Strategies teachers can use to support inferencing for students with learning disabilities

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Abstract

Inferring meaning from text is a critical issue within reading comprehension that affects many students with learning disabilities. Research has shown that a student's ability to infer meaning from text (information that is not explicit in text) is more difficult than recalling literal information from a given text, based on the heavier demand it places on cognitive processing and working memory. Two types of researched comprehension strategies were modeled and utilized to support inference generation. Strategies included think-alouds and wordless picture books. The findings and implications suggest that the participant paraphrased material that was read, posed questions, made meta-comments and made text to text as well as text to world connections. Research suggests that implementing strategies for inferencing is critical for students with learning disabilities, as it enables them to better respond to written text.
The ability to infer meaning from text is a complex comprehension skill common to many successful readers. Making an inference involves combining text information with one’s own personal experiences in order to create meaning that is not specifically stated in text. Zwiers (2010) states that, “Inferences might be seen as taking little “thinking steps” off the safe path of the literal and seeing if they lead to where the author intends” (Zwiers, 2010, p. 99). Struggling readers may have a much more difficult time inferring meaning from text, as the process requires the following simultaneous processes: working memory ability, activating and linking background knowledge and schema, as well as reading comprehension.

The students whom this study will focus have exemplified deficits with inference making per daily instructional observations, Developmental Reading Assessments (administered quarterly throughout the school year) as well as Running Reading Records/Retelling forms per Fountas and Pinnell’s Leveled Literacy Intervention (LLI), administered on a weekly basis. Continuums of reading comprehension for such assessments indicate strong literal comprehension skills and significantly weak inferential skills. Zwiers (2010) suggests that, "An inference, because it extends past the known, is one of the main ingredients of creative thought and expanded learning (p. 100). The focus of this study is to identify strategies for teachers to implement in order to support students with learning disabilities, specifically, to better connect with text information and make text-to-text inferences as well as text-to-self and text-to-world inferences.

One particular aim for this study is to provide students with learning disabilities differentiated ways to experience literacy through authentic texts. Meier (2003) notes the
The importance of using authentic texts in classrooms that make literacy meaningful to students' lives. Activities such as modeling and utilizing wordless picture books in the classroom, for example, provide children with an opportunity to create dialogue independently by merging and synthesizing their own background knowledge with illustration concepts from a text. The oral language component with this strategy is a powerful way to gauge student understanding, prediction and inference making.

**Theoretical Framework**

Literacy encompasses an array of components and is, at times, difficult to narrow to one definition. Luke and Freebody (1999) state that, “We agreed that there was no single definitive, truthful, scientific, universally effective, or culturally appropriate way of teaching or defining literacy” (Luke & Freebody, 1999, p. 1). Similarly, Larson and Marsh (2005), declare that, “Literacy does not just reside in people’s heads as a set of skills to be learned, and it does not just reside on paper, captured as texts to be analyzed. Like all human activity, literacy is essentially social, and it is located in the interaction between people” (Larson & Marsh, 2005, p. 10). Literacy is significantly affected and impacted by cultural and linguistic variations, as well as the components of oral and written language. Literacy occurs in today’s classrooms in a variety of contexts. The social aspects of literacy are apparent in all interactions between students and teachers.

Larson and Marsh also explain that, “Literacy is not simply an individual cognitive activity, but is a communicative tool for different social groups with social rules about who can produce and use particular literacies for particular social purposes (Larson & Marsh, 2005, p. 19). This is echoed in research conducted by Gee (2001)
Strategies teachers can develop to improve their understanding of the discourses and their social impact on students. Individuals use their discourse as a tool for communicating and this is variable, depending on the social context of a given situation.

Gaining knowledge in language occurs in two forms, acquisition and learning (Gee, 2001). Gee describes acquisition as a process of acquiring something subconsciously by exposure to models and a process of trial and error, without formal teaching. (Gee, 2001, p. 539). Learning, however, involves conscious knowledge gained through teaching. Many components of language are both acquired and learned for the child. Gee attests that much of what we come by in life, after our initial enculturation, involves a mixture of both acquisition and learning. Gee evaluates acquisition and learning through the lens of discourse. Discourses are simply the socially accepted association of the ways of using language and of thinking. Discourses are ideological, and reflect individual traits and characteristics, and are also categorized as primary or secondary (Gee, 2001). For instance, many people will speak and interact differently depending on the social context of the situation. A child may interact in his/her primary (acquired at home) discourse differently than his/her secondary discourse (in this case: school). Acquisition and learning are means to quite different goals within society (Gee, 2001, p. 542).

Cultural and linguistic variation significantly impacts the acquisition of literacy. Heath (1982) explains the cultural differences that impact acquisition of literacy in three diverse communities. Heath describes a literacy event as an occasion in which written language is integral to the nature of the participants’ interactions and their interpretive
Strategies teachers can use processes and strategies (Heath, 1982). This is aligned with the sociocultural historical theory, and signifies that literacy events play a key role in mediating learning (Larson & Marsh, 2005, p. 131). The bedtime story, in many cultural communities is believed to be a significant literacy event. It is a distinct ritual between children and parents that establishes an importance on literacy and routine. The communities of Maintown, Roadville and Trackton were the focal point of this study and were compared based on their cultural community for fostering language development at home. Halliday’s research on the personal model of language is echoed through Heath’s studies as both researchers place emphasis on learning language development through the scope of a child (Halliday, 1969). The children growing up in the community of Roadville, for example, were welcomed into their homes by an environment that fostered learning and exploration, and the young child was provided with a room that was equipped with learning materials. On the contrary, the children born into the community of Trackton were likely to arrive in a home where they were to sleep in the same quarters as their parents and were essentially submerged into a purely “human” environment that was not necessarily geared toward the children’s personal literacy needs (Heath, 1982). It is essential to recognize that all students have varying upbringings which differentiate their experience with literacy acquisition.

Considering that all students arrive in school with differing backgrounds, discourses and experience with oral and written language vary as well. Many educators acknowledge this diversity and prepare and implement instruction that reflects an appreciation to diversity in the classroom. Meier (2003) notes the importance of using
Strategies teachers can use to incorporate authentic texts in classrooms that make literacy meaningful to students’ lives. Meier suggests that reading behaviors need to be taught explicitly given that students have differing background knowledge and experience with literacy acquisition. Essentially, if reading behaviors are taught explicitly, all students are prepared to read and interpret text in meaningful ways, regardless of their upbringing (Meier, 2003).

Constructivism is a learning theory that is student centered. Within this model, students are constructing new material by relating it to background knowledge, thus building and linking schema (Fresch, 2008). Schema is a framework for which knowledge is cognitively organized, and it grows as students continue to learn and retrieve information. The constructivist theory, specifically schema theory, supports the importance that prior knowledge has on reading and the effect that it has on readers' understanding of a given text (Fresch, 2008, p. 83). Ouellette, Dagostino, & Carifo (1999) define schema theory as a, "Collection of comprehension models that assume a that a reader's schema, or organized knowledge of the world, is the basis for understanding, learning, and remembering the ideas in texts" (Anderson, 1985; Ouellette et al., 1999, p. 73). Research shows that students with inadequate background knowledge cannot distinguish relevant material from irrelevant material (Fresch, 2008, p. 131).

Aligned with the constructivist theory of reading, Pearson and Dole (1987) suggested that, "Readers use strategies or processes to construct meaning, and often, readers need demonstrations in comprehension strategies so they can construct meaning" (Fresch, 2008, p. 44). For this study, students with learning disabilities face a variety of challenges when it comes to reading, as reading comprehension is dependent on multiple
strategies teachers can use to simultaneously process. Teachers develop and implement explicit strategies to enable students to comprehend reading material.

Reading comprehension, as defined by Harris and Hodges (1995) is, "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" (Fresch, 2008, p. 83). There are four components that help students become successful readers. Freebody and Luke place emphasis on the notion that a successful reader in our society needs to develop and sustain the resources to adopt four related roles: code breaker, text participant, text user and text analyst. Code breaking is linked to linguistics and is based on the nature of the relationship between spoken sounds and written symbols, as well as the ability to use the basic features of language. A text participant is cognitive in nature and draws inferences connecting textual elements and background knowledge. This incorporates schema theory, inferences and reader response. This role is extremely important in terms of comprehension, as many students need background knowledge to apply and learn new information. A text user’s role is deemed successful at reading based on social activities and knowing how to participate in social activities. The fourth role, text analyst, is also sociocultural and is based on critically analyzing texts and understanding that texts are ideologically laden (Freebody & Luke, 1990).

Essentially, the sociocultural and constructivist reading theories suggest that the concept of generating inferences within reading depends on student background knowledge, word knowledge, active construction of meaning, and overall comprehension.
Strategies teachers can 9 of texts. Over decades of reading research, comprehension has become more active, constructive and reader-based. Pearson (1985) attests that comprehension became one of several factors—including prior knowledge, strategies, the task, and the situation (Fresh, 2008, p. 92).

**Research Question**

Given that literacy is indeed a social practice and relies on the reader to make connections with texts and personal experiences while building schema, this action research project asks, what are the strategies that a teacher can use to support inferencing for students with learning disabilities?

**Literature Review**

Reading comprehension is a broad umbrella that encompasses various skills such as activating background knowledge, visualizing, predicting, summarizing, questioning, making connections and inferring. Kintsch, (1998) attests that, “The goal of reading is understanding, a process that goes beyond decoding, and involves comprehension processes at the word, sentence, and text level (Kintsch, 1998; Bowyer-Crane & Snowling, 2005, p. 189). Research suggests that inference generation and reading comprehension are ‘inextricably linked’ (Bowyer-Crane & Snowling, 2005, p. 194). The ability to infer meaning from text, or generate inferences is a complex component of reading comprehension for both average and struggling readers. Inferencing is defined as the integration of world knowledge, text knowledge, and previously processed information (Marinellie, 2010, p. 179). The ability to infer meaning and predict are terms that are often used synonymously, yet it is important to consider that predicting
Strategies teachers can use to improve reading comprehension include strategies that rely on generating predictions, or guesses based on literal information presented in text whereas inferences bridge background knowledge and world meaning with information that is not explicit in text.

Children who experience difficulty with reading comprehension may have differing explanations for their struggle such as inaccurate or inefficient decoding of words in text as well as deficiencies in language, cognitive and reasoning processes. They may also have weak semantic and syntactic skills, which affect their ability to construct meaning of phrases and sentences (Cain, 2009, p. 12). Syntactic ability refers to understanding of individual words whereas semantic ability refers to understanding the meanings of words or phrases and their expressions (Botting & Adams, 2005, p. 49). Research conducted has shown that modeling and implementing various types of comprehension strategies are critical for students to infer meaning from text. Such strategies include think-alouds, conducting structured read alouds, utilizing wordless books and books with illustrations, self-questioning techniques and story mapping.

Some children may successfully comprehend literal information explicitly stated in text, yet experience difficulty going beyond the text. Laing & Kamhi (2002) note that the ability to make inferences plays an important role in the understanding of and integrating texts (Laing & Kamhi, 2002, p. 437). Similarly, Cain (2009) identifies that inference making is crucial for good text comprehension. It is much more difficult and laborious for struggling readers to integrate meaning across sentences and combine information in the text with general knowledge for inference generation (Cain, 2009, p. 12). Caldwell & Leslie (2010) indicate that reading comprehension of both narrative and
Strategies teachers can use to improve reading comprehension involve the active construction of a textbase and a situation model. The textbase is most affiliated with students’ recall of literal information, whereas the situation model represents inference making as it, “Requires the integration of information provided by the text with relevant prior knowledge and the goals of the comprehender” (Kinstch & Kinstch, 2005, p. 73). Similarly, Graesser & Kreuz (1993) suggest that a situation model is a, “Microworld of agents, objects, actions, events and spatial composition that is actively constructed by the reader during comprehension” (Graesser & Kreuz, 1993, p. 147). The situation model is assessed when students respond to comprehension questions that require inferences to be made.

Research conducted on inferring meaning from text for students with learning disabilities has focused on a few key areas to address the issue, such as working memory ability, background knowledge and explicit comprehension strategies to implement for text understanding. Taylor, Alber & Walker (2002) support explicit teaching for inferring meaning from text. According to the text, “Direct instruction in specific reading strategies has been documented to improve reading comprehension” (Taylor et al., 2002, p. 70). Furthermore, students with learning disabilities can benefit from strategy training that enables them to actively respond to written material (Taylor et al., 2002, p. 70). The research on explicitly teaching inferential strategies for students with learning disabilities provides great insight on steps that can be taken to further differentiate reading instruction to meet student needs.
Swanson, Kehler & Jerman (2009) define working memory (WM) as the limited capacity system that allows simultaneous storage and processing of temporary information. Similarly, Cain (2009) states that working memory refers to the type of memory involved in the simultaneous processing and storage of information (Cain, 2009, p. 13.). The integration of two or more sentences requires a reader to continuously read and maintain the meanings of multiple sentences in order to fully comprehend the text. Bowyer-Crane & Snowling, (2005) attest that participants in their study of assessing children’s inference generation when asked to answer questions from memory, less-skilled comprehenders did not perform as well as the skilled comprehenders on inferential questions (Bowyer-Crane & Snowling, 2005, p. 190). Swanson, Kehler & Jerman (2009) looked at the effects of strategy knowledge and strategy training on the working memory performances in children with and without reading disabilities. They argued that, “Students with Reading Disabilities (RD) do not suffer deficits in strategy knowledge, but rather have constraints in WM capacity” (Swanson et al., 2009, p. 25).

The study included two different experiments. Experiment one looked to determine the influence of strategy knowledge on the WM performance of students with RD. Experiment two focused on the effects of strategy training on the relationship between WM and reading performance (Swanson et al., 2009, p. 25). Experiment two sought to prove that strategy training for students with RD was much more beneficial than with students without RD. In order to assess students with WM capacity, each child was required to hold increasingly complex information in memory while responding to a
Strategies teachers can question about the task. Digit-Sentence Span and Mapping/Directions tests were administered from the S-Cognitive Processing Test (S-CPT). The Digit-Sentence Span assesses the participant’s ability to remember numerical information embedded in a short sentence. The participant was shown procedures (strategies) to remember an address with the following instructions: (a) Rehearsal-saying the number over to oneself (b) Clustering-saying the numbers in pairs (c) Association- remembering that the numbers go with a particular street (d) Elaboration-thinking of other things with the numbers (Swanson et al., 2009, p. 28). The important findings indicate that children with RD scored lower across all conditions versus students without RD. Additionally, students who made unstable choices (not one of the stable strategy choices) had lower WM span scores than those who made stable strategy choices.

The Mapping/Directions test determined whether the participant could remember a sequence of directions on a map that was void of labels (Swanson et al., 2009, p. 28). Participants were given a street map with lines connected to a number of dots that illustrated the direction that a bike would go to get through a city. They were given ten seconds to study the map before it was removed. When asked questions after studying the map, students were encouraged to use the following strategies to remember information: (a) Elemental-fill in the dots and then draw lines (b) Global- start with design and then fill in dots (c) Sectional- do the parts that you remember first, then fill in the rest (d) Backwards-start from the place that the bike rides out and work backwards. As stated in the text, “These four strategies correspond to elemental, global, sectional and backward processing of patterns, respectively” (Swanson et al., 2009, p. 28). According
Strategies teachers can to the text, “The two experiments show that children with RD benefitted significantly from strategy instruction but such procedures failed to account for the covariation between WM and reading (Swanson et al., 2009, p. 40). Also, the differences between the two reading groups were more likely due to constraints in WM capacity than variations in strategy choices (Swanson et al., 2009, p. 33).

Alptekin & Ercetin (2009) studied working memory capacity for Language 1 (L1) and Language 2 (L2) learners. Generally speaking, working memory capacity depends greatly on the reader’s interaction with a given text. Kintsch (1998) supports the idea that “Reading tasks involve in varying degrees the contribution of surface code, textbase and situation model of comprehension” (Alpetkin & Ercetin, 2009, p. 628). Given different interactions with a text, WM capacity is differently involved. Inferential reading, for example, is found to be more difficult than literal reading because of the heavier demands it places on working memory capacity (Alptekin & Ercetin, 2009, p. 628). The participants in this study were Turkish undergraduate students who were given the Reading Span Test (RST) which consisted of 70 unrelated simple sentences each 11-13 words in length. The sentences were divided into 20 sets. The total number of words recalled across all trials was recorded as the measure of the participant’s storage capacity. Finally, storage and processing scores were converted to z-scores and their average was taken in order to obtain composite scores (Alptekin & Ercetin, 2009, p. 631).

The results show that working memory is a significant factor affecting the dependent variable of reading. According to the text, “Inferential reading, unlike literal reading, shows a consistently meaningful relationship with working memory” (Alptekin
As expected, the participants performed better in understanding literal questions compared to inferential questions. Inferential reading understanding requires integration of surface code, the textbase, and the reader’s relevant knowledge. This aligns with the constructivist theory of reading, specifically schema theory, considering the importance that prior knowledge has on reading and a readers’ understanding of a given text (Fresch, 2008, p. 83). According to Ouellette, Dagostino & Carifio (1999) “The reader’s schema sets expectations and limits on the attributes associated with a concept and signals the reader about which characteristics to notice and what their values may be” (Oullette et al., 1999, p. 73). Additionally, Graesser & Kreuz (1993) note that schemata are natural packages of structured world knowledge (Graesser & Kreuz, 1993, p. 146).

**Strategies that support inferencing for struggling readers**

Research on explicitly teaching students to infer meaning from text indicates that strategies such as Think-Alouds, Self-Questioning, Story Mapping, use of illustrations and observation/inference charts, to name a specific few, are effective for struggling readers and students with learning disabilities. According to Van Kleeck (2008) “Comprehension strategies require the reader to actively interact with the content of the text” (Caccamise & Snyder, 2005, p. 6; Van Kleeck, 2008, p. 632). Research has shown that students with learning disabilities have little awareness with narrative and expository text structures and therefore experience difficulty comprehending text. Wong & Wong (1984) found that students with learning disabilities were less aware of passage organization and text structure (Gersten, Fuchs, Williams, Baker, 2001, p. 279). Students
Strategies teachers can with learning disabilities are typically poor readers (usually shown to have poorer memory than good readers) indicating that specific reading strategies are essential for activating schema and making connections with text to world knowledge. The ability to make these connections are dependent upon overall comprehension of material, and more specifically, the ‘availability and accessibility of a relevant knowledge base’ (Barnes, 1996, p. 217).

Think Alouds

Caldwell & Leslie (2010) sought to analyze and compare student understanding of text from utilizing a think aloud versus recall of text upon completion of text reading. A think-aloud is a strategy in which a teacher periodically stops students throughout text to have them think aloud about what was happening in the text (summarizing/paraphrasing events thus far, generating predictions, analyzing outcomes of past predictions, noting change in characters). According to the text, “Think-alouds offer researchers the opportunity to ‘examine what the reader does to facilitate comprehension’ during reading” (Caldwell & Leslie, 2010, p. 311). Additionally, thinking aloud may serve as a cycling of text information in short-term memory that leads to it being related to previous text information and stored in long-term memory (Caldwell & Leslie, 2010, p. 334).

The situation model is introduced in this study, and requires the integration of information provided by the text with relevant prior knowledge. This is then assessed when students generate inferences while thinking aloud, during recall of text, and answering questions that require inferences to be made (Caldwell & Leslie, 2010, p.
Inferences that are generated through think-alouds in this study are coded. Backward inferences, forward, and concurrent inferences are outlined. Backward inferences connect a text segment to immediately preceding text information. Forward inferences set expectations for future content. Concurrent inferences elaborate on text information (Caldwell & Leslie, 2010, p. 314).

Modeling the think-aloud process prior to administering the strategy was absolutely necessary to ensure student understanding. Once thorough modeling had taken place, students were told to read a passage and stop at each mark indicated on the pages to talk about what they were thinking (Caldwell & Leslie, 2010, p. 320). The results from the study indicate that given the implementation of think-alouds, 44% of students paraphrased at least twice as often as they made inferences. 28% of students were more than twice as likely to make inferences as they were to paraphrase. Finally, 28% were equally likely to make inferences or paraphrase (Caldwell & Leslie, 2010, p. 325). The findings also suggest that paraphrasing during think-alouds is related to fewer inferences during student recall of information. Additionally, it is noted that paraphrasing during think-alouds actually inhibits inference generation (Caldwell & Leslie, 2010, p. 330). It is discussed within the study that more research needs to be conducted, especially at the middle school level using expository texts while thinking about using the strategy as an independent assessment tool.

Brown, Pressley, Van Meter, and Schuder (1996) utilized think-alouds as an assessment measure and found that the data was helpful in determining the effectiveness of instruction. One reason for this is that the think-aloud is not dependent on long-term
Strategies teachers can use to improve memory and can be aided by the presence of the text making it a more ‘sensitive tool’ than recall alone (Caldwell & Leslie, 2010, p. 336).

Similarly, Laing & Kamhi (2002) studied the use of think-aloud protocols to compare inferencing abilities to average and below-average readers. The participants in this study were third grade students that were involved in four different conditions. Condition 1 consisted of a standard think-aloud. Condition 2 was a think-aloud listen where students listened to two passages, one line at a time, and verbalized their understanding of the story after each line. Condition 3 was a read-through where students read the entire story. Finally, Condition 4 consisted of a listen through-where children listened to the entire story. Two passages were read in each condition and six questions (3 literal and 3 inferential) were asked after the entire story was read (Laing & Kamhi, 2002, p. 438). Similar to Caldwell & Leslie’s (2010) findings, Laing & Kamhi (2002) found that children answered significantly more comprehension questions in the think-aloud conditions, than the other conditions. The major finding in the study indicates that comprehension performance was significantly better in the think-aloud condition than in the listen-through condition (Laing & Kamhi, 2002, p. 441).

Illustrations

Pike, Barnes & Barron (2009) study the role of illustrations in children’s inferential learning. Many studies have found that pictures facilitate the ability to remember specific and concrete information from the text as well as reducing the demands on working memory when processing text (Pike et al., 2009, p. 244). The
Strategies teachers can use to support working memory. The concept of working memory is supported in this study as it is noted that inferencing ability is affected by child-based factors, such as working memory, in addition to text-based factors. According to the text, “Inference making also appears to involve a strong working memory component” (Pike et al., 2009, p. 244). Inferencing is described as the making of connections, which is considered a strong predictor of reading comprehension. When students read and refer to illustrations, they conduct a mental model in their minds. The mental model is described as the development of a mental representation of the situation described by a text.

The study examined the effects of illustrations on children’s ability to make inferences under three conditions: consistent, inconsistent, and text-only (Pike et al., 2009, p. 245). The consistent condition included a picture that was related to the text information read. The inconsistent condition included a picture that is related to the text, yet should be ignored to make the correct inference. The text-only condition is the control group and includes no picture. The findings of this study indicate that the consistent condition had a facilitative effect on making inferences while the inconsistent condition had an interfering effect on making inferences, although it is noted that this reduced as grade level progressed. Additionally, the role of working memory was not differentially affected by working memory but was a significant predictor of inferencing in all three conditions (Pike et al., 2009, p. 250). As anticipated, the inconsistent condition was difficult for students as the illustration presented somewhat aligned with the text, yet needed to be ignored to infer meaning from the text.
Strategies teachers can use

The conclusions from the study support the hypothesis that pictures are salient sources of information that children process in conjunction with the text (Gyselenck & Tardieu, 1999) and that pictures are used in the construction of meaning during reading (Pike et al., 2009, p. 253). Illustrations are also found to have more of an effect on inference making for younger readers than older readers.

**Self-Questioning and Story Mapping**

Taylor, Alber & Walker (2002) study the effects of self-questioning strategies and story mapping on reading comprehension of elementary students with learning disabilities. According to the text, “Students with learning disabilities have difficulty attending to the meaning of the text, using prior knowledge, making inferences, identifying main idea, monitoring comprehension, and remembering facts” (Bos & Vaughn, 1994; Mercer & Mercer, 2001; Oakhill & Patel, 1991). Direct, explicit instruction in reading strategies that enables students to actively respond to written material has proved to enhance reading comprehension (Taylor et al., 2002, p. 71).

Story mapping is described as a reading comprehension intervention in which the student creates a visual representation of the story by writing the important elements (e.g., character, setting, plot, resolution) on a graphic organizer (Swanson & De La Paz, 1998). Similarly Idol (1987) used a story mapping technique outlined by Beck and McKeown (1981) to enhance the reading comprehension of a class of third and fourth grade students. Results from these studies indicate that once students began using the story mapping strategy, there was a significant and positive shift in reading comprehension (Ouellette et al., 1999, p. 74). Students ranging in grade level and ability
Strategies teachers can have improved literal and inferential comprehension as a result of direct instruction in comprehension (Taylor et al., 2002, p. 71).

Self-Questioning is described as a procedure in which students stop periodically while reading to ask and answer questions related to the text. According to the text, “Actively responding to the reading passage in the form of self-questioning is effective for monitoring and increasing comprehension of written materials” (Taylor et al., 2002, p. 71). Elements of self-questioning include direct instruction, guided and independent practice, and corrective feedback.

For each condition of story mapping and self-questioning, in addition to a control group which did not receive a specific intervention strategy, students completed a comprehension test after reading the story. The test consisted of 10 open-ended questions (literal and 5 inferential) about specific events in the story. The literal questions asked required students to recall information explicitly stated in the text while the inferential questions required students to conclude information that was not explicitly stated in the text (Taylor et al., 2002, p. 74).

The results of the study determine that the accurate responses were higher in the self-questioning condition. The mean percent correct for story map items ranged from 81.9%-92.8% and the mean score for self-questioning ranged from 88.2%-94.6% (Taylor et al., 2002, p. 71). For the comprehension questions, all students scored higher on literal than inferential comprehension questions during the no intervention and the story mapping conditions. However, in the self-questioning condition, the students scored slightly higher on the inferential questions (Taylor et al., 2002, p. 78). Essentially,
Strategies teachers can according to the article, “The study indicates that given systematic training, elementary students with learning disabilities can complete story maps and answer self-questions with a high degree of accuracy” (Taylor et al., 2002, p. 81).

Conclusion

Research on inference making has indicated that overall, students with learning disabilities benefit greatly from activation of background knowledge as well as direct and systematic instruction of strategies. The working memory component has proven to be a significant factor and determinant of ability to infer meaning from text, given that students’ ability to infer relies on the understanding and retention of multiple sentences in text. Given explicit teacher modeling of strategies, students are provided an opportunity to create a situational and mental model of a given text to then think beyond the words that exist on the page. After compiling and analyzing the research for inferencing, the question remains as to what strategies are most useful and beneficial to assist students with inference generation depending on age and grade levels.

Methods

Context

The research for this study took place at an urban elementary school (Jackson Elementary) located in Batavia, New York. This school district is located Genesee Country, which is between the cities of Buffalo and Rochester. Batavia City School District has three elementary schools, one middle school and one high school. The total number of students (Pre-K-Grade 12) enrolled during the 2009-2010 school year, according to the New York State Report Card was 2,353. Jackson Elementary,
Strategies teachers can specifically, had 350 students enrolled during the 2009-2010 school year. In terms of demographics, the district at large is 81% white, 9% Black or African, 5% multi-racial, 3% Hispanic or Latino and 2% Asian. Jackson Elementary’s students are considered the most economically disadvantaged compared to the other two elementary schools in the district. The Free and Reduced Lunch rate at this building for the current school year is 74%, compared to its counterparts who rate 45% (Robert Morris Elementary) and 55% (John Kennedy Elementary) respectively.

The room in which the research was conducted is a small Academic Intervention Services (AIS) room on the second floor of the school. No other classes or intervention services take place in this room other than its scheduled services.

**Participant**

The participant for this research study is an 8 year old third grade student who is classified as having a learning disability. She has been in the self-contained classrooms at Jackson since first grade. Bailey (a pseudonym) a white female, is currently reading at a Developmental Reading Assessment (DRA) level 8. She has demonstrated some reading growth from the first quarter of the 2010-2011 school year (Level 4 to a Level 14). Bailey’s expected reading level for third grade is Level 30. Her reading intervention this school year is Fountas & Pinnell’s Leveled Literacy Intervention (LLI) which is implemented 5 times/week for 30 minutes. Running Reading Records are conducted each week. Bailey is assessed on both oral reading fluency and accuracy in addition to an oral retelling component that assesses literal and inferential recall of information from the text. She has a good sight word knowledge base according to the Dolch sight word list,
and understanding of literal meaning from text according to the continuum scoring sheet on LLI. The continuum is scored 1-3 with 3 indicating proficiency. Bailey scores 2 and 3 consistently for the literal retell component. Bailey also demonstrates a strong work ethic/desire to learn in reading group. She struggles with using word parts, onsets and rimes, clusters (sl, cl, sn, sm) and digraphs (ch, wh, th, sh) to decode new words and inferencing material that is not explicit in text (narrative, expository and fantasy genres, specifically). This information is also derived from the inferential continuum scores in which Bailey consistently scores 1s.

**Researcher Stance**

My role as a teacher for this study was an active participant. I am the special education teacher in the school that is responsible for providing reading interventions for students in the self-contained classrooms. I have been working as Bailey’s reading teacher since the beginning of the 2010-2011 school year. Bailey is observed nearly every other day in group (which consists of one male student and Bailey). Running Reading Records have been conducted to gather baseline data on generating inferences from text. Additionally, the strategies of Think-Alouds and utilizing wordless picture books were planned and implemented to support inference generation. The Think-Aloud intervention was initially modeled and then administered for about a week and a half, as well as utilizing wordless picture books. Bailey’s self-contained classroom teacher, Mrs. Newberry (a pseudonym) was interviewed to gain information on Bailey’s performance with generating inferences in her daily guided reading block in class.
Method

1. During the three week data collection period, Bailey’s ability to utilize the Think Aloud strategy (for the first week and a half) in addition to the wordless picture book strategy (for the second week and a half) were observed. These strategies were chosen because they are most appropriate for Bailey given her age and grade level, reading level, and observed preferences for learning. The Think Aloud enabled her to stop periodically during text and actually reflect on what she is thinking and learning. Research has shown that Think-Alounds offer researchers an opportunity to ‘examine what the reader does to facilitate comprehension’ during reading (Caldwell & Leslie, 2010, p. 311). My role during this strategy was to chart and maintain all information orally shared during the Think Aloud to later analyze.

The wordless picture books open doors to Bailey’s creative side and provide opportunities to activate prior knowledge and apply it (given text illustrations) to creating the story line for a text. Pike, Barnes & Barron (2009) have found that pictures facilitate the ability to remember specific and concrete information from the text as well as reducing demands on working memory when processing text (Pike et al., 2009, p. 244). One specific role that I have as a teacher during the observations for this strategy is scribing the storyline that Bailey orally shares based on text illustrations and background knowledge.

A total of (6) observations have taken place throughout the data collection period.
Strategies teachers can use

Three observations were based on the Think-Aloud strategy and three observations were based on the wordless picture book strategy. Each observation lasted approximately 30 minutes, indicating the standard session time for reading intervention group.

2. It is important to assure credibility, transferability, dependability and confirmability of this study. Mills (2007) defines credibility as the researcher’s ability to take into account the complexities that occur during a study and to deal with patterns that may be difficult to explain. My informal and formal observations are persistent over the period of the study. This was feasible because Bailey's reading group is such a small group. I have assured that this study is credible by having a peer mentor evaluate the data I have collected so that it is an unbiased interpretation of the data. Transferability refers to researcher’s believing that everything they study is context bound and not to develop statements that can be generalized to larger groups of people (Mills, 2007). Transferability will be assured based on the idea that the strategies utilized to aid in Bailey’s inference generation are context specific. She used strategies that research supports for using with elementary students. Older students, for example, might benefit from other types of strategies. Additionally, depending on learning styles and preferences, it would be inappropriate and misleading to generalize that a strategy would work for all students with learning disabilities. Mills states that dependability refers to the stability of the data, was also important to ensure during the study (Mills, 2007). The data collected is dependable because of the two critical colleagues that I have conferenced with given data and results. Each critical colleague has evaluated my study
Strategies teachers can to ensure that I have taken the proper steps to ensure that the study is indeed dependable.

Finally, Mills (2007) defines confirmability as the neutrality or objectivity of the data that has been collected. Bailey was evaluated on three different strategies/methods for inference generation: LLI Running Reading Record oral retelling continuum form, Think-Aloud observations and observations from using illustrations and wordless books.

3. In order to obtain informed consent from Bailey’s parents, I developed a formal permission slip identifying the purpose of the study, anonymity of names and data, as well as assurance that there was no risk involved in this study. I also obtained assent from the participant, Bailey. She and I had a conversation about my study for school and she was excited to participate. I also had a conversation with Bailey’s self-contained teacher (Mrs. Newberry) to explain what I would be working on with Bailey and that an interview with Mrs. Newberry would follow in order to have a complete representation of Bailey’s ability to generate inferences.

**Data Collection**

The tools that were used to collect data for this study are Running Reading Record forms from Fountas & Pinnell’s Leveled Literacy Intervention, observations and anecdotal notes from Think Aloud strategy lessons, as well as observations and anecdotal notes from wordless picture book strategy lessons. An interview was conducted with Bailey’s self-contained teacher, and the latest information on working memory capacity was accessed, viewed and evaluated, given the link between working memory and inference generation conducted for the research of the literature review. Bailey’s ability
Strategies teachers can use to generate inferences given one or both of the strategies are compared to prior oral retell continuums (inferential) from Fountas & Pinnell’s Running Reading Record forms.

Data Analysis

In order to analyze Bailey's data, the data from the Think-aloud strategies were separated from that of the wordless picture book strategies. Each original set of data (3 observations each) were photocopied and read through a minimum of three times each. Once thorough reading had taken place, I began coding types of statements. The suggestions and ideas for coding were extracted from researchers in the field who analyzed Think-alouds and wordless picture books. I looked for examples when Bailey paraphrased/summarized information, made meta-comments, asked questions and made associative knowledge based inferences. From there, I created tables to chart the findings based on specific coding. I looked at themes that were prominent in each type of strategy and implications they had on Bailey's overall ability to infer meaning.

Findings and Discussion

As stated in the methods section, the first half of data collection for Bailey was based on the inferencing strategy of Think-alouds. A think aloud was first modeled by the teacher and ideas were written on large easel paper to make information visible and accessible to both Bailey and the teacher. Bailey was then instructed to read three separate, leveled books that aligned with her instructional reading level per Developmental Reading Assessment (DRA) and Fountas and Pinnell. The teacher read the books prior to implementing the strategy and marked page numbers where it would be
Strategies teachers can be effective for Bailey to stop and think-aloud about the text characters, events and illustrations. The illustrations at the stopping points did not lend particular information or bias to prediction and inference making. The recorded data are represented on graphs in the appendix of this paper (Appendix A).

**Think-aloud**

The first story, *The Goat in the Garden* by Linda B. Ross (Level G), is a story about a farmer and his wife whose plants on the farm are being eaten and destroyed by a mean goat. An array of animals are requested to help the farmer and wife, yet to their dismay, are all unable to help alleviate the situation. One very small ant, however, uses his ability to bite to chase the goat from the garden and save the farm.

The main types of behaviors that were observed through this book include paraphrasing (summarizing the events), meta-comments (comments based on one's experience), associative knowledge based inferences (provide answers to what, how, where, when and who questions in narrative text) and text-text connections. For example, Bailey used both paraphrasing and associative knowledge based inferences when she thought aloud at the beginning of the text. As recorded, "The farmers are trying to get rid of the goat. He was eating their food. They could put vegetables somewhere else-like inside." Bailey summarized what was happening thus far and with her mental model that had been established, she proposed that they could put the food away somewhere else where the goat couldn't get to it. Bailey made meta-comments when she thought aloud on p. 12 of the text. The ant in the illustration was red and Bailey bridged her background knowledge about red ants to infer that the ant would be
Strategies teachers can able to really hurt the Goat. She noted, "He's (the red ant) is red and I know they're mean. He will bite Goat and get him to leave the garden." She continued to discuss that the farmer and his wife would be so surprised that the ant could help because he's so small. Most people think that small things can't help anyone. On p. 13, Bailey made a text-text connection when she compared this book to a previously read book *The Great, Big, Enormous Turnip*. In that story, a little mouse saved the day just like a little ant saved the day in *The Goat in the Garden*.

The second book that was utilized for a think-aloud strategy was *Baby Bird* by Charlot Wilson (Level G). This story is about a baby bird growing inside of an egg. As the pages progress, the baby bird continues to get smaller and smaller in his space inside the egg. For this story, Bailey did not make connections with the text, illustrations or background knowledge that the baby bird was growing inside of an egg the entire time. She paraphrases four times, and makes three meta-comments. She paraphrases about the bird getting bigger from the illustrations and text, and comments that, "He's (the bird) in his room. He needs a new room." It is not until the end of the book that Bailey realizes that the bird was growing inside of an egg and pecked his way out once he was ready to.

The third and final book used for a think-aloud strategy was *Lizzy* by Rebecca Smith (Level G). Bailey paraphrased, posed questions, and made meta-comments during this book. On pages 3, 6 and 9 she summarizes how Lizzy (the lizard) keeps blending in with different things. On p. 3, she asked, "What does the blending in mean? What is it called?" The teacher responded that an animal's ability to blend in with its surroundings is called camouflage. On p. 4, Bailey made a meta-comment and text-self connection
when she stated that, "This reminds me of when Amanda lost her phone in the couch. They were both blue." Additionally, at the end of the book, Bailey noted that the strawberry would trick Lizzy to get back in her cage, just like we (her family) tricks her dog with treats to get him back in his cage.

Essentially, Bailey demonstrated strength in paraphrasing/summarizing, making connections and making text-text and text-world connections within the Think-aloud strategies. During the book, Baby Bird, however, Bailey does not infer where the baby bird is given exposure to the text and illustrations, as well as the strategic stopping points in the think-aloud. This may be an area that she has weak background knowledge.

**Wordless Picture Books**

The first book that was implemented for a wordless picture book strategy to support inference making was Pancakes for Breakfast by Tomie DePaola. Bailey was instructed to read the illustrations and orally create the dialog with her own words based on what she sees depicted in the illustrations. This book depicts a typical Saturday morning for an older woman that desires to make pancakes on her farm but she continues to run out of supplies and encounters some problems along the way.

Bailey's responses to this wordless picture book were mostly coded as paraphrasing from the illustrations provided. For example, on p.4 she noted, "It looks like she wanted to make pancakes. She got the flour, eggs, sugar, milk and butter." Once the illustrations depicted that the eggs were gone on p.7, Bailey made a meta-comment/prediction and stated, "She will probably go to the barn and get eggs." She repeated that comment when the woman ran out of milk and said that she would go to get
milk from the cow in the barn. Bailey posed two questions during the wordless picture book activity. On page 12, she asked the teacher what a particular illustration was. It was a churner that the woman was using to make butter. The teacher explained what a churner was and how it was used. Additionally, Bailey did not recognized the style of a maple syrup bottle and asked what the woman ran out of near the end of the book. She did not infer, from the type of meal that the woman was making that it would be syrup. Again, the teacher informed her that it was a maple syrup bottle used for pancakes. At the very end of the story when the woman had jumped through all of the hoops to make pancakes and her plan was ruined because the cat and dog made a mess of the supplies, Bailey commented that the old woman looked tired and needed a nap. Bailey also stated that she, too, would need a nap after all of that hard work. This was a great prediction and interpretation of how the woman was feeling because she did just that at the end.

The second book that was utilized for the wordless picture book strategy was *The Snowman* by Raymond Briggs. This book is a quite lengthy children’s wordless picture book, yet its pictures truly evoke emotion and feelings of the characters. It also represents a mode that is conducive for many kids to relate to—making a snowman outside and having it come alive to do things with you and be your friend.

Just as in *Pancakes for Breakfast* by Tomie DePaola, Bailey was coded for paraphrasing a great deal throughout *The Snowman*. She summarized how the boy was making a snowman, putting the scarf, carrots, hat and coal on it. On p. 6, she described that the boy told the snowman not to get near the fireplace. She extended that comment
Strategies teachers can with a meta-comment, indicating that, "That fire would turn him into water." On p. 8 she summarized that the snowman took the roll of paper towels. She made a meta-comment by indicating that, "The boy must've said stop because he looked scared and put his hand up. That means stop." Once the snowman and the boy were flying high in the sky, Bailey noticed that the sky was getting brighter, She declared that, "They should go soon, it's getting mornin out." Finally, at the end of the book, the boy looked like he couldn't sleep because he kept fluffing his pillow and turning. Bailey indicated that he must've been worried that the snowman was gone. He realized in the morning that it had been a dream.

The third and final book used for the wordless picture book strategy was *Tuesday* by David Wiesner. In this book, every Tuesday a turtle and his other turtle friends who are otherwise bored sitting on logs in the pond turn into flying frogs on lily pads. They go on flying adventures all throughout the community.

Bailey used her experience with facial expressions and gestures that the turtle did not like sitting on the log on p.1. She summarizes on pg. 2-9 about the frogs flying over houses. As she states, "There is a man sitting at his table late at night eating a sandwich. His face looks like something weird is going on." On p. 12 the frogs flew into an older woman's house and used their tongue to click channels on the remote control. Bailey posed the question, "Do you think they will hurt her?" At the end of the story, she paraphrased that, "It looked like it was getting lighter out and they were slowing down. It must be time to go back to being a turtle." She exemplified a text-text connection when she stated, "It's like on *The Snowman* when the boy and snowman come back home.
Strategies teachers can use in classroom activities include think-aloud strategies and wordless picture book strategies. Based on the data collected from both the think-aloud strategies and the wordless picture book strategies, it is evident that each create a mental model in Bailey's head and continuously remind her and help her to reflect on the ongoing problems and goals in the stories. She made text-text connections with many of the activities, which does not often appear on standard oral retelling from LLI scoring continuums. Additionally, the wordless picture books enabled Bailey to focus much more on facial expression and gesture interpretations without physically having words present. She posed questions to herself during *Pancakes for Breakfast* and *Tuesday* which was informative to see because it might not be a question she would pose to me during a standard reading group session. Additionally, when she reads each day in guided reading with her classroom teacher, her teacher noted that Bailey does not ask questions when she doesn't understand a concept, idea or word. She will continue to progress even if it may not make sense. By strategically having Bailey stop and think-aloud, she can better process information and build schema.
Implications

The data collected from this study indicate that Bailey significantly benefits from small, strategic reading instruction to support inference making. She was provided with ample time to access and analyze given texts as well as her own thinking without the distraction of other students. The two types of strategies utilized, think-alouds and wordless picture books, were appropriate for both her age and experience with text. The data showed that Bailey displayed strength in paraphrasing and summarizing text events with both strategies. This was expected, as her guided reading block in her self-contained classroom and her intensive reading instruction in my classroom place great emphasis on the ability to retell a story's events in sequential order using details. Additionally, she made several text-text connections with books that are utilized with LLI. It is evident that LLI has provided opportunities for students to revisit different series of books and different types of genre that support building background knowledge and schema. When these connections are established and accessed, students can then begin to infer meaning based on text and personal background knowledge. Bailey's classroom teacher has been impressed this year with the LLI program and format of lessons. She is pleased to hear that Bailey, as well as other students in her class, are gaining so much from the books and materials presented in the program. It is not until background knowledge is accessed, schema is built, automaticity of sight words, and strong decoding skills are present that inferential meaning can take place, due to the notion that inferencing is higher level thinking ability that is reliant on a strong foundation of basic skills.
The data from this study also suggests that Bailey is likely to make meta-comments and pose questions with the text, due to the unique nature of the strategy sessions. For instance, when reading the book *Lizzy*, Bailey asked what it meant when animals could blend in with where they were (Appendix A). I explained to her that was called camouflage, and from there, she made a meta-comment about when her sister Amanda couldn't find her phone because both her phone and the couch were blue (Appendix A). The questions and meta-comments that she made would not have otherwise appeared in daily instruction. During the standard picture walks that take place before reading a book, Bailey may make some comments to make connections, but she rarely does so during the actual reading of the book. The think-aloud strategy, specifically, forced Bailey to slow down and really think about her reading and analyze text events. Bailey has made quite a bit of growth this year with reading and in turn, she has benefited from developing confidence. With this confidence; however, Bailey tends to speed through text a little too quickly and she has lost her ability to pay attention to details and text features. Given increased exposure and experience with the strategy of think-aloud, specifically, Bailey will enhance her ability to analyze her thoughts about texts and make connections, to ultimately generate inferences.

Bailey's scores on the LLI continuum continue to remain consistent with baseline data for this research. Thinking beyond the text and inferring meaning continue to be an area of focus for instruction. For example, the retell continuum for a book read at the end of the data collection period, Bailey scored a 2 out of 3 for inferential meaning. She was not able to explain how a young boy and his dad feel about working together. When
given the prompt, *How do you think Jake and his dad feel about working together?*

Bailey answered that she didn't know because it didn't say it in the text. What the text did include; however, were explicit illustrations where both Jake and dad looked like they were having fun. They also had pleasant conversation where they were helpful to each other. The more experience Bailey has with analyzing illustrations, text and human interactions, Bailey will be better prepared to infer meaning.

**Conclusions**

The focus for this research project sought to analyze what strategies can be used to support the ability to infer meaning from text for students with learning disabilities. Fresch (2008) identifies that constructivism, specifically schema theory, establishes the foundation for students to construct new meaning by relating it to background knowledge. It is critical for schema to be established and accessed for students to learn from text and generate inferences. Students with learning disabilities face a variety of challenges when it comes to reading, as reading is dependent on multiple simultaneous processes. The findings from the research conducted attests that implementing specific, strategic strategies help students comprehend material, as well as infer meaning from text. Such strategies that have been researched and recommended are think-alouds, wordless picture books, self-questioning and story mapping. The strategies each have their own benefits and can be more beneficial depending on grade and age level of the student and learning preferences. I have found that the modeling and implementation of strategies for Bailey, specifically, helped her to make her journey toward inferential thinking. She enjoyed stopping during think-alouds and analyzing text, as well as
Strategies teachers can creating her own dialogue for wordless books. The idea of using wordless picture books is such a great idea because it is engaging for the student and extremely insightful for the teacher. With this strategy, there is no wondering what the student is thinking throughout the process as you are able to scribe it all for him/her. Jalong, Dragich, Conrad & Zhang (2002) attest that, "Wordless books are particularly useful in teaching children how to recognize, interpret, and express themselves through pictures long before they master print...As they invent narratives, children develop their sense of story, demonstrate an understanding of sequence, practice oral or written storytelling skills and expand their cognitive abilities (Jalong, Dragich, Conrad & Zhang, 2002, p. 168).

If I were to do this study again, I would aim to do at least (6) sessions for each strategy versus 3. I would do this to compile more data and assess and compare the data from one strategy to another. I would be eager to see if Bailey made a shift and went from mostly paraphrasing to making associative inferences and meta-comments. Much of the research on inferencing indicates a shift from students simply paraphrasing to making inferences, after which they were cognitively aware of what it means to infer meaning.

A question that remains in my mind is the extent to which most special education teachers are teaching about inferential meaning from text versus recalling literal information. A few colleagues that I have shared my research with attest that they don't feel very comfortable teaching inferential meaning because it is not explicit in text and therefore typically more difficult for the students. Inferential meaning does indeed
Strategies teachers can require higher level thinking, yet this is a skill that is absolutely critical for students to become aware of and comfortable with.
References


Strategies teachers can use


### Appendix A

<table>
<thead>
<tr>
<th>Think-aloud #1</th>
<th>Goat in the Garden</th>
<th>Paraphrase</th>
<th>Associative Knowledge Based</th>
<th>Meta-comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>p. 3</td>
<td>Farmers are trying to get rid of the Goat</td>
<td>They could put vegetables somewhere else like inside the house</td>
<td>Like greenhouses. I've been to one.</td>
<td></td>
</tr>
<tr>
<td>p. 6</td>
<td>Looks like farmer and wife are really getting mad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.12</td>
<td></td>
<td>Ant would really be able to hurt Goat</td>
<td>Red ants hurt really bad</td>
<td></td>
</tr>
<tr>
<td>p. 14</td>
<td></td>
<td>Farmers will be surprised that ant can get Goat out prolly because he is so small</td>
<td>This is like the <em>Great Big Enormous Turnip</em> because the little animal helped save the turnip</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix B

<table>
<thead>
<tr>
<th>Think-aloud #2</th>
<th>Baby Bird</th>
<th>Page Number</th>
<th>Paraphrase</th>
<th>Associative Knowledge Based</th>
<th>Meta-comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>p.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Look's like she's on a sidewalk</td>
</tr>
<tr>
<td>p. 4</td>
<td>She's getting bigger</td>
<td></td>
<td></td>
<td></td>
<td>I guess he's in his room</td>
</tr>
<tr>
<td>p. 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p. 9</td>
<td>Everything keeps getting bigger</td>
<td></td>
<td></td>
<td></td>
<td>She needs a new room</td>
</tr>
<tr>
<td>p. 15</td>
<td>Oh, he was in an egg growing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix C

<table>
<thead>
<tr>
<th>Think-aloud #3</th>
<th>Paraphrase</th>
<th>Associative Knowledge Based</th>
<th>Meta-comment</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>p.3</td>
<td>She is blending in with the couch</td>
<td></td>
<td>This reminds me of when Amanda lost her phone in the chair. They were both blue</td>
<td>What does that mean? (camouflage)</td>
</tr>
<tr>
<td>p.6</td>
<td>She's blending in again to brown now</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.9</td>
<td>She's blending in to blue now</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.11</td>
<td></td>
<td></td>
<td>The strawberry is a trick to get her back in the cage. We use treats to get my dog back in its cage.</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix D

<table>
<thead>
<tr>
<th>Wordless Picture Book #1</th>
<th>Pancakes for Breakfast</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page Number</strong></td>
<td><strong>Paraphrase</strong></td>
<td><strong>Meta-comment</strong></td>
<td><strong>Question</strong></td>
</tr>
<tr>
<td>p.4</td>
<td>It looks like she wanted to make pancakes. She got the flour, eggs, sugar, milk and butter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.7</td>
<td></td>
<td>She will go to the barn to get eggs since she ran out</td>
<td></td>
</tr>
<tr>
<td>p.8</td>
<td></td>
<td>She'll prolly go in the barn to get milk from the cow too. Can't believe she ran out</td>
<td></td>
</tr>
<tr>
<td>p.12</td>
<td>She's mixing all the stuff around</td>
<td></td>
<td>What's that called? (churner)</td>
</tr>
<tr>
<td>p.14</td>
<td></td>
<td>She might go to a friend's to get it</td>
<td>What did she run out of now? (maple syrup)</td>
</tr>
<tr>
<td>p.18</td>
<td>Oh, no the cat and dog are making a mess. She's really mad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.24</td>
<td>She's so tired.</td>
<td>I would need a nap too.</td>
<td></td>
</tr>
</tbody>
</table>
### Wordless Picture Book #2: The Snowman

<table>
<thead>
<tr>
<th>Page Number</th>
<th>Paraphrase</th>
<th>Meta-comment</th>
<th>Associative Knowledge Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>p. 2</td>
<td>He was making a snowball. He made it bigger. He asked mom for carrots, scarf, hat, and coal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p. 6</td>
<td>Boy said &quot;sh&quot; they went to the fire but it was too hot</td>
<td>That would turn him to water</td>
<td></td>
</tr>
<tr>
<td>p. 8 &amp; 9</td>
<td>Snowman took roll of paper towels</td>
<td>I can tell boy said stop! Because he put his hand up. My mom would stop me if I was doing that to paper towels</td>
<td></td>
</tr>
<tr>
<td>p. 11</td>
<td>They got in the car</td>
<td>I bet boy said, &quot;Put your seatbelt on.&quot;</td>
<td></td>
</tr>
<tr>
<td>p. 16</td>
<td>They are flying around in the sky and it's getting brighter out</td>
<td>Snowman prolly said that mornin was coming and we should get back home</td>
<td></td>
</tr>
<tr>
<td>p. 20</td>
<td>Boy couldn't sleep. He kept fluffing pillows and turning</td>
<td>I bet he was worried that snowman would be gone.</td>
<td></td>
</tr>
<tr>
<td>Page Number</td>
<td>Paraphrase</td>
<td>Meta-comment</td>
<td>Text-text connection</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>p.1</td>
<td>Turtle on a log and wants to get out</td>
<td>I can tell by his face</td>
<td></td>
</tr>
<tr>
<td>p. 2</td>
<td>They turned into frogs on Tuesdays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p. 6&amp;7</td>
<td>Looks like they're flying over the houses. A man eating sandwich looks like something weird is going on outside of his house</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p. 12 &amp; 13</td>
<td>In Grandma's room using their tongues to click the channels on her remote</td>
<td>Question: Do you think they will hurt her?</td>
<td></td>
</tr>
<tr>
<td>p. 17</td>
<td>The frogs are slowing down on the lily pads and getting closer to the ground</td>
<td></td>
<td>It's like on <em>The Snowman</em> when the boy and snowman come back because it's getting light out and morning is coming. Their adventure is over</td>
</tr>
<tr>
<td>p. 20</td>
<td>The frogs made a mess in the town. The cops are talking to people</td>
<td></td>
<td>Oh look! There's the guy that was eating his sandwich and saw them earlier</td>
</tr>
<tr>
<td>p.22</td>
<td>Now the pigs want to try it nex Tuesday</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>