessary for tutors to successfully use the tool to diagnose and address their tutee’s comprehension breakdown. The Sources of Missed Understanding framework served its purpose as a map, to illuminate for tutors where and why in the reading process their students’ reasoning failed, and it helped them to monitor their student’s progress toward understanding. Knowledge building about the comprehension continuum, and how skills can build on one-another, informed tutors instructional choices.

Tutors valued and often referenced the construct materials, requesting improvements such that they better exemplify how the Sources of Missed Understandings may be conveyed differently in non-fiction and fiction. Some tutors sought support for addressing reader characteristics that impact comprehension such as emotion, attention and memory. Reader characteristics were more strongly emphasized in van der Broek and Kremer’s (2000) synthesis of factors that affect reading comprehension and could be more explicitly woven into the Sources of Missed Understanding construct.

The initial training in my diagnostic process proved insufficient. Within the first two weeks of the study, tutors were expressing a lack of confidence enacting a diagnostic process more than they were expressing confusion with the taxonomy. This brought to light the fact that teachers need more than just a practical knowledge about the reading process and a map of common sources of meaning break-down to formatively assess and
address their students’ comprehension glitches. They also need significant support developing the thinking patterns of diagnostic thinking and teaching habits.

**Becoming Diagnostic Teachers: Using the Sources of Missed Understanding**

**Framework**

This inquiry revealed that all five tutors were unaware of their own diagnostic thinking at the start of the study, and all benefitted from seeing their personal diagnostic processes mapped. The diagnostic maps made tutor’s thinking concrete and visible, which helped clarify their reasoning, obstacles and instructional choices. All five required thinking partner support at various touch-points in their processes. These were outlined in Figure 4.10 of Chapter Four and touched on below.

Each tutor’s diagnostic process involved 1) taking in data and observations about their tutee’s understanding of text, 2) reflecting on those findings to formulate hunches of Missed Understandings, and then 3) making instructional choices to further test those hunches or to respond to the Source of Missed Understanding identified. Tutors observed tutee responses to those instructional choices, reflected on them, and the diagnostic process iterated multiple times.

The first hurdle for some tutor/tutee pairs was to expose missed understandings. Consistent with Black, William and colleagues’ King’s Medway Oxfordshire Formative Assessment Project findings (2003), tutors needed to engineer interactions such that they students would disclose their thinking. This involved building trusting relationships with tutees such that they knew would be supported at the edge of their zone of proximal development, as Beth did when she coaxed Daniel into the text. It also involved tutors transferring to tutees responsibility for their own learning. Here tutors increased wait
time, and engaging tutee in a variety of ways to elicit their reasoning behind each response. This came more naturally to some tutors than others. Elena, for example, needed to learn to set aside her predisposition to teach in order to listen. Holly needed to increase wait time even when she felt pressure to move on with a lesson.

Tutors used a variety of means to expose their tutee’s comprehension issues. They started with the results of their students’ Basic Reading Inventory, and expanded to include artifacts and observations such as tutee oral and written responses to questions or prompts, tutee prepared or manipulated sticky-notes and index cards, and tutee responses during instructional routines. Like teachers in King’s College Assessment for Learning Group’s (Black, Harrison, Lee, Marshall & Wiliam, 2003) work, tutors become increasingly purposeful in the questions they asked, the prompts they offered and the activities they planned.

As tutee confusions were exposed, tutors used the Missed Understanding framework and materials to systematically develop hunches of where they thought student comprehension broke down. Tutors then tested those hunches, chronicling their observations in their lesson reflections and on the Sources of Missed Understanding recording forms. Tutors used a collection of observations to notice a tutee’s propensity for a category of confusion. With support, tutors used this information to make reasoned instructional choices. Tutors acted with the purpose of either further diagnosing the points of confusion or addressing their tutee’s miscarriage in meaning making.

As expected at the start of the study, tutors required some coaching as they used the Sources of Missed Understanding construct to diagnose the cause of their tutee’s comprehension breakdown. However, an unanticipated and important finding was the
significant amount of thinking partnering employed to determine the instructional options for addressing students’ specific comprehension challenges. As classroom teachers, the tutors were more practiced in developing lesson plans to achieve a standard or curriculum goal, not the very specific comprehension needs of a single student. Furthermore, even with an accurate diagnosis, there is not one simple cure to any category of missed understandings. As Pearson (1985) stated, “good comprehension instruction is too interactive and dynamic to be captured easily in an abstract set of directions” (p. 27). Part of helping tutors use this formative assessment proved to be making them comfortable with the process of iterating – both to find a where a student is lost in their comprehension and to bring them to better understanding.

Much of the thinking-partnering involved sharing ideas of possible instructional options and together evaluating if they were working. Duffy (2002) noted “The [instructional] technique itself is not as important as the teacher’s ability to be thoughtful and sensitive in making adaptations that account for the multilayered and situational nature of comprehension instruction” (pp. 35-36). The Source of Missed Understanding construct was helpful in the determining-instruction-phase because it helped define what change in comprehension was necessary. Because we knew the expected outcome of the instruction, we were able to more quickly and thoughtfully adapt instruction when expectations were not observed. This instruction-phase use of the tool should be more clearly outlined.

**Contextual Elements**

Beyond the training and support requested by tutors, other contextual elements likely contributed to the effectiveness of the tool. Those identified during the course of
the study include: Teacher stance, relevant teacher experience, student comprehension level, and time. Perhaps not surprisingly, some tutors were more efficient and effective than others. One contributor to this was teacher stance, as teachers bring personal philosophies about learning and teaching to the formative assessment event. Some tutors immediately embraced the diagnostic stance: “I’m going to learn how you think.” They easily engaged in diagnostic listening and flexibly evolved prompts to evoke student understanding and expose confusion. Others took more time and support to become comfortable with the time investment and activities so as to draw out student thinking and use that information to form judgments about how to help their tutees. Training could be expanded to acknowledge a range of teacher pre-dispositions toward using this type of diagnostic tool and address some areas teachers may and may not initially feel comfortable or confident.

Relevant tutor experience was another factor that impacted the efficiency and effectiveness of the tool. Those tutors who had background experience that most closely matched the context of diagnosing upper elementary or middle school students’ comprehension challenges were able to use the tool most effectively. In fact, Amy, the tutor experienced at supporting Tier 2 and Tier 3 students in a small group setting that most closely matches the context in which the tool was developed and tested, is the only tutor who continues to use the tool in her personal practice. Since the premise of the study is that teachers are knowledge-workers, it is logical that those most knowledgeable about the context for using this assessment tool would be the most successful.

This raises the question if the “sweet spot” for this tool is Tier 2/Tier 3 struggling readers in upper elementary and middle school and their experienced teachers/reading
specialists. That is the population for which the Sources of Missed Understanding construct was conceived and tested in this study. This may be why the tutee’s Sources of Missed Understanding were clustered in the middle section of the continuum. However, the tool is based on research about the reading process for all students and the factors that impact comprehension for all readers. As such, the construct includes lower and higher-level comprehension skills than were addressed during this study. It is plausible that this formative diagnostic assessment is applicable for students working in their Zone of Proximal Development at any reading level, and is a topic for future research.

A final contextual factor is time. It takes time to build a trusting relationship between a teacher and a student such that the student will expose what they do not understand. It takes time to engineer interactions that promote disclosure of confusion. Once comprehension difficulties are identified, these also take time to address. This may also explain why a limited range of posited Sources of Missed Understanding were vetted as part of this study. As tutees’ comprehension was becoming shored up in the middle range of the Sources of Missed Understanding continuum, a few tutors were stretching their tutees into to higher comprehension skills. However, the full range of missed understandings was not addressed in five weeks.

Notion of Scalability

This study was a beta test where the Sources of Missed Understanding construct was tried by a limited number of experienced teachers, each tutoring a single student, in a university reading specialist practicum setting, with me, the intervention developer, on-site providing support. One outcome was to determine the feasibility of a gamma phase,
where there would be broad adoption requiring less intense, individualized support. This leads to the question of scalability – for both the tool and a future study.

The current research demonstrates that the Sources of Missed Understanding framework could be used with a segment of experienced upper elementary teachers and Tier 2/Tier 3 Reading Intervention providers. These teachers would need training about the comprehension process and the points of break down this tool describes. A professional learning community would need to be established to provide an apprentice-type network of thinking-partners so as to develop proficiency in the diagnosing and addressing of comprehension failure. With this support network, teachers could learn diagnostic listening, develop their diagnostic map, and collaborate on instructional methods to address student comprehension gaps.

However, this study indicates that the Sources of Missed Understanding construct is not scalable by the parameters often attributed to scale—simplification, standardization, mass distribution. At the heart of this tool’s effectiveness is that it helps a teacher peel into the mind of an individual reader. Doing so is uniquely intellectual and deeply personal. Finding and unraveling missed understandings, along with emotions, attention, memory, language and other student characteristics that may impact the comprehension process of a struggling reader, is not easily packaged and sold.

**Limitations**

There are limits to this study. First, the Summer Reading Program lasted only five weeks, which may have limited the breadth and depth of comprehension factors tutors could consider and thus limited the range of Source of Missed Understanding they addressed. Second, tutors and tutees were new to each other. As a result, it took time for
them to know and trust one another. Next, the researcher was also an adjunct professor during the practicum in which the study was set, and in this dual role, had responsibilities beyond the study which drew focus away from the study at times. This dual-role may also have also impacted the trust building required between the tutors and the researcher as their thinking partner. Finally, tutor and tutee participants in this study were predominately monolingual, and tutors predominately white. While the Sources of Missed Understanding construct was developed in a more diverse setting and employed with more diverse students during the alpha phase, further consideration is needed to determine supports needed for use by diverse teachers and with diverse students.

**Future Research**

Many questions remain related to the use of the Sources of Missed Understanding framework. Some of these include:

- How would upper elementary Tier 2/Tier 3 providers implement the Sources of Missed Understanding construct within their small groups in a school-based setting?
- How would experienced, upper elementary teachers implement the Sources of Missed Understanding construct with 1-3 target students struggling with comprehension in a general education classroom?
- Does this tool apply to average and/or above average readers?
- Can networks of teachers create a Professional Learning Community to provide one another the thinking partner support, while having an expert “liason” to the group? What information would they need to share (e.g., video, reflection sheets, lesson plans, observations)?
• Are the recommendations to the training and support outlined by this study sufficient, or do teachers with different cultural and linguistic backgrounds or those who work in other settings require different supports?

**Conclusion**

Scholarship on reading comprehension has identified a population of students with specific comprehension difficulties (SCD) whose issues often become apparent in upper elementary grades when text and task demands become more complex (Adlof, Perfetti, & Catts, 2011; Cain & Oakhill, 2006; Spear-Swerling, 2011). Scholarship also recognizes that students with reading comprehension problems struggle with a range of skill deficits and that teachers lack diagnostic assessments necessary to focus instruction to their specific students (Cain and Oakhill, 2006, Duke, Pearson, Strachan, & Bilman, 2011, Spear-Swerling, 2011, 1016). This study aimed to evaluate a formative diagnostic assessment tool to address this need, and to determine the context and support teachers would need to effectively use it during the course of one-to-one reading instruction in a five-week university summer tutoring setting.

The results of this study were promising. Five teachers (tutors) successfully used the Sources of Missed Understanding tool while conducting authentic reading instruction, each with a different upper elementary or middle school student struggling with comprehension. Teachers reported feeling enabled by the tool: They were able to identify student sources of confusion and adapt instruction accordingly, to monitor results, and re-adjust instruction as needed, so that student comprehension improved.

This study illuminated the supports teachers needed to use this assessment framework successful. First they required training in the comprehension process and
Sources of Missed Understanding to become metacognitive about their students thinking. Next they needed explicit coaching on and mapping of the diagnostic process; and they needed ongoing thinking partnerships to progress on a trajectory of development to become reflective, iterative, and intentional diagnostic teachers.

In the end, all five teachers believed they got to the heart of their student’s (tutee’s) comprehension challenge. All but one claimed they would have been unable to do so without the Sources of Missed Understanding framework and supports. This diagnostic assessment tool has the potential to be impactful, but it is not an “off the shelf” type of assessment. Similar to Goodman’s miscue analysis for print, this intervention is about investing in teacher know-how, enhancing how they approach a comprehension conversation with a student, and empowering them to be more analytic and adaptive teachers of reading comprehension.
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Appendix A

Letters of Consent

June 22, 2018

Dear Prospective Participant,

You are being asked to participate in a study conducted by Jennifer Tarr, doctoral student at National Louis University occurring from June 25, 2017 - July 27, 2018 during the practicum in reading at the North Shore Campus. The study is entitled “Sources of Missed Understanding: A Framework for Diagnosing Comprehension Breakdown.” The purpose of this study is to help you pinpoint causes of your upper elementary or middle school student’s comprehension failures during the course of authentic reading instruction so that you may more effectively support your student’s comprehension needs.

This consent form outlines a description of your involvement and rights as a participant. Much of the research will be observations and artifacts as part of the practicum program. However, your participation will include an additional commitment of the following:

1. Completion of pre- and post- practicum surveys about your understanding and comfort with comprehension assessment (about 15 minutes each).
2. Utilization of the Sources of Missed Understanding framework during the course of authentic comprehension instruction to help them probe a student’s sources of confusion.
3. Completion of Sources of Missed Understanding recording forms that may be submitted with practicum reflections.
4. Audiotaping of the comprehension-focused portion of the tutoring session and submission of two audio accounts per week for analysis in the study with explanations for why those two were chosen.
5. Participation in weekly 45-minute research team meetings/experience sharing during scheduled practicum seminar time.
6. Participation in additional conversations and coaching as needed by either you or the researcher.
7. The project does not expect to take much extra time for participants beyond practicum.

Your participation is voluntary and can be discontinued at any time during the period of the study without penalty. If you choose not to participate, this will not impact your grades or class standing. However, in recognition for your time investment, an Amazon gift card of $150 will be given to you upon completion of the study.
If you participate, your identity will be kept confidential by the researcher and will not be attached to data. A pseudonym will be assigned to you and your student’s name. For confidentiality purposes, all data and artifacts collected will be kept in a locked cabinet for 5 years and then destroyed. Electronic data will be kept on a password-protected computer, and will also be destroyed after 5 years.

Your participation does not pose any physical or emotional risk beyond that of everyday life. The likely benefit of participation is additional coaching in comprehension and a better understanding of how to diagnose and address reading comprehension failures. The results of this study may be published or otherwise reported to professional groups of educators, but your identity will in no way be revealed. Results of the study will be provided upon request.

If I have any concerns or questions before, or during, participation that I feel have not been addressed, you may contact the researcher, doctoral student Jennifer Tarr at (224) 216-9353, jtarr@my.nl.edu.

For any concerns or questions before or during participation that have not been addressed by the researcher, you may contact the chair of NLU’s Institutional Research Review Board: Dr. Shaunti Knauth, National Louis University, 122 South Michigan Avenue, Chicago, Illinois 60603; (312) 261-3526, shaunti.knauth@nl.edu.

You will be given a copy of your signed consent form. Please acknowledge with your signature below your consent to participate in this study.

Participant’s Name (print):

______________________________________________

Participant’s Signature:

______________________________________________ Date:__________________

Researcher’s Name (print):

______________________________________________

Researcher’s Signature:

______________________________________________ Date:__________________
Dear Parent & Student,

Thank you for participating in this year’s Summer Reading Improvement Program. We are excited to get started! During our program this year, we are pleased to be able to provide our tutors additional support in the assessment and teaching of reading comprehension through the use of a Sources of Missed Understanding construct. Our goal with this enhanced comprehension assessment is to help tutors pinpoint causes of their student’s comprehension breakdown so that they may more effectively support each student’s needs.

This consent form outlines the purposes of the study entitled “Sources of Missed Understanding: A Framework for Diagnosing Comprehension Breakdown” and provides a description of your child’s involvement and rights as a participant.

I understand that a research project will be conducted by doctoral student Jennifer Tarr at National Louis University, North Shore, occurring from June 25, 2018 through July 27, 2018, during the Summer Reading Improvement Program.

I understand that the purpose of the “Sources of Missed Understanding” study is to develop a classroom assessment framework to help teachers pinpoint sources of student comprehension breakdown.

8. Tutors will utilize the Sources of Missed Understanding framework during the course of authentic comprehension instruction to help them probe a student’s sources confusion.

9. Tutors will audiotape the portion of the tutoring session focused on comprehension and submit two audio accounts per week for analysis in the study.

10. Tutors will reflect on a student’s sources of comprehension failure to tailor instruction to meet a student’s needs.

11. Doctoral student, Jennifer Tarr, will analyze audiotaped sessions, tutor reflections and feedback, and reading data normally collected during tutoring.

12. The project will not take any extra time or actions on my child’s part. The comprehension lessons as part of this study are already part of my child’s Summer Reading Program Instruction.

I understand that my child’s participation is voluntary and can be discontinued at any time during the period of the study without penalty. If I choose not to
participate, my child will still engage in this instructional approach, but no data will be included in the research. I understand that the results of this study may be published or otherwise reported to professional groups of educators, but my child’s identity will in no way be revealed. Results of the study will be provided to me, upon my request.

For confidentiality purposes, all data and artifacts collected will be kept in a locked cabinet for 5 years and then destroyed. Electronic data will be kept on a password-protected computer, and will also be destroyed after 5 years.

If I have any concerns or questions before, or during, participation that I feel have not been addressed, I may contact the researcher, doctoral student Jennifer Tarr at (224) 216-9353, jtarr@my.nl.edu.

For any concerns or questions before or during participation that you feel have not been addressed by the researcher, you may contact the chair of NLU’s Institutional Research Review Board: Dr. Shaunti Knauth, National Louis University, 122 South Michigan Avenue, Chicago, Illinois 60603; (312) 261-3526, shaunti.knauth@nl.edu.

I grant permission for my child’s work to be used as part of this study.

Student’s Signature:

____________________________________________Date:__________________

Parent’s Signature:

____________________________________________Date:__________________

Researcher’s Signature:

____________________________________________Date:__________________
Appendix B

Initial Training Presentation

Sources of Missed Understanding
construct

Initial Training
Spring 2018

Agenda

• Comprehension Process
• Sources of Missed Understanding
• Diagnostic Process
• Recording Your Observations
• Joining the Research Team
Comprehension Process - C-I Model

Extract Intended Meaning from Text
- Attention
- Short-Term Memory

Construct Coherent Representation of What Text Says
- Connect
- Long-Term Memory

Interpret Situational Representation of What Text Means

Sources of Missed Understanding
- Unclear How Print Works
- Missed Referential Inferences
- Lost in Transitions
- Over-reliance on Background Knowledge
- Low Standards of Coherence
- Causal/Logical Inferences Missed
- Misjudge Importance
- Trouble with Theme
- Over-/Under-Connect or Contrast
- Issues With Perspective and Bias

Breakdown: Extracting Meaning
- Unclear How Print Works
- Missed Referential Inferences (Syntactical and Lexical Flexibility)
- Lost in Transitions
**Breakdowns: Extracting Meaning**

**Extract Intended Meaning from Text**

- Unclear How Print Works
  - EXAMPLES:
    - Dialogue goes back and forth
    - Extra large breaks between paragraphs signals change (usually setting)

**Missed Referential Inferences (Syntactical and Lexical Flexibility)**

- EXAMPLES:
  - Pronoun - antecedent
  - People, places or events known by different words or phrases in the same text
    - Familial relationships; naming conventions
    - Synonyms
    - Phrases
  - Seeing connections of categories and parts

**Lost in Transitions (unstated or subtle)**

- EXAMPLES:
  - Flashback, flash-forward, dreams
  - Specific to general; general to specific
Breakdowns: Extracting Meaning

- Extract Intended Meaning from Text

Try a few....
- Artifacts and examples from my own experiences

Breakdown: Constructing What it Says

- Over-reliance on background knowledge
- Low standards of coherence
- Causal/logical inferences missing or misguided
- Misjudging importance

Symptoms: Reader is confident...but wrong
- Reader "picks and chooses" information to support prediction; disregards other
- Reader personal beliefs or motives override character's or author's
- Too "lightly" read because they already "know"
Breakdown: Constructing What it Says

**Low Standards of Coherence**

SYMPTOMS: Reader grown accustomed to not understanding; reads shallowly, avoids answering questions
- Re-reads instead of recounts in own words or tells one detail (usually what read last)
- Repeats what has been said in past or cliché answers (e.g., character is sad, mad)
- Not recognize inconsistencies between answers and the text or within a text

**Causal/Logical Inferences Missing or Misguided**

SYMPTOMS: Tells what happened...but not why or how
- Reader responsibility to reason based on author clues not understood
- Show not tell
- Consequences unstated
- Character or author goals not correctly identified, nor their role in driving actions and decisions

**Misjudge Importance**

SYMPTOMS: Recount is overly complete or unbalanced
- Reader compelled to retell every detail
- Focused skewed
  - Some too much on emotion; some too much on the action
  - Cool or funny vs. important
- Too locked in one idea; inflexible
Breakdown: Constructing What it Says

Try a few:
- Roll-play - what do you think?

Breakdown: Interpreting What it Means

Trouble with Theme
Over-/Under-Connect and Contrast
Issues with Perspective and Bias

Examples:
- Confuses plot and theme
- Reader has a general concept of what a theme is, but has trouble identifying appropriate themes to a particular story
Breakdown: Interpreting What it Means

Overlay/Under-
Connect and Contrast

**EXAMPLES:**
- Connections to background knowledge not tied to core message thus creating distraction and not building knowledge
- Not contrasting differences within the same categories or just assuming opposite without data on both, thus coming to inaccurate understanding
- Not seeking connections outside narrow topic

---

Breakdown: Interpreting What it Means

Issues with Perspective and Bias

**EXAMPLES:**
- Trouble recognizing perspective/bias
  - Authors and characters have beliefs different from readers
  - Non-fiction does not mean non-biased
- Not noticing (or knowing how to notice) wording that conveys perspective and bias
- Lack of experience with considering bias/perspective in context of goals (character, author, reader goals)

---

Breakdown: Interpreting What it Means

**TRY A FEW....**
- Artifacts and examples from my own experiences
Interrelated Processes Build Upon One Another

Extract Intended Meaning from Text

Attention ST Memory

Construct Coherent Representation of What Text Says

Connect ST Memory

Interpret Situational Representation of What Text Means

When Do I Use It?
ANY OPPORTUNITY

When Do I Use It?
ANY OPPORTUNITY

Diagnostic Process

Inquiry Listening

Hunch

Exploratory Questions

Trend

Mini-Lesson

When Do I Use It?
ANY OPPORTUNITY

When Do I Use It?
ANY OPPORTUNITY

Diagnostic Process
Recording Your Observations

Slide 24

Date: ____________

Test and Pages:

- Extract Intended Meaning from Text
- Missed Referential Inferences
- Low Standards of Coherence
- Causal/Logical Inferences Missed
- Issues With Perspective and Bias

Certainty: Hunch Trend

Diagnostic Thoughts:

- Initial probe - Unbalanced recount
- Only focused on second group - Baleen Whales (told many details)
- Missed point in first paragraph about 2 different groups of whales - and next 2 pages on Toothed Whales
- When directed to go back to beginning - re-read first paragraph
- Recognized immediately that there was another group other than Baleen
- When asked to self-reflect - pointed to picture of Baleen whales, “not sure” “Baleen-teeth is weird”

Next Steps:

- Look for
  - Points on later thing, vital instead of basic/elemental
  - Provided too much in relating - general to specific?

Student Name: ____________________________

Date: __________________

Slide 25*
Research Team Commitment

- Most research will be of artifacts or observations as part of the practicum program
- Additional commitment includes:
  - Quick pre-/post- practicum survey
  - Audio tape the comprehension portions of your daily lessons with your upper elementary/middle grade student
    - Submit only 2 per week with e-mail telling why you chose those 2
    - Prefer one that shows a successful diagnostic moment and one that shows a diagnostic challenge (with which I will help you); otherwise, any two.
  - Complete notes on Sources of Missed-Understanding recording forms which you will submit with your practicum reflections
  - Weekly 45 minutes research team meetings/experience sharing

Research Team Benefits

- Additional coaching on comprehension and teaching students who struggle with comprehension
- Experience of participating on a research team
- $150 Amazon gift card for your additional time investment

* Indicates slide was included in notebook tutors used for reference
Appendix C

Sources of Missed Understanding Recording Form

<table>
<thead>
<tr>
<th>Date</th>
<th>Student Name _______________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Text and Pages:</td>
</tr>
<tr>
<td></td>
<td>Certainty: Hunch Trend</td>
</tr>
<tr>
<td></td>
<td>Diagnostic Thoughts:</td>
</tr>
<tr>
<td></td>
<td>Next Steps:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extract Intended Meaning from Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear How Print Works</td>
</tr>
<tr>
<td>Missed Referential Inferences</td>
</tr>
<tr>
<td>Lost in Transitions</td>
</tr>
<tr>
<td>Over-reliance on Background Knowledge</td>
</tr>
<tr>
<td>Low Standards of Coherence</td>
</tr>
<tr>
<td>Causal/Logical Inferences Missed</td>
</tr>
<tr>
<td>Misjudge Importance</td>
</tr>
<tr>
<td>Trouble with Theme</td>
</tr>
<tr>
<td>Over/Under-Connect or Contrast</td>
</tr>
<tr>
<td>Issues With Perspective and Bias</td>
</tr>
</tbody>
</table>
APPENDIX D
Pre- and Post-Survey Questions for Tutors

Pre-Survey

Comprehension Assessment Tools
In this section, you will be asked to reflect first on your experience with the BRI with your Summer Reading Program students. Then, you will be asked to consider a comprehension assessment you use as a teacher in your regular classroom.

1. Research tells us that skilled comprehenders employ skills and strategies before, during and after reading. In looking at the comprehension section of the BRI, how are these elements addressed? *(short answer response)*

2. Research tells us that comprehension of complex texts involve not only recall of facts, but also contextualization, analysis, synthesis and evaluation. In looking at the BRI, how are these elements addressed? *(short answer response)*

3. After reviewing the BRI you conducted for your younger student, please comment on what information helped you to see where a student is relative to grade level expectations. *(short answer response)*

4. After reviewing the BRI you conducted for your younger student, please comment on what information helped you plan for instruction. *(short answer response)*

5. After reviewing the BRI you conducted for your older student, please comment on what information helped you to see where a student is relative to grade level expectations. *(short answer response)*

6. After reviewing the BRI you conducted for your older student, please comment on what information helped you plan for instruction. *(short answer response)*

7. For the next questions consider another comprehension assessment you personally use in your school or with your class. Please specify which assessment you are considering. *(multiple choice)*
   a. MAP (Measures of Academic Progress)
   b. Fountas & Pinnell Benchmark Assessment System (BAS)
   c. Qualitative Reading Inventory (QRI)
   d. Basal Program Assessments
   e. Other/Specify

8. Please indicate the grade level with which you have used this comprehension assessment. *(short answer response)*
9. Research tells us that skilled comprehenders employ skills and strategies before, during and after reading. In looking at the comprehension section of the comprehension assessment you identified above, how are these elements addressed? *(short answer response)*

10. Research tells us that comprehension of complex texts involve not only recall of facts, but also contextualization, analysis, synthesis and evaluation. In looking at the comprehension assessment you identified above, how are these elements addressed? *(short answer response)*

11. How have you used information from this identified assessment to help understand where a student is relative to grade level expectations? *(short answer response)*

12. How have you used information from this identified assessment to help understand how to plan future instruction? *(short answer response)*

**Comparing the Assessment Tools**

For the next set of questions, please compare the BRI and the comprehension assessment you identified above.

13. What are the strengths and weaknesses of each assessment tool in relationship to the assessment of comprehension (although you may also note other aspects as well, such as ease of administration)? *(short answer response)*

14. What do you like and dislike about each one? (You may use this question to address any other aspect you'd like to convey about the two assessment tools that has not been addressed.) *(short answer response)*

**Self-Reflection**

Please consider the following statements about assessing and teaching reading comprehension.

15. I believe I have a strong understanding of the factors that impact my students' comprehension challenges. *(Likert scale)*

<table>
<thead>
<tr>
<th>1 strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 strongly agree</th>
</tr>
</thead>
</table>

16. I am able to effectively assess my students' comprehension needs. *(Likert scale)*

<table>
<thead>
<tr>
<th>1 strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 strongly agree</th>
</tr>
</thead>
</table>

17. My comprehension instruction is differentiated to meet the specific comprehension needs of my students. *(Likert scale)*

<table>
<thead>
<tr>
<th>1 strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 strongly agree</th>
</tr>
</thead>
</table>
Demographics

18. What is your current teaching position and years at that position? *(short answer response)*

19. Previous experience? *(short answer response)*

20. What is your age? *(multiple choice)*
   a. 24 years or younger
   b. 25-34
   c. 35-44
   d. 45-54
   e. 55 or older
   f. Other

21. To what gender do you identify? *(multiple choice)*
   a. Female
   b. Male
   c. Gender Expansive (including LBGTQIA)
   d. Other

22. Please describe your racial/ethnic background? *(multiple choice)*
   a. African
   b. African American/Black
   c. American Indian/Alaskan Native
   d. Asian (South Asian, East Asian, Southeast Asian, Central Asian)
   e. Hispanic/Latinx (South and Central Americas, Caribbean)
   f. White/Caucasian
   g. Bi-racial/Multi-racial
   h. Other

Post-Survey

Comprehension Assessment Tools
In this section, you will be asked to reflect on your experience with the BRI and the Sources of Missed Understanding construct during the summer practicum.

1. Research tells us that skilled comprehenders employ skills and strategies before, during and after reading. In looking at the comprehension section of the BRI, how are these elements addressed? *(short answer response)*

2. Research tells us that comprehension of complex texts involve not only recall of facts, but also contextualization, analysis, synthesis and evaluation. In looking at the BRI, how are these elements addressed? *(short answer response)*
3. After reviewing the BRI you conducted for your younger student, please comment on what information helped you to see where a student is relative to grade level expectations. *(short answer response)*

4. After reviewing the BRI you conducted for your younger student, please comment on what information helped you identify progress (or lack thereof) in comprehension as a result of your instruction. *(short answer response)*

5. After reviewing the BRI you conducted for your older student, please comment on what information helped you to see where a student is relative to grade level expectations. *(short answer response)*

6. After reviewing the BRI you conducted for your older student, please comment on what information helped you identify progress (or lack thereof) in comprehension as a result of your instruction. *(short answer response)*

7. Research tells us that skilled comprehenders employ skills and strategies before, during and after reading. In looking at the Sources of Missed Understanding construct, how are these elements addressed? *(short answer response)*

8. Research tells us that comprehension of complex texts involve not only recall of facts, but also contextualization, analysis, synthesis and evaluation. In looking at the Sources of Missed Understanding construct, how are these elements addressed? *(short answer response)*

9. How have you used information from the Sources of Missed Understanding construct to help understand where a student is relative to grade level expectations? *(short answer response)*

10. How have you used information from the Sources of Missed Understanding Construct to help understand how to plan future instruction? *(short answer response)*

**Comparing the Comprehension Assessment Tools**

For the next set of questions, please compare the BRI and the comprehension tool identified above.

11. What are the strengths and weaknesses of each assessment tool in relationship to the assessment of comprehension (although you may also note other aspects as well, such as ease of administration)? *(short answer response)*

12. What do you like and dislike about each one? (You may use this question to address any other aspect you'd like to convey about the two assessment tools that has not been addressed.) *(short answer response)*
Self-Reflection
Please consider the following statements about assessing and teaching reading comprehension.

13. I believe I have a strong understanding of the factors that impact my students' comprehension challenges. *(Likert scale)*

<table>
<thead>
<tr>
<th>1 strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 strongly agree</th>
</tr>
</thead>
</table>

14. I am able to effectively assess my students' comprehension needs. *(Likert scale)*

<table>
<thead>
<tr>
<th>1 strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 strongly agree</th>
</tr>
</thead>
</table>

15. My comprehension instruction is differentiated to meet the specific comprehension needs of my students. *(Likert scale)*

<table>
<thead>
<tr>
<th>1 strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 strongly agree</th>
</tr>
</thead>
</table>

16. Do you plan to use the Sources of Missed Understanding construct when you return to your classroom? *(multiple choice)*
   a. yes
   b. no
   c. maybe

17. Why or why not? *(short answer response)*