ABSTRACT

Title of Dissertation: PANCAKES, DUCKLINGS, THINKING IN YOUR BRAIN: MANIFESTATIONS OF 4-YEAR-OLDS' EMERGING METACOGNITION DURING JOINT PICTURE BOOK READING

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Developmental psychologist John Flavell (1979, 1981) used the term metacognition to encompass any form of thinking about one's thinking. Flavell did not consider this second-level capacity to be a regular part of the thinking and learning of preschool children. However, research using developmentally-appropriate tasks, especially early literacy tasks, has suggested otherwise. Therefore, through this qualitative and exploratory study, I investigated whether and how seven 4-year-olds attending full-day preschool were metacognitive as they read narrative picture books with me in their classroom. Over the course of their pre-kindergarten school year, during free choice morning centers, I engaged the participants in repeated joint readings of commercially available, narrative picture books. Throughout the informal dialogue of each joint reading session, I posed questions meant to encourage metacognitive processing. I transcribed the dialogue from these sessions and coded each researcher and

participant speech turn. I utilized a constant-comparative process to analyze transcriptions throughout the data collection process while referring to Flavell's (1979, 1981) conceptualization of metacognition and prior studies of metacognition with preschool participants. This process resulted in the articulation of seven categories of metacognition relevant to preschoolers' joint reading processes: Feeling of Knowing Story Content, Judgment of Difficulty, Reflecting on Reading, Verbal Self-Revising, Expanding Storytelling, Task Planning, and Justifying Verbalizations. Participants engaged in a total of 219 instances of these forms of metacognition. Approximately 60% of these instances were prompted—occurring in response to a question that I posed within the joint reading dialogue. However, approximately 40% of recorded instances of metacognition occurred spontaneously. All seven participants were metacognitive in at least five of the seven categories, across all four books, and through both prompted and spontaneous verbalizations. Consistent with Flavell's (1979) conceptualization, metacognition functioned as a transactionally-relevant resource for each joint reading participant, manifesting in ways that reflected varying efforts to participate in the task and construct meaning from the story. My results challenge the notion that metacognition has limited relevance before proficient or conventional print reading (Baker, 2005; Hacker, 1998; Pressley & Gaskins, 2006; Veenman, et al., 2006) and provide further support for Whitebread et al.'s (2009) conclusion that underappreciation of the metacognitive capabilities of preschoolers is becoming an "increasingly untenable" position (p. 64). Given my findings, I discuss implications for metacognitive theory and for future research on reading-relevant metacognition with preschool children.

PANCAKES, DUCKLINGS, THINKING IN YOUR BRAIN:

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DURING JOINT PICTURE BOOK READING

by

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Dedication

In loving memory of my Godparents, John and Maria Kubitz

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CHAPTER 1: INTRODUCTION

Metacognition refers to a secondary level of cognition through which someone can revisit, reflect on, and react productively to their cognitive efforts and experiences (Brown, 1978; Flavell, 1976, 1979, 1981). Metacognition has been recognized as a critical factor in successful reading from the initial decoding of words (Clay, 1991) through the comprehension of connected text (Baker & Brown, 1984) and the ability to learn from reading at all academic levels (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; Bransford, Brown, & Cocking, 2000; Hacker, 1998; National Institute of Health & Child Development, 2000; Pressley & Gaskins, 2006; Veenman, 2014; Veenman, Van Hout, & Afflerbach, 2006; Wang, Haertel, & Walberg, 1990). It is widely recognized that metacognition is important to literacy development and proficiency, and it is widely recognized that children have meaningful literacy experiences before they begin to read print in the conventional sense (Clay, 1991; Dooley & Matthews, 2009). However, metacognition is not commonly considered to be a fundamental component of emergent literacy. This assumption may be attributable to developmental psychologist John Flavell's (1976, 1979) original explication of the concept, which excluded preschool children from metacognitive agency, as well as the results of research in which preschool children failed to accurately rate their knowledge, select helpful tools for a task, object to egregious illogic, or generally think or talk about their thinking (Flavell, 1979; Flavell, Friedrichs, & Hoyt, 1970; Flavell, Green, & Flavell, 1995; Vygotsky, 1978). A 1998 joint statement on emergent literacy by the International Literacy Association and the National Association for the Education of Young Children may have reflected this assumption by not explicitly mentioning metacognition in conjunction with preschoolers.

However, Revelle, Wellman, and Karabenick (1985) and, more recently, Whitebread et al. (2009), have argued that reliance on unfamiliar, decontextualized, and irrelevant tasks has resulted in under-recognition of young children's metacognitive abilities in research and theory. Preschoolers have been more likely to be found to be metacognitive when research settings, tasks, and materials were relatable and when the criteria for being metacognitive could be met through behaviors and forms of communication typical for their age (Marulis, 2014). For example, Whitebread et al. (2009) and Neuman and Roskos (1997) documented multiple forms of metacognition in preschoolers' intentional, goal-directed, and sometimes planned behaviors while working at learning centers in their classroom. Rowe (1989) noted preschoolers' self-reflective revisions and expansions as they composed and revised original texts through self-selected emergent writing activities. Fang and Cox (1999) documented similar behaviors when preschoolers dictated original stories to a scribe. Holdaway characterized preschoolers' first experiences with picture storybooks as having a pervasive element of metacognition, manifested through self-regulatory behaviors during their "re-enactments" (1979, p. 7). Brenna (1995) observed that precocious preschool readers employed metacognitive meaning-making strategies that referenced and sometimes coordinated self, task, and text knowledge. Skarakis-Doyle and Dempsey (2008) found that preschoolers with a range of developmental profiles objected to the insertion of an error in the second read aloud of a simple, short story. In her seminal study of pretend storybook reading, Sulzby acknowledged that a pre-reading participant made an introspective and self-referential "meta-statement" (1985, p. 465). However, meta-processing did not become part of her emergent literacy schemata. This collection of evidence using developmentally appropriate tasks depicts a preschooler who can revisit, reflect on, and react productively to her or his own cognition across multiple early literacy and learning scenarios.

Were these manifestations of metacognition exceptions—or do conceptualizations of both metacognition and emergent literacy need to be updated to accommodate them?

A related question concerns whether metacognition plays a role in joint picture book reading. Joint picture book reading is a foundational emergent literacy experience, yet it is underutilized as a methodological approach for studying early metacognition. The National Early Literacy Panel (NELP; 2008) recommended joint (i.e., shared) picture book reading as a developmentally appropriate, supportive, and naturalistic emergent literacy experience for preschoolers. In various forms, jointly reading a picture book with an adult caregiver is a typical practice in children's homes and in the preschool setting. Approximately 50% of U.S. children under five experience joint reading at home on a regular basis (U.S. Department of Education [USDOE], 1999; Scholastic, 2018). Additionally, almost nine out of ten young children have heard a story read aloud within the prior week (USDOE, 2018). In the preschool classroom where this study took place, interacting with picture books was a valued and familiar activity. One-to-one joint readings were considered to be best practice and occurred occasionally, based on the availability of a teacher or adult volunteer. Class members also experienced picture books on a daily basis through listening to whole class read alouds and engaging in pretend reading at the class library, during centers, or at nap time.

Within this setting, I engaged seven 4-year-old class members in repeated joint readings of commercially available, narrative picture books intended for a preschool audience. My goal was to investigate 4-year-olds' metacognitive behaviors and verbalizations during the joint reading of picture books that they might encounter when not under study. Joint picture book reading is one of many foundational emergent literacy experiences thought to contribute to reading and thinking skills (NELP, 2008; Pellegrini & Galda, 2003; Schickedanz & McGee,

2010; Snow, Burns, & Griffin, 1998). Since metacognition has been shown to be germane to the various emergent literacy activities referenced above (e.g., independent pretend reading and writing, detecting errors during read alouds, and participating in learning centers), I sought to investigate the relevance of metacognition to joint picture book reading. I also sought to explain how early metacognition in this context is consistent with Flavell's conceptualization and is therefore worthy of continued study through the same theoretical foundation used to study metacognition during conventional literacy.

Preschool children (3- to 5-years-old in the U.S.) are considered to be in a phase of emergent literacy—a period of development involving the acquisition of fundamental skills and beliefs that will enculturate them into a print-based society (NELP, 2008). Preschoolers achieve emergent literacy milestones as they notice environmental print, play with rhyming sounds, turn book pages from front to back, pretend to read, say the letters in their name, and listen to books that adults read aloud (Clay, 1991; Dooley, 2010; Sulzby, 1985). During this period before conventional print reading, jointly "reading" and discussing narrative picture books with an adult offers opportunities to consider story structure, react to evocative scenarios, make inferences about the motivations of characters, and hear new words that label tangible and intangible things in the world (Dooley, 2010; Lynch, van den Broek, Kremer, Kendeou, White, & Lorch, 2008; NELP, 2008; Stahl, 2014; Sulzby & Teale, 1991). For conventional readers, these scenarios can be rich spaces for metacognition (Annevirta, Laakkonen, Kinnunen, & Vauras, 2007; Baker & Brown, 1984; Boulware-Gooden et al., 2007; Bransford et al., 2000; Palincsar & Brown, 1984; Veenman, 2014). Through the present study, I sought to understand whether and how jointly reading narrative picture book stories could enable spaces for 4-year-old pre-readers to manifest early, reading-relevant metacognition.

Preschoolers' actions and reactions while participating in joint reading are not only constructive ways of knowing, but also may be precursors to the comprehension processes of conventional readers (Dooley, 2010; Lynch et al., 2008). Thus, I chose a joint (or shared) reading dynamic to both encourage and document participants' meaning-making processes as they jointly "read" the book and discussed settings, characters, events, and the range of novel and familiar ideas and information represented (NELP, 2008). I intended for this methodology to create multiple opportunities for participants to wonder, infer, learn, remember, reflect, connect, and update their understanding—spontaneously or in response to my questions (Baker & Brown, 1984; Paris & Paris, 2003; Schickedanz & McGee, 2010; Stahl, 2014).

Motivation and Rationale

As a teacher, I have always been interested in *how* literacy cultivates thinking and learning. Moved by awareness of disparate achievement and underachievement, I became interested in the relationship between metacognition and literacy. In 2015, I began my study of metacognition as an active and higher order capacity important for constructivist learning—that is, when a learner actively constructs meaning from a framework of prior knowledge, prior experiences, and personal motivations (Flavell, 1993; Markman, 1981; Morrison, 2008). I decided to investigate metacognition during the joint reading of narrative picture books as an alternative to focusing on discrete early literacy skills such as vocabulary, letter recognition, or book-handling (Blamey, Beauchat, & Sweetman, 2012; Britto, Fuligni, & Brooks-Gunn, 2006). Acquisition of code-based skills has received extensive attention; additional research is needed to understand the less discrete skills that contribute to comprehension and self-aware literary agency (Paris, 2011; Schickedanz & McGee, 2010).

How young children think and think about their thinking while interacting with picture books is an important yet understudied phenomenon. A relative lack of research on such an "unconstrained" skill (Paris, 2005, p.187) may be attributable to the arduous nature of collecting and interpreting children's thoughts as well as pessimistic presumptions suggested by Flavell's description of a much older metacognitive agent, Piaget's hierarchical stage view of cognitive development, and historical research approaches (Marulis, 2014). However, if comprehending and learning from texts are the penultimate goals of reading, then concern for mindfulness must start when literacy starts, which is before the onset of conventional print reading (Baker, 2005; Clay, 1991; Markman, 1977; Schickedanz & McGee, 2010). Thus, I designed this study to investigate the cognitive and metacognitive knowledge, skills, and experiences that preschoolers can rely on to make sense of narrative picture books. I intended for my results to advocate for increased inclusion of preschoolers in metacognition research as well as increased attention to evidence of early metacognition in discussions of emergent literacy. In the next sections, I present additional information that further supports my rationale for investigating the metacognitive capacities of preschoolers during joint reading.

Metacognition is not just a function of age. Preschool children are developmentally capable of basic metacognition as they make reflective sense of everyday social experiences and learn basic ideas through interaction with others and the environment (Baker, 2005; Kuhn, 2000; Trawick-Smith, 2006). Though Flavell referenced older readers and students to exemplify his ideas, he conceded that "some aspects of metacognition, just like some aspects of general cognition, are probably present almost from the beginning" (1987, p. 25). An extensive body of psychological research and a growing body of literacy research have established that 4-year-olds can be metacognitive, especially when the task seems relevant or familiar and when the criteria

for being metacognitive can be met through typical communication and behavior (Stein, 1986; Whitebread et al., 2009). Granted, younger children are not as cognitively and metacognitively capable as older ones (Annevirta & Vauras, 2001; Flavell et al., 1995), and pre-conventional readers cannot yet read. However, readers of any age can have limited metacognitive knowledge about reading as a mental activity (Jacobs & Paris, 1987) and limited ability to discuss reading in a self-reflective manner (Martin & Kragler, 2011; Mokhtari & Reichard, 2002). Developmental limitations may impose parameters on reading processes and performances (van den Broek, Kendeou, Lousberg, & Visser, 2011), but they do not lessen the importance of investigating metacognition during those processes and performances (Annevirta et al., 2007; Baker, 2005).

Emergent comprehension and metacognition have been understudied in the preschool population. The National Research Council's *Preventing Reading Difficulties in Young Children* (Snow et al., 1998) addressed the need for high quality preschool experiences for all children—especially those at risk for disparate achievement. Snow et al. (1998) recommended that preschoolers experience frequent, open-ended, adult-child conversation about books and literacy experiences. They recommended that conventional readers benefit from metacognitive pedagogies, such as Reciprocal Teaching (Palincsar & Brown, 1984). In other words, Snow et al. (1998) explicitly mentioned metacognitive pedagogy for conventional readers but not for preschoolers. A decade later, the National Early Literacy Panel, which was purposed with extending the scientifically-based findings of the National Reading Panel to children birth through age five, concluded that "code-focused instruction" was the necessary pathway forward (2008, p. 120). Though the NELP also recommended shared or joint reading for its educative adult-child interactions, it consistently referred to comprehension as an aspect of "conventional" versus "emergent" literacy (2008, p. 3). In sum, both NELP (2008) and Snow et al. (1998)

recommended that preschoolers experience the rich conversation of dialogic reading, yet neither explicitly assigned importance to metacognitive skills for preschoolers.

Many scholars, including Dooley and Matthews (2009) and Paris (2011), have suggested that the emergent literacy community pay increased attention to the processes and skills that are less constrained than code-based skills. For example, Tompkins, Guo, and Justice (2013) proposed that inferencing should be considered an important aspect of emergent literacy, since story comprehension is driven by a network of inferences, whether the story is read, jointly read, viewed, or heard (Kendeou, van den Broek, Helder, & Karlsson, 2014). Through the present study, I sought to investigate metacognitive processing as a higher order, unconstrained emergent literacy capacity (Paris, 2005) during joint picture book reading, wherein comprehension was presumably the goal.

There is urgent demand for better understanding of metacognition in early reading and learning. In the United States, there is an increasing demand for metacognitive reading and learning, exemplified by the Common Core State Standards' (Council of Chief State School Officers, 2014) emphasis on higher order thinking and metacognition from kindergarten onward. According to Afflerbach, Holmberg-Masden, Ozturk, and Faust (2014), "metacognitive proficiency is a fundamental underpinning of the new type of critical thinking and self-directed reading and learning called for by the new Common Core State Standards" (p. 1). Yet the Standards do not provide thorough guidance on how to develop these capacities in young learners (Afflerbach et al., 2014; Brown, Garzarek, & Donegan, 2014). In response, the National Association for the Education of Young Children (NAEYC, 2012) encouraged the formation of connections between preschool experiences and the sophisticated thinking that the Standards require as soon as kindergarten. Exploration of the ways that preschool children can be

metacognitive, and how metacognition can aid their comprehension, is a reasonable response to this recommendation. Description of comprehension and metacognition during joint reading can contribute specific examples of the thinking that preschoolers can rely on during their interactions with texts featuring ideas, structured information, and narrative situations (van den Broek et al., 2011).

Studying metacognition during emergent picture book reading may help to inform connections between emergent literacy and the metacognition that is in demand during conventional reading. In fact, Annevirta et al. (2007) reported a positive relationship between growth in metacognitive knowledge before reading and eventual reading comprehension. Lysaker and Hopper (2015) proposed that "finding continuities between early meaning-making practices and later conventional reading strategies could inform early reading instruction and help children make important connections between meaning making with non-print and print-related tasks" (p. 650). Finally, Markman (1977) cautioned that a comfortable tolerance of incomprehension (caused by a lack of metacognition) can begin early and persist throughout conventional literacy.

Developmentally-appropriate, relevant methods can advance the study of reading-relevant metacognition before print reading. Joint picture book reading may reveal more information about early metacognitive processing than prior approaches such as independent pretend reading or error detection procedures. Historically, researchers have asked preschool-aged or slightly older participants to react to an error in text read aloud (Baker, 2005; Flavell, 1979; Garner, 1987; Markman, 1977; Revelle et al., 1985). These oral procedures were based on tasks in which conventional readers were invited to detect errors implanted in printed text. Better error detectors tended to be better comprehenders (Garner, 1987; Oakhill, Hartt, & Samols,

2005), suggesting that this approach revealed insights about how readers detected and communicated their comprehension problems (Garner, 1987). In a classic example, Flavell (1987) asked kindergarteners to build a block tower according to instructions played from a tape player. Some of the instructions were "ambiguous, impossible to execute, or otherwise inadequate" (p. 24). Flavell reported that 5-year-olds and 6-year-olds displayed and verbalized puzzlement yet still attempted to carry out the problematic instructions. Many of these participants claimed that the instructions were "good" (p. 24) and that their tower met the requirements. Markman (1977) found similar results for first-graders, but she also noted that first-graders' performances improved after witnessing a demonstration. Markman (1977) concluded that a demonstration mediated task demands by presenting abstract ideas on a physical plane (Vygotsky, 1987). In other words, additional scaffolding led to more successful metacognitive processing for participants who had previously been determined to be incapable of useful metacognition. Flavell speculated that young children may have feelings of "incomprehension" (1987, p. 25), yet not be able to rely on them to inform their next steps. Markman's (1977) results suggested that reducing task demands—through joint participation—helped children put metacognition into action.

These error detection procedures exemplified how an unfamiliar task can underestimate the metacognitive abilities of young children (Markman, 1981; Revelle et al., 1985; Whitebread et al., 2009). By embedding an error detection task into the familiar procedure of a storybook read aloud, Skarakis-Doyle and Dempsey (2008) found that preschoolers noticed and objected to erroneous information inserted for research purposes. Their results further support the contention that young children are better able to utilize any available metacognition in the context of a familiar and mediated experience. A logical next step is to investigate the relevance of

metacognition to the mediated (i.e., joint) reading of a book as preschoolers are likely to encounter it, at home, at preschool or day care, or in a library.

Jointly reading picture book stories is a promising method for documenting metacognitive processes. The cognitive processes involved in comprehending typical preschool stories can be fertile ground for developing both comprehension skills and metacognition (Lynch et al., 2008; Schickedanz & McGee, 2010). Stories are unfolding communication events that provide opportunities to respond personally, compare information to world knowledge, and change one's mind (Flavell, 1987; Markman, 1977; McGee & Schickedanz, 2007; Stahl, 2014, van Kleeck, 2008). Whether a story is read, heard, or interpreted from illustrations, similar meaning-making processes are involved (Baker, 2005; Flavell, 1981; Kendeou et al., 2014; Paris & Paris, 2003; Stahl, 2014). For example, to establish understanding of stories viewed and/or heard, preschoolers might need to assimilate unexpected plot twists or discern how a character is suffering from a false belief. Joint reading is thus a challenging yet familiar and mediated context. Based on the reasoning discussed in the prior section, I assumed that these characteristics would enable opportunities for young children to experience and manifest metacognition. Furthermore, since meaning-making processes can vary situationally based on interest, familiarity, text complexity, and available schema (Baker & Brown, 1984; Kintsch, 2004; Rosenblatt, 1978), I decided to study preschoolers' interactions with multiple texts.

Statement of the Problem

The issues discussed throughout my rationale can be summarized in the following statement of the problem. More than a decade ago, Veenman et al. (2006) called for our understanding of metacognition to be broadened, including the accommodation of mounting evidence of young children's (5-year-olds, in their example) metacognitive capacities. However,

our present understanding of metacognition during preschool emergent literacy remains limited. A relative paucity of research in this area may be attributable to expectations set by Flavell (1979, 1992, 1993), who excluded preschoolers from full metacognitive agency, or by characterizations of early metacognition as exceptions to the contention that reading-relevant metacognition develops later (Baker & Brown, 1984; Marulis, 2014; Veenman et al., 2006). Emergent literacy scholarship did not historically prioritize metacognition, as exemplified by an exclusion of preschoolers from the discussion of metacognition and an exclusion of the term *metacognition* from the discussion of preschool pedagogies (e.g., Snow et al., 1998). Finally, the research that has produced evidence of preschoolers' metacognitive capacities has not utilized joint reading as a task context, in spite of the importance of this dynamic to emergent literacy.

Both exclusion and diminution are called into question by evidence of 4-year-olds' metacognitive engagement across developmentally-appropriate literacy tasks and scenarios: emergent writing tasks (e.g., Fang & Cox, 1999; Rowe, 1994), modified storybook read alouds (e.g., Skarakis-Doyle & Dempsey, 2008), and daily learning in the preschool classroom (e.g., Neuman & Roskos, 1997; Whitebread et al., 2009). Joint storybook reading is a developmentally-appropriate task of equal familiarity and importance. Joint reading of a narrative picture book also has special potential to manifest metacognition. Within this familiar procedure, a moderate degree of challenge and need for metacognition may be posed by the information presented through the story and through the conversation with the adult reading partner. Therefore, exploratory research on metacognition in this particular context is needed to more fully understand the relevance of metacognition during emergent literacy and to provide detailed descriptions of early metacognitive activities that can contribute to the updating of conceptualizations of this phenomenon.

Purpose of Study

Given the nature of the problem space and my rationale, the purpose of my study was to examine the metacognition manifested by preschoolers participating in joint readings of narrative picture books typical for the preschool audience. I intended to investigate how preschool children understood and reacted to these stories and how they could manifest comprehension and reading-related metacognition. I anticipated that the joint reading dynamic could be a context for the documentation of metacognitive experiences, metacognitive knowledge, and metacognitive regulation. I intended to use the open-ended and mediated dynamic of joint reading to help make preschoolers' cognitive processes observable so I could document, describe, and categorize them.

Research Question

I posed the following research question: How can 4-year-old pre-readers manifest metacognition during joint picture book reading? This question enabled a qualitative and exploratory approach to the research problem. To answer this question, I engaged 4-year-olds in repeated joint picture book readings as a special form of participant observation and as a context for data generation and collection.

Overview of Methodological Approach

I entered the study site as a classroom volunteer. From 9 a.m. to 10 a.m. each school day, I interacted with pre-kindergarten class members as they engaged in free choice morning centers. I invited preschoolers who weren't occupied to select a book from the classroom library and read it with me. By the second week, reading with me was a regular option during centers. By the third week, I began to implement a joint reading procedure with enrolled participants. Since my aim was exploratory, I interacted with 4-year-olds through informal yet purposeful conversation.

I introduced the title and cover of each book and invited each participant to "read it with me." I allowed each reading session to uniquely unfold, as long as we proceeded through the text from the front cover to the last page. I prepared for my role by developing comprehension questions and metacognitive prompts based on my review of literature. I posed these questions and prompts when there was a lull in dialogue or when I thought questioning would spur useful metacognition or aid comprehension. I recorded each session, transcribed all utterances, and inserted observational notes.

I began thematic coding during the first week of data collection and conducted additional rounds through a constant comparative process until all data were coded. I confirmed the accuracy of my transcription through an independent review by a professional transcriptionist. I eventually conducted a final round of coding which confirmed seven categories of metacognition. I then established acceptable inter-coder consistency by requesting that a second rater independently code a randomly-selected sample of transcripts. I reduced this data set by presenting descriptive statistics of occurrences of seven categories of metacognition and by writing case impressions for each participant. In Chapter 4, I use these cases to discuss what occurred before and after instances of metacognition and to compare joint reading performances between participants, across books, and across readings.

Applying Flavell's Conceptualization of Metacognition to a Reading Task

To pursue my research question, I applied Flavell's definition of metacognition to conventional reading. Then I adapted Flavell's (1979, 1981) model of cognitive monitoring for use as a model of metacognition within an emergent joint picture book reading task. Flavell intended for this model to "capture the variety of things that can happen during a cognitive enterprise in which the subject does at least some monitoring of cognitive goals, experiences, and

actions" (1981, p. 39). Since all metacognitive activity can be presumed to result from some second-level monitoring of engagement of the self in an activity, domain, or enterprise (Flavell, 1976, 1981), this model can be used to support investigation of metacognition in both conventional and emergent reading.

Flavell (1992) endorsed a cognitive constructivist framework for the study of learning and development. In this framework, the young child is always engaged in "intellectual commerce with the environment" (Flavell, 1992, p. 998). Accordingly, I chose to investigate the thoughts and motivations of the child to understand joint reading behaviors. Per Brown's (1983) description of constructive engagement, I expected preschoolers to engage in "knowledge-extending and knowledge-refining activities … [to] question the veracity or range of applicability of their theories … [to] perform thought experiments, question their own basic assumptions … and [to] reason on the basis of whatever knowledge they have" (as cited in Flavell, 1992, p. 998).

Reading tasks, especially for young children, tend to pose at least some degree of novelty or difficulty and have the ostensible goals of completing the text and understanding it. Ideally, reading is a dynamic process of active and reflective meaning-making, making cognitive and metacognitive aspects variably relevant (Baker & Brown, 1984; Bransford et al., 2000; Flavell, 1981; Pressley & Gaskins, 2006). In fact, Baker & Brown (1984) advocated that the process of comprehending be seen as inherently metacognitive, as constructive meaning making involves constant formation of a hypothesis of what something is about, followed by confirmation, expansion, or revision of the hypothesis as more information is encountered and more processing takes place.

As shown in Figure 1, Flavell's model of cognitive monitoring (1979, 1981), used here as a visual representation of metacognition during a literary task, features metacognitive knowledge, metacognitive experiences, goals, and actions taken to reach goals.

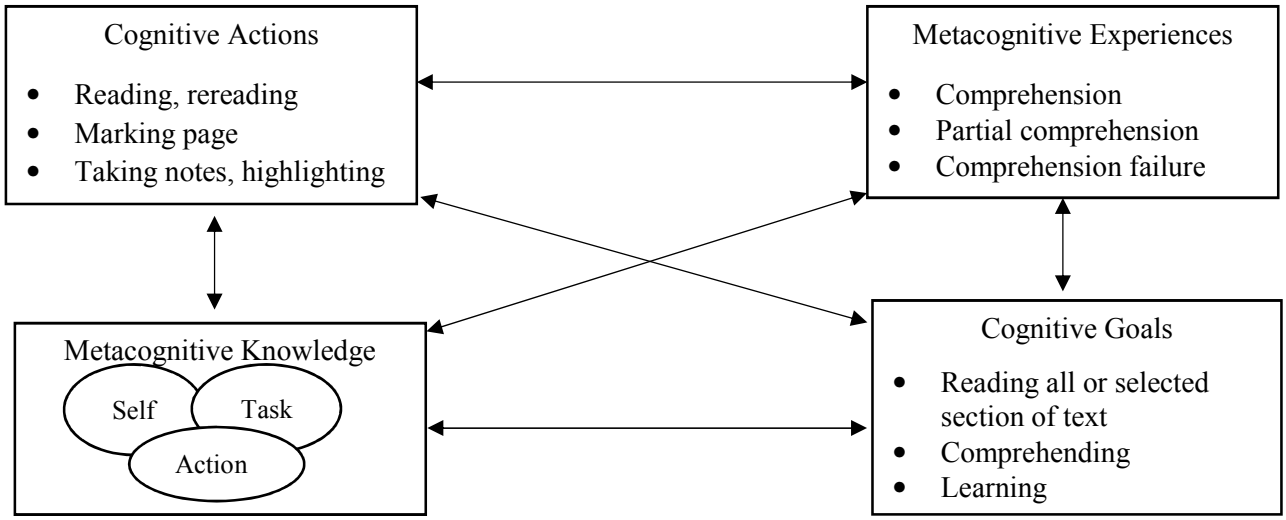

Figure 1. Flavell's model of cognitive monitoring (1981, p. 40) applied to a reading task.

Metacognitive knowledge can be gained about one's self, task demands, or cognitive actions one may take. These three forms of metacognitive knowledge may influence each other in complex ways, and each may interact with factors represented in other parts of the model to influence reading task performance. Sometimes, the meta- or second level of knowledge in any of these three areas is not correct or is not skillfully applied (Veenman et al., 2006). At other times, accurate metacognitive knowledge of self, task, or possible actions facilitates success. Success on a task can lead to personal and academic growth (Flavell, 1981). Metacognitive knowledge of the self as a literate being can be "intraindividual," "interindividual," or "universal" (Flavell, 1981, p. 43). A reader may develop the self-knowledge that she or he can't read a word, is able to remember more from reading silently, or that the narrative genre is more relatable than a list of scientific facts. One can know that a feeling of incomprehension should be

taken seriously and acted on. Thus, metacognitive knowledge and metacognitive experiences are interconnected, as are all parts of Flavell's model. Knowledge of a task's demands, built through exposure, instruction, and metacognitive experiences, can help a reader take productive actions (Bransford et al., 2000; Griffith & Ruan, 2005; Pressley & Gaskins, 2006). Cognitive and metacognitive knowledge of actions that are called for by a task can be gained through individual experience, social learning, and formal instruction. Though experience is a key component of expertise, the constructive efforts of novices are worthy of study (Chi, Glaser, & Rees, 1982).

Metacognitive experiences occur frequently, such as when readers consciously realize something or have a feeling of confusion relative to their desire for understanding (Flavell, 1981). Since these more nebulous, second-level insights may occur at any point during or after a task (Flavell, 1979), arbitrary limitations on reaction times may cause metacognitive experiences to be discouraged or dismissed. Also, according to Flavell (1981), metacognitive experiences tend to have affective dimensions in addition to cognitive ones. Clay (1991) incorporated this idea in her description of how metacognitive experiences are fundamental to early print reading: a kindergartener or first grader must coordinate multiple cognitive and perceptual efforts to decipher printed English and must also possess the motivation to try to do so and the resilience to keep trying when efforts fail. Because of these characteristics, Flavell (1981) proposed that readers may have more difficulty identifying and reporting on metacognitive experiences as opposed to metacognitive knowledge, which tends to function as a stateable fact from long term memory. Thus, despite the relative ubiquity of metacognitive experiences, readers may not always translate them into stateable metacognitive knowledge or productive actions (Baker & Brown, 1984; Bransford et al., 2000). This scenario suggests the revelatory value of prompting in research and the academic value of metacognitive education in general. Flavell (1981) provided

the following examples of metacognitive experiences that are relevant to reading education: realizing that part of a message is critical and must be remembered, surmising that the teacher is reading too fast for you to keep up, recognizing that you are overwhelmed by a large amount of information or a limited time for rehearsal, and realizing that there can be another way to approach a task or meet a goal.

Cognitive goals, such as comprehension of text or completion of a reading task, define what actions should be taken. Familiarity with a task or a goal supports more efficient selection of actions taken to reach that goal. Hence, reading education has significant potential to increase cognitive and metacognitive efficiency, and vice versa (Bransford et al., 2000; Flavell, 1979, 1981; Palincsar & Brown, 1984). Cumulative successes or failures can lead a reader to adjust goals upwards or downwards. Over time, achieving or missing goals can contribute to what is believed to be knowledge about the self, such as being able or not able to read or read well.

Cognitive actions are taken to reach a goal. Actions taken in pursuit of a goal may be mastered skills, rote procedures, the application of a formal strategy, or an effort made as a result of intuition or experimentation in the moment. Flavell (1981) provided the following examples of cognitive actions: trying another approach, redoing a task, paraphrasing, taking notes, and using memorization techniques. Metacognition can bring together cognitive actions and first-level knowledge during a task. For example, realizing the need to try another approach to constructing meaning for a text is a metacognitive experience. Knowing that this feeling should always be taken seriously and acted on is metacognitive knowledge. Trying another approach is a cognitive action. Knowing three possible approaches is cognitive knowledge (Flavell, 1981).

A commitment to a strategic approach to reading can increase the likelihood of applying metacognition when needed (Palincsar & Brown, 1984; Pressley & Gaskins, 2006). Reading comprehension strategies, such as re-reading, pausing to define unknown terms, and determining relative importance are examples of productive actions while reading (Palincsar & Brown, 1984; Palincsar & Schutz, 2011). At the cognitive level, a reader can name a strategy and follow its component steps. At the metacognitive level, the reader has ideas about her or his proficiency with a strategy and makes a thoughtful choice about when to use it. These forms of knowledge are referred to in the literature as declarative, procedural, and conditional (Jacobs & Paris, 1987). These distinctions highlight the complexities of investigating whether task performance can be attributed to cognitive factors, metacognitive factors, or some combination or interaction. Lack of metacognition is considered to be an *availability* deficiency; inability to apply metacognition is considered to be a *production* deficiency (Veenman et al., 2006).

Adapting a Model for Joint Reading with Preschoolers

Flavell (1993) recognized that preschoolers are aware of thinking as an internal, representational, mental activity. In this view, Flavell considered the preschooler to be more advanced than did Piaget (1929/1997), who insisted that children as old as five or six years still did not understand thinking as an abstract enterprise. Nonetheless, Flavell (1979, 1992, 1993) concluded that preschoolers cannot consistently or productively rely on a continuous stream of consciousness to help themselves cope with task demands through metacognition. Flavell (1981) also concluded that preschoolers are not yet able to process messages from text as cognitive units upon which more mental work may be done. However, Flavell did not test his ideas about young children in the interactive and supportive context of joint picture book reading, which can

mediate connections between the cognitive and the metacognitive through the process of comprehending as well as interaction with the adult reading partner (Pellegrini & Galda, 2003).

The essence of Flavell's (1981) task-oriented model of cognitive monitoring and his distinction between knowledge, experience, and regulation can be applied to emergent joint picture book reading. I claim that 4-year-olds can engage in constructively-responsive meaning making during joint reading and that metacognition is a situationally relevant part of this response, manifesting in ways that make sense for the reader, the text, and the task. Thus, as shown in Figure 2, I adapted Flavell's (1981) model for use in the study of joint picture book reading and inserted the seven forms of metacognition that I identified through coding.

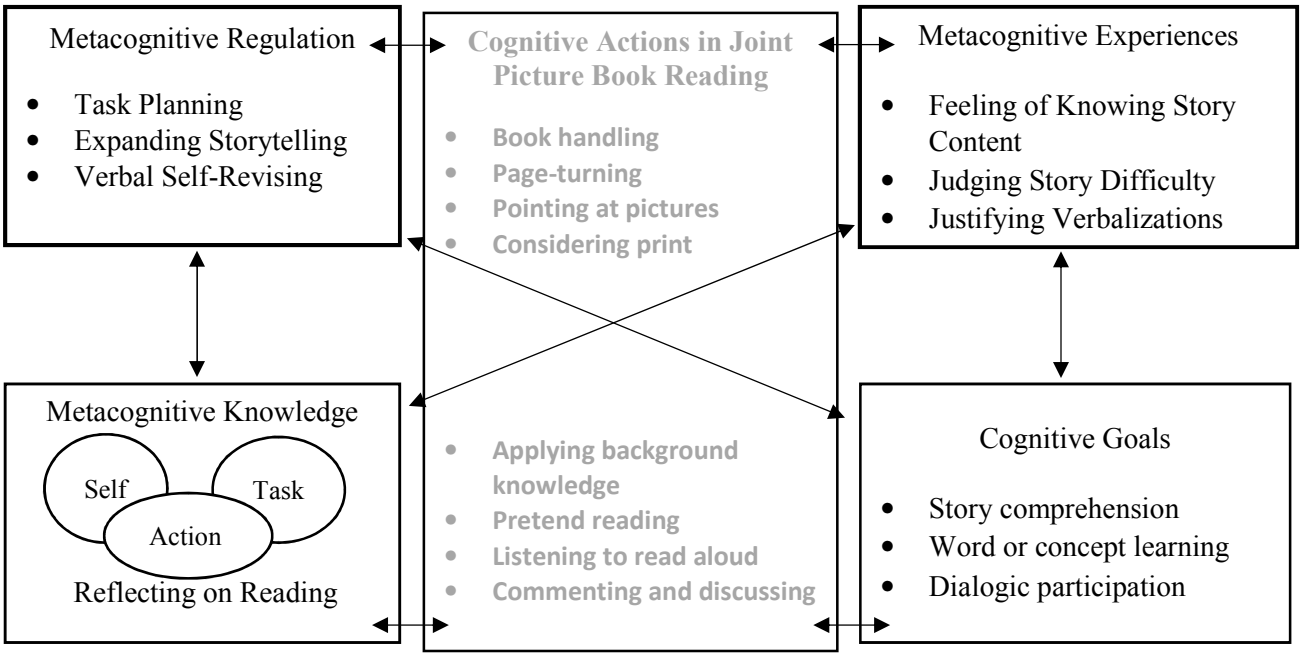

Figure 2. Flavell's model of cognitive monitoring (1981) adapted for a joint reading task

Preschoolers may engage in many cognitive actions during joint reading, as shown in the middle box of Figure 2. The primary adaptation of this model for use in emergent versus conventional reading is the positioning of these emergent literacy actions as a medium that

engaged preschoolers in a developmentally-appropriate task that enabled metacognition. This task provided a meaningful context that connected age-typical behaviors in pursuit of a goal. Additionally, I presumed that preschoolers' text interaction behaviors would be less strategic than what can be observed in proficient elementary, middle, and high school readers who have had years of formal schooling. I also presumed that this difference would not lessen the relevance of metacognition to their emergent reading. In sum, I viewed preschoolers' manifestations of metacognition as proportional to the reader, the text, and the task. Participants' metacognition co-occurred with their discussion of the pancakes, ducklings, baby birds, and fireflies that were central to study texts.

I anticipated that jointly reading a well-structured narrative would enable opportunities to construct understanding, to learn, to discuss information, and to be metacognitive. Dooley and Matthews applied a constructive and transactional (i.e., self, text, and task; 2009) lens to the study of preschool emergent literacy by using developmentally-appropriate texts and tasks. In my adapted model, the preschool child is a cognitive-constructive and metacognitive agent engaged in a variety of age-typical cognitive and metacognitive efforts in the context of joint picture book reading. In sum, I relied on Flavell's situational (i.e., task-oriented) model of metacognition, complemented by a cognitive-constructivist lens, to make claims about metacognition and comprehension during joint picture book reading.

Goals imply conscious intentionality. Flavell (1981) described a bi-directional relationship between cognitive goals and metacognition. The more experience one has with an academic or literary task, such as understanding a story or describing its plot, the easier it becomes to set appropriate goals and select appropriate resources. Appropriateness is multi-faceted. What persons need to be successful on a task tends to vary based on their knowledge,

task experience, interests, and motivations. Thus, mindful familiarity with a task can facilitate productive intentionality. Goals can be set by the reader or by the task. Setting goals and behaving intentionally both reflect and contribute to the growth of metacognition.

Flavell explained that "metacognitive knowledge is that segment of your (a child's, an adult's) stored world knowledge that has to do with people as cognitive creatures and with their diverse cognitive tasks, goals, actions, and experiences" (1979, p. 906). Such knowledge can be gained through explicit instruction, statements about reading made by parents, teachers, and caregivers, social or academic feedback, and informal literacy experiences. In turn, it can influence subsequent efforts and experiences while reading. In the present study, I documented *Reflecting on Reading* as a manifestation of emergent metacognitive knowledge when participants articulated, in their own words, a budding awareness of the self as reader, of reading as a particular type of mental activity involving extracting or constructing meaning, of the text as a story to be understood, or of the task of joint reading as working through the book with me from front to back, going back and forth between storytelling and other dialogue. Knowledge is a constructive mental resource; it can be applied to achieve more efficient, productive, and powerful reading behaviors. I aimed to describe the metacognitive knowledge that pre-readers articulated before formal K-12 instruction, as this knowledge can influence their engagement in constructive meaning making.

Brenna (1995) prompted precocious preschool readers to articulate statements of self, task, and text knowledge that were relevant to their early independent reading experiences. Strommen and Mates (1997) explained that many pre-reading preschoolers, and not just precocious readers, are already constructing knowledge about themselves as readers, reading as a task, and text as something to be read. In other words, preschoolers are beginning to reflect on

themselves as readers, on the text as messages to be interpreted and processed, and on reading as a defined cognitive enterprise. The beginning of an identity as a literate person has already been recognized to be an aspect of emergent literacy (Dooley & Matthews, 2009; Sulzby, 1985). I sought to document and describe how metacognitive aspects of this phenomenon manifested and mattered during joint picture book reading. Metacognitive knowledge is only one aspect of metacognition. It is important to document, but it has limited value on its own. As noted by Veenman, "individual beliefs are personal and subjective by nature, and so remains metacognitive knowledge when it is not put to the test by the actual execution of strategies or skills (2014, p. 3).

Flavell (1979) explained that metacognitive experiences function as feelings, realizations, or states, such as puzzlement, failure, or success. The content of a metacognitive experience may overlap with metacognitive knowledge. However, metacognitive experience functions as a state of being versus defined information or fact. Metacognitive experiences are not easily documented, even when working with mature, experienced, and conventional readers. They are thus likely to be even more challenging to research in preschoolers, who have less reading experience, fewer verbal labels for their experiences, and fewer opportunities to discuss them. Nonetheless, they can spur the application of strategies and growth in metacognitive knowledge. For example, the metacognitive experience of being confused can spur a young reader to ask questions. As reflected in the inter-connectedness of the parts of Flavell's model, cognitive knowledge and goals would affect the precision of the question. Readers do not need to know and do not ask questions about every detail encountered. The feeling of not knowing some information that you need to know does not occur constantly. It is therefore noteworthy to

describe under what conditions it does occur for novice comprehenders, prior to formal instruction.

In the present study, I claim that preschoolers experienced metacognitive feelings, sensations, and realizations while participating in joint reading, manifested as *Feelings of Knowing Story Content*, *Justifications of Prior Verbalizations*, and *Judgments of Story Difficulty*. Feeling of Knowing and Judgment of Difficulty are typically considered to be expressions of Metamemory, which itself was historically considered to be a form of metacognitive knowledge (Veenman, 2014). However, Veenman noted that since feeling and judging involve active and coordinated self-evaluation within a particular situation, they are better conceptualized as forms of "metacognitive skillfulness" (2014, p. 4) with procedural relevance.

An example of Feeling of Knowing comes from Cultice, Somerville, and Wellman (1983), who found that 4-year-olds expressed reasonably accurate Feelings of Knowing when asked if they would recognize pictures of preschool classmates, children from neighboring classes, classroom visitors, and people they had never met. Lockl and Schneider (2002) commented that Cultice at al.'s results, which suggested greater Feeling of Knowing capacities than previously assumed for young children, could be attributed to the developmental appropriateness and personal relevance of the task. Cultice et al.'s (1983) Feeling of Knowing task provided important evidence of this capacity in preschoolers. However, when the task is reading, what one does with information that is known or not, in pursuit of comprehension, is a more complicated expression of a feeling of knowing or not knowing. A preschooler's experiential capacity to feel whether she or he knows something in the story is important to monitoring whether a mental model is being built. A feeling of not recognizing, knowing, or being able to name a character, object, or idea can trigger corrective action. This feedback loop is

especially important to comprehension when unknown information is critical. Positive feelings of knowing can be presumed to occur without conscious recognition, and negative feelings of knowing may be experienced but not expressed. Therefore, in addition to observing whether a child asked a question or sought help, prompting a verbal report of knowing can facilitate the assessment of this experience within the joint reading dynamic.

Well-structured stories, such as the four picture book stories that I used in this study, are composed of narrative elements and embellished with numerous details. The entire story is also a holistic unit of meaning that can be referred to by title (Thorndyke, 1977). Thus, a child's sense of how difficult it was to understand a part of or the whole story is a valid metacognitive insight. According to Veenman, conventional metacognitive readers "evaluate their comprehension of the text against their reading goals" after reading (2014, p. 9). An assessment, or Judgment, of difficulty could reveal insights about what specifically made a story challenging or salient for a pre-conventional preschooler, and whether this young child can be aware of and articulate the nature of any difficulty experienced (Touroutoglou & Efklides, 2010). Being prompted to evaluate and share an experience of difficulty or ease while reading a book may bring attention to, and help develop labels for, this type of insight and how to respond to it. Such prompting may also provide an early opportunity to think about the story as a whole and the processes undertaken to understand it. Over time, a young child could internalize such prompting and feedback and begin to engage in metacognitive processes under his or her own direction (Muñoz & Santa Cruz, 2016; Pellegrini & Galda, 2003). Being aware that a reading experience is difficult can lead to more sensitive self-monitoring and more adept response practices in the conventional reader. During pre-reading emergent literacy, being able to report difficulty implies an emerging, self-aware capacity to name and interpret one's experiences and discuss them.

Justifying a prior verbalization is an outward, verbal manifestation of an awareness of why one had a thought about the story (Paris & Paris, 2003; Whitebread et al., 2009). That there are reasons for thoughts is a sophisticated, abstract, and second-level concept requiring a theory of mind and an ability to understand and use metacognitive language (e.g., think, know) in conversation (Flavell et al., 1995). Reporting why a claim was made involves recall and articulation of one's thoughts; the reporting expresses a metacognitive insight into the thought itself as an object. Vygotsky stated that "to be conscious of a mental operation means to transfer it from the plane of action to that of language" (1986, p. 163). The content of the justification would have to enter one's consciousness to be reported. Most readers do not spontaneously justify or explain why they are thinking something. Such a discourse pattern might be more typical to formal reading instruction or writing a geometric proof. However, I found in the present study that preschoolers understood my *Justification* prompts (i.e., Why do you think that?) and provided reasonable responses. Though they typically had to be prompted to justify their thoughts, they could do so.

The adapted model features a box titled *Metacognitive Regulation*. Metacognitive regulation encompasses the manifestations of metacognition that most directly propelled the reader through the joint reading task, starting with introduction to the book and continuing through the process of building and updating a mental model of the story. These were *Task Planning*, *Verbal Self-Revising*, and *Expanding Storytelling*. Though all seven forms of metacognition identified in the present study can be characterized as active and constructive, these three categories were immediately observable forms of engagement with the task. They involved in-progress choices that could be observed to determine what happened next.

Metacognitive *Task Planning* involved developing a plan of action based on knowledge of self, text, and task. Implementing the plan involved one or more cognitive actions, such as choosing where to sit or how to manipulate the book. Veenman explained that the "higher-order processes of evaluation and planning at the meta-level govern the object level" (2014, p. 10). In the present study, one participant wanted to read with me, but did not want to read through the entire book on that particular day. She requested that we open the book in the middle and read from that point forward. She then followed through on her stated plan. She actively exerted control over how she engaged in the task to match her personal preference for not wanting to read the entire book. Her plan reflected an assertion of her coordinated knowledge of the text (e.g., an approximate middle), knowledge of the task (e.g., that she was still participating in her own way), and knowledge of reading as an enterprise (e.g., that you can read half of a text). Fang and Cox (1999) documented preschoolers' planning behaviors when dictating an original story as a form of metacognitive "self-management" (p. 175). In their study, planning was an active form of participation in the tasks of story construction and communicating with an adult scribe partner. Similar to Jacobs and Paris (1987), Fang and Cox (1999) thought that planning worked in concert with monitoring and regulating relative to a presumed intention for constructing meaning. Fang and Cox (1999, p. 179) counted children's conversational verbalizations such as "Now what do I do?" and "Let me think" as verbal evidence of planning (see also Cox & Sulzby, 1982).

Verbal Self-Revising refers to a scenario wherein a verbalization was offered and then replaced with an updated version, within the same reading session, and sometimes within the same speech turn. This category is essentially self-correction, as the subsequent statement cancels out the first. I assumed that children were correcting themselves for misspeaking or

misunderstanding. Fang and Cox (1999) counted children's oral edits as they dictated a story about a personal memory as self-correction based on misspeaking relative to their intentions for their story. Monitoring one's performance enables the correction of errors, whether the errors were due to casual misspeaking or underlying incomprehension. In the present study, *Revising* was relatively easy to document; it manifested as immediate or prompt correction of one's storytelling or other verbal statements (Fang & Cox, 1999; Rowe, 1989; Vygotsky, 1978). Most *Revisions* were spontaneous, suggesting not only self-motivated self-monitoring but also the capacity to act on problems detected through monitoring. *Revising* also offered the most immediate and observable benefit to the participants, by allowing them to be more accurate in their storytelling and in statements made as part of the joint reading conversation.

Expanding Storytelling involved updating an earlier verbalization to extend or embellish it, as opposed to contradicting it. I based the category of *Expanding* on Fang and Cox's (1999) approach of counting children's elaborations as literacy-related metacognition. When reading, *Expanding Storytelling* results in story telling that is more like what the author intended. Since I did not coach children in how to tell a story, I assumed that *Expanding Storytelling* manifested constant updating of their mental model of the story, achieved through ongoing constructive processing and monitoring within and across readings (Baker & Brown, 1984; Kintsch, 1998). *Expanding* was based on the idea that reading is an inherently constructive and metacognitive activity (Baker & Brown, 1984). *Expanding* manifested the dynamic and responsive development and management of hypotheses and mental models that are the subject of further processing. Feuerstein, Feuerstein, and Falik (2010) emphasized that the capacity to grow and change is a fundamental manifestation of metacognition. The *Expanding* category accounts for both the ability and the proclivity to do so when jointly reading a story.

Definitions of Key Terms

Flavell defined metacognition as "knowledge or cognition that takes as its object or regulates any aspect of any cognitive endeavor" (1981, p. 37). This broad definition of metacognition describes a second level of processing that may be variably observable, relevant, or beneficial, depending on a reader's strengths and weaknesses and challenges posed by a task. In the present study, I defined metacognition as the revisiting of an act or aspect of cognitive participation in joint reading that enabled insight about the relationship between task participation and the self as a reader, the text as something to be read, or the task of reading as a defined act of extracting or constructing information. The seven manifestations of metacognition described in the present study (*Feeling of Knowing Story Content, Judgment of Difficulty, Reflecting on Reading, Verbal Self-Revising, Expanding Storytelling, Task Planning,* and *Justifying Verbalizations*) represented secondary levels of processing of a thought or reading behavior. Each involved the objectification, storage, retrieval, articulation, and re-examination of some prior cognition. All of these concepts have been recognized as possibilities for four-year-olds. In the present study, I described their metacognitive nature and relevance to the joint reading dynamic.

Investigating metacognitive processing during joint picture book reading implicates many different behaviors, skills, and experiences. I therefore complemented my use of Flavell's original definition of metacognition with key terms and concepts from multiple areas. I drew on literature describing the cognitive-constructive processes involved in comprehension, such as applying background knowledge, making inferences, and synthesizing and prioritizing information (Kintsch, 1998; Pressley & Gaskins, 2006). I also referred to literature describing the unique processes implicated by narrative comprehension, such as relying on a theory of mind

and recognizing false belief scenarios (Flavell, 2004; Lynch et al., 2008; Paris & Paris, 2003). To define forms of metacognitive processing possible in a joint reading task context, I drew on research from psychology and education describing the metacognitive capacities of 4-year-olds. From this collection of literature, I identified and defined the following key terms.

Reading. I employed the RAND Reading Study Group's definition of reading as a transactional process of "simultaneously extracting and constructing meaning through interaction and involvement with written language" (Snow, 2002, p. 11). For conventional readers reading printed text, this definition applies to reading words in the text and understanding the idea units conveyed through words, sentences, paragraphs, and other expressive conventions of written language (Kintsch, 2004; Purcell-Gates, 2001). For preschoolers, analogous actions to reading the printed word are listening to and responding to the written language read aloud and extracting and responding to information presented through illustrations (Dooley & Matthews, 2009). The stories in wordless or near-wordless books were conceived of in written language by the author. Likewise, the story they present can be pretend read in storybook language by the reader. Thus, the essence of this definition makes it viable for use in a study of joint reading using three types of picture books (traditional, near-wordless, and wordless). The "extraction" element of this definition is consistent with the idea that the mental labor required to understand might vary given particular combinations of reader and text. The "construction" element is consistent with the cognitive constructive orientation of the present study and with Kintsch's model of comprehension. Both extracting and constructing meaning create opportunities for metacognitive processing (Baker & Brown, 1984).

Joint reading. Joint reading is a collaborative and interactive emergent literacy technique that can be practiced in a preschool classroom or in the home with a reading caregiver (Morrison,

2008). Joint reading places the burden of word recognition on the adult or older reader, thus enabling a pre-reader to construct meaning through other pathways (Morrison, 2008). Joint picture book reading with preschoolers is most often intended to be dialogic; an adult reader encourages active participation in whatever ways are feasible and poses questions to help the child process the content (Zevenbergen & Whitehurst, 2003). I chose to conduct one-to-one joint reading to enable the collection of the most verbal and non-verbal data possible. In a conventional instructional setting, working individually with the teacher is considered to have the most instructional intensity (van Kleeck, 2008). Using this dynamic as a research device followed the same principle and also allowed participants to internalize aspects of my contributions to the dialogue about the book and the process of reading it (Cox & Sulzby, 1982; Vygotsky, 1978). Pellegrini and Galda noted the special potential for joint reading to manifest and develop "thought and meaning-making processes" (2003, p. 308). Referencing Vygotsky, they claimed that "children's metacognition is seen to have its origins in the social interchange between children and their tutors" in such a dynamic (p. 308).

The joint reading dynamic allowed me to document multiple forms of reading-relevant metacognition that manifested underlying awareness, knowledge, and regulation. Since participants were free to focus on and provide data about any aspect of the joint reading experience, the object of their metacognition could have been their interpretation of a picture, recognition of a letter, incomprehension of a main idea, or the entirety of their mental model of the text. Participants could have also articulated meta-level knowledge concerning their identity as readers or reading as a task or meta-experiences of being puzzled by unknown content.

Dialogue. Joint reading is dialogic; it involves multiple forms of social and verbal interaction that can benefit the younger participant. The U.S. Department of Education (2014)

defined dialogic reading as “an interactive shared picture book reading practice designed to enhance young children’s language and literacy skills.” Dialogic book reading is a recommended emergent literacy practice, yet it is often used to develop relatively constrained skills such as learning discrete vocabulary words (Paris, 2011; Schickedanz & McGee, 2010). By jointly reading a book in which the pictures convey a portion of meaning, an adult and child can share responsibility for constructing a story through informal discussion. In this dynamic, the work of meaning-making, which often includes reflection and problem-solving, can be shared (Dooley & Matthews, 2009). Joint reading arrangements can vary from highly structured (i.e., scripted) to loosely-structured conversations influenced by the adult in a situational manner (NELP, 2008; Schickedanz & McGee, 2010).

In contrast to Sulzby’s (1985) independent pretend reading procedure, joint reading is a space for multiple types of text interaction patterns and corresponding forms of dialogic interaction: independent pretend reading, listening to an adult read aloud, and implementation of a question and answer regime. In the present study, I intended for each joint reading session to be perceived as informal and conversational. I influenced the dialogue by posing pre-planned questions meant to elicit comprehension and metacognition. However, participants shared control of the overall dynamic. They could choose to pretend read or request to be read to. Additionally, I acknowledged and engaged with their spontaneous verbalizations and behaviors, which resulted in unpredictable conversations about the book. My approach differed from that of Skarakis-Doyle and Dempsey (2008), who prioritized standardized procedures over spontaneous commentaries, as well as that of Fang and Cox (1999), who affirmed children’s commentaries but did not elaborate on them. I intended to engage participants in dialogic conversation. Removing the times I read the printed text aloud, the number of my speech turns roughly equaled

the number of the participant's turns in each session. Overall, participants set a new topic for discussion approximately 30% of the time.

Comprehension. According to Kintsch and Rawson (2005), comprehension is a situationally-influenced process and product. Based on Kintsch's Construction-Integration model of text comprehension (2004), I defined comprehension as an internally consistent working mental model of a story that grasped the author's message. Working with this definition allowed me to focus on the actions that participants took to achieve understanding as opposed to the verbal sophistication of their pretend reading performance. Kintsch (1998, 2004) contended that comprehension results from (re)creating a mental model of the text. To achieve this "situation model" (Kintsch & Rawson, 2005, p. 223), a reader must integrate information from the smaller meaning units of words, sentences, paragraphs, and main ideas. Each proposition (e.g., word, idea, fact, relationship, or detail) can be thought of as a thread; readers weave together multiple propositions into a microstructure of literal meanings. Successful readers then use the text's main ideas to construct a macro-level structure of this information. Together, the microstructure and the macrostructure form the text base—what the author communicated through print. Background knowledge, life experiences, familiarity with genre, and affective factors influence a reader's final understanding. Many inferences are made along the way, such as to resolve a pronoun's antecedent, to determine the main idea, or to explain why a character took a dangerous action (Cain & Oakhill, 1999; Kintsch & Rawson, 2005; Stahl, 2014). In sum, comprehension is constructive, multi-faceted, and cumulative.

Comprehension is also transactional (Pressley & Afflerbach, 1995). The RAND Reading Study Group's *Reading for Understanding* defined reading comprehension as "the process of simultaneously extracting and constructing meaning through interaction and involvement with

written language" (Snow, 2002, p. 11). The three pillars in this process are "the reader, the text, and the activity or purpose for reading" (Snow, 2002, p. 11). The RAND group recommended study of the "coordinated operation" (Kintsch & Rawson, 2005, p. 226) of these processes in each situation of reader and text meeting. Unless a reader already knows a text, or all the information referenced by it, effortful mental work is required to comprehend, creating opportunities for successes, failures, repairs, and reflection (Baker & Brown, 1984). Narrative comprehension implicates the coordination of multiple thinking and literacy skills; for pre-reading preschoolers, it is both practice for and predictive of comprehension during conventional reading (Lynch et al., 2008).

For pre-reading preschoolers, Dooley defined emergent comprehension as "that period when young children, prior to conventional text comprehension, engage in personally meaningful experiences that stimulate use of meaning-making strategies with the potential to affect later reading comprehension" (2010, p. 274). This definition echoes that of Marie Clay, who described both emergent and early reading as a "message-getting and problem-solving activity" (1991, p. 6). In the present study, I intended for my procedures to instigate constructive meaning making. Participants could have constructed meaning from listening to me read aloud, looking at the pictures, or recalling prior exposure to the text. They could have been aided by my questions or prompts or my reactions to their verbalizations or behaviors.

Emergent literacy. Pre-reading preschoolers are considered to be emergently literate (Clay, 1991; Dooley & Matthews, 2009; Sulzby & Otto, 1982). Through a joint statement, the National Association for the Education of Young Children and the International Literacy Association (1998) defined emergent literacy as basic understandings of literacy concepts and functions, including symbols, oral language, pictures, print, and play, as well as creating and

communicating meaning in a variety of ways. Their statement used the term "metacognitive strategies" in association with "primary grades" learning, but not preschool learning (1998, p. 7). The International Literacy Association's 2018 brief entitled *Effective Pre-K Literacy Instruction* promoted open-ended shared reading as a method to facilitate vocabulary acquisition and develop comprehension skills, but it also did not explicitly reference metacognition.

Marie Clay (1991) noted the following emergent reading skills for preschoolers: becoming familiar with the predictable layout of books, telling stories in the written register of language, recognizing that reading is an act of interpreting meaningful messages, and developing an affinity for books and reading. Clay (1991) considered these skills to be as important as print and phonological skills. Clay (1991) also suggested that pre-readers are already coordinating multiple streams of information when they independently re-read familiar picture books, such as balancing what they recall from an adult's oral reading, making a story out of the pictures, and composing sentences in storybook language. She documented verbal self-corrections during these processes, which she thought manifested self-monitoring.

Narrative genre. According to Fountas and Pinnell, "genre refers to any type or kind of literary or artistic work or a class of artistic endeavor that has a characteristic form or technique" (2012, p. 2). The narrative genre refers to stories with elements such as setting, character, goal, problem, events, and resolution, presented along a narrative arc of logically-connected rising and falling actions (Yopp & Yopp, 2000). Narratives that have these elements have a salient, holistic structure; they are easier to comprehend than stories with missing elements (Leslie & Caldwell, 2010). Through his classic study of comprehension and recall, Thorndyke (1977) demonstrated that readers tend to remember and understand holistically, and that fully-formed narratives are a relatable whole. The four study texts were fully-formed narratives that afforded opportunities to

think and respond and perhaps change thinking as more information was revealed (Baker & Brown, 1984; Markman, 1977). They also employed familiar themes, emotions, and experiences, which allowed more cognitive resources to be spent on reflection versus coping with completely novel information (Skarakis-Doyle & Dempsey, 2008). The content of the four study texts and the dialogue surrounding them were challenging enough to elicit a range of cognitive and metacognitive efforts from participants. This moderate difficulty scenario is consistent with Flavell's (1981) and Brown's (1987) ideas about when metacognition could be most easily observed or most relevant to a task.

Picture books. Picture books are commercially-available trade books that convey either a significant portion of or all of the author's intended meaning through rich and salient illustrations created with a preschooler or young reader in mind. Two of the four picture books used in the study, *The Very Lonely Firefly* and *Are You My Mother?* also featured fully printed stories that could be read aloud. When interacting with these texts, participants could have gleaned information from my read aloud of the printed text within each session or from a prior read aloud. In contrast, wordless picture books "rely entirely on illustrations to tell a story" (Jalongo, Dragich, Conrad, & Zhang, 2002, p. 167). In this study, *Pancakes for Breakfast* was completely wordless and *Have You Seen My Duckling?* was nearly wordless. Since an entire story could not be read aloud from print in these texts, both researcher and participants had to rely on the pictures to construct meaning without the constraint (or scaffold) of printed words from the author. Interaction with wordless books could thus allow for or require greater originality.

Preschool. Preschool refers to any organized educational placement before kindergarten or to participants who are old enough (three to five years of age in the U.S.) to attend such a placement. Three states offer universal, free public education beginning at age four,

Massachusetts does so at age three, and the rest not until five years of age (National Center for Education Statistics, 2015). Universal public preschool is not available for 4-year-olds in the state where this study took place. The setting of this study was a private, non-profit daycare program that was licensed by the state to provide preschool or pre-kindergarten education. Tuition could be paid for through two tiers of financial-assistance vouchers or private payment of $175 a week. This organization, its clients, and the surrounding community variably referred to the full-day, 4-year-old program as both preschool and pre-kindergarten.

CHAPTER 2: REVIEW OF LITERATURE

Metacognition, or thinking about thinking, has been an important part of educational thought for some time. According to Brown (1987), historical concern for metacognition can be found in the works of Plato, Aristotle, and Locke. American educational philosopher John Dewey claimed that metacognition was at the "very roots of the learning process" (Brown, 1987, p. 66). Twentieth century information processing theorists depicted metacognition as a governor of cognitive subsystems (Alexander & Fox, 2004; Brown, 1987).

I rely on the work of Flavell, a progenitor of the study of metacognition in the past three decades, to define metacognition in the present study. Since Flavell did not consider preschool children to be metacognitive, he relied on adults, mature learners, and conventional readers to explain how metacognition can benefit a learner. This conceptualization of metacognition is consistent with the foundational learning theories of both Piaget and Vygotsky. Vygotsky (1978) claimed that metacognition, manifested as self-regulation, is a hallmark of socially-driven intellectual development. Vygotsky observed that preschoolers consistently failed to utilize readily-available aids to help themselves succeed in a card game. Since older children were much better at using the aids, Vygotsky concluded that a capacity to engage in second-level self-awareness and self-regulation of effort had not yet come online for preschoolers. Conscious, self-aware management of knowledge is also fundamental to Piaget's constructivist theories about learning (Brown, 1987). However, Piaget considered the pre-operational, preschool child to be bound by the concrete and therefore incapable of the abstract intellectual skill of metacognition.

In contrast to these views, the following review of literature provides evidence that 4-year-olds are capable of possessing metacognitive knowledge, having metacognitive

experiences, and engaging in metacognitive regulatory actions that fit with Flavell's original definition and model. The tasks that produced this evidence differed from those utilized by Flavell, Piaget, or Vygotsky. Study tasks in this review of literature involved engaging young children in representation of and communication about information that was immediately relevant to them, such as thinking about classmates or interpreting and constructing stories.

In the next sections, I discuss and coordinate literature that addresses narrative comprehension as a cognitive-constructive process and multiple manifestations of metacognition and narrative comprehension during emergent literacy. As shown in Figure 3, I intended to

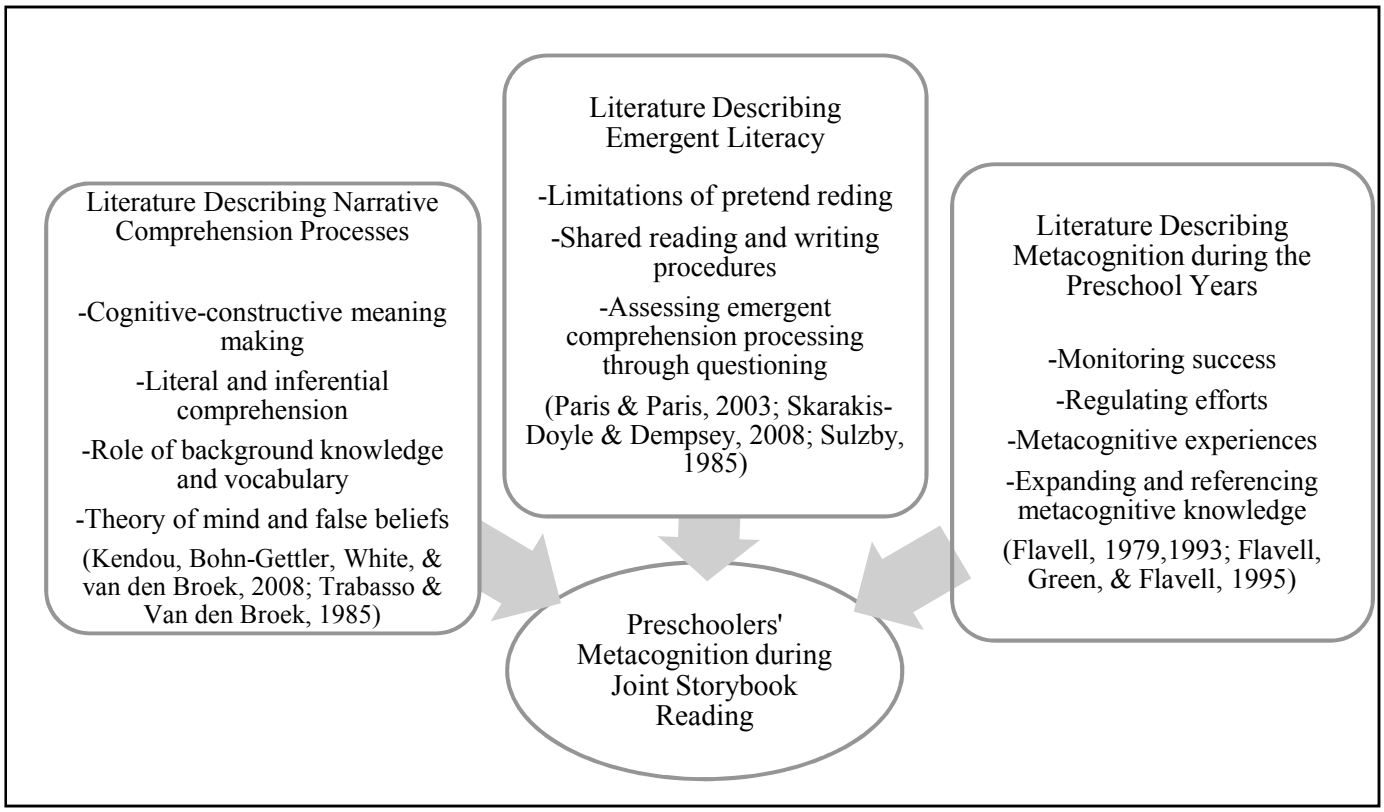

Figure 3. Multiple areas of research inform the present study of metacognition in joint reading.

coordinate literature in order to support my claim that preschoolers can engage in meaningful cognitive and metacognitive processes during typical emergent literacy activities.

Literature Review Procedures

I began my search for sources in scholarly volumes relevant to the multiple phenomena involved in my study. In this initial phase, I hand searched Flavell's most relevant publications as well as titles from the field of education, including *Metacognition in Literacy Learning* (2005) and multiple volumes of the *Handbook of Reading Research* (1984, 2000, 2011). I also hand searched the journals *Metacognition and Learning* and *Child Development*. These sources provided background information and perspective and suggested seminal studies for review.

Next, in order to design my developmentally appropriate study of metacognition within the context of joint storybook reading, I selected and reviewed prior investigations of literacy-relevant metacognition with preschool participants. To locate studies, I searched the Education Source and PsycINFO databases for peer-reviewed studies published in English in any year, using combinations of the search terms in Table 1. Therefore, the research tasks in my included studies involved a range of emergent literacy and learning tasks as well as non-literacy tasks that I deemed to be relevant to literacy processes, such as naming and remembering.

Table 1

Literature Search Terms by Category

Category	Descriptors
To describe metacognition	metacognition, awareness, mind, think, monitor, regulate
To describe my target population	preschool, emergent literacy, 4-year-old
To describe methods	pretend reading, shared reading, dialogic reading, joint reading, storybook, narrative
To describe comprehension processes	comprehension, inference/inferential, retell, literal, theory of mind, cognitive

I included studies that met the following five criteria: 1) researchers directly interacted with or observed young children, 2) participants were engaged in literacy or literacy-relevant tasks, 3) the authors claimed to address some form of metacognition, 4) study procedures could be used in typical classroom settings, and 5) the authors provided qualitative description of children's cognitive and metacognitive processes. Metacognition is a complicated construct; it can affect individual comprehension in varying ways based on constellations of reader, text, task, and context (Flavell, 1987). In order to avoid artificially conscribed versions of a phenomenon that is not yet thoroughly understood (Baker, 2005), I sought studies wherein researchers provided first-hand descriptions of metacognitive processes.

Comprehension as a Cognitive Constructive and Metacognitive Process

Kintsch's (1998) model of text comprehension intersects at multiple points with Flavell's (1979, 1987) conceptualization of metacognition as a cognitive-constructive capacity. Kintsch's (1998) model is based on "a comprehender who has specific goals, a given background of knowledge and experience, and a given perceptual situation" (p. 4). This comprehender constructs an orderly representation by integrating multiple streams of input from the varying units of information in the text. Examples of units, or forms, of input include words, pictures, sentences, paragraphs, text structure, and genre. According to Kintsch (1998), texts present not only topics, concepts, or ideas, but also propositions about the relationships between topics, concepts, and ideas. In other words, texts do not just present information, but also relationships between and among pieces of information. Different units of information about a text (e.g., a single word, a catchy rhyming pattern, a scene, or a global theme) may variably influence a reader (Kintsch, 1998). Therefore, even if preschoolers provide relatively simple or limited verbal data during conversation about a text, that data may still reveal important qualitative

evidence of comprehension and metacognitive processes, such as prioritization of more important content, inferential claims that help to make sense of a story, or a spontaneous revision of a flawed interpretation. In other words, the content of preschoolers' simple or brief verbal statements about a story can communicate meaningful processing.

There are two main parts of Kintsch's model (1998, 2004). First, readers construct a text base from printed words, sentences, and paragraphs. This is a literal, text-bound representation of what the text "said". For simple or straightforward texts, the text base may represent all of the information that the author intended. However, most authors, including those writing for a preschool audience, do not explicitly state everything that they want or expect the reader to know, think, or feel (Peskin & Astington, 2004). Thus, a reader must construct a situation model, the second part of Kintsch's model. Situation models are constructed through a process of inferring information that was not explicitly stated yet needed to understand. For example, comprehension of a well-structured narrative requires inferences about story characters' mental states and unstated motivations (Flavell, Miller, & Miller, 1993; Kintsch, 1998; van Kleeck, 2008). In another example, the relative importance of multiple pieces of information has to be inferred.

Ultimately, the reader's situation model arises from an integration of the text base, the reader's prior knowledge, and goals for interacting with that text (Kintsch, 1998). Many forms of knowledge are relevant to constructing a situation model, including world knowledge, genre knowledge, and linguistic knowledge (Kintsch, 1998). Situation models are cumulative and dynamic representations of the text as a whole, but they are not guaranteed to be accurate (Kintsch, 1998). Kintsch (1998) illuminated the relationship between text base and situation

model by pointing out that one can recall a text without understanding it or understand a text's fundamental message without being able to recall individual sentences or claims.

Kintsch's (1998) fundamental claim was that "we comprehend a text, understand something, by building a mental model" (p. 93). Mental representation of text allows abstract consideration of the text and one's thoughts about it (Kintsch, 1998). A comprehender can use many tools to build this mental model, including world knowledge, familiarity, vocabulary, and interest. The ability to use these tools is subject to both social and developmental influences. Thus, consistent with Vygotsky (1978), Kintsch claims that comprehension processes are a result of both "phylogenetic" (culturally influenced) and "ontogenetic" (internally unfolding) influences (p. 16). In other words, comprehension performance is both socially-influenced (e.g. vocabulary used and book reading experiences in the home) and developmentally-influenced (e.g., biological limitations on working memory by age; see Baker, 2017). Studies should therefore address both of these lines of influence.

Though Kintsch's model is intended for use with conventional readers perceiving printed text, its fundamental ideas can be applied to preschool comprehenders invited to react to and make sense of information provided through words read aloud by the researcher and/or illustrations (Paris & Paris, 2003; Skarakis-Doyle & Dempsey, 2008). Through text read aloud, some information is explicitly stated, and some is implied. The same is true of illustrations. Background knowledge, vocabulary, expectations, and familiarity with story form may influence both pre-readers and conventional readers. For example, scripts from daily life experiences, such as grocery shopping, can contribute to the understanding of a text base about grocery shopping and to the construction of the overall situation model (Flavell et al., 1993; Kintsch, 1998; Skarakis-Doyle & Dempsey, 2008).

Processes Involved in Narrative Comprehension

Flavell et al. (1993) noted connections between the development of narrative comprehension and cognitive and metacognitive development. Stories are powerful contexts for cognitive and metacognitive development. The abstract and representational nature of text as a communication medium, the mixture of familiar and unfamiliar content, and the structure of the narrative arc create many opportunities for cognition and metacognition. Notable emergent literacy research involving stories has often overlooked these features of stories in order to focus on the acquisition of pretend storybook reading, book handling skills, concepts about print, and growth in oral language (Clay, 1991; Purcell-Gates, 2001; Sulzby, 1985). The aforementioned skills are important milestones in a literate society and variably contribute to conventional reading outcomes (NELP, 2008). However, because there is well-structured content to be understood in stories (Kintsch, 1998; Thorndyke, 1977; Van Kleeck, 2008), it is important to include comprehension processes as a research focus. If comprehension is involved, then metacognition is implicated (Baker & Brown, 1984).

Given all the cognitive actions involved in reading, there may be meaningful, multiple, and constructive relationships between metacognition and comprehension for any reader. Baker and Brown (1984) relied on Flavell's model (1979) and Brown's original work (1980) to define metacognition as "the knowledge and control the child has over her or his own thinking and learning activities, including reading" (p. 353). Baker and Brown (1984) cited Brown (1980, p. 354) to explain that metacognition is implicated in conventional reading comprehension in the following ways:

1. "clarifying the purposes of reading; understanding both the explicit and implicit task demands,

2. identifying the important aspects of a message,

3. focusing attention on the major content rather than trivia,

4. monitoring ongoing activities to determine whether comprehension is occurring,

5. engaging in self-questioning to determine whether goals are being achieved, and

6. taking corrective action when failures in comprehension are detected"

These six actions are part of an overall model of metacognition in reading in which metacognitive knowledge involves declarative, procedural, and conditional knowledge and metacognitive regulation involves planning, monitoring, and evaluating (Jacobs & Paris, 1987). Preschool children may not have enough formal experiences with tasks in order to have declarative, procedural, and conditional knowledge. However, the essence of metacognitive knowledge can be captured in notions of who you are and what you can do (Jacobs & Paris, 1987). These questions are relevant to preschool children who are beginning to think of themselves as "readers" (Strommen & Mates, 1997) or at least meaning-makers (Dooley, 2010). Metacognitive experiences may inform and facilitate growth in these areas, though they are harder to define, observe, and predict (Flavell, 1981). The demands of intermediate-difficulty reading tasks challenge and offer growth and feedback opportunities in both the knowledge and control dimensions of metacognition (Brown & DeLoach, 1978; Fisher, 1998; Flavell, 1981).

Though there is limited research on metacognition in pre-reading text comprehension, the field of psychology has produced a large body of work on preschoolers' metacognitive capacities for oral comprehension, perceptual tasks, memory tasks, and on their rapidly developing theory of mind and metacognitive vocabulary. Many of these constructs are especially or uniquely relevant to the comprehension of narrative texts, in which characters are driven by internal motivations to take actions towards an ultimate goal. Many topics in this section come very close

to being metacognitive or can have a relationship with metacognition. For example, the last topic in this section is use of metacognitive language. Narrative situations use or implicate the use of metacognitive terms. For example, in order to comprehend, a reader must be concerned with what a character thought, wanted, or will decide to do (Peskin & Astington, 2004). However, a child's use of metacognitive language may or may not manifest actual metacognition, and a book's use of metacognitive terms may implicate comprehension but not necessarily metacognition. Therefore, in this study, I treated use of metacognitive language as a distinct yet situationally-related capacity to comprehension and metacognition.

Having a theory of mind. According to Flavell (2004), having a *Theory of Mind* enables a functional awareness of "the inner world inhabited by beliefs, desires, emotions, thoughts, perceptions, intentions, and other mental states" (p. 274). This knowledge can be used to infer the internal states of characters that drive their actions and help the story make relatable sense. Therefore, it is relevant to comprehension and often an object of metacognition. Kuhn (2000) claimed that three-year-olds can think of themselves as knowers and think of knowledge as an object to be known. They are starting to develop a theory of mind — thinking of one's self as having a mind distinct from others— which facilitates recognition of varying perspectives, playing hide-and-seek, and fibbing with the intent of getting away with it (Crain, 1992; Flavell, 2004). Lockl and Schneider (2006) defined theory of mind as the "ability to attribute mental states, such as beliefs, desires, and intentions, to self and others, [including the] knowledge that mental representations of events need not correspond to reality" (p. 16). A working theory of mind is required to label thinking as a phenomenon and articulate thinking to others, since no one can read your mind. Flavell (2004) explained that "theory-of-mind development is the area of cognitive development research that investigates the nature and development of our

understanding of the mental world—the inner world inhabited by beliefs, desires, emotions, thoughts, perceptions, intentions, and other mental states" (p. 274). Flavell (1979) found that younger preschoolers were not able to recognize that a belief can be false, but subsequently claimed that developmentally-sensitive techniques could lead to results that favor a more sophisticated view of the 4-year-old.

Theory of mind also includes understanding what you can do with your mind. Schraw and Moshman (1995) concluded that "children as young as three or four appear to possess tacit theories of their own cognition" that serve "social and cognitive functions" (p. 356; see also Flavell et al., 1993). Tacit theories are challenging to articulate or otherwise communicate (Schraw & Moshman, 1995), yet preschoolers were not historically given the opportunity to begin to learn to do so. Williams and Atkins (2009) criticized the separation of theory of mind research with preschoolers and strategic comprehension research with elementary readers. They called for "longitudinal studies of children, followed until they reach literacy" (Williams & Atkins, 2009, p. 40). Emerging metacognition encompasses theory of mind, and theory of mind encompasses the following abilities relevant to storybook comprehension: recognition of false beliefs, inferring the mental states of others, using metacognitive vocabulary, and experiencing metamemory (Peskin & Astington, 2004; Van Kleeck, 2008). In addition to facilitating narrative comprehension, a theory of mind enables a preschooler to do the work of thinking of one's self as a reader or a meaning maker through mental effort. In sum, theory of mind is important to reflecting on reading and to the capacity to learn from that reflection.

Recognizing false beliefs. Theory of mind also enables the recognition of false beliefs. Lockl and Schneider (2006) highlighted this relationship in their definition of theory of mind as "children's ability to attribute mental states, such as beliefs, desires, and intentions, to self and

others [including] their knowledge that mental representations of events need not correspond to reality" (p. 16). Around age four, children begin to understand that others, including book characters, can have false beliefs—that is, a belief based on incorrect or incomplete knowledge (Kuhn, 2000). A classic false belief test involves showing a child that a box labeled candy actually contains pencils (Flavell, 1979). Children younger than five tend to claim that someone who has not seen the inside of the box knows that pencils can be found there (Flavell, 1979). There is no empirical reason to make this claim; younger preschoolers were unable to consider that the person who has not been granted insight to the contents of the opaque candy box have no way of knowing that it actually contains pencils. Subsequent studies have granted more sophistication in detection of false beliefs to 4-year-olds (Flavell, 1987; Lockl & Schneider, 2006).

False beliefs are relevant to narrative text comprehension in that a reader, in order to build a reasonable model of the text, may need to know something important that the main character does not know yet or will never know (Kintsch, 1998; Paris & Paris, 2003; Peskin & Astington, 2004). Awareness that beliefs can be false and that unique characters and actors do not always have the same information are signs of a developing theory of mind (Flavell, 1987). Per Vygotsky (1986), theory of mind sophistication does not switch on at a pre-programmed age. Rather, developmental capabilities enable certain capacities, and exposure to abstract representations of information (Lockl & Schneider, 2006), such as through reading, writing, and social interaction around texts, spurs development in this area (Fang & Cox, 1999; Peskin & Astington, 2004).

Inferring the mental states of others. Inferring the mental states of characters is a fundamental aspect of narrative comprehension, as characters' feelings and attributes spur their

goal-driven actions in the plot and undergird elements of story such as characterization, conflict, and resolution (Paris & Paris, 2003; Van Kleeck, 2008). This important aspect of narrative comprehension is enabled by a working theory of mind. Thus, psychological research on this topic has implications for comprehension research. For example, Flavell et al. (1995) used simple pictures of people with an object pictured in a thought bubble above their heads. After training, preschoolers as young as three distinguished between what a pictured child was doing from what the pictured child was thinking about (as shown in the thought bubble). Flavell et al. (1995) realized that participants could have simply memorized that questions about what the pictured child was thinking involved referencing the thought bubble and questions concerning what the child was doing involved referencing the other picture. They then investigated whether a child knew that a researcher could think about a doll that she saw a few minutes ago but could not presently see. Preschoolers discerned between being able to see the doll and thinking about it. This finding supported the claim that once familiar with the thought bubble as a graphic format, preschoolers understood the basic idea that a pictured person can be thinking about something, whether or not they could see the object of thought (Flavell et al., 1995). This basic capacity helps to unlock many narrative plots.

Across multiple laboratory tasks, Flavell et al.'s (1995) preschoolers could generally recognize, with stronger performance at the higher end of the three-to-five age range, that someone was thinking when looking pensive, trying to solve a problem or make a decision, or responding to emotional arousal. In conclusion, aspects of metacognition facilitated comprehension of pictured situations. It could also be concluded that reading and doing purposeful mental tasks with what is read (e.g., recalling, reconsidering, evaluating, discussing), helps to develop theory of mind and metacognition (Vygotsky, 1978).

One of Flavell et al.'s (1995) studies of theory of mind relevant to narrative comprehension did not produce promising results. However, the technique employed may have limited the outcomes. Flavell et al. (1995) presented 4-year-olds with a simple picture of people and an accompanying story about what was happening in the picture. Less than half of 4-year-olds offered a reasonable inference as to exactly what was going on in the minds of the pictured persons. Furthermore, 4-year-olds did not reliably indicate that pictured people were thinking at all, though they generally indicated that people actively doing something or responding to an emotional event were more likely to be thinking than people sleeping or staring blankly. Participants just one year older (age five) had more mature performances and were better at expressing what pictured people were probably thinking about.

Flavell et al. (1995) utilized isolated laboratory tasks, whereas engaging with the deep structure of a story through shared or joint reading may afford a more holistic context for understanding a pictured character's mental life. If Whitebread et al. (2009) were correct that preschoolers have more sophisticated metacognition when engaged in ecologically valid tasks, then shared reading of stories can be expected to produce a different performance. In Vygotskian terminology, if 4-year-olds are sometimes capable of inferring what a pictured character is thinking and applying other aspects of theory of mind to the task of comprehension, then interaction with a more skilled other may help them progress towards fuller realization of their potential for this type of mental work.

Using metacognitive language. Metacognitive language refers to specific words used to express mental states and actions involved in thinking and learning. Flavell et al. (1995) tested children's ability to distinguish between the metacognitive terms *think* and *know*. Results indicated that 4-year-olds can distinguish between the terms *thinking* and *knowing* in their

receptive and expressive vocabularies, though they do not always do so, and they are not always proficient at inferring what someone is thinking about. In other words, 4-year-olds have two distinct words in their vocabularies—*think* and *know*—but they do not consistently use these words to describe an internal state based on specific epistemological reasons, such as access to information or the status of the information within the subject's mind (Lockl & Schneider, 2006; Trawick-Smith, 2006). It appears that preschoolers acquire metacognitive vocabulary in the same way that they acquire vocabulary in general—they begin to use words at the beginning of a long process of learning to use them correctly (Lockl & Schneider, 2006; Trawick-Smith, 2006). Thus, preschoolers' use of metacognitive language is best triangulated with other data.

Peskin and Astington (2004) examined how pre-kindergarteners in low-income neighborhoods responded to read alouds of storybooks as published or with the insertion of explicit metacognitive terminology. Each condition featured the same stories, and all participants were invited to understand characters' feelings, states of mind, knowledge, and perspectives. Children in the experimental condition (n=24) heard stories implanted with mental state verbs. The insertion of explicit metacognitive terms changed how the reader was invited to interact with the text. For example, a sample from a control group story read "Fox is not careful and bumps into a rake. Rosie hears the loud BUMP, but does she turn around?" The experimental group's version of this text read "Did *you know* that Fox would bump into a rake? Rosie heard the loud BUMP, but did *she figure out* that it was hungry Fox behind her?"

Peskin and Astington (2004) were concerned with the functioning of "metacognitive terms in fostering a representational understanding of the mind" (e. g., *know* and *figure out*, p. 254). They inserted metacognitive terms such as *think*, *know*, *remember*, *wonder*, *figure out*, and *guess* into the modified experimental texts and corresponding comprehension questions to

investigate whether explicit exposure to these terms would result in metacognitive growth at the end of the four-week study period.

Peskin and Astington (2004) utilized five forms of assessment to collect a range of information about preschoolers' theory of mind during their emergent literacy:

1. Through a false-belief prediction task, children reported their thoughts before and after finding out critical information. Then they reported the thoughts of a hypothetical peer who lacked the critical information. Understanding why the peer would be ignorant provided evidence of understanding that some people can hold false beliefs. A working theory of mind undergirds false belief proficiency (Flavell, 2004).

2. Through a false-belief explanation task, children inferred the thinking behind the misguided and/or ignorant actions of story characters who lacked information. Reporting on a false belief is evidence of representational thinking – i.e., examining the belief as a mental object (versus examining a toy as a physical object; Flavell, 1987).

3. Through a metacognitive verb comprehension task, children distinguished between the terms *know* and *think*, based on a brief story. This task assessed receptive comprehension of these terms, in order to triangulate valid inferences about children's use of these terms later in the study.

4. Through a metacognitive verb production task, children used props to create a story about a wolf who can deceive to get what it wants. This task allowed the researcher to count the metacognitive verbs children spontaneously used in expressive discourse about theory of mind concepts.

5. The Test of Early Language Development assessed expressive and receptive language, since communicative proficiency could have confounded inferences about children's use of specific "metacognitive" terms.

Peskin and Astington (2004) found that their short-term, explicit training in metacognitive terms had limited benefits. Experimental group members increased their use of metacognitive language in subsequent storytelling, but they did not increase their understanding of what these words really meant. Furthermore, control group members out-performed experimental group members in identifying the false beliefs held by storybook characters. The authors concluded that young children often use new terms before they truly know what they mean. An implication of this result is that preschoolers' use of metacognitive terms cannot be assumed to match an internal metacognitive state; more information would be needed to determine whether preschoolers used these words to knowingly articulate their metacognition. Another important implication concerns the potential for stories to both support the development of and aid in the research of cognitive and metacognitive capacities. The experiences and emotions of characters driven by internal motivations can encourage children to think about dimensions of theory of mind. Likewise, unfolding plots with twists and turns can invite children to revise their evolving mental model of the story.

As Mar and Oatley (2008) explained, "literary fiction allows us to experience social situations vicariously, thus allowing for personal consideration of response and action. The simulation of interacting ideas and emotions evoked by a story simultaneously permits the exploration of our own ideas, feelings, and desires, and of our own potential reactions to the story's plot" (p. 183). Thus, another important implication of these results is that well-structured

stories can be used as experimental texts for metacognition research without any modifications. Researchers do not have to insert contrived errors or metacognitive language.

Processes Involved in Emergent Literacy

Picture book stories can provide preschoolers with meaningful opportunities to experience comprehension and metacognition. The mental capacities that enable narrative comprehension are already a part of the child's social world (Stahl, 2014; Vygotsky, 1978). Toddlers gain familiarity with elements of story (e.g., problem and resolution) as they pursue daily goals and experience successes and setbacks. Preschoolers can produce oral stories showing sensitivity to these elements and can also appreciate and relate to characters going through familiar struggles (Flavell et al., 1993; Rowe, 1989; van den Broek et al., 2011). Since preschoolers bring to stories what they first experience through socio-emotional and physical learning (Vygotsky, 1978), familiar settings, routines, and relationships can be relied on to understand a represented sequence of events (Skarakis-Doyle & Dempsey, 2008). Preschoolers can also make inferences, as needed, to create holistically relatable situations from given information (Flavell et al., 1993; Markman, 1981; Tompkins et al., 2013). In sum, as explained by Stahl (2014), "the foundations of reading comprehension begin well before school entry" (p. 384).

Although exposure to a variety of types of books is important during the early years, stories are especially well suited to provoke early experiences with a full range of comprehension processes and with situationally-relevant metacognition (Markman, 1977). Indeed, Tompkins et al. (2013) reported that narrative comprehension in preschool can predict conventional reading comprehension outcomes. Ongoing investigation of the cognitive and metacognitive processes that might underlie this outcome is needed. Picture books with fully formed stories might help

children bridge the gap between social comprehension and narrative comprehension by introducing a developmentally-appropriate balance of the concrete and the abstract, as well as the familiar and the unfamiliar. Skarakis-Doyle and Dempsey (2008), referencing Kintsch (2004), stated "comprehending a story requires children to construct a mental representation of the material" (p. 131). Representing ideas in the mind provides opportunities for metacognition – thinking about one's thinking. Responding to familiar objects and situations invites labeling and naming, and this is complemented by the more sophisticated processing required to create a situation out of constituent details. Accordingly, Skarakis-Doyle and Dempsey noted that even emergent comprehension involves higher order cognition, as "to create such a representation, children must marshal a coalition of knowledge processes from their developing social, cognitive, and linguistic systems" (2008, p. 131). Hannon and Frias (2012) concluded that preschoolers go through the same types of cognitive processes as adults when presented with structured information to be understood. This range of processing creates opportunities for metacognition to occur in situationally-relevant ways as children engage with familiar and unfamiliar information and situations in stories. A focus on children's processing of the information in stories differs from a focus on the sophistication of their oral discourse while pretend reading a story.

Independent, pretend reading. Literacy researchers have three main options for investigating reading processes in children who cannot yet read print: listening to an adult reading aloud, joint reading with an adult, or observing independent "pretend" reading. Sulzby's (1985) seminal schemata of emergent literacy levels was informed by using the latter method. She investigated how preschoolers pretended to read their favorite storybooks sent into the preschool classroom from home. Sulzby employed a standardized pretend reading procedure.

She asked her participants to independently read their books to her and engaged in minimal interaction. Her analysis of data collected from 2-year-olds through kindergarteners suggested a developmental pattern in emergent book reading behaviors. The youngest participants tended to "read" by providing a series of labels for pictured objects. In contrast, older pre-readers, mainly kindergarteners, performed a pretend reading that better resembled the story as written. More advanced renderings featured explanation of scenes versus isolated labeling, use of storybook language, and speech in a written versus an oral register of language (Purcell-Gates, 2001; Sulzby, 1985). The most advanced participants in her schemata fluently read print. Whether the child could read print or not, overall storytelling behaviors progressed with age and skill from being dialogic, i.e., immediate and conversational, to being monologic, i.e., rendering a story for an audience separated from the author by time and space (Purcell-Gates, 2001; Sulzby, 1985). Thus, Sulzby's work prioritized the child's acquisition of the discourse form of printed story text (Cazden, 2002). Correspondingly, in her schemata, cognitive sophistication was presumed to be manifested by scene-level pretend reading performed in a monologic fashion (Cox & Sulzby, 1982; Sulzby, 1985).

Though Sulzby's work did not directly address comprehension (Paris & Paris, 2003), her notion of progression from context-bound to abstract has influenced emergent literacy research. Sulzby wanted to address comprehension but lacked an intentional link between her research design and whether children understood the various books from home that they "read." Furthermore, the books brought in from home were not necessarily well-structured narratives, meaning that comprehension could not be compared across readers. Of particular importance to the present study, Sulzby (1985) noted that a participant who was at a relatively lower level in her schemata offered spontaneous "meta-statements" during his pretend reading, such as

commenting that certain parts of the story were enjoyed more (p. 465). Though Sulzby reported this observation, she did not privilege a role for meta-statements in her schemata. Since Sulzby's schemata is often used as a proxy for overall emergent literacy sophistication, it was important to review what it, and pretend reading in general, do and do not reveal about children's capacities.

How do pre-readers understand content? Sulzby's schemata (1985) yields useful information about how preschool-aged children continually develop in the direction of the formal "print register" of a literate person (Purcell-Gates, 2001). The delivery style of a pretend storybook reading can be a proxy for the processing of structured content. However, other work that directly addresses comprehension and metacognitive processes is needed to fully understand preschoolers' capacities. In response to this gap, Paris and Paris (2003) developed the Picture Walk procedure (PW) to simultaneously assess narrative comprehension processing and emergent literacy skills in kindergarten through second grade students. Many of Paris and Paris' kindergarten participants could not yet decode, making the assumptions and procedures behind the PW relevant to pre-reading pre-kindergarteners. The PW utilized wordless narrative picture books as study texts, such that a fully-structured narrative story was conveyed through illustrations. Through a series of studies, Paris and Paris (2003) established validity and reliability for their use of the PW to assess narrative comprehension independent of print proficiency. Thus, the PW addressed a need in the field, as young children's ability to read print lags their ability to understand the content of stories. The PW distinguished among book handling skills, affective engagement, picture comments, story-level comments, and comprehension strategies. Through this multi-faceted approach, pre-reading kindergarteners were found to have meaningful literal and inferential comprehension of structured information and sensitivity to major elements of story (e.g., setting, character). However, they showed

relatively lesser use of comprehension strategies assumed to manifest comprehension monitoring, such as asking questions, looking back and forward as needed, making predictions, and self-correcting.

Paris and Paris also posed what I considered to be a proto-metacognitive prompt (*Why do you think so?;* 2003, p. 51) to follow up on children's initial responses to comprehension questions. Though this was termed an elaboration prompt, it did invite a self-referential report of processing as opposed to more details that would answer the original question. Nonetheless, Paris and Paris' work demonstrated a developmentally-appropriate integration of comprehension and metacognition, even if not languaged as such. Thus, Paris and Paris's approach provided a more comprehensive assessment of emergent literacy than Sulzby's schemata.

The PW task can be used with any fully-formed narrative presented through a wordless picture book. Since a PW does not require creation or alteration of a text, it can be highly relevant to children's experiences with commercially-available texts. The PW procedure allows for documentation of a variety of constrained and unconstrained emergent literacy behaviors, from storytelling style, vocabulary, and response to questions. The procedure also invites participants to revisit and justify answers given to comprehension questions during reading. Revisiting a prior thought meets Flavell's (1979) original definition of metacognition in that the child is asked to reconsider and comment upon this thought as an object for further consideration. However, wordless picture books are only one type of picture book, and metacognition is likely to be relevant in more ways than in their study design.

Alternatives to pretend reading. The discussion of the Picture Walk exemplified that there are alternative procedures to pretend reading. Skarakis-Doyle and Dempsey (2008)

reviewed options for assessing pre-reading preschoolers' story comprehension. These procedures can be used as alternatives to the prevailing model of pretend reading. In this next subsection, I discuss their commentary and integrate additional research.

1) Posing questions during reading. Skarakis-Doyle and Dempsey (2008) explained that both literal and inferential comprehension questions are appropriate to use with preschoolers, and that they can be pre-planned and customized to the text. However, some preschoolers may not understand the questions as posed, especially if they confuse wh- words (e.g., who, what, why). Memory and expressive language may also diminish the validity of a child's answers in indicating comprehension. To reduce verbal output demands, a researcher may ask for yes/no or single word responses, but this type of data may curtail expression of how each child is making sense of the story.

Van den Broek et al. (2011) reported more success with using online (i.e., during reading) questioning with preschoolers than with posing questions after reading. Stahl (2014) pointed out that adults can use questions and interactive prompts during reading to help preschoolers gain experience with making both local and global inferences. Stahl (2014) distinguished between local inferences, such as resolving anaphoric references and using context clues to resolve an unknown word, and global inferences, such as speculation on a character's unstated inner experiences. Both types can be relevant to joint reading.

2) Joint Story Retelling (JSR). Children in the primary grades are often asked to retell stories after reading or hearing them. Retelling can assess memory of and recall of idea units and elements of story (Leslie & Caldwell, 2010). Older children can be expected to reproduce a story grammar, but this task is generally too complicated for preschoolers (van den Broek et al., 2011).

Because retellings are open-ended, they allow for diverse data from each reteller (van den Broek et al., 2011). However, retellings can underestimate comprehension if the child has limited expressive language or a different cultural model for how to tell stories. Brown and French (1976) found that preschoolers are capable of ordering three events in a simple story, though they tend to fixate on the last event.

Skarakis-Doyle and Dempsey (2008) developed a joint story retelling (JSR) technique. Their joint technique utilized an oral form of the cloze procedure in order to overcome developmental limitations for participants aged two and one-half to four years. The contribution of the researcher to the retelling compensated for limited expressive language and working memory. The examiner read stories about daily life routines and then asked for the child's help with a second reading. The child "helped" the researcher by supplying missing information. This procedure resembled parent-child book reading and lowered the output demands on young children. Children only had to make sense of a small section of text at a time, and they could answer from memory, context clues in the second reading, or a combination thereof. Empirical studies by the authors have shown that JSR has validity and reliability. Though their modifications allow for many children to successfully participate, children who have limited expressive vocabularies and/or limited English proficiency may struggle with supplying the exact word that is called for by the cloze prompt.

3) Expectancy Violation Detection Task (EVDT). Skarakis-Doyle and Dempsey (2008) developed the EVDT to investigate preschoolers' comprehension monitoring. A preschool-aged child is assumed to have expectations about everyday routines such as bath time (Flavell et al., 1993; Markman, 1981); their reactions to violations of these expectations are assumed to manifest comprehension monitoring. In the EVDT task, three types of expectancy violations are

inserted into the second reading of a familiar story: goal disruptions, within-story substitutions, and unacceptable changes of content. Goal disruptions are encountered when an unexpected obstacle confounds normal progression toward the story's goal. In within-story substitutions, a character or highly relevant object is replaced with another. In content violations, relevant material is placed at a point in the story where it does not make sense or help the story progress toward the anticipated outcome. On a second reading of the story, the child is tasked with catching the mistakes. Verbal and non-verbal manifestations of confusion are noted. The authors considered the EVDT to be a real-time technique that reduced the need for memory, genre familiarity, or sophisticated verbal output — the young participant either reacts to violations or not. However, even with practice, some children may be uncomfortable with correcting an adult or may be distracted by other aspects of the EVDT that do not resemble typical book reading experiences.

4) Televised story viewing. Televised shows and movies that many preschool children view can provide experience with the narrative structure. Sitcoms, cartoons, and children's movies can feature high quality storytelling with character development, implied motivations, goals, a sequenced plot, and a resolution. Thus, these media can give children experience in sequencing, memorizing and recalling, noting details, and inferring important information to make sense of a situation. Children can be asked to respond to comprehension questions and/or retell stories that they view. Skarakis-Doyle and Dempsey (2008) noted that the audiovisual medium is more concrete, multi-sensory, and dynamic than static pictures in a physical book. Preschoolers can be asked to answer questions about and otherwise discuss audiovisual presentations just as they can for print books.

However, use of audio-visual media has its own set of limitations. The continuous nature of episodes in media versus having to turn a page of a book may provide a scaffold for understanding the story as a connected whole. On the contrary, turning the page between episodes may help children chunk information and have time to question or respond before continuing. Kendeou, Bohn-Gettler, White, and van den Broek (2008) found that preschoolers' inference making abilities were consistent across a televised story viewing condition and a read aloud condition. Thus, though audio-visual media may be more appealing in some ways, the fundamental work of processing the structured information of a story presented through any media remains the same.

I discussed these four procedures as alternatives to pretend reading procedures. Each featured a different approach to the assessment of comprehension (e.g., asking questions), metacognition (e.g., EVDT), or both comprehension and metacognition (e.g., PW). Because they focused on cognitive and/or metacognitive processing, the meaningfulness of how young children responded to text took precedence over how they communicated. Sulzby's pretend reading procedure tasked children with relaying or re-enacting a familiar book. The child's oral performance is assessed. Neither the book itself nor the reader-text interaction is analyzed, and therefore not much is uncovered about whether and how children understood what they were "reading." A highly rated reenactment could result from multiple exposures and verbatim memory, but this high rating would not necessarily reveal whether the child engaged in higher or lower order comprehension processing or metacognitive processing. In contrast, a preschooler could participate in the Expectancy Violation Detection Task (EVDT) without speaking at all (e.g., through non-verbal protestation) and still provide insight into early metacognitive processing. Not all stories will be familiar, and the strengths and weaknesses that a reader brings

to each story will vary. In other words, the cognitive and metacognitive processing needed to understand will vary for each reader and text. This scenario suggests that literacy researchers should utilize a full range of methods to investigate emergent literacy, in order to fully understand the capacities of young children.

In sum, the alternatives to pretend reading discussed above offered robust ways to collect data about comprehension and metacognition without relying on the capacity to read print. By taking print proficiency and sometimes verbal responding out of the equation, meaning-making processes received fuller attention. Furthermore, the practices discussed above are important because young children experience many of them in their regular lives when not under study. Through audio-visual media and the trade book market, young children may experience extensive exposure to structured narrative stories, and thus have opportunities to engage in comprehension and metacognitive processes. Pretend reading and error detection procedures are only two of many investigative options for these phenomena. These examples of alternative techniques showed the relevance of the comprehension of structured information and metacognition to the everyday thought life of preschoolers. In the next section, I discuss literature describing a fuller range of preschooler's metacognitive capacities that could be relevant to narrative comprehension.

Review of Studies of Metacognition During Emergent Literacy

The prior discussion of comprehension highlighted intersections among developmental capacities, narrative comprehension, and forms of metacognition. These interconnections may be routinely unrecognized if there are low expectations for cognition and metacognition before conventional literacy (Marulis, Palincsar, Berhenke, & Whitebread, 2016). It is possible that metacognition has always played an important role in early comprehension processes without

being identified. For example, DeBruin-Parecki & Squib (2011) noted positive outcomes of training preschool teachers to utilize four comprehension strategies (connecting new ideas to held knowledge, connecting new words to known words, predicting, and retelling) when reading storybooks aloud to the class. DeBruin-Parecki & Squib (2011) attributed their results to the intentionality of strategy instruction and the integration of strategies, but they did not mention the term *metacognition*.

Even authors who have claimed metacognition may not have fully appreciated it. Flavell's model features metacognitive knowledge, metacognitive experiences, and metacognitive regulation as major categories, and it suggests that these factors work together variably in any one situation based on reader-text-task demands. Isolating any part of this model may lead to incomplete understanding of metacognitive capacities. For example, some authors have implicated metacognition by investigating either one major category or a small range of predefined forms of it. Either approach can result in incomplete description of what actually took place for a child working on a task that implicated metacognition. Brown et al. (2014) successfully trained a small group of 4-year-old preschoolers at-risk for academic failure to monitor whether they were including the major elements of story in their retellings. Brown et al. (2014) used the broad term *monitor* to describe what could be many different cognitive and metacognitive processes involved in reading and retelling. Hsieh, Ku, and Chen (2013) also used a broad term—*revise*—to encompass a range of children's meta-behaviors when creating a story from a wordless picture book. Hsieh et al. (2013) categorized children's storytelling *revisions* into three categories based on whether the revision was offered before, during, or after the scribe wrote it down. However, many more factors in addition to when the revision was offered were likely to have been influential on children's choices for this task.

In the next section, I present literature describing a wide range of specific ways that the preschool-aged child may be metacognitive. Comprehension is not the most frequent context for studies reviewed in the next section. However, all forms of metacognition reviewed are directly relevant to the cognitive processes involved in participating in joint reading.

Metacognition in the context of emergent reading processes. Emergent reading may include pretend reading, listening to an adult or caregiver read aloud, or interactive reading. Since print recognition is not required, the focus in all of these dynamics is on comprehension of structured information. The overall goal of comprehension, however, may situationally include learning new words or ideas, correcting a misconception, or coordinating multiple streams of information (e.g., memory of prior readings, topical background knowledge, information in pictures). The studies reviewed in this section exemplified the range of cognitive and metacognitive knowledges, skills, and experiences that are relevant to a variety of emergent reading experiences. At the conclusion of this section, I identified the forms of metacognition claimed by the author(s) as well as latent forms that I felt were not distinguished or identified. I used this information to connect to and justify my thematic codes.

Skarakis-Doyle and Dempsey (2008) employed an error detection methodology to analyze the self-monitoring skills of three groups of preschoolers: typically developing (n = 13), Language Impaired (LI; n =10), and typical younger children with receptive vocabulary matching the LI group (n = 14). The LI group had deficiencies in auditory comprehension, vocabulary, syntax, and communicative language use. The researchers were interested in uncovering how LI might affect both comprehension and comprehension monitoring.

To carry out their investigation, Skarakis-Doyle and Dempsey (2008) created the narrative picture book *Splish-Splash* about the everyday routine of bath time. Researchers read this story while children looked at the pictures and posed comprehension questions. Then the researchers began the monitoring phase. First, they trained children to verbalize protests to alterations (Violations) of a favorite storybook brought from home. After training, researchers began their Expectancy Violation Detection Task (EVDT) with *Splish Splash* using eight violations: two goal-disrupting events, five within-story substitutions of names or words, and one insertion of content antithetical to the gist. Children were assessed on whether and how they responded to these errors, which were presumed to conflict with their expectations for the second reading of a familiar story. Participants' expectations could have been violated by incongruity between the error and familiarity with the story or between the error and background knowledge. Any form of protest given within five seconds of the presentation of the error was assumed to be an outward sign of comprehension monitoring.

This approach is consistent with the work of Markman (1981) and Flavell et al. (1993) on the origins of narrative comprehension, which are rooted in practical knowledge about the world, especially daily experiences and corresponding discourses. Violations of expectations about routines represented in stories were expected to trigger comprehension monitoring, which could occur in the form of error (violation) detection, evaluation, and/or correction. The researchers accepted verbal and non-verbal data as evidence of error detection and recognized three possible manifestations of monitoring—error detection, evaluation, and correction. Acceptable inter-rater agreement for these factors was reached for a sample representing 38% of the collected data.

All children noticed deviations from typical bathtime routines, indicating that preschoolers can monitor their comprehension of simple, relatable stories for which they have

experiential expectations and a corresponding discourse. However, participants in the three groups seemed to take different actions in response to the violation. Typically developing children engaged in double the amount of protests with added corrections versus protests without correction. The LI group and the young group showed the reverse pattern. The LI group also had limited participation. Four of ten members did not respond at all, and the six who did protest did so nonverbally. The LI group resembled the young group in terms of comprehension yet had the weakest demonstration of monitoring. In sum, members of all three groups showed some evidence of comprehension monitoring. However, members of the most advanced group were more likely to participate and to provide more fluent verbal data.

Skarakis-Doyle and Dempsey (2008) successfully obtained meaningful verbal and nonverbal data about comprehension monitoring. Since they had multiple tiers of data, they were able to validate their methods by confirming a low false-positive rate for nonverbal displays of expectancy violation. However, this study is not without limitations. Procedurally, the researchers did not engage with children's spontaneous comments during shared reading, but instead gave a pre-planned neutral response. Protestations had to be initiated within five seconds of the violation. Meaningful data about metacognitive processing could have been lost by the dismissal of spontaneous or delayed comments. Legitimate processing of new information may take place long after five seconds of the presentation of that information. Thus, their study highlighted a methodological tension between standardization of procedures and obtaining all available verbal data from each participant. Pre-defining strict constraints on data collection facilitated data collection and comparison, yet it may have excluded some evidence of comprehension and comprehension monitoring.

In contrast, Paris and Paris' Picture Walk (PW; 2003) invited participants to say whatever came to mind as they looked through the pictures. The PW's less structured approach yielded observational data on book handling skills, interest in the task, and spontaneous interactions with the book. After making their commentary, PW participants were asked to close the book and retell the story. Their verbalizations were transcribed and graded on recognition of elements of story. Then the participant was instructed to look through the text a second time and answer literal and inferential comprehension questions. Researchers followed up on inferential responses by posing *why* questions to elicit elaboration, justification, or alternative explanations. Observations were thematically coded and inter-rater agreement of at least 90% was reached.

Analysis of variance did not show a significant difference between the Picture Walk performances of pre-readers versus readers in the first grade. Regression analysis revealed that age and code-based skills were positively related to comprehension, but that comprehension was not completely explained by these factors. These findings supported the conclusion that the thinking skills involved in comprehension were a unique ability meriting focused investigation. Paris and Paris (2003) concluded that *constructing* a story from a narrative picture book involves many of the same cognitive actions involved in comprehension of printed text. These cognitive actions include integrating multiple pieces of information, focusing on the most important information, monitoring understanding, and checking previous pictures to correct misunderstandings. Thus, many cognitive actions were involved in their task, which created many situational opportunities for metacognition to be relevant based on person, task, and strategy characteristics (Flavell, 1979). In sum, using the PW procedure with published picture books may have produced different results and more insight into processing than either the EVDT's error detection methodology or the independent pretend reading methodology.

Hsieh et al. (2013) measured typically-developing preschoolers' metacognition through an entirely different approach than the PW or EVDT. Using the published wordless storybook, *A Boy, A Dog, and A Frog* (Mayer, 1967), Hsieh et al. engaged Taiwanese preschoolers in creating a story from the pictures. During a second round, they reread the participants' first versions and actively sought revisions. They considered that just over 90% of their participants engaged in at least one of three types of metacognitive revisions. However, preschoolers' revisions tended to focus on their feelings and opinions whereas first graders attended to larger units of meaning–such as a sentence or a paragraph.

Hsieh et al. (2013) divided the children's revisions into three types: immediate revisions, delayed revisions, and reviewed revisions. Timing determined membership in the respective category. Immediate revisions were given before the scribe could write down the child's story rendering, delayed revisions were initiated before the scribe finished recording, and reviewed revisions were initiated by the child after the scribe had stopped writing. Though this approach exemplified a more open-ended and naturalistic approach than error detection, and a more interactive approach than observation of pretend reading, it still featured an artificial limit on how the child could be metacognitive. Revision is a broad category and, based on sampled anecdotes, appeared to encompass forms of metacognition such as *Planning* and *Reflecting*. Hsieh et al. directly addressed the comprehension-metacognition relationship by evaluating the coherence of the story transcribed. Though first graders' metacognition appeared to influence performance on storytelling, no consistent benefit emerged for the preschoolers.

However, Brown et al. (2014) were able to document benefits of metacognition to preschoolers. They trained a small group of four-year-old preschoolers considered at-risk for academic failure to self-monitor their retelling of a story. The goal was for 4-year-olds to

independently include five major elements of story in their retellings after small group training sessions that used commercially-available storybooks. Training was a part of typical small-group rotations in the classroom. The intervention was successful for the three 4-year-old participants. They essentially quadrupled the number of story components included in their retelling from baseline to post-intervention assessment, and they showed a further increase at a maintenance assessment two weeks later. The 4-year-old participants appeared to have internalized the "guided self-monitoring" (p. 161) from the intervention procedures. The measured outcome, the number of key ideas in the retelling, is typically considered to be a proxy for comprehension. The children were taught these abstract elements as a cognitive strategy and then received assistance with monitoring their compliance. Since the details of "correct" responses varied by story, application of a strategy was what was taught. This study's approach thus exemplified how strategic processing could be a nexus between comprehension and certain forms of metacognition, even for pre-readers.

Story elements can be considered to be macrostructures; they fill in the story's narrative arc and together form at least the text base of a story. They also provide a consistent (though abstract) scaffold for retelling across stories. Other scaffolds in Brown et al.'s study included the small group interaction during the training sessions and picture prompts for five pre-selected story elements: the main character, the initiating event, the main character's internal motivation, main actions, and final consequence or outcome. Brown et al.'s methods and results demonstrated how a focus on monitoring allows for investigation of the integration of comprehension and metacognition. However, participants were invited to perform – and therefore monitor – only one way of interacting with a story (retelling it). There are many more cognitive and metacognitive experiences relevant to story comprehension.

Brenna (1995) observed that precocious preschool readers utilized a variety of metacognitive strategies, some more than others. Though Brenna (1995) worked with early print readers, her concern was for the "thinking and reasoning processes early readers use in comprehending text"—which she anticipated would be highly metacognitive (p. 55). Brenna identified a developing "text knowledge" (p. 55) as a form of metacognition, which she considered to work with knowledge of self and task. Brenna's text knowledge consisted of standard concepts about print typically assessed during emergent literacy, as well as more literate knowledge, such as recognizing a reciprocity between reading and writing. Her construct of text knowledge is very closely related to person knowledge, as a view of the self as a reader and writer makes text knowledge meaningful. Brenna's person-task-strategy (action) framework, based on Flavell (1979, 1981), made visible the various ways that metacognitive knowledge, metacognitive experiences, and cognitive and metacognitive strategies implicated and contributed to each other.

Brenna (1995) triangulated information from interviews, observations of home literacy life, and observations of independent reading in order to reach her conclusions. In addition to recognizing metacognitive strategies in precocious 4-year-old readers, she recommended that multiple methods be used in any one study in order to fully understand young children's emergent literacy and metacognition. Though her early readers shared common characteristics, they also demonstrated important individual differences in how they approached the reading task and employed metacognition. Brenna pointed out that different data collection methods can yield different results and lead to different conclusions. A singular method or a singular data collection technique may thus fail to document relevant phenomena in a multi-faceted situation such as storybook reading. Error detection, observation of independent pretend reading, and pre/post

intervention studies may be too narrowly focused to capture all metacognitive processing in a complicated problem space such as reading.

Summary of forms of metacognition identified in emergent reading studies. I identified the following forms of emergent metacognition in research describing young children's emergent reading interactions with texts: self-monitoring, self-revising, self-reflecting, and justification of verbalizations. Studies that used reading as their task seemed to let the broad categories of self-monitoring and self-revising represent metacognition.

Self-monitoring. Self-monitoring is a major category of metacognition. Monitoring may be challenging to measure in preschool participants because this form of strategic behavior may lack an outward manifestation. Or, monitoring may have many different outward manifestations. Researchers have traditionally used error detection methodologies to overcome this challenge by providing participants with an opportunity to demonstrably react to an error. Skarakis-Doyle and Dempsey (2008) implanted objectionable information into a familiar story and measured protestations as manifestations of monitoring. Participants had to protest or object to an error in order to reconcile the threat to their reasonable expectations. However, many situational factors other than monitoring could have facilitated or suppressed an outward protest. Background knowledge, memory of the first reading, and comparison of the first to the second reading could have been variably influential. Furthermore, many aspects of a story reading experience may be monitored. Error detection is one step removed from the study of literacy processing; attention is given to children's reactions to contrived alterations of the story, but not to monitoring whether one learned anything, realized something new, or applied or changed comprehension strategies. Thus, only one form of monitoring was called monitoring.

Self-revising. Hsieh et al. (2013) used the term revising with the same broad brush. Revising is an active form of metacognition from the regulation category of Flavell's model. Just as there can be many manifestations of monitoring, there may be many types of revisions. Stories inspire a wide range of cognitive and metacognitive actions and experiences and allow for various forms of metacognitive knowledge to be acquired, affirmed, and/or applied. Based on evidence that preschoolers can engage in meaningful monitoring and revising, I aimed to broaden the possibilities for data collection on these phenomena, in order to explore any subtle and various manifestations not documented by prior approaches.

Justifications of verbalizations. In their Picture Walk procedure, Paris and Paris (2003) followed up on children's responses to comprehension questions with the elaboration prompt "Why do you think that?" They found that young children (as young as pre-reading kindergarteners) could revisit their answers and comments as they discussed the story with an adult. Thus, consistent with Flavell's original definition (1979), students' thoughts were an object for reconsideration. A prompt may have led them to engage in such an action at that moment, but the capacity was within the young child. As with any verbal reporting, the threat of words not matching true inner processes always exists. Ideally, multiple methods would triangulate whether intrapersonal insight is communicated through statements. I concluded that Paris and Paris' elaboration prompt was actually metacognitive in nature, and I aimed to determine whether my preschoolers understood such a request and could reply to it through intra-personal insight into their comprehension processing.

Reflecting on reading as a task. Brenna (1995) highlighted the person, task, and strategy knowledge that precocious early readers used as they engaged in reading. Each of these inter-related forms of knowledge had a meta-level appreciation for the self as a literate or

communicative agent that gave deep meaning to relatively small and rudimentary forms of reading and writing. Brenna's work highlighted the affordances of using a reader-task-strategy view based on Flavell's model of metacognition. Important early literacy phenomena could have gone undocumented without it.

Metacognition in the context of emergent writing processes. Writing involves the intentional construction of meaningful information to be shared with others. Writing, as a form of literary communication, unfolds (as reading does) through a process. Literary processes invite revisiting, reconsideration, and revision, perhaps more than isolated tasks (Fang & Cox, 1999). Revisiting and reconsidering text helps a learner to further understand the abstract and representational nature of text, and vice versa (Fang & Cox, 1999; Vygotsky, 1978). Both readers and writers have goals for understanding or being understood; goals implicate *Planning*, *Monitoring*, and *Revising*. Children who are too young to engage in conventional writing may compose connected oral discourse that an adult scribe may write down. Just as understanding is at the heart of reading, composing coherent communication is at the heart of writing (Fang & Cox, 1999). Therefore, emergent writing can be a context for metacognition (Rowe, 1989).

Fang and Cox (1999) examined preschoolers' self-monitoring while dictating a story about a personal life event. All 44 of their participants were in a pre-reading, pre-writing stage of emergent literacy, yet three-quarters engaged in some form of metacognition while composing their story. After establishing rapport, a researcher/scribe asked the preschoolers to talk about a personal memory. Then the researcher/scribe invited the child to relay the memory again, but in the form of a story that other children would like to hear. As the child told the "autonomous" story, the researcher/scribe dictated verbatim and periodically reviewed what was said. The researcher/scribe did not give the child any formal prompts or pre-planned feedback concerning

the quality or coherence of the story. Children's spontaneous metacognitive utterances while composing their autonomous story with the scribe were counted and categorized.

This study addressed both cognition and metacognition. First, the researcher asked the child to recount an interesting life event from memory, without the benefit of pictures, props, or a parent who could provide memory cues. Then, the researcher asked the child to tell this event again, in the form of an interesting story. The cognition involved memory and familiarity with the story format. Metacognition was expected of the child during the presentation of the information in story form—through monitoring of the sequence, coherence, and accuracy of the story as it was dictated. For example, when the researcher stopped to recap what was dictated so far, the child could compare the unfolding story to his or her intended communication and revise accordingly. Referencing the duality of awareness and regulation in metacognition, Fang and Cox (1999) assumed that self-regulation of storytelling would proceed from self-appraisal of what was already said, and that it would be easier to observe than metacognitive awareness.

Fang and Cox (1999) used a Vygotskyian framework to highlight the importance of spoken and tacit language in thinking. They used a challenging task to encourage preschoolers to vocalize their inner speech to the scribe, who took on the mechanical burden of writing. The mental work of composing a story relative to their intention and meeting the requirements of "autonomy" was done by the child. Based on the idea that "early forms of metacognition or its precursors may be observed in children's natural speech as they engage in challenging activities" (p. 176), the researchers delineated two categories of verbal data: the text that the child composed and any metacognitive utterances made throughout the composition process. These two categories are roughly equivalent to reading comprehension and metacognition in the present study.

To create an autonomous text, participants had to monitor coherence while considering a hypothetical audience. The researchers transcribed the autonomous stories and assigned a "cohesive harmony" score through a multi-step analysis of lexical units and overall logical consistency (p. 179). They also assessed participants' emergent literacy using Sulzby's (1985) schemata, which revealed that while no children were attending to print, their abilities to render a story from pictures varied. Analysis of variance revealed that this emergent literacy level had a statistically significant ($p = 0.00$) effect on metacognition, measured as metacognitive utterances during dictation. Perhaps because writing is a self-reflexive process, the type of metacognition instigated and the type of outcome were positively related in this study. However, nine of the fourteen children who did not verbalize any evidence of metacognition while telling their own story exhibited some evidence of overall story structure while pretend reading a storybook. In conclusion, emergent literacy sophistication was influential, but not clearly deterministic.

Fang and Cox (1999) expected and observed two main forms of emergent metacognition in their study: strategic planning for dictating their story to the scribe and regulation of the comprehensibility of the story that was being formed through this process. Their task involved many emergent literacy skills and posed a special challenge by asking for the second telling of the story to be delivered in the written register (Purcell-Gates, 1995). Fang and Cox (1999) claimed validity by analyzing "children's spontaneous speech *during* a natural literacy event (i.e., the composition of a personal story) to infer their metacognitive processes" (p. 179). Fang and Cox avoided unwarranted inferences from verbal report data or other forms of self-report by obtaining concurrent metacognition during an actual literary event. In other words, children discussed something they were doing in the moment.

Through a more extended design, Rowe (1989) made weekly observations of 21 three and 4-year-olds engaged in their classroom's literacy center. Rowe (1989) used the constant comparative method to "generate theoretical propositions about the role of metacognition in young children's literacy learning" (p. 67). Rowe recorded observations and engaged in thematic coding of metacognition relevant to what the children were working on in the writing center. She triangulated her interpretations by conferring with the children's regular preschool teachers. Rowe identified nine major categories of metacognitive behavior in preschoolers' self-initiated writing activities in the preschool classroom. In parentheses, I matched each to thematic categories from the present study:

1. Referring to self as a reader or writer *(Reflecting on Reading)*
2. Referring to cognitive strategies used in the task *(Reflecting on Reading)*
3. Requesting help when needed relative to task goal *(Feeling of Knowing)*
4. Articulating task plans *(Task Planning)*
5. Identifying and discussing barriers to goals *(Task Planning)*
6. Self-correcting *(Self Revising)*
7. Identifying discoveries *(Judgment of Learning from Story)*
8. Referring to peers as readers and writers *(Reflecting on Reading)*
9. Discussing the task *(Reflecting on Reading)*

Consistent with Flavell's model, Rowe (1989) claimed that she observed person, task, and strategy knowledge. Rowe considered preschoolers to exhibit knowledge along the personal dimension when they spoke about themselves as readers and writers and consciously carried on as readers and writers for their own literary purposes in the classroom. Such behavior included an awareness of what reading and writing entailed, how to engage in it, and how to seek help from others who also have reading and writing skills. Underneath these behaviors was an awareness of reading and writing as communicative domains in which all class members participated. In other words, knowledge of self as a writer is metacognitive in nature because it

involves acting out of an awareness of mental capacities that are called for by the task one is engaged in.

Writing can take on many forms and serve many purposes; even for preschoolers, many tasks can be included under the umbrella of writing. This scenario provided opportunities for naturalistic observation of task choice, goal setting, and goal-seeking actions. Rowe (1989) considered knowledge about how to complete the task and how hard the task is in general to represent the task dimension of Flavell's model. Rowe's preschoolers manifested task knowledge by explaining that they couldn't read pictures (since they lack words) and by requesting the time and space they needed in proportion to the difficulty of a task. Finally, Rowe claimed that the preschoolers she observed exhibited the strategy dimension of metacognitive knowledge when they consciously employed a cognitive strategy to accomplish a writing goal. They often knew that a certain strategy was well suited to a certain task. For example, one child consciously chose to observe another child in order to learn how to do something. In sum, Rowe documented a wide range of self-regulatory behaviors, in which children used their metacognitive knowledge to monitor themselves and others in different classroom situations.

Rowe's (1989) extensive interaction with participants allowed for the collection of a large data set collected under familiar conditions and demands. Though Rowe directly observed the children, it is not known how they would have reacted to questions or prompts. By viewing the task from the child's perspective versus the adult's perspective, Rowe was able to describe how important metacognition was to their participation in emergent literacy tasks. Preschoolers' cognitions and metacognitions appeared to be less sophisticated and less efficiently intertwined than that of older children, but no less relevant to the task, from their perspective. Due to the

variety, challenge, and abstract representation involved in writing, both cognition and metacognition seemed to occur in connection and with reciprocal benefit.

Summary of forms of metacognition identified in emergent writing studies. This collection of literature suggests that the following forms of emergent metacognition can be observed in young children's typical and prompted emergent writing behaviors: reflective self-awareness, self-monitoring, self-revising, self-expanding, task planning, and feeling of knowing.

Self-awareness, monitoring, revising, and expanding. Writing is a communicative, evolving, and self-referential *process* by design. Because young writers have goals in mind, akin to a mental model of a text, they have intentions that can be monitored as they work to produce story content. Some revisions cancelled out an earlier statement, as if it had been mistaken or in jest. These were straightforward examples of monitoring and putting monitoring into action by revising. However, some verbalizations embellished, elaborated on, and/or further integrated prior verbalizations into the whole of the story. These additional statements had a qualitatively different purpose. Thus, they support the creation of *Expanding* as a thematic category distinct from revising. For example, I considered the metacognitive utterance "I wanna change the word" to revise whereas "He listen to them, to his mommy" expands because it adds a second category of people listened to. Revising cancels and replaces prior information whereas expanding adds additional information in a logical connection to and implicit affirmation of prior information. I presumed the young child felt internally driven to volunteer additional information due to monitoring satisfaction with her or his story production relative to an intended mental model of what should be articulated.

Task Planning. The above discussion of monitoring, revising, and expanding illustrated how the intentionality of the writing process—whether self-initiated or in response to an adult's prompting—involves having an initial goal, vision, or mental model that is pursued. Thus, planning, monitoring, revising, and expanding have dynamic and intertwined relationships. As pointed out by Brenna (1995) and Rowe (1989), a nascent awareness of the self as a literate agent seems to allow young children to make and coordinate cognitive and metacognitive efforts towards a literacy goal.

Feeling of Knowing. In the studies reviewed, if preschool writers didn't know something needed for their task, they sought to uncover the missing information or helpful resources. Thus, I interpreted a *Feeling of Knowing* as a metacognitive experience that manifested a finer gradation of monitoring. I concluded that knowing of knowing would represent metacognitive knowledge, whereas feeling that you do or do not know a specific piece of information relevant to your goal is a metacognitive experience in relationship with monitoring. Thus, it can be spontaneous, scaffolded, or prompted.

Metacognition in the context of classroom learning centers. Whitebread et al. (2009) recorded preschoolers' verbal reports of their self-monitoring and observed preschoolers' self-regulated behavior while they engaged in typical classroom tasks. According to Whitebread et al. (2009), their observation of semi-structured engagement at learning centers filled a methodological gap by using careful observation to investigate preschoolers' "internal representations" (p. 78). They intended for their close observations to reveal as much processing as think aloud methods, which they considered too challenging for the preschool population. Whitebread et al. (2009) argued that observation is more valid for preschool participants because it enables researchers to see what three to five-year-olds can do before they can report doing it.

Observation of speech during meaningful action may also enable the linking of actions and task details in ways that can more thoroughly explain what young children can and cannot do.

To advance these aims, they developed the Children's Independent Learning Development checklist (CHILD) for use by preschool teachers. CHILD assessed metacognition as the cognitive aspect of self-regulation in a classroom setting. CHILD used observation of stimulating learning tasks to overcome a fundamental challenge in researching metacognition in preschoolers—less metacognition and/or qualitatively different metacognition may be just as important to the young participant's task engagement as more or more sophisticated metacognition is to an older participant's engagement in a task. Whitebread et al. (2009) pointed out that traditional research on metacognition in preschoolers has mistaken limitations on verbal ability and working memory as characteristics of limited metacognition. However, these are actually separate constructs. Whitebread et al. (2009) concluded that preschoolers can give more advanced performances when tasks are "ecologically valid and meaningful" (p. 65).

Whitebread et al. (2009) encouraged future researchers to consider non-verbal data such as gesturing and eye gaze focal points. Non-verbal communicative data can indicate thinking that cannot be expressed verbally. Non-verbal behaviors may also help the child develop cognitive and metacognitive processing; concrete interactions with books and learning tools are an important intermediate step towards abstract or purely representational processing (Vygotsky, 1986).

The CHILD was designed for general preschool classroom use. I considered the following metacognitive performances from the CHILD to be relevant to the processes involved in joint reading and used them to support development of my thematic codes (in parentheses):

1. Child can speak about how s/he interacted with text (*Reflecting on Reading*)

2. Child can speak about what s/he learned from text (*Judgment of Learning from Story*)
3. Child can speak about a plan to interact with text in a certain way in the future (*Task Planning*)
4. Child states a reason for a choice or decision (*Justification*)
5. Child spontaneously asks questions to try to better understand – seemingly to fill in missing information (*Feeling of Knowing Story Information*)

Neuman and Roskos (1997) also documented metacognition in preschoolers' participation in classroom learning centers. They observed 3- and 4-year-old children's talk and behavior at three thematic literacy centers: the post office, the doctor's office, and a restaurant. Each center was introduced through a themed learning unit that included read alouds of relevant literature and relevant field trips or guest speakers.

Children's activities were captured by motion-activated cameras, resulting in 20 hours of videotaped data of 76 episodes. Adults did not prompt or otherwise interact with children while they played at the centers. The preschoolers' monologic and dialogic talk was transcribed verbatim and coordinated with non-verbal behaviors (e.g., pointing, turning to a conversation partner). This data set revealed children's cognitive and metacognitive sophistication when the only available scaffolds were familiarity from world knowledge or prior instruction, interaction with other children, and the physical environment. Adults did not guide or prompt.

Neuman and Roskos (1997) posed three research questions to their collected data: "1) What features distinguished literacy in practice? 2) What knowledges did the activities require? and 3) What cognitive and metacognitive operations were involved in the activities?" (p. 14). After coding each speech turn or gestural unit, coding categories were refined, and acceptable inter-coder agreement was reached. Three levels of analysis were then applied – broad features

of literacy in practice, literacy knowledge in practice, and the relationship between domain-specific and strategic literacy activity.

Literacy knowledge in practice was divided into instances of declarative and procedural knowledge. For example, in the post office center, children expressed that they knew what writing paper, stamps, and envelopes were for, and they corrected each other for using these things outside of the norm. When confusions or disagreements arose, children resorted to a reflective, meta-level review of the situation to reach a resolution. For example, children debating whether the post office was open referred to the word *closed* printed on a sign to resolve the issue. Though they had difficulty reading the word, one child decided to state each letter to confirm that the word was indeed c*losed.* The child's awareness of cognitive uncertainty (i.e., What is that word? How can we find out?) and strategic decision to resolve the uncertainty by applying formal knowledge (letter names) was considered metacognitive. Thus, independent of print accuracy, a separate and often-prioritized cognitive skill, preschool children consciously employed and articulated reasonable actions to reach their cognitive goal. Print accuracy will likely develop later; the impressive finding in this episode was the meta-approach to the task that employed what was known about self and language. This scenario fits Flavell's model, even though some children were technically missing key information. They applied what they knew.

Neuman and Roskos (1997) concluded that they had observed the same types of processing seen in mature or conventional learners, although in qualitatively different forms relative to their young agents and their tasks. They observed declarative knowledge (I know that…) and procedural knowledge (I know how to …), though evidence of procedural knowledge exceeded that of declarative knowledge in all three centers. They considered this finding as indicative of children's developmental tendency to perform actions before being able to

thoroughly discuss them. The implication of this finding is that when researching literacy skills with young children, behaviors should be analyzed along with verbalizations, and strategies should be analyzed alongside accuracy.

Neuman and Roskos (1997) also concluded that they observed "strategic knowledge" – a meta-level of processing that spanned settings, whereas declarative and procedural knowledges were tied to a domain (p. 23). Neuman and Roskos (1997, p. 23) claimed that their participants engaged in six types of metacognitive, strategic behaviors. I correlated their categories with categories from the present study in parentheses:

1) seeking needed information *(Feeling of Knowing)*
2) correcting others
3) self-correcting (*Self-Revising*)
4) assigning roles and resources *(Task Planning)*
5) checking correctness *(Self-Revising)*
6) gathering resources for a desired action *(Task Planning)*

I considered the seeking and checking behaviors to have been driven by an underlying *Feeling of Knowing*. For example, Neuman and Roskos (1997) noted that in the vignette from the post office center, strategic knowledge was abundant while declarative and procedural knowledges were lacking. Metacognitive strategy use came online to surmount the challenge that missing information posed to the pursuit of task goals. An awareness of a lack of important information occurred to participants without prompting. This interpretation of results is also consistent with Flavell's (1978, 1979) situational model of metacognition, in that children knew they needed more information to fulfill their task goals.

Though Neuman and Roskos' analysis was elegant, they did not resolve some endemic complications of working with verbal data from young children. For example, a portion of their verbal data consisted of a child ostensibly verbalizing why she or he was doing something

("Excuse me, I have to write something down, so I won't forget," p. 25). In this example, it is not known for sure if the child was mimicking a behavior seen in the home or if the child spontaneously and strategically chose to write something down for the articulated goal of remembering it later. Researchers made inferences when coding children's verbalizations and when analyzing their meaning. Ideally, another source of data would have bolstered confidence in the true metacognitive or strategic value of the verbalizations from such young participants. As observed by Peskin and Astington (2004), preschoolers' verbalizations may not always match underlying cognitive or metacognitive processes.

This study informed my own. First, the authors concluded that preschoolers can access, monitor, articulate, and follow through on their literacy-related thoughts. These capacities are required to study metacognition through joint reading. Second, their findings illustrate the many situated ways that preschoolers may be metacognitive, such as to confirm the identity of a letter or word or to check the clarity and communicative effect of a spoken sentence. Their analysis supports my categories of *Self-Revision, Feeling of Knowing Story Information, and Task Planning*.

Though Neuman and Roskos (1997) obtained sufficient verbal data through observation alone, they did not assess if questions or prompts can lead to more or more sophisticated data. Vygotsky (1978) posited that schooling should challenge students, and Flavell (1979) suggested metacognitive training. Joint reading as an interactive dynamic may allow for the benefits of both prompting and observation.

Summary of forms of metacognition identified in observations of children at learning centers. The selected literature describing preschoolers' work at learning centers

suggested the most diverse and robust forms of metacognition across this literature review. Whitebread et al.'s (2009) study provided evidence for five of the seven forms of metacognition coded for in the present study (all except *Judging Difficulty* and *Expanding Storytelling*). The open-ended nature of learning centers may have invited more and more varied activity, and it may have allowed children to interpret or define tasks for themselves. Also, since children were not engaged in storytelling at the two center studies, they did not have an opportunity to *Expand*. Creating or interpreting text appears to invite *Expansion* in ways that atextual tasks do not.

Whitebread et al. (2009) and Neuman and Roskos (1997) detailed the available scaffolds for participants as they worked through a task–other children, the materials provided, and classroom instruction. As opposed to scripted procedures with an adult, these studies could include behavior completely initiated and carried out by a young child. Without the immediate presence of an adult, it was easier to ascribe holistic meaning to observed behaviors. Thus, while scripted reading and writing studies may have overlooked some forms of metacognition, observational studies may have considered almost everything the children did to be metacognitive. The following forms of emergent metacognition were observed in young children's activities at classroom learning centers:

Self-Revising. Neuman and Roskos' (1997) example of self-revising is set in the context of play at centers. One of their participants placed a letter in a cash register and then commented "Oops, that doesn't go there" (p. 24). They also considered correcting others to be a metacognitive strategy. For example, one participant told a peer "You can't send money in the mail" (p. 24). What united correcting self and others and what made these actions metacognitive was their attempt to change, cancel, correct, or improve upon an effort in relation to a task goal. These actions likely resulted from monitoring.

Feeling of Knowing. Neuman and Roskos' (1997) documentation of pre-readers solving an unknown word reveals much about the meta-level processing that they brought to a situation wherein their cognitive resources were not sufficient. Their feeling of not knowing relevant information spurred corrective action to reach a goal. Future research may help to reveal if a *Feeling of Knowing* (or not Knowing) is spurred by or spurs monitoring. In reference to the present study, it is justified to interpret a task-based or story-based *Feeling of Knowing* that accesses whether or not key story information is being understood. During the process of meaning making, knowing or not is critical. Preschoolers were found to be aware of and able to report on knowing or not. In observational studies, not knowing led to questioning or taking corrective action. Since knowing did not require repair, it was not as easily observed.

Task Planning. Whitebread et al. (2009) and Neuman and Roskos (1997) documented multiple instances of conscious planning, wherein preferences and goals were considered before actions were taken. Planning enables monitoring of progress towards a goal. Additionally, spontaneous reasons for monitoring may occur throughout any task. In the practical behaviors invited by Neuman and Roskos' (1997) classroom centers, planning involved "assigning roles and resources," such as selecting the dress up clothing needed to match a pretend environment (p. 24).

Justification of Verbalizations and Reflecting on an Emerging Literacy. Whitebread et al. (2009) observed that preschoolers engaged in multiple forms of conversation about their activities at learning centers. They justified or defended the reasonableness of their statements and they discussed their activity with books in a way that showed early awareness of being a reader (i.e., someone who gets meaning from books) and engaging in reading as a defined mental activity. In both of these metacognitive activities, young children were able to review or mentally

revisit their cognitive efforts as an object for examination and discussion. As with writing, the practical, holistic, and familiar nature of center tasks gave children something to do, which may have been a useful scaffold for reflective thinking about what they were doing.

Metacognition in the context of relevant activities. Many early metacognitive capacities have been documented through experimental tasks that did not directly involve literacy skills. Since many of these studies were produced through psychological research, there are no holistic emergent literacy settings or tasks to describe. Therefore, I directly organized this section of my review by type of metacognition. In the subsections that follow, I review literature describing the following forms of metacognition that I considered relevant to joint storybook reading: *Metamemory*, *Self-Monitoring*, *Feeling of Knowing*, *Judgment of Difficulty*, and *Judgment of Learning*.

Metamemory. After multiple rounds of coding, *Metamemory* was ultimately excluded as a category in this study. However, there was some evidence from the literature and from collected data that this form of metacognition may be relevant under different circumstances. Therefore, I discuss it. Many investigations of early metacognition have focused on memory as the first-level cognition. Brown (1978) defined metamemory as "knowledge concerning one's own memory abilities and strategies" (p. 81). Brown (1978) explained that younger children lag older children in both memory and metamemory. The two are related (Schneider, 2001). Brown (1978) detailed that younger children know less, have less organization of what they do know, are not efficient at storage and retrieval, and have limited recall techniques. Larkin (2009) referred to metamemory as the awareness of one's memory and the ability to use the vocabulary of remembering. Larkin (2009) explained that metamemory emerges during typical social interactions in the preschool years. According to a recent review by Lai (2011), most authors

agree that children begin to use memory verbs around the age of four. In other words, 4-year-olds are aware of, can label, and can communicate aspects of remembering. However, as demonstrated by Peskin & Astington (2004), the depth of the match between metacognitive verbs and knowledge or performance of metacognition is hard to confirm in the young child. In everyday experience, a child with metamemory can communicate that she or he forgot where a toy was hidden, understand why she or he cannot find it, and request help from an adult to resolve the situation (Larkin, 2009). Brown (1978) did not consider preschoolers to be developmentally capable of having metamemory or related capacities that conventional readers would regularly rely on to read, study, and learn. However, Flavell and Wellman's (1977) distinctions between situational performance of metamemory, sensitivity to the relevance of memory to the task, and stable, declarative knowledge of memory as a cognitive enterprise suggest that young children may have limited meta-level abilities that they can't report on or consistently benefit from. In this regard, a fragmented emergence of *Metamemory* may resemble the emergence of other forms of metacognition. In the final analysis, I concluded that data that I originally coded as *Metamemory* could not be characterized as self-aware discussion of memory as a mental action.

Self-Monitoring. Revelle et al. (1985) implemented an error detection technique to assess preschoolers' cognitive monitoring during a contrived task set in the regular preschool classroom. Revelle et al. (1985) gave various oral instructions for children to carry out tasks such as retrieving an item from a classroom location and bringing it to the experimenter. Some instructions were fungible, but some were ambiguous, nonsensical, purposefully inaudible, too much to remember, or impossible to perform. Reasonable reactions to these obstacles to task completion were considered evidence of self-monitoring. The youngest participants only

responded to the inaudible instructions and appeared to be insensitive to breakdowns in meaning. Older preschoolers began to react to meaning-based problems in the given instructions. This technique did not involve a connected story, but oral instructions for completing a task. The experimenter was not the children's regular teacher, and the children's perceptions of the meaningfulness of the tasks were not known. It is not known if children would have performed differently if the teacher had been the requestor or if the tasks had been part of a holistic and meaningful classroom activity, such as building a block house or working on a class project.

Feeling of Knowing. Wellman (1977; as cited in Karably & Zarbucky, 2009) referred to a feeling of knowing as a form of confidence in one's ability to recognize (i.e., know that you know) a target, independent of the ability to provide a name or label for it. Knowing that you know or do not know can be obscured by being able to label something that is not understood. In the context of a holistic task, a sensation of knowing or not should lead to maintenance or adjustment of effort. However, this capacity is often documented as being present or not, versus being investigated as one of many factors in a constant stream of cognitive or metacognitive efforts implicated by a multi-faceted task. For example, Hembacher and Ghetti (2014) investigated 3- to 5-year-olds' feelings of certainty or uncertainty concerning the accuracy of their memories. Hembacher and Ghetti (2014) exposed preschoolers to a simple picture and then asked them to choose whether they had seen the picture before. They also asked their preschoolers to indicate their confidence in their answers (i.e., I saw it or I did not see it) by requesting that their answer be recorded or disregarded. Participants in each age group expressed uncertainty when they really did not know if they had seen a picture, though the 4- and 5-year-olds did so more often. Hembacher and Ghetti (2014) concluded that feelings of uncertainty may be a precursor to conscious cognitive monitoring of memory. Since introspection concerning

memory is part of the umbrella of metacognition, their study illustrated the existence of metacognitive experiences in the preschool population (Flavell, 1981).

In another study, Cultice et al. (1983) presented 4-year-olds with pictures of other children who were very likely to be known, somewhat likely to known, or not likely to be known. Participants were asked to state whether they knew the pictured child and to provide a name. Their participants understood the dual nature of the task (recognizing and naming), had accurate feelings of knowing, and spontaneously used metacognitive language to report on their mental states relative to the task (e.g., "I know her, but I don't remember her name", p. 1485). Cultice et al. (1983) concluded that 4-year-olds are capable of meaningful *Feelings of Knowing*. In concurrence, Ghetti, Hembacher, and Coughlin (2013) referred to a "judicious preschooler" (p. 160) who makes choices about how to proceed with a task based on knowledge levels and who can report on knowing or not. Ghetti et al. (2013) explained that their intent to investigate metacognition led them to their conclusion: "by adopting a metacognitive framework, we have discovered skills in introspection and control earlier in development than previously believed, which has opened exciting avenues for inquiry" (p. 164).

These findings suggested that 4-year-olds can be trusted to intend to be accurate and to monitor their grasp of information. Since people of any age do not constantly share whether they know something or not, prompts are often used to obtain verbal reports of this metacognitive state. As with other forms of metacognition, it may be difficult to know for sure if the prompt cued the metacognitive state or substituted for it, especially when a yes/no answer could be given. To add to the literature, I sought to investigate how *Feeling of Knowing Story Information* could be experienced and reported throughout the task of joint reading.

Judgment of Learning. Determinations of "learning that occur during or soon after learning of new materials" (Lockl & Schneider, 2002, p. 327) are Judgments of Learning. According to Schneider, Vise, Lockl, and Nelson (2000), preschoolers tend to overestimate their ability to be successful on a task before they perform it. This type of prediction is conceptualized as a form of metamemory. Gaining academic thinking experiences from attending conventional schooling seems to help even slightly older children calibrate their Judgments. This construct can be adapted to accommodate the academic learning demands placed on conventional readers. Thus, I used the term Judgment of Learning (JoL) to refer to retroactive evaluation of whether content recently presented in the story had been learned. For conventional readers, a JoL evaluation may influence choices about subsequent studying. Research is ongoing about how to maximize the academic benefits of JoLs. For example, Bui, Pyc, and Bailey (2018) found that delaying JoLs led to greater accuracy for adults. Other studies have found the opposite. JoLs are typically investigated under laboratory conditions, using a list of multiple discrete items or one item at a time (see Schneider et al., 2000). Preschoolers do not typically study to learn.

However, after interacting with a book, being able to state whether something was learned or not provides valuable insight. In the present study, I developed the category *Judgment of Learning from the Story* that closely resembles metacomprehension or "a person's ability to judge his or her own learning and/or comprehension of text materials" (Dunlosky & Lipko, 2007, p. 228). In the constant comparative process, initial analysis suggested that some participants were capable of reporting that they had learned something from reading the book in a way that met this definition. However, after the final round of coding, *Judgment of Learning* was considered to be out of reach of preschoolers in the present study. Future studies that only task the young child with comprehension and retroactive or even in-progress *Judgment of Learning*

may produce different results. In the present study, prompting for multiple types of comprehension processing and metacognition may have diluted how much each participant could dedicate to any one form of metacognition.

Judgment of Difficulty. Touroutoglou and Efklides (2010) described a "feeling of difficulty" (p. 171) as a metacognitive experience within the learner, separate from the objective difficulty of the task itself. They explained that many features of the task may result in a learner perceiving difficulty or challenge, such as a sense that one's working memory is overloaded (Baker, 2017), knowledge of high task demands, or perplexing content. Per Touroutoglou and Efklides, a related concept is the predicted "ease of learning" content that older learners can rely on to plan for studying, e.g., allocating time or selecting and obtaining resources. Touroutoglou and Efklides explained that a feeling of difficulty can help a learner adjust effort on a difficult task, thus leading to success. However, feeling that a simple task is difficult may just provide insight into the fact that it really is. Touroutoglou and Efklides (2010) also explained that complex tasks tend to result in greater feelings of difficulty. Reading comprehension is a complex task. An accurate rendering can be arrived at through multiple pathways, can be hard to obtain, and can be dynamic (Fisher, 1998).

Participating in joint reading is a complex task with comprehension as the presumed goal. A straightforward *Judgment of Difficulty* would involve a rating of the ease or difficulty of a task (Karably & Zarbucky, 2009). Due to the lack of studies of this capacity in preschoolers and the overlapping nature of the Judgment categories, I assumed that preschoolers might be able to retroactively judge the difficulty of a reading session if a plain-language prompt was posed very soon after the story ended. I did not expect them to have much experience with this line of thought (see Schneider et al., 2000), but I anticipated that they could verbalize basic insight into

their perception of story or task difficulty. Preschoolers' sensitivity to perceived difficulty may be an important aspect of their emerging comprehension and metacognition. Furthermore, it is possible that a joint reading context could allow for documentation of not only their evaluation of difficulty, but also whether their behaviors during the task seemed to correlate with their evaluation.

Synthesis of Literature

My review of the literature establishes that many preschoolers are capable of metacognition, depending on the tasks and settings. The literature may be expanded by research questions that ask how, when, and why these children are metacognitive, and to what beneficial end. Adapting Flavell's person-task-strategy model of metacognition to include emergent literacy tasks would support such lines of questioning while adhering to the fundamental principles of metacognitive theory.

The results of my literature review fit with my adaptation of Flavell's model, as shown in Figure 4. Through the accretion of metacognitive experiences, declarative metacognitive knowledges are built. These in turn support expectations for having recognizable metacognitive experiences, which in turn may confirm and expand metacognitive knowledge. An emergent literacy task gives young children something real and concrete to do and something abstract and meaningful to think about and discuss. Thus, the middle box displays various cognitive actions common in emergent literacy functions as a medium through which the cognitive and metacognitive interact—sometimes in straightforward ways, as in the detection of an implanted error, and sometimes in intricate and subtle ways, as in the construction of an original story.

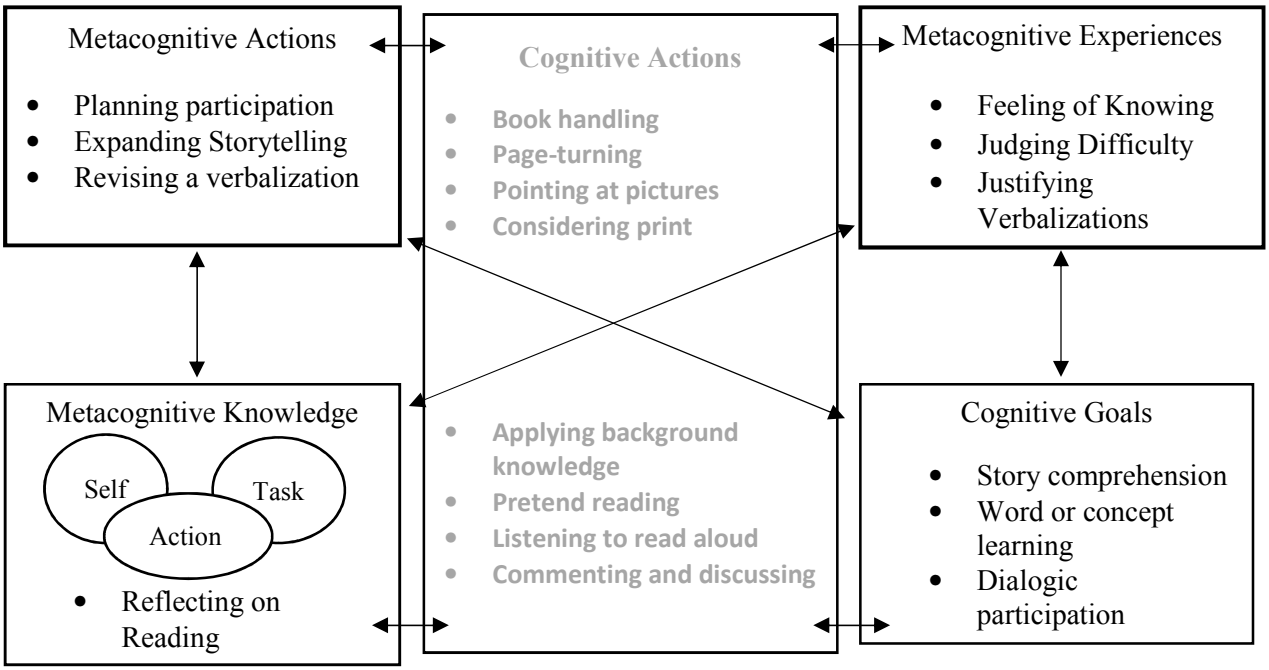

Figure 4. Revisiting the adaptation of Flavell's model for a preschool joint reading task.

Figure 4 displays the metacognitive actions, metacognitive experiences, and metacognitive knowledge that I observed in the present study. The actions were constructive, purposeful, and meaningful acts conducted to participate in joint picture book reading. The experiences and knowledge were important to the joint reading. Participants' metacognitive knowledge, experiences, and actions were immediately relevant to the task. They influenced and were influenced by the typical cognitive efforts one might expect of a 4-year-old.

Since I synthesized and repackaged some forms of metacognition from prior studies, I provide other names used for my categories in Table 2. The literature reviewed for this study included research from the fields of psychology and education. Therefore, in the body of the literature review, I provided the authors' operational definitions and then explained how these concepts informed the present study.

Table 2

Other Names for Categories of Metacognition in Present Study

Category in Present Study	Construct Name in Prior Studies
Task Planning	Planning
Self-Revising	Revising
Judging Difficulty	Ease of Learning Judgment
Justifying Verbalizations	Elaboration (as a form of comprehension)
Expanding Storytelling	Monitoring, Revising
Reflecting on Reading	"Meta-statements" Self and Task Knowledge
Feeling of Knowing Story Content	Feeling of Knowing (as a form of Metamemory)
Judgment of Learning from Story	Judgment of Learning as a form of Metamemory
Self-Monitoring	Self-Monitoring, metacomprehension
Metamemory for Reading	Metamemory

In Appendix A (Table 27), I summarized the evidence for and against preschoolers' abilities to engage in the specific forms of metacognition that I gleaned from the literature. I formed my categories through a constant comparative process, going back and forth between data collection, data analysis, and literature review. Early in the process, I expected participants to manifest evidence of these forms of metacognition. However, in my final analysis, I decided that instances originally coded as *Judgment of Learning* and *Metamemory* did not fully meet evidentiary standards based on the literature. In addition, I considered cognitive monitoring to be too broad of a category for coding. Therefore, monitoring is not specifically named in my codes, but it is presumed to be at the root of all forms of metacognition in some way.

Conclusions and Implications for Methodology

By engaging participants in meaningful, familiar, or developmentally-appropriate tasks, researchers across psychology and education are expanding evidence in favor of the metacognitive capabilities of preschoolers (Hsieh et al., 2013; Whitebread et al., 2009). Though preschoolers may have less sophisticated or less efficient metacognition than older children or adults, their metacognition is just as relevant to their texts and tasks. It occurs where and how it would be expected to occur—relative to learner characteristics, task knowledge, and repertoire of emergent literacy strategies or actions. Therefore, after reviewing the literature, I concluded that Flavell's model is a fitting theoretical framework through which to consider preschoolers' cognitive and metacognitive efforts during the joint reading task (Rowe, 1989). In the studies reviewed, preschoolers had stateable metacognitive knowledge of self and task, they could mindfully regulate their efforts towards a goal, and they had meaningful metacognitive experiences.

Whether observational, interactive, or experimental, the studies that I reviewed utilized verbal and behavioral data from preschoolers in order to study metacognition. However, they did not necessarily capture all possible data. Strict predefinitions of metacognition and highly structured procedures narrowed how a young child might be metacognitive. These approaches were overrepresented in studies of defined emergent reading and writing tasks. In contrast, observation of unstructured engagement at learning centers led to more liberal interpretation of the ways that a young child could be metacognitive. Though all procedures in reviewed studies could be viewed through a situational lens, each study varied in its reliance on a situational model. The education studies tended to use holistic tasks and therefore included at least some description of person, task, and strategy variables. The psychological studies tended to use

contrived tasks in isolation, meaning that the tasks might not be repeated in the child's regular home or school life. Therefore, not as much context was described. More work needs to be done to correlate children's documented capacities on isolated laboratory tasks with typical emergent literacy experiences.

As opposed to discrete tasks, reading and writing always have person, task, and strategy (or action) dimensions. Comprehension, the goal of reading, and coherence, the goal of writing, are situationally-influenced. As Paris and Paris (2003) reasoned, "If narrative competence is a general characteristic of children's thinking and reading, it should be evident in a variety of materials and stories" (p. 51). Therefore, the study of metacognition, especially in conjunction with comprehension, needs to be situational. I concluded that exploratory investigation of metacognition during repeated joint readings was needed to add to the literature. Repeated joint reading would prioritize situational use of metacognition while balancing the affordances and limitations of participation versus observation. Below, I discuss in more detail the methodological implications drawn from this conclusion.

Developmental parameters are not deterministic. Developmental parameters, such as limitations on short and long-term memory, working memory, attention span, metamemory, and theory of mind, undoubtedly affect comprehension and metacognition (Baker, 2017; Stahl, 2014). However, they are not deterministic. In fact, Baker and Brown (1984) stated that "inadequate metacognition" is not just a "disease of childhood" (p. 355). As early as they can read print, children *can* begin to exhibit various forms of metacognition during reading, spontaneously or in response to formal instruction (Baker & Brown, 1984; Clay, 1991). *Before* they can read print, children can reflect on information in storybooks and their understanding of

it (Baker, 2005). Thus, it is important to research metacognition in preschool emergent literacy using a research design that considers the reader, text, task, and context (Brenna, 1995).

Early print readers, typically in Kindergarten and first grade, are capable of engaging in and benefiting from metacognition for an additional purpose—decoding print. In English, decoding print requires the visual and cognitive processing and reprocessing of multiple types of information (i.e., grapho-phonic, semantic, and syntactic; Clay, 1991; Schmitt, 2001). Self-monitoring is required to query whether all sources of information coincide (Clay, 1991). Reading Recovery, a successful first grade remediation program, incorporates metacognition by helping new readers develop "inner control" of their efforts to read (Clay, 1991, p. 234; Griffith & Ruan, 2005). However, these slightly older children may have difficulty discussing their actions. Martin and Kragler (2011) found that children in kindergarten and first grade had difficulty reporting their behaviors during and after reading. These findings do not suggest a decrease in metacognitive capacities after preschool or a falsely high rating of the metacognitive capacities of pre-readers. Rather, different tasks require different cognitive and metacognitive skills. Expectations about the relationships among cognition, metacognition, and verbal reporting may have to be reconsidered each time.

Less structure and more interaction may reveal the most about reading-related metacognition. Since reading itself remains imperfectly understood, limitations on understanding the meaning of verbal data to the participant must be kept in mind when drawing conclusions (Afflerbach & Cho, 2011). However, since "reading is a complex problem space" (Pressley & Afflerbach, 1995, p. 3), open-ended verbal data can be relied on to provide evidence of "constructively responsive" processing (Pressley & Afflerbach, 1995, p. 2). For very young participants, triangulation of what the child meant in the moment is key. For example, Holdaway

(1979) recognized that a toddler "reader" consistently shook his head as if to say "no" to indicate negation while articulating the rest of a sentence. Thus, verbal data alone may have said "the dog want the bone" when the child meant "the dog does not want the bone." Careful coordination of verbal and nonverbal communication in the moment, by a researcher familiar with the child's early literacy behaviors, is required to interpret pre-conventional text discussions.

Both Flavell's model and a transactional view of reading implicate thorough and varied investigation of a reading event. Multiple readings can increase the quantity of data from 4-year-olds—a population that produces relatively less talk. Since each experience with a book may be unique (Rosenblatt, 1978), multiple readings also allow for deeper and wider data collection (Paris & Paris, 2003). Extending this reasoning, repeated readings of multiple texts should maximize the quantity and quality of data collection in pursuit of the research question. Furthermore, since readers can be characterized by both stable (e.g., world knowledge) and dynamic (e.g., interest level) characteristics (Baker & Brown, 1984; Rosenblatt, 1978), repeated readings also decrease the likelihood of assigning stable traits to children based on situational performances (Brenna, 1995). In sum, repeated readings of four books increases the trustworthiness of this study by increasing the volume of data from participants who provide relatively limited speech and by enabling comparison of data from different situations.

Joint reading is preferable to observational, interventional, error detection, or pretend reading tasks. Baker and Cerro (2000) observed that chosen measurement techniques tend to correspond with an underlying operational definition of metacognition. Pre and post intervention studies have to rely on a consistent definition of metacognition written before interaction occurs. Thus, they lack the agility to document metacognition that occurs in ways other than what is being looked for. Garner (1987) reported that the intent of error-detection

studies has been to gain insights into comprehension processes that can be applied when reading texts without errors. However, these connections are not clear (Hacker, 1998). Both error detection and observation lack the interaction with an adult that can prompt application of capacities held but not commonly expressed. Per Vygotsky, novices should be able to do slightly more with the help of a more skilled other than they can do independently. In this view, interaction does not create metacognition but rather prompts it. Joint reading provides a preschooler with opportunities for unstructured, joint meaning-making in a familiar context. As a technique, it allows for the most thorough data collection of a preschooler's metacognitive knowledge, actions, and experiences within the context of a meaningful task. Reading occurs when not under study and is a fundamental aspect of one's literacy lifespan.

CHAPTER 3: METHODOLOGY

I generated and collected qualitative data from repeated joint storybook reading sessions with 4-year-old preschoolers from Fall 2015 to Spring 2016. Before reading began, I engaged participants in toy-playing tasks to ensure that they had the required background knowledge and topical vocabulary to understand the gist of each story. Study activities resulted in 86 conversational data collection events with seven participants. I transcribed each of these sessions verbatim and then reduced and interpreted the resulting data set through open and closed coding. This process resulted in a narrative case impression of each child's emergent literacy profile and a situational analysis of metacognitive events during joint storybook reading.

Methodological Rationale

Though I designed the broad parameters of the joint reading scenarios and pre-selected study texts, I allowed participants to pursue preferences, lines of thought, and tangents during the dialogue. Therefore, this study is grounded in symbolic interactionism, as I interpreted meaning from how participants engaged in joint reading. I assumed that four-year-olds desired to understand, and I investigated whether metacognition would be part of their efforts.

Interpreting data. My background inspired commitment to an interpretivist theoretical perspective (Crotty, 1998). All data has to be interpreted to some degree, due to cultural and personal differences between researcher and participants and pervasive methodological limitations. In the present study, preschool participants spoke words and took actions, and I assigned meaning to these phenomena (Altheide & Johnson, 1994). To increase the trustworthiness of my interpretations, I engaged in reflective and reflexive interpretation processes, in order to lessen the role of my biases and reduce the likelihood of unqualified

inferences. The interpretivist paradigm provided parameters for my active attempts to "understand and explain human and social reality" (Crotty, 1998, p. 66-67). Interpretivism recognizes that a value-driven researcher collects and makes sense of data about human behaviors that are influenced by culture and history (Lather, 2006).

Interpretivism derives from a constructionist epistemology, which holds that meaning is co-constructed with participants and local stakeholders (Crotty, 1998). This epistemological perspective allows the researcher to claim meaning from an interpretive process that subsumes participants' intents and situational influences (Bredo, 2006). Accordingly, validity is achieved through argumentation to a community of researchers and stakeholders. Rowe (1989) reviewed her interpretations of children's writing behaviors with their regular preschool teachers. I coordinated with my participants' regular preschool teachers to make sure that study procedures seemed typical and comfortable and to ensure that participants were engaging as they typically would. In other words, my "created" findings were intended to be relative, "local", and "specific" (Guba & Lincoln, 2005, p. 193, 195). They were intended to explain, through interpretation, what was happening in the moment.

Interpreting verbal data as cognitive data. Vygotsky posited that working with the representationality of text enhances abstract thinking, which in turn enhances comprehension (Crain, 1992; Flavell et al., 1993). According to Vygotsky (1978), interacting with a more skilled other should lead to more sophisticated performance. Vygotsky thought that metacognition indicated an individual's development from being regulated by more skilled others to being self-regulated (Braten, 1991; Brown, 1987). Self-regulation enables self-direction of the cognitive actions necessary or desired to fully engage with text, relative to a goal (Holdaway, 1979). For Vygotsky, the process of continually internalizing other regulation from the environment as self-

regulation begins in early childhood (Brown, 1987). Language, such as the speech that occurs within the interactive joint reading discourse, is a tool that children can use to label, organize, examine, and express thoughts (Braten, 1991; Kucan & Beck, 1997, Vygotsky, 1978). Language enables consideration and reporting of the abstract – thinking about characters' unspoken motivations or thinking about the thinking one has done about that topic (Braten, 1991; Garner, 1987; Vygotsky, 1978). A challenging task, such as joint reading featuring challenging questions, may create a context for participants to be aware of their coping processes, including their metacognition (Fang & Cox, 1999; Flavell, 1987).

My aim of discovering whether and how preschoolers could communicate their thinking was thus enabled by connections among verbal data, comprehension, and metacognition. Historically, there has been a close relationship between study of metacognition and verbal data. Brown (1987) cited Rozin's accessibility theory to explain this connection: "Conscious access to the routines available to the system is the highest form of mature human intelligence" (p. 71). In a similar vein, by defining metacognition as knowledge about one's mental functioning that can be shared with others, Jacobs and Paris (1987) highlighted the connection between thinking and language that makes think alouds a worthwhile methodology. If thoughts about thoughts are conscious, then they can be stated. Thus, the goal of analyzing verbal data, such as dialogic participation in shared reading, is to "enrich our understanding of reading" processes (Afflerbach, 2000, p. 173). Painstaking work has gone into validating verbal reports as reports of cognitive processes (Ericsson & Simon, 1984/1993). Though I did not conduct a formal think aloud procedure, I designed and posed questions meant to elicit open-ended articulation of thinking (Ericsson & Simon, 1984/1993).

Tompkins et al. (2103) found that posing questions to preschoolers *during* reading is a trustworthy method to investigate real-time processing (see also van den Broek et al., 2011). Metacognition is an advanced capability that can be fostered by, but is technically not dependent on, advanced language skills. Though verbal skillfulness may make metacognition easier to research through verbal data, preschoolers can evince metacognition through their natural conversational language, talking to themselves, gesturing, staring, and other book interaction or communicative behaviors (Flavell et al., 1995; Holdaway, 1979; Whitebread et al., 2009) typical for their age.

In prior studies, verbal data was successfully collected from preschoolers through unobtrusive observations (Dooley & Matthews, 2009; Neuman & Roskos, 1997), interaction with books with words (Peskin & Astington, 2004), and stories dictated to a scribe (Fang & Cox, 1999). Though young children may not be able to validate their verbalizations in the way that older children or adults can, Dooley and Matthews (2009) and Larkin (2009) promoted the practice of interpreting children's verbalizations and accompanying non-verbal behavior as cognitively significant data.

Interpreting corresponding non-verbal data. Vygotsky's propositions about thought, reflective thought, and language complement Flavell's theory of metacognition in a study of preschoolers' processes as they engage with stories. Since thoughts are not a concrete object for examination and manipulation, the child has to use language inasmuch to think as to communicate what is being thought (Braten, 1991; Brown, 1978; Vygotsky, 1978). One of Vygotsky's most celebrated ideas is that inner speech helps one manage cognition (Braten, 1991; Kucan & Beck, 1997; Vygotsky, 1978). For example, speech is used to both recall information from memory as well as to plan a mental action, such as the application of a strategy (Crain,

1992). From a Vygotskyian perspective, verbal data is evidence of mental processes. The essence of this claim is actually that communication can provide evidence of mental processes. Accordingly, both Holdaway (1979) and Skarakis-Doyle and Dempsey (2008) collected non-verbal data as an alternative or corroborating form of communicative data when conducting emergent storybook reading research with preschoolers. In this population, non-verbal communication, such as pointing, staring, gesturing, or slapping, can be meaningful and can function as an intermediate step between physical interaction and abstract processing (Holdaway, 1979; Sulzby, 1985; Vygotsky, 1978).

Researcher background and positionality. The study site regularly hosted volunteers from the community to read and to interact with the children. I entered the research site as a daily volunteer in the pre-kindergarten (4-year-old) classroom. Therefore, I was able to establish rapport with the children and teachers before beginning recruitment and data collection. I then engaged participants in joint storybook reading within the classroom as a special form of participant observation. Due to the non-standardized nature of joint reading with preschoolers, my position in the research process influenced my decision-making about the collection and interpretation of data (Mukherji & Albon, 2010). According to Lather (2006), positionality refers to the nuanced position of the researcher in a socially and politically ordered world. One dimension of my positionality is my identity as a white, middle-class, childless woman and former classroom teacher. My position could have exerted biased cultural expectations concerning book reading and classroom behavior. An affordance of my positionality, however, is that my background as an educator sensitized me to the importance of using the familiar to engage children in conversation. Since I valued the familiar, I worked with trade books available

at bookstores or the local library and conducted the reading sessions during a time when an adult volunteer might read with a child or children anyways.

Joint Storybook Reading as a Context

I used joint storybook reading as a form of participant observation to generate and collect data. I then organized the data through thematic coding and reduced the data for presentation through the creation of narrative impressions of emergent storybook reading and situational analyses of metacognitive events within that context. I interpreted the meaning of data from these events through reference to the local community, careful inference based on the literature, and consideration of counterfactuals.

I implemented three repeated sessions of joint reading for each of four books. This procedure was a special form of participant-observation (Crotty, 1998), in which interaction and activity flowed in a conversational manner. As such, the joint reading sessions were interactive, semi-structured, and developmentally-appropriate. Researcher and participant jointly steered each book reading session by taking turns and sharing the work of book reading. Similar to the format of guided reading (Fountas & Pinnell, 1996), I posed preplanned and spontaneous questions and prompts with the intention of highlighting the processes of comprehension and metacognition. This design created a naturally "proleptic" dynamic, through which implicit and explicit scaffolding occurred through interaction with the researcher (Lee & Schmitt, 2014; McGee & Schickedanz, 2007; Palincsar & Brown, 1984, p. 122-123; Vygotsky, 1978).

Repeating readings. I used repeated joint readings to both generate and collect data. From the perspective of Flavell's theory of metacognition, repeated readings provided more opportunities to have metacognitive experiences, which could have informed metacognitive

knowledge and decision-making during subsequent tasks. In Kintsch's construction-integration model of comprehension, repeated readings give the reader more time to engage in analytic thinking and inference making. Repeated reading is also consistent with the transactional definition of reading that I adopted in Chapter 1 (Snow, 2002). Since each interaction with a text can be different, one interaction may be insufficient for data collection on the phenomena of interest. Repeated shared readings also respected Vygotsky's ideas about not only assessing what a child can do independently, but also what a child can do while interacting with a more skilled other, and after internalizing this scaffolding (Cox & Sulzby, 1982; McGee & Schickedanz, 2007; Vygotsky, 1978). In sum, repeated joint readings were a theoretically justified technique.

Situational questioning and prompting. The ostensible goal for each session was for researcher and participant to jointly read one book from front to back. Exactly how participants proceeded towards this goal could and did vary. Thus, participants received differently-worded questions and prompts based on how they were responding to the text and participating in the session. This type of variance fit in the middle ground between the strictness of error detection procedures and the openness of exploratory observation, as discussed in Chapter 2.

Questioning and prompting offered more opportunities to generate and collect data than techniques such as implanting errors and recording responses. Children are not likely to encounter texts with *contrived* errors outside of research studies, but they will spend years in various states of comprehension, incomprehension, and meta-comprehension as they interact with picture books, basal selections, textbooks, and novels. Jointly reading narrative storybooks provided a context for constructive attempts to build and maintain comprehension of structured, substantive content. The joint reading context also provided a multiplicity of opportunities to understand using the same constructive meaning making processes that conventional readers are

thought to use, such as relying on prior life experiences, prior knowledge from learning, cache of vocabulary, and/or familiarity with author, genre, text features, or discourse patterns.

Table 3 highlights the benefits and drawbacks of various research procedures in terms of when data collection occurs relative to the phenomena of interest, how the data collection is structured, and the distance between the data collection procedures and the task. Repeated joint reading offers the benefits of all the techniques listed in Table 3, except for interviewing.

Table 3

Options for Researching Metacognition in Preschool Emergent Literacy Activities

	Reviewed Method				
	Think aloud	Interview	Teacher Questioning	CHILD Observation	Shared Reading
Time	Concurrent	Retrospective or prospective	All	Concurrent	All
Structure	Open-ended; brief prompts	Pre-planned questions or intentions; verbal follow up	Pre-planned questions; verbal follow up	Exploratory or confirmatory; no interaction	Interactive; proleptic; loosely-structured
Distance from Phenomena of Interest	Task defined and informed; tension between Task 1/Task 2 demands	Typically, not connected to task; about general skills, knowledge, attitudes	Addresses architecture of comprehension; must understand question	Context provides more information; may not spontaneously communicate thoughts	Participant-observation; defined by text and task; invited to communicate

Affordances of narrative case impressions. Individual joint reading sessions with seven participants and four books produced a large volume of loosely-structured, qualitative data. Therefore, I created narrative cases for each child to accommodate the complexities of how reader, text, and task interacted (Berliner, 2002; Rosenblatt, 1978; Snow, 2002), and how

metacognition manifested as a situational resource in these task scenarios (Flavell, 1981). To construct the narrative cases presented in Chapter 4, I utilized fundamental principles of qualitative research, such as constant comparison of data during collection and analysis and thematic categorization of collected data (Wiersma & Jurs, 2009). I used coding to label all data and then linked distinct data by a common essence (Coffey & Atkinson, 1996) within and across readings. Then I articulated and justified my inferred "linkages" (Coffey & Atkinson, 1996, p. 27) through my narratives. Within each narrative, I integrated the reporting of many different types of findings for each child. Emergent literacy skills, comprehension, and metacognition are ultimately individual phenomena, justifying the use of individual narratives of joint storybook reading from a cognitive-constructivist perspective (Dinsmore, Alexander, & Loughlin, 2008; Kintsch, 1998).

Analysis by child, book, and reading. According to Yin (2003), "research design is the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of the study" (p. 19). Narrative cases foreground the child as the primary unit of analysis while allowing for comparisons by book, by reading, and by other characteristics. Each reading session was an "abstract" unit of analysis, embedded within the "concrete" child unit of analysis (Yin, 2003, p. 56). I translated data from each participant's set of sessions into a narrative case. A unique affordance of case impressions was the proximity of data collection processes to the phenomena of interest, as actions under study occurred (Flyvbjerg, 2006). I began to compose the narratives while data collection was ongoing, in accordance with a constant comparative process.

Increased transparency and trustworthiness. However, a tradeoff of this close connection is the risk of bias toward verification of assumptions (Flyvbjerg, 2006). Therefore, I

considered a constant stream of rival hypotheses, triangulated data, expert input, literature, and local stakeholder input (Flyvbjerg, 2006). This process increased construct validity, or the match between claims about phenomena under study and the true nature of the phenomena (Yin, 2003). I honored construct validity by searching for multiple streams of evidence—verbal data in response to questions and prompts, spontaneous verbal data, behavioral data in response to questions and prompts, and spontaneous behavioral data. These forms of data were interpreted consistent with the literature on comprehension and metacognition. By being concerned about construct validity throughout the data collection and analysis processes, I increased trustworthiness. By documenting my lines of reasoning and changes in them, I increased transparency.

Description of Surrounding Community

Per Census data, slightly more than 100,000 people (6,000 of whom are children five and under) live in Tree County (all names are pseudonyms), a rural area in a Mid-Atlantic state that has been deeply affected by the decline in American manufacturing. Census data also indicate that Tree County is whiter (96%) and older than the rest of the United States, with more English-speaking and domestic-born residents than the national average (U.S. Census Bureau, 2016). Only 6% of Tree County residents spoke a language other than English at home, as compared to 22% across the nation. Tree County matched the national average in percent of adults 25 and older who are high school graduates yet lagged the national average in percent of persons with a bachelor's degree.

Also, per 2015 Census data, only 11% of Tree County residents lived in the federal definition of poverty, which is below the 15% national average. However, 60% of the county's 6,000 children under five lived in "at-risk" households—meaning that family income did not

exceed 300% of the federal poverty level. Approximately one out of every ten Tree County babies was born to a mother with less than a high school diploma. Furthermore, 43% of children in the local public school system received Free or Reduced Price Meals.

Description of Study Site

In the town that is the setting of this study, public pre-kindergarten is not provided through a school system. Some local preschool children qualify for Head Start, and the rest attend a variety of family owned, for-profit, and non-profit providers. Town Child Care (TCC), a service of a private, independent, non-profit organization, is the largest provider of childcare in Tree County (T. Howard, personal communication, August 1, 2015).

TCC is housed within a large community activities building that provides social outreach and fitness programs to children, adults, disabled adults, and senior citizens. All children enter through a single door and proceed to their age-based classroom. Classrooms are separated by retractable dividing walls, and the activities of other classrooms can sometimes be heard through these walls. All children share a bathroom in the hallway that connects the classroom entrances. All classrooms have a rear exit that opens to a shared, fenced-in playground. Beyond the playground is a grassy park with picnic tables and the back of a historic, red-brick private school.

TCC is certified by the state to provide daytime care to babies, toddlers, and preschoolers. According to the Parent Handbook (T. Howard, personal communication, August 1, 2015), TCC's curriculum was designed to increase "self-help, cognitive, emotional, social, and physical skills" and to emphasize positive peer relationships. TCC has a high rating with the state and no recorded deficiencies (T. Howard, personal communication, August 1, 2015). TCC feeds into two public elementary schools. Both are Title I schools that have adopted the Reading

Recovery program. In keeping with its mission to prepare children to be ready to enter public kindergarten, TCC takes graduating 4-year-olds on a spring field trip to their assigned elementary school.

Daily activities are intended to address the state's published Learning Standards for Pre-Kindergarten (T. Howard, personal communication, August 1, 2015). Two main areas of this curriculum are *Learning through Play* and *English Language Arts*. Learning through Play includes learning standards such as asking questions to learn more and applying knowledge taught in one setting to a novel setting. The English Language Arts standards are divided into Foundational Skills, Reading Informational Text, Reading Literature, Writing, and Speaking and Listening. My procedures did not include any evaluation of classroom experiences relative to these standards.

At TCC, preschoolers followed a daily schedule: breakfast, free center play, whole class circle time, structured center play, lunch, nap time, recess, and free center play. As soon as children arrived in the morning and finished breakfast, they were free to choose any center(s) for approximately 45 minutes. The only rules were no more than three children at a center and to clean up before changing centers. It was during this time that my reading sessions were introduced as an optional center. Therefore, some children read books with me during this time as a classroom volunteer, and some children read to participate in the study. I did not announce or distinguish between these two types of visitors to my center. Later, during structured center play, children were assigned to move from center to center every 15 minutes in designated groups. Special activities at each center were introduced and encouraged at this time. During circle time, the weather and letter of the week were discussed, and a book was read aloud. The

focal letter influenced the week's curriculum, though the literature read aloud and made available in the room did not necessarily relate to the focal letter.

According to the Parent Handbook (T. Howard, personal communication, August 1, 2015), each classroom was staffed by a lead teacher and an assistant teacher. Assistant teachers were required to have at least a high school diploma or G. E. D., and the lead classroom teacher had some post-secondary training in early childhood education. Each year, teachers received at least 18 hours of state-approved professional development for childcare providers. The maximum class size for a room with two teachers was 20 children.

The 4-year-old class in which the study took place was referred to as "Pre-K." Through the placement of furniture, the room was divided into three main sections: group dining and activity tables, learning centers, and an alphabet rug where children gathered for morning circle and other whole class meetings. A small classroom library with a tiny couch was frequently updated through the visiting book-mobile. Tables that were used for breakfast were immediately sterilized for use in learning activities. This process repeated at lunch. Around these tables, there was enough room for one person to maneuver. I approximated the size of the Pre-K classroom to be 500 square feet. A portion of that space was occupied by furniture and by clearance room for two doors. To situate that figure, the average living room in new U.S. homes built in 2013 was 330 square feet (Emrath, 2013). Children working at any location in the classroom could hear everyone else's conversations. Learning centers could accommodate up to four children at a time. Each center featured at least one relevant book. Children could pretend read that book or request that a teacher read it to or with them.

Participant Selection and Recruitment

Though I had no information about the home reading experiences of preschoolers who attended the chosen school, their attendance at this preschool means that they had daily experience with teacher read alouds, weekly experience with story time at the local public library, independent reading opportunities at the classroom library center and during nap time, and opportunities to request a 1:1 reading with a teacher. Therefore, I assumed that participants had experienced enough book interaction to be comfortable with joint reading.

Recruitment, selection, and consent processes. The two Pre-K classroom teachers considered all class members to be typical for the setting, meaning that they felt that each child exhibited speaking, listening, and early literacy behaviors that were within their expectations. They anticipated that every member of the class could successfully participate in my joint reading procedures. Therefore, all 20 class members were recruited. Parents received a sealed recruitment package in a brown envelope in their child's home-school communication folder. The package contained a cover letter, two copies of the consent form, and a second sealable brown envelope for the confidential return of the consent form. The cover letter explained the study and stated my availability to answer questions.

Ten out of twenty forms sent home were returned, representing a 50% response rate. One form declined participation. The other nine returned forms indicated consent for five boys and four girls to participate. Out of the pool of nine participants, two children, Aidan and Inez, were eventually excluded. Aidan expressed more interest in the camera than in jointly reading the books. In his first two sessions, after I convinced him to ignore the camera, he expressed a consistent preference to look at the book by himself and not respond to any prompts or questions. Aidan conversed normally in the classroom. However, I excluded Aidan because I could not

obtain any verbal data from him through my particular study design. Inez, the second child excluded, only attended preschool two days a week and often just for half a day. She often arrived after breakfast, during free choice morning centers. Her friends were eager to see her, and she was typically surrounded by other children who wanted to invite her to play during this free choice time. She willingly tried to participate in sessions, but she seemed distracted by her peers waiting on her to quickly finish reading so she could play with them. Therefore, she was excluded. It is not known how parents who consented and returned the form differed from parents who did not respond or consent. The seven children who did participate seemed to represent the individual diversity found in the classroom. They had unique family characteristics, personalities, verbal abilities, and preferences for participating in classroom life. According to Yin (2003), replication across six to ten cases is strong evidence in support of underlying theory. Therefore, I considered seven participants engaging in twelve readings each to be sufficient for my purpose and design.

Data Collection Procedures

I conducted two types of data collection events with each participant: one toy playing session to assess background knowledge and vocabulary and three readings each of four commercially-available, narrative picture books. I intended for this study's procedures to provide multiple opportunities for participants to speak spontaneously and in response to questions or prompts. I anticipated that the joint reading approach might overcome the limitations of prior approaches discussed in the literature review. These included restrictive parameters on what could be accepted as metacognitive data (e.g., detecting a planted error), only collecting data from observation, or utilizing unfamiliar or acontextual experimental tasks that would not normally occur when not under study. I collected verbal and non-verbal data from dialogue and

from responses to questions and prompts that occurred during the joint interaction from multiple reading sessions using multiple texts.

Multiple opportunities for data generation. White (1988) suggested that researchers study metacognition, cognitive performance, and the relationship between the two through multiple approaches. Brenna's (1995) study of precocious readers aged four to six illustrated the need to follow this suggestion; some of her participants evinced metacognition through particular data collection methods but not others. Desoete (2008) found the same in a study of metacognition in elementary mathematics learning. Therefore, I designed my data collection procedures during joint storybook reading to provide multiple opportunities to observe the phenomena of interest. For example, I engaged participants in responding to questions meant to elicit metacognition and comprehension and in open-ended pretend reading, thinking, and conversing.

Within the joint reading dynamic, participants could have variably relied on each text's illustrations or printed words. This age-appropriate variance in the cognitive actions taken to complete a task did not lessen the invitation to create and articulate meaning from the storybook. Relying (to at least some degree) on pictures is a typical pre-primary and primary (K-2) reading strategy that remains relevant even after the onset of print reading (Fountas & Pinnell, 1996). In the present study, the two books with print (*Firefly* and *Mother*) relayed the most important information through their printed words, with pictures illustrating (e.g., highlighting) content in an adjunct capacity. It was possible that participants had heard these texts read aloud before, thus exposing them to the text base that the author intended. In contrast, the two wordless picture books (*Duckling* and *Pancakes*) relied "entirely on illustrations to tell a story" (Jalongo, et al., 2002, p. 167). These books uniquely required the reader to become an active storyteller, because

they could not have been read aloud (Arizpe, 2013). Thus, jointly interacting with richly-illustrated and wordless texts offered multiple opportunities to collect verbal data, regardless of prior exposure to study texts. `

Suitable texts. I used four narrative picture books: two with words, one with a few lines of simple text on some of the pages, and a truly wordless narrative picture book. These texts were commercially available trade books and representative of texts that preschoolers would encounter through read alouds, shared reading, or independent book viewing. In 2015, neither the Fountas and Pinnell (1996) nor the Lexile (lexile.com) text leveling system evaluated the difficulty of wordless or near wordless books. Therefore, in Table 4, I reported characteristics of each text that might affect perceived difficulty.

Data from the background knowledge sessions suggested that all participants had sufficient background knowledge to comprehend the gist of study texts. However, toy playing sessions could not exhaustively address the minutiae of the content of study texts, especially the more esoteric content. For example, due to practical constraints, I did not present props representing a butter churn or fireworks, even those these were important in *Pancakes* and *Firefly*, respectively. In any scene from a picture book, multiple represented objects could play a part in the plot. The presence of *some* challenging or unfamiliar information enhanced the study of metacognition by creating opportunities to be aware of and choose how to react to uncertainty or incomprehension.

The four texts were well-structured narrative stories featuring salient, age-appropriate themes (e.g., stay close to mom; Flavell et al., 1993; Markman, 1981). In each text, a protagonist pursued a relatable, situational goal, encountered obstacles, recovered from failed attempts at

goal attainment, and ultimately achieved a satisfactory resolution. Despite this broad appeal, each text featured specific content or situations that proved to be variably familiar to participants. As previously suggested, these gaps created situational opportunities for metacognitive processing and problem-solving. It was not feasible to obtain an objective rating of difficulty of each text. However, in Table 4, I presented an overview of likely difficulty characteristics of each text. Then I discuss each text in detail in the sections below.

Table 4

Summary of Difficulty Characteristics and Features of Study Texts

Text	F&P Level	Lexile Level	Pages/ Words	Gist
The Very Lonely Firefly	I	AD530L	32/247	Baby firefly approaches unknown objects and animals while seeking to join other fireflies
Are You My *Mother*?	I	80L	63/698	Baby bird approaches unknown objects and animals while seeking his mother
Have You Seen My Duckling?	WB	n/a	32/n/a	Mother duck approaches pond animals while seeking her missing duckling, who is actually hiding
Pancakes for Breakfast	WB	n/a	32/ n/a	Little old lady seeks to make pancakes, but her efforts are thwarted by mishaps

Note. L = Lexile. LB = labeled pictures. WB = wordless book. AD = adult direction (read aloud) recommended.

The Very Lonely Firefly (Carle, 1995) is a classic Eric Carle picture book. In this story, a firefly separated from his family makes several attempts to connect with lights that could, from a distance, be the fireflies he is seeking. False belief is implicated in that from a distance, these lights appear to be something they are not. For example, the firefly approaches a car's headlight,

a light bulb, and a cat's eye, but to no avail. The printed text conveys this pattern. This text's Lexile rating of AD530L is the highest in this study. AD stands for the suggestion of adult direction or read aloud of this book. This Lexile rating is likely attributable to sophisticated descriptive phrases such as "darkening sky" and figurative expressions such as "flooding the night".

Are You My Mother? (Eastman, 1960) is the lengthiest narrative in the study. In this story, a baby bird hatches while his mother is away from the nest. Not realizing that his mother has only left briefly to find food, he decides to leave the safety of the nest to look for his mother. Since he does not know what she looks like, he approaches animals and inanimate objects to pose the titular refrain "Are you my mother?" Finally, a construction crane returns him to his nest, where he is pleased to meet his mother and enjoy the food she brought for him. Due to the simplicity of the language of the printed text, this book is the longest in pages but not the highest in Lexile rating. Even with its simple text, select world knowledge is needed; knowing what a construction crane is and knowing that baby birds cannot yet fly aids comprehension.

Have You Seen My Duckling? (Tafuri, 1984/1991) is a short narrative wherein a *Mother* duck repeatedly poses this titular question to different animals around the pond. The reader can see that the mischievous missing duckling is close by but not falling in line with the other ducklings. After the mother duck asks many animals around the pond if they have seen her duckling, the duckling is finally reunited with his family. Most of the text is the refrain, yet many pages have no words at all. Therefore, this text shares features of both traditional and wordless picture books.

Pancakes for Breakfast (de Paola, 1978) is a wordless narrative about a little old lady who wakes up wanting pancakes for breakfast but does not have all the necessary ingredients.

Across many scenes, she obtains one ingredient at a time only to realize upon her return home that she still doesn't have everything she needs. Instead of going to a grocery store, she collects eggs from a hen house, milk from a cow, and maple syrup from a plaid shirted-man by a tree tap. However, her efforts are ultimately thwarted by her unsupervised pets. In the end, she invites herself to her neighbors' house to enjoy some of their pancakes. Although pancakes may be familiar, this book features information that could be unfamiliar, such as butter being churned and maple syrup coming from a tree. Therefore, participants could have learned.

Introduction and background knowledge session. Using background knowledge to aid in the understanding of text is an early constructive reading behavior (DeBruin-Parecki & Squibb, 2011). Furthermore, having background knowledge is related to using and understanding corresponding vocabulary (Hart & Risley, 1995). Therefore, my first session with each participant was an introduction and background knowledge session. I presented toys representing important objects and ideas in the four study texts. Per Vygotsky (1978), gesturing and physical manipulation of objects is an intermediate step before a child represents ideas on the mental plane. Therefore, observing a child use a prop in a certain way was considered an indication of knowledge or familiarity, even without corresponding verbal reporting. For example, participants could have pretended to mix together ingredients to make pancakes or could have pretended to add butter or syrup to the completed pancakes. This behavior could have communicated knowledge in spite of or in addition to verbal communication. Participants were invited to play with the props however they wanted to while conversing with me. For example, for *The Very Lonely Firefly*, I presented a small plastic flashlight, a lantern, and a stuffed firefly with a light-up tail. I asked the participant what the insect was called and what it did. I engaged

each child in informal conversation about the items in order to gain a sense of participants' background knowledge and expressive and receptive vocabulary relevant to the story.

These sessions unfolded in an unstructured and conversational manner. For example, I gestured at the selection of pancake ingredients and toy cookware and asked Erin, "What is all this stuff?" Erin replied, "Cookin' stuff." When pressed further ("What do you use it for?"), Erin reiterated "cookin'" and returned to exploring the props that caught her interest. This exchange suggested that Erin might not always elaborate by providing greater specificity. Observing this behavior when not challenged by a book, question, or prompt also helped me to consider whether any lack of elaboration in a reading session might be due to joint reading procedures or if this behavior occurred when no text was present.

Each participant saw each item listed in Table 5. No participant was wholly unfamiliar with any of the items presented. I reintroduced myself in this one-to-one setting, briefly explained the study, and then explained that we would be starting our work together by playing with some toys based on the books. The sessions provided an additional source of insight into each child's verbal sophistication and interaction style. In sum, the goal of the background knowledge session was to collect verbal and behavioral data that could be compared to text-interaction behaviors observed during the joint reading sessions.

Table 5

Props and Prompts for Background Knowledge Introduction Session

Text	Background Knowledge	Props	Prompts
The Very Lonely Firefly	• that fireflies have a light up tail, easily seen at night • that non-lit objects (e.g., animal eyes) can reflect light at night and "shine" • that certain objects give off light (e.g., lightbulb, flashlight, car headlight)	• firefly with light up tail • plastic lantern • plastic flashlight • mirror • toy lightbulb • stuffed animal with glassy eyes	1. What do you call this bug? 2. Can this bug do anything special? 3. Show me everything that can make light. 4. How can this give off light?
Are You My Mother?	• that baby birds hatch from eggs • that birds live in nests • that *Mother* birds bring food to the nest for babies to eat	• baby and *Mother* bird • faux bird nest • plastic eggs • toy construction equipment	1. Why would the big bird and little bird be together in the nest? 2. What does the baby bird need to live? 3. How does the *Mother* bird help the baby bird?
Have You Seen My Duckling?	• animals that live in a pond • that ducklings typically follow the *Mother* duck closely	• duckling and *Mother* duck • frog • turtle • lily pad • plants • bird • bug	1. What do you call these animals? 2. Where do they live? 3. Do baby ducks follow their moms around? Why? 4. Have you ever seen that? 5. Do you think it's a hard job to be a mama duck?
Pancakes for Breakfast	• how to make pancakes • what eggs, milk, syrup, butter, pancakes are • butter and syrup as condiments • house in the country • dog, cat as indoor pets	plastic food set with • milk • eggs • flour • pancakes • fruit • syrup	1. Have you ever had pancakes? 2. How do you make them? 3. What goes in them? 4. Where can you get pancakes? 5. What do you put on top of pancakes?

Repeated joint storybook reading sessions. In the following sections, I discuss the rationale and procedures for questioning and prompting within the joint reading dynamic. Questions and prompts posed by an adult are a large part of jointly reading with preschoolers. Paris and Paris (2003) noted that adults, such as parents, often "co-narrate" with young children, a dynamic in which questioning provides scaffolds for learning what type of information stories should communicate. Hannon and Frias (2012) noted that questions spur greater inferencing from preschool participants. In this scenario, the young child could make inferences to understand the story; questions encouraged them to do so. Therefore, non-standardized implementation of questions and prompts is a reasonable feature of an exploratory study of joint reading. I posed multiple and varied questions and prompts meant to address multiple aspects of comprehension, emergent literacy skills, and metacognition. These varied in nature, wording, and placement, yet they shared comprehension of the story as a fundamental essence and were carefully based on prior research with posing questions and prompts during joint or shared reading with the preschool participant (Stahl, 2012).

Content of comprehension questions and prompts. Understanding a narrative requires understanding the basic elements of this form as well as content specific to each story. Therefore, I developed comprehension questions that assessed narrative elements as well as details specific to each story. My comprehension questions were based on Stahl's (2014, p. 385, adapted from Van Kleeck, 2008) guidelines for questions when jointly reading stories with preschoolers:

1. Literal questions can orient the child to key facts or background knowledge that can be used in subsequent inferential questions.

2. Questions should focus on the goals of the character, as these relate to the most important mental states and main actions of the story.

3. Questions should draw attention to the relationship between the unfolding of plot events and the characters' mental states.

4. Questions should draw attention to the relationship between individual episodes, events, or ideas and the "macrostructure" (p. 385) of the text.

5. Pose questions that address cause and effect.

6. Pose questions that address the elements of story.

7. Pose evaluation questions such as "Did the character do the right thing?" (p. 385)

Stahl's (2014, p. 385) suggested questions based on these guidelines are reproduced in Table 6 with closely corresponding metacognitive questions.

Table 6

Questions Crafted and Posed to Assess and Facilitate Comprehension and Metacognition

Category	Subcategory	Comprehension Question	Metacognitive Question
Cause and Effect (C&E)	Initiating event or problem of narrative arc	What is this story about? What is [the main character's] problem?	What makes you think that? Why do you say that?
	Main character's corresponding inner state	How does [character] feel? What is [character] thinking?	How do you know [character] is [thinks or feels that]?
Main Character's Goal (MCG)		What does [character] want/need? What is [character] looking for?	How do you know that's what s/he wants?
Episodic Attempts at Goal Attainment (GA)	Relationship of episodes to macrostructure	What is happening? Why is that important?	Why do you think that is important?
	Prediction	What will happen next?	
	Goal seeking behavior	What will [character] do to solve this problem?	

Category	Subcategory	Comprehension Question	Metacognitive Question
	Consequences of attempt; character's inner state	Did [specific attempt] work? Why or why not?	How did you know that wasn't going to work?
Final Outcome (FO)		Did [character] get/find what s/he was looking for?	What makes you think that?
Information About Story Elements (ES)	Characters	Who is in this story?	How did you know that is where [character] lives?
	Setting	Where does [character] live?	
Vocabulary and World Knowledge (NV/WK)	Background Knowledge	What do you know about [topic]?	Where/when did you learn that?
	Concepts and Terms Used in Story	What is [that]? Is that important in this story?	What makes you think that is important?
		What is [object in text or picture]?	

Potential for overlap between comprehension and metacognition in questions. Stahl also suggested follow up questions such as "How did you know that?" that she did not identify as metacognitive, though Paris and Paris (2003) considered this type of follow up question to be proto-metacognitive. Since Stahl's questions are consistent with Kintsch's (2004) model of comprehension, Markman (1981) and Flavell et al.'s (1993) views on the cognitive processing invited by narratives, and my theoretical model, I posed them in the study and used her categories as codes for data pertaining to story comprehension.

The difficulty in categorizing a question such as "How did you know that?" draws attention to significant correspondence or overlap between comprehension and metacognition. As Baker and Brown explained, "any attempt to comprehend must involve comprehension monitoring" (1984, p. 355). Accordingly, more successful readers demonstrate better use of metacognitive skills (Baker & Beall, 2009; Veenman, 2014). Baker and Brown's (1984) stance

recognizes three main forms of metacognition relevant to reading comprehension: awareness, monitoring, and repairing. My stance expanded upon that by claiming that reading, including jointly reading a narrative picture book, is metacognitive in nature. Metacognition is mainly relevant to establishing, maintaining, and repairing comprehension, but it is also a driver in the ongoing cycle of learning content and vocabulary, integrating information to resolve unknowns, being open to the need to learn, learning about one's self as a reader, and learning about reading as a defined act. Feedback from all of these processes becomes a part of a reader's metacognitive knowledge and skills, and therefore influences future efforts. A reader who needs to make any effort at all to comprehend is thus always accessing, referencing, and being influenced by a second level of cognition.

Reading takes place in the space between what an author instantiated in text and what a reader interpreted as the communicated message (Snow, 2002). The mindful and dynamic questioning that characterizes joint reading can be used to gather data from that space by encouraging and documenting processing and the results of it (van Kleeck, 2008). For texts that communicate structured information, such as stories, this space is where constructive meaning making operates. The constructive meaning maker allocates mental and affective resources for the task, takes risks, and flexibly strives to succeed (Dooley & Matthews, 2009; Pressley & Gaskins, 2006). A constructive meaning maker actively responds to the text before, during, and after reading by applying background knowledge, respecting personal preferences for reading, and monitoring attainment of a desired level of harmony with what they say the text says and what they think the text could say. Texts invite readers to constantly assimilate, evaluate, and integrate information of many different grain sizes (Kintsch, 1998; Stahl, 2014). In this task space, reflexive actions – those that are built off of earlier ones – often result in understanding,

deeper understanding, or correction of misunderstanding (based on Baker & Brown, 1981). Thus, a reader is constantly relying on not only the text but also their working mental model of the text, which was built through interpretation, prioritization, and assimilation. There may be moments in all of these efforts when comprehension and metacognition are indistinguishable.

Content of metacognitive questions and prompts. In the present study, participants' metacognition was categorized as spontaneous or prompted. The following language was used in questions and prompts at critical points in the plot – or critical points in the participants' participation. Since my procedures were less structured than implied in Stahl's questioning regime, my metacognitive questions developed the essence of her questions but did not replicate them. In Chapter 4, I report how participants responded to questions. Collectively, these represent prompted metacognition. Metacognitive utterances that were instigated by the child and not given in response to a question or a prompt from my most recent or one additional speech turn were classified as spontaneous. I provided examples of posed questions intended to elicit defined types of metacognition in Table 7.

Table 7

Questions Crafted and Posed to Prompt Seven Forms of Metacognition

Metacognitive Category	Example of Posed Question Intended to Elicit Metacognition
Justification	Yes, the mother duck did say, "Have you seen my duckling?" How did you know she keeps saying that?
Judgment of Difficulty	Was this an easy, medium, or hard story?
Judgment of Learning	Did you learn any new words when reading this book?
Task Planning	Wait, not yet. Is this really the end?
Expanding Storytelling	Do you want to add anything?
Reflecting on Reading	Now, how do you know what words to say, though?

Metacognitive Category	Example of Posed Question Intended to Elicit Metacognition
Metamemory for Reading	Have you ever read [this book] at your house or at school?
Self-Revising	Is she making it or thinking about it?
Feeling of Knowing	What's this called?

Open-ended "thinking" prompts. Well-structured stories present a significant amount of information to process and react to. Dorl (2007) recommended that preschool teachers share their thinking as they read aloud and invite young children to do the same. In this study, I also posed questions that prompted preschoolers to share whatever they were thinking at the moment. Though I did not use a think aloud procedure, I based my prompts on Pressley and Afflerbach's (1995) recommendations for think aloud research (based on Ericsson & Simon, 1984/1993):

1. Ask participants to report their thoughts. Since I expected sharing thinking on demand to be a novel task, I integrated a model and used understandable language. For example, for *The Very Lonely Firefly*, I said "I'm thinking in my head that the baby firefly is flying around by himself and that he's really lonely. What are you thinking?"

2. Rely on short-term memory. I posed prompts so that they were temporally close to students' presumed processing, such as immediately following the presentation of important information in the flow of the story or soon after a child's demonstrated response to the text.

3. Consider the proleptic nature of the task in interpretation of data. Van Kleeck (2008) explained that joint reading is naturally proleptic; the expert-novice dynamic can easily foster the development of thinking skills, such as drawing inferences critical to comprehension. Joint reading is also a natural setting for a teacher/adult to model metacognitive thinking (Stahl, 2014) and for children to internalize and reproduce reflective thinking and literacy behaviors

(Vygotsky, 1986). Any increased sophistication could indicate that the joint reading scenario corresponded to participants' zones of proximal development, which could explain why their performance improved after interaction with a more capable other (Vygotsky, 1978). Since emergent literacy skills are developed slowly through small interactions, this scenario would not cast doubt on the metacognitive nature of children's performances. Metacognition is also developed slowly through social and literary interactions (Flavell, 1987). Furthermore, a word search conducted on the transcriptions of reading sessions did not suggest verbatim mimicking of the researcher's thinking prompts.

Frequency and placement of questions and prompts. Questions and prompts are important to the joint reading discourse during preschool. Therefore, I interspersed questions and prompts throughout my interaction with participants. The minimum recommendation for use of questions is one per page, since a page is a naturally-occurring unit for pausing and processing (Institute of Education Sciences, 2015). The literature currently does not recommend an ideal or maximum number of questions, though a general recommendation is that questions should serve to scaffold and engage the young child within a supportive and interactive context (Institute of Education Sciences, 2015).

Though I posed questions and prompts informally, I did so with concern for the role that questions and prompts should play before, during, and after reading (Fountas & Pinnell, 1996). Before reading, I tried to assess familiarity by posing questions that directed attention to the cover or first page. During reading is when the most and most critical processing takes place. During reading, I posed comprehension questions about major elements of story soon after the presentation of that element. I posed metacognitive questions and prompts in lulls in storytelling or when confusion or insufficient information was expressed. After reading, I posed questions

implicating a working mental model of the whole story and reactions to that. For example, *Judgment of Difficulty* and *Judgment of Learning* prompts were always posed after reading, as these required reporting a response to the whole of the text and reading session.

The excerpt below of questions that I posed to Bert before, during, and after his first reading of *Mother* exemplifies these principles. The questions posed before assessed familiarity and oriented Bert towards macrostructure clues in the title and on the cover. The example of during questions evaluated theory of mind and elicited evaluation of a character's actions. They tasked Bert with thinking critically and deeply about the text base and with responding to it. After reading, Bert was asked to consider everything that had occurred during the story to evaluate whether the ending was happy.

Before Reading
R: Have you read this book before?
Bert: [Bert shrugs but does not verbally answer.]
R: Well, it's about a little birdie, and he goes up to this dog, and he says, "Are you my mother?"
R: Why is he saying that?
Bert: 'Cause his mother leaves to get food for him.

During Reading
R: "Where is my mother?" he said. He looked for her.
R: Now did the mom know that he was going to hatch while she was gone?
Bert: No.
R: *Should* she have left?
Bert: Yes, to get food.
R: To get food, right.

After Reading
R: "You are my mother!" The end!
R: Was that a happy ending?
Bert: Mmm-hmm.
Bert: They lived forever.

Throughout this first reading of *Mother*, my use of questions and prompts was interwoven in the discourse of joint reading. They occurred as part of the conversational discourse that advanced us through the book as reading partners—in concert with reading aloud,

providing directions, affirming or clarifying what Bert said, and listening to Bert. In this reading, I engaged in 88 speech turns, and Bert engaged in 45 speech turns. Out of my 88 speech turns, 38 posed questions, 46 involved reading the printed text aloud, and four were used to provide procedural directions or clarifications. In the second reading, I engaged in 80 speech turns, and Bert engaged in 35. Out of my 80 turns, 31 posed questions, 38 were reading aloud, and 11 were procedural directions or clarifications. The content of my turns not used to read aloud provided evidence of an informal conversation – an equitable distribution of speech turns between researcher and young participant. Table 8 reports the discourse from pages 42-43 of Bert's second reading of *Mother*. This excerpt exemplified the turn-by-turn integration of these speech functions in the conversation that is supposed to take place during joint reading.

Table 8

Function of Questions in Bert's Second Reading of Are You My Mother?

Speech Turn	Function
R: And then he saw a what?	Comprehension question posed to try and transfer storytelling to Bert.
Bert: An airplane.	Bert answered question but did not assume storytelling role.
R: And he called out "Here I am!"	Researcher advanced session by reading printed text aloud.
R: Did the plane stop?	Researcher posed a comprehension question that could have been answered with a yes or no.
Bert: No. Bert: It was too noisy.	Bert spontaneously elaborated on his binary response by explaining that the plane didn't stop for the bird because it couldn't hear the bird's small voice over its loud plane noise.

Data Analysis Procedures

This study was an exploratory, descriptive investigation using informal communicative data from a small number of participants. Consistent with Vygotsky's (1978) view that there is no useless speech, all verbalizations, prompted or spontaneous, were analyzed. All recorded non-verbal data points, such as gesturing, pointing, tapping, book-handling, or page-turning, were also analyzed (Whitebread et al., 2009).

The background knowledge sessions were videotaped and transcribed verbatim. Field notes were coordinated with the audiovisual record. Using an approach based on Hannon and Frias (2012), I compared transcripts from background knowledge tasks to reading sessions to ascertain whether and how children used their knowledge to comprehend or otherwise interact with the text. I also investigated whether children recognized information in the story not addressed in the background knowledge tasks.

Comprehension data comprised story construction, spontaneous statements and behaviors, verbal or behavioral responses to researcher prompts, and responses to comprehension questions. Unlike Sulzby (1985) and Paris and Paris (2003), I did not assign proficiency categories or scores. Instead, I utilized the principles of grounded theory (Strauss & Corbin, 1994) to engage in open and closed coding of joint reading dialogue. I utilized ideas about comprehension about gaining meaning from a book from Dooley and Matthews (2009), Sulzby (1985), and Stahl (2014). I compiled this information into case narratives in Chapter 4 to describe, interpret, and relate the data for each child. I also analyzed children's performances across repeated readings to look for indications of growth in comprehension or metacognition. Data from repeated readings comprised any data from the session, including story construction, as relevant, and all other verbal and behavioral data (e.g., responses to repeated and non-repeated

questions). Since preschoolers may not always be able to declaratively communicate learning or realizations, changes across readings were also analyzed.

I assessed metacognition through coding and analysis of qualitative data: responses to metacognitive questions, metacognitive review prompts, metacognition evinced in response to open-ended thinking prompts, and spontaneous metacognitive verbalizations or behaviors. Anticipated, useful, and ideal metacognitive verbalizations and behavior were informed by the manifestations of metacognition discussed in Chapters 1 and 2.

Transcription. I transcribed participants' verbalizations from the reading sessions. I also coordinated my field notes and impressions of each session from memoing with this information. After completing transcription of audio-visual recordings, I replayed the media file while reading through each transcription. This process resulted in minor corrections throughout the typed files that did not affect data analysis. A professional transcriptionist independently reviewed two files selected at random using the same process. Accuracy was determined to be 90%, with most errors being minor in nature and not changing the meaningfulness assigned to data.

Constant comparison. Similar to Rowe (1989), I engaged in constant comparison of collected data to other data and literature throughout the collection and analysis processes. Creswell (2002) explained that "constant comparison is an inductive (from specific to broad) data analysis procedure" that is meant to "ground" constructed categories in the data (p. 451). I intended for this process to ground categories that I defined in the ways that participants actually engaged in emergent reading behaviors (Kolb, 2012).

Thematic coding. I transcribed verbatim all sessions and inserted field notes at relevant locations in the transcripts. I utilized the constant comparative method (Strauss & Corbin, 1990)

to begin coding while transcribing and to decide on major categories emerging from early data collection, in order to seek out more information for those categories in further data collection (Bogdan & Biklen, 2007). I uploaded all transcriptions into the NVIVO qualitative data analysis software for coding and analysis. NVIVO is an example of Computer Assisted Qualitative Data Analysis (CAQDA; Richards, 1999), which was appropriate for my volume of data. NVIVO's ability to document participants' verbalizations and behaviors on each page spread of a study text supported my goal of analyzing the cognitive and metacognitive processes each child underwent at multiple levels— e.g., word, sentence, page, or text (Kinnunen, Vauras, & Niemi, 1998). Use of NVIVO also enabled more efficient comparisons by child and by book and by any two characteristics compared through a matrix table.

My open coding process was based upon principles from grounded theory. Grounded theory is a "general methodology for developing theory that is grounded in data systematically gathered and analyzed" (Strauss & Corbin, 1994, p. 273). A pure grounded theory process allows for raw data to inform categorical labels, keeping conceptualizations endogenous (Strauss & Corbin, 1994). Though my categories drew their names from existing constructs in the literature, each categorical label also captured the unifying essence of corresponding raw data. However, my interpretive coding process was once removed from the child's communications because it was informed by exogenous influences and contained inferences about each child's internal states and intentions. I sought to increase the trustworthiness of my findings by articulating each step in my coding process and by frequently returning to my raw data. I also reported extensive raw data in addition to codings.

I arrived at my final categories of metacognition by repeatedly reading, coding, and recoding transcripts. The final categories represented the nature and range of information from

the data set; all designated metacognitive data can be conceptualized in terms of the final categories. Thus, the final categories are robust, communicative containers for the information collected. They are parsimonious in that there is inter-relationship among categories, but not overlap.

The category definitions and the subsequent ratings within each category are hinge points upon which the data can be placed into one group or another. In all cases, the available information can be assigned a rating within each of these categories. I strived for trustworthiness through constant comparison of data to theory and prior research (Strauss & Corbin, 1994) and through obtaining acceptable inter-rater agreement of coded data.

Open coding. I followed the open coding process outlined by Strauss and Corbin (1994). I coded all data, as it was collected, in order to describe it. Then I began to use codes to identify thematic categories. Since I compared constantly as I continued to collect data, I reconsidered codes until I was confident that they accommodated all data. Once I established categories, I coded axially to create subcategories. Subcategories explained more about when, why, and how categories mattered, and provided further specification of the observed metacognitive phenomena. Finally, I used a review of coded transcripts and graphic models to articulate relationships between and among categories. This process was consistent with my commitment to situationally and transactionally analyze instances of metacognition, comprehension, and other emergent literacy phenomena.

Closed coding. I used closed coding to code for age, gender, and static features of study texts. Text coding was based on standard narrative features and Judgment of how that text or illustration would be processed by a proficient conventional reader (Markman, 1981; Thorndyke,

1977; van Kleeck, 2008). Coding of text in picture books with words was based on the elements of story (van Kleeck, 2008). Coding of illustrations in picture books with words was based on the role of the illustration: illustrating specific information in the text, illustrating a general idea in the text, providing a critical detail not given by the text, or illustrating a reasonable inference one should draw from the text. The illustrations in wordless picture books were also coded based on elements of story.

Reflecting on coding. I reflected on my coding processes by assigning confidence levels, triangulating, and writing. I rated my coding of each instance of metacognition as being done with high, medium, or lower confidence, based on how much evidence was available to categorize that data as a certain type of metacognition. Triangulation played a large role in this approach. When sufficient data was available, I triangulated all streams of reader, text, task, and context data. This corroboration was intended to bolster the trustworthiness of my claims about the abstract phenomena of metacognition and the suitability of interpreting verbal data as evidence of processing from young participants (Denzin, 1970, as cited in Atkinson & Delamont, 2008; Yin, 2003).

Inter-rater evaluation of coding. To increase the trustworthiness of the study, I sought to ascertain the degree of initial independent agreement in coding with another coder. Another researcher with a PhD in the psychology of reading and familiarity with the study independently reviewed a repeated reading set from two randomly selected participants for one randomly selected book. This process occurred twice, resulting in inter-rater review of Bert's and Chris' readings of *Are You My Mother?* and Erin and Gabby's readings of *The Very Lonely Firefly*. The data reviewed through this process sampled four out of seven (57%) participants, two out of four (50%) books, three out of twelve (25%) reading sessions for each participant, and twelve out of

eighty-three (15%) total individual sessions comprising the study. The reviewed data also accounted for thirty-six out of the 219 metacognitive instances in the study. Complete independent agreement existed for 31 of the 36 instances and for at least one example of each of the seven categories of metacognition. Consistent with the overall confidence ratings of the codings in the study, most of the reviewed coded instances were high confidence codings; two were medium confidence and one was lower confidence. Thus, coverage was sufficient and representative of the different transactional elements under study. Agreements for each data set ranged from a low of 75% for Chris to a high of 100% for Bert and Gabby, resulting in an average inter-rater initial independent agreement of 89.5%.

Reasons for coding discrepancies were reviewed. Even though Chris was hard to understand, the 25% discrepancy in the coding of his data revolved around the meaning of the codes. However, Chris' communicative style did distract from what he meant. Inter-coder agreement for Erin's verbalizations was near the mean at 83%. Discrepancies for her sampled data seemed to be attributable to the difficulty of conveying non-verbal data such as facial expressions and body language in the typed transcripts.

Writing. Writing was both a process and a product of my data collection and analysis. I used writing as a form of inquiry, communication, and validation (Richardson & St. Pierre, 2005; Strauss & Corbin, 1998). Describing cognitive and metacognitive behaviors in joint reading through writing was a goal of this study. I thus intended to write a thick description of these phenomena. Geertz's (1973) concept of "thick description" (as explained in Atkinson & Delamont, 2008, p. 299) is a classic principle of qualitative research. Thick descriptions are dense and multiple (Atkinson & Delamont, 2008). Therefore, writing enabled me to be reflexive and transparent by articulating my chain of reasoning. Therefore, I wrote research memos to

describe each reading session, each category, changes in my coding scheme, and emerging relationships between categories. These ideas were eventually presented as results through narrative case impressions, with the goal of describing (Eisenhart, 2006) how participants engaged in joint reading and manifested comprehension and metacognition. Writing enabled a record of my chain of reasoning and helped me to maintain transparency as I proceeded through an exploratory research process.

I intended for the coordination of these qualitative practices to support rigor, reflexivity, and trustworthiness. Any procedural choice can be characterized as having its own affordances and limitations relative to the design of the study. I considered the relative affordances of my approaches, given my purpose. In Figure 5, I depict the qualitative data collection and analysis procedures I chose to answer my research question.

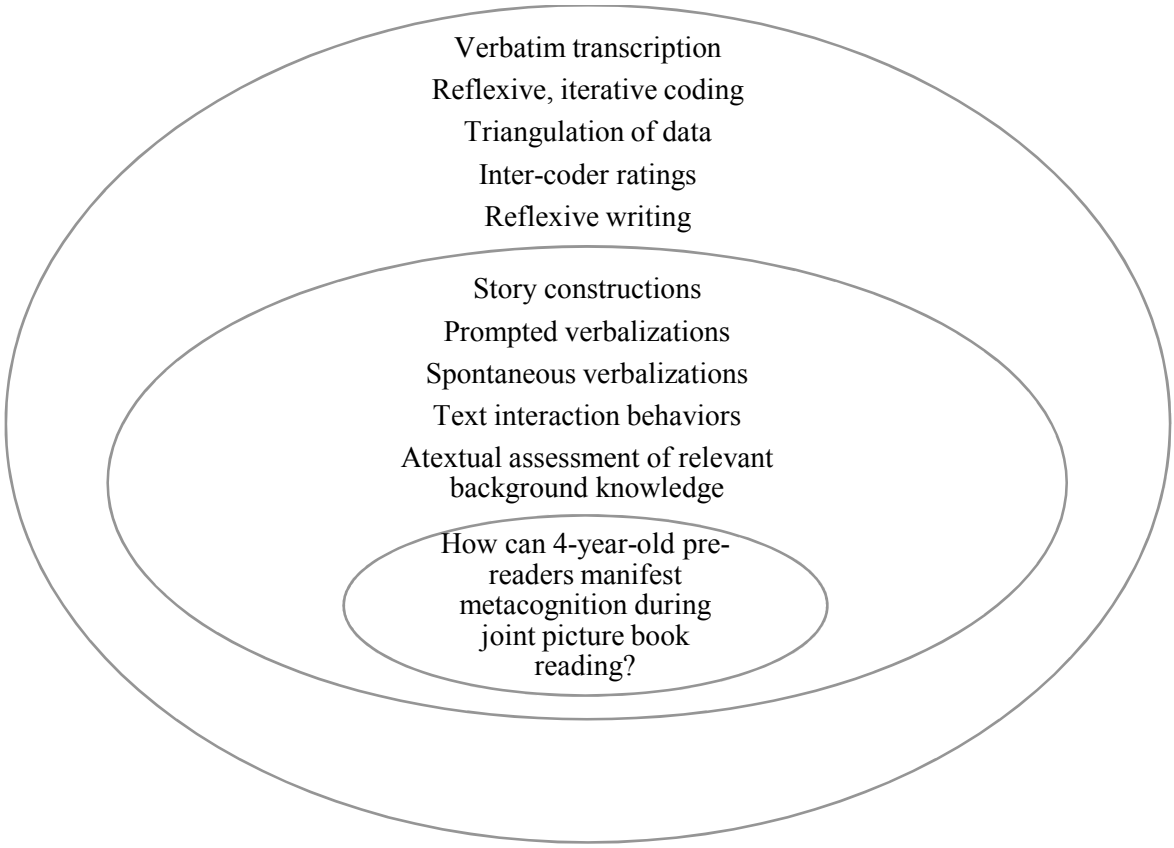

Figure 5. Data collection and analysis procedures based on the research question.

After reviewing the logic of my research design relative to my question, I also carefully considered potential rival explanations for my findings. Due to characteristics of my design decisions, as well as the setting of my study and the developmental characteristics of my population, rival explanations could potentially account for what I considered to be evidence of comprehension or metacognition during joint storybook reading. In Table 9, I recount the steps I took to increase trustworthiness relative to potential rival explanations.

Table 9

Steps Taken to Address Potential Rival Explanations

Potential Rival Explanation	Steps Taken to Increase Trustworthiness
Participants mimicking researcher/other children	Sessions spaced apart
Researcher assigning meaning to coincidental behaviors	Transactional analysis; repeated readings of same story
Participants inferring desired verbalizations or behaviors	No coaching or targeted praising; spontaneous verbalizations allowed; participants allowed to influence conversation
Participants displaying Hawthorne effects	Researcher established rapport as classroom volunteer; sessions presented as free choice center
Participants becoming fatigued	< 15-minute sessions

Joint reading in a classroom is a social reading dynamic in a social setting. It is therefore always a potential space for the informal, social learning that is a natural part of childhood. My choice to use this dynamic entailed recognizing the possibility of social learning influencing performance. My concern was for avoiding meaningless acts of copying or mimicking the researcher or a previous participant, not to prevent social learning.

CHAPTER 4: RESULTS AND ANALYSES

Over the course of their pre-kindergarten year, I engaged seven 4-year-old preschoolers in repeated joint readings of four narrative picture books. I sought to investigate how metacognition could manifest during the joint reading task and for what benefits, such as repairing or enhancing comprehension or enabling learning. The chosen stories provided participants with meaningful and structured information to be understood, and the iterative and interactive nature of repeated joint readings provided a context for comprehension and metacognition within and across readings.

I intended for my approach to provide more varied and contextualized verbal data than what has been collected from error-detection methodologies (i.e., focusing on whether children can detect contrived errors; Garner, 1987; Hacker, 1998; Kucan & Beck, 1997; Skarakis-Doyle & Dempsey, 2008) or non-interactive observation of classroom behaviors (Neuman & Roskos, 1997; Whitebread et al., 2009). Preschoolers will likely spend many hours interacting with an adult reader over a picture book. I sought to uncover the relevance of metacognition to this dynamic.

In the next section, I report on the thematic coding processes that I undertook to analyze my joint reading data. I also overview observed comprehension processes in order to lay the groundwork for my coordinated discussion of comprehension and metacognition in the rest of the chapter. Then, I report results for each participant through narrative case impressions. Finally, I report additional analyses of my results across readers, readings, and texts. My approach applied Flavell's model of metacognition by considering metacognitive behaviors in conjunction with each participant's emergent literacy knowledge and actions.

Refinement of Metacognitive Coding Categories

With a transactional lens in place, my primary focus was analyzing participants' metacognitive data through a constant comparative approach. Based on conceptualizations of metacognition relevant during conventional and emergent literacy, I established seven categories of emergent metacognition relevant to the joint reading of narrative picture books: 1) Task Planning, 2) Verbal Self-Revising, 3) Expanding Storytelling, 4) Justifying Verbalizations, 5) Judging Difficulty, 6) Reflecting on Reading, and 7) Feeling of Knowing Story Content. Through the iterative nature of the coding process, I ultimately excluded two categories—Metamemory for Text and Judgment of Learning from the Story.

I expected that established roles for metacognition would be evident in my data set. Therefore, I began the constant comparative process with operational definitions of constructs considered to be manifestations of metacognition. However, consistent with the exploratory nature of my study, I also completed inductive coding processes, to adapt established definitions in a novel way to the task of joint picture book reading and to establish *Expanding Storytelling* as a new category. I worked through four rounds of coding schemes. Each round resulted in finer differentiation. For example, my initial coding scheme combined *Self-Revising* and *Expanding Storytelling* before I established their mutual exclusivity. Also, I spliced the initial category of Judging into *Judgment of Difficulty* and *Judgment of Learning*. Though children occasionally learned new words during the readings, none were able to report on doing so in a way that I could code with an acceptable confidence level. In sum, I distinguished *Metamemory for Text* and *Judgment of Learning* as unique categories, but eventually excluded them, resulting in seven metacognitive categories for final analysis.

Metamemory for Text. Brown (1978) defined metamemory as "knowledge concerning one's own memory abilities and strategies" (p. 81). Larkin (2009) referred to metamemory as the awareness of one's memory and the ability to use the vocabulary of remembering. Larkin (2009) explained that metamemory emerges during typical social interactions in the preschool years. According to Lai (2011), children begin to use memory verbs around the age of four, and procedural metamemory expands in concert with language and thinking from ages six to eleven. In this study, I originally interpreted a specific manifestation of metamemory—reporting on or making claims about the use of memory relative to reading a study text or reading in general. For example, a comment that referenced an awareness of memory as a capacity and process, as when a participant stated that repeated readings help her remember better, would have been counted as metamemory. I considered being able to converse about the cognitive benefits of prior experience with a text to be an active and second-level capacity that could shape a participant's performance. Since metamemory is related to memory, one limitation of this category is that forms of memory related to joint reading could not be assessed or verified. Brown (1978) also explained that relative to typical adults, preschoolers' long-term memories contain less information, lack efficient organization, and might not be as helpful during a task.

In this study, I did not consider any participant to have manifested Brown's definition of metamemory. I posed 20 metamemory prompts, resulting in four scenarios that I eventually decided did not meet evidentiary standards. I also found both short and long term memory to be more limited than I expected. Many participants did not recall reading study texts with me in prior sessions, even when directly asked to do so. However, Bert, one of the more self-aware participants, once spontaneously inquired why we were reading a certain text "again." Being aware of how and why one remembers might have limited impact on joint storybook reading, as

young children do not read to study or learn on purpose. *Judgment of Learning* scenarios were also excluded. A lack of first level memorial capacity may have resulted in participants' inability to report on new learning that took place within reading sessions.

Reflecting on Reading referred to making implicit or explicit claims about the self as a reader, reading as a mental task, or a book as something to be read through mental effort. Self-awareness is a fundamental form of metacognition; it is at the root of metacognitive knowledge of self and task (Flavell, et al., 1993). Awareness of one's thinking begins in the preschool years (Flavell et al., 1993), thus enabling reflection. Bransford et al. (2000) considered reflecting (as well as sense-making, predicting performance, monitoring learning relative to a goal, monitoring understanding, and engaging in self-assessment) to be a major form of metacognition for conventional readers. Both Neuman and Roskos (1997) and Rowe (1989) concluded that preschoolers have a working self-awareness as literacy task doers, although Rowe (1989) noted that this phenomenon may be easier to observe in the creation of a written product versus reading, since reading doesn't involve the production of a physical artifact as writing does. Strommen and Mates noted this "philosophical" activity in preschoolers as young as three (1997, p. 99). Further, Sulzby and Otto (1982) documented kindergarten pre-readers' "meta-linguistic knowledge" of text as part of their emergent literacy experiences (p. 181). This knowledge indicated an awareness of text as a "separable, memorable, and manipulable entity" (Sulzby & Otto, 1982, p. 182). Emerging knowledge of the self as a reader is intertwined with knowledge of reading as an activity and the text as a defined entity to be read. Thus, the *Reflecting* category coordinated this literature and data from the present study in accordance with RAND's (Snow, 2002), Rosenblatt's (1978), and Dooley and Matthews' (2009) views of reading as a transaction between the reader, the text, and the task (or purposeful context).

In the present study, five out of seven participants engaged in *Reflection*. One *Reflection* prompt was ignored, and two spontaneous statements that could have manifested *Reflection* were excluded in a subsequent round of coding. I interpreted three main themes from participants' *Reflecting* data: 1) Reading is an advanced skill that they are on the precipice of doing; 2) Reading is hard work but something to be proud of; and 3) Though reading has something to do with print, it is ultimately about understanding the meaning represented in the book. Dylan took the third idea one step further by understanding that he could enjoy maximum meaning with minimal effort by having the adult read or tell the story. *Reflecting* could have been prompted or spontaneous.

Feeling of Knowing Story Content referred to verbalizations or behaviors that communicated that key story information was known or not known. Though I could not know if participants reacted to every instance of not knowing, I was able to document the self-reporting of familiarity or lack of familiarity with content represented in the texts. The data suggested that this type of meta-statement reported on an internal state that was relative to one's goal for understanding the study text. Since the books featured pictures of unfamiliar objects and print that participants could not yet read, there were many opportunities for this form of metacognition to occur spontaneously. Additionally, when participants seemed confused, I asked whether they knew something or not, resulting in prompted *Feeling of Knowing* data.

Feeling of Knowing is typically researched in conventional readers under the umbrella of metamemory (Karably & Zabrucky, 2009). This relationship makes sense for a conventional reader who is reading and studying a defined body of knowledge in the formal institution of schooling. I adapted a definition for use with a pre-reader who has been asked to respond to a picture book through the open-ended joint reading format. The essence of this category is

knowing that you know or not; this state of mind was presumed to result in expressions of surety or requests for information needed to read or converse about the text. *Feeling of Knowing* behaviors were active and responsible actions that supported comprehension; they were constructively-responsive ways to participate in the joint reading task. Consistent with the findings of Whitebread et al. (2009), 4-year-olds in this study made the extra effort to find out what they needed to know to tell a meaningful story or engage in meaningful dialogue about the book. All seven participants evinced *Feelings of Knowing*.

Judgment of Difficulty. At the conclusion of a session, I asked participants if the book was easy, medium, or hard. I then asked participants to elaborate on their categorical choice. I created the *Judgment of Difficulty* category from a reinterpretation and adaptation of Veenman's (2014) treatments of the constructs of *Judgment of Learning* and *Feeling of Knowing*— two important and related phenomena that preschoolers may be capable of (Whitebread et al., 2009). According to Veenman (2014, p. 5), *Judgment of Learning* and *Feeling of Knowing* "are the result of monitoring item difficulty and evaluating memory content." Brown (1978) also addressed estimation of task difficulty as a meta-level mental activity. I wanted to distinguish evaluation of difficulty as an expression of awareness of mental work involved. Since preschoolers do not read or re-read to study written materials and learn a formal body of knowledge, this distinction was appropriate versus allowing this construct to be subsumed under the large umbrella of metamemory. I thus intended for the *Judgment* prompt to invite participants to evaluate difficulty in a way that was immediately relevant in time to the reading experience yet challenging due to its abstract and representational nature. Evaluation of difficulty is an introspective, meta-level Judgment. One limitation of the *Judgment* prompt as executed in this study was that participants could report on the difficulty of the text itself, the questions I posed,

or some unarticulated combination of text, task, and contextual factors in that session. Nonetheless, the totality of data suggested that participants understood the essence of the *Judgment* prompt, with one exception when Erin interpreted the prompt concretely (versus representationally) and thus reported on the size of the physical book. It should be noted that Erin interpreted all other *Judgment* prompts representationally, though I did not coach her or provide a model. Due to perceived fatigue at the end of sessions, I collected less *Judgment* data than anticipated. Across 82 reading sessions, I only posed 27 *Judgment* prompts. These resulted in 20 replies that could be coded with at least minimum confidence.

Task-Related Planning referred to verbalization of an intention to engage in the joint reading task in a certain way. Planning is a well-researched form of metacognition that is more easily observed in mature, conventional readers, such as students who are reading and studying to learn (Brown, 1978). Planning is a manifestation of intentional decision-making about how to engage in an understood task. One can plan how to expend mental resources based on estimation of task demands, as well as affective factors such as interest, and task conditions such as time available (Flavell, 1979; Veenman et al., 2006). A review of the literature suggests that planning is a least represented form of metacognition in preschoolers (Whitebread et al., 2009), perhaps due to lack of formal experiences with planning a literacy task or text interaction.

Fang and Cox (1999) counted preschoolers' planning behaviors when dictating an original story as a form of metacognitive "self-management" (p. 175). In their study, planning was an active form of participation in the tasks of story construction and communicating with an adult scribe. Similar to Jacobs and Paris' (1987) Index of Reading Awareness for conventional readers, Fang and Cox (1999) thought that planning worked in concert with monitoring and regulating the adult scribe relative to a presumed intention for constructing meaning. Similarly,

Vygotsky (1986) presented children with challenging laboratory tasks and observed whether they could cope with the challenge by planning (as well as regulating efforts through using available tools). Under these conditions, preschoolers were not skilled planners. Fang and Cox (1999, p. 179) counted children's conversational verbalizations such as "Now what do I do?" and "Let me think" as verbal evidence of planning (see also Cox & Sulzby, 1982). In the familiar context of joint reading, preschoolers planned spontaneously and in response to a prompt. They seemed to plan to control how they participated in a task. Sometimes they planned to honor a preference, such as getting done quickly so they could read another book or play at a center. All *Planning* prompts were answered.

Verbal Self-Revising referred to a scenario wherein a verbalization was offered and then replaced with an updated version, within the same reading session, and sometimes within the same speech turn. This category is essentially self-correction. I assumed that children were correcting themselves for misspeaking relative to some intended communication. Fang and Cox (1999) counted children's oral edits as they dictated a story about a personal memory for a hypothetical audience as self-correction based on misspeaking relative to an intended mental model. Monitoring one's performance enables the correction of errors – whether from casual misspeaking or a mistaken belief.

Verbal Self-Revising was perhaps the most straightforward, demonstrable category in the study (Fang & Cox, 1999; Rowe, 1989; Vygotsky, 1978). The limiter "verbal" had two meanings. The object of the child's monitoring could have been his or her own speech. Or, even if the object of monitoring was not known, the manifested evidence of monitoring was communicated verbally. I intended for this category to capture casual and conversational evidence of self-monitoring. Participants could have had many more internal experiences of self-

monitoring that were not captured by my method. *Verbal Self-Revising* differed from *Expanding Storytelling* in that the second statement didn't just alter the first one – it cancelled and replaced it.

Expanding Storytelling referred to updating the telling of the story within each reading session or across the three reading sessions for each book. *Expanding* was based upon my reading of Fang and Cox (1999), who counted children's elaborations (and not just self-corrections) as literacy-related metacognition. In this study, *Expanding* refers to a child articulating more information or better integrating information such that their rendering is more like what the author intended. Since I did not coach children in how to tell a story, I assumed that expanded renderings were enabled by realizations or decisions to more fully engage in the task. *Expanding* was based on the idea that literacy is a metacognitive capacity. *Expanding* indicated that participants could change performances—presumably due to some internal ability and proclivity to do so. Feuerstein et al. (2010) emphasized the capacity to grow and change as the essence of being metacognitive. *Expansion* captured this idea. Only three participants, Helen, Chris, and Dylan, did not manifest *Expanding*. The four who did *Expand* did so spontaneously as part of their storytelling. I prompted Bert to *Expand* once when I thought it was appropriate, but he did not do so. Due to the limited time available for each session and concern about fatigue, I did not attempt to prompt any more participants to *Expand* their storytelling.

Justifying one's verbalizations and text interaction behaviors is considered metacognitive based on the work of Paris and Paris (2003), wherein pre-reading children as young as kindergarten were asked to explain why they answered narrative comprehension questions in the way that they did, and Whitebread et al. (2009), who noted the same capacity in 4-year-old preschoolers. Pieschl, Stallmann, and Bromme (2014), in their study of high

schoolers' interpretations of tasks, explained that justification of knowledge is epistemic in nature; it involves reviewing knowledge as an object, and it is related to the idea that knowledge can change. *Justification* was overwhelmingly prompted. This area is a rich source of debate over the cognitive or metacognitive nature of justifications. Stahl (2014) suggested that preschool teachers pose the *Justification* type of follow up question in order to develop thoughtful engagement but did not necessarily consider that question to be metacognitive. In the instances coded as *Justification*, participants could have reported on their true mental processes in order to justify their answers or they could have indicated something concrete that was somehow related to the question. Therefore, the true metacognitive nature of justifications is a debated issue. To circumvent this issue, I only accepted as *Justification* responses to the prompts "How did you know that?" or "Why do you think that?" I issued these prompts when I thought it was situationally appropriate to do so, as follow up to a child's storytelling or answer to a comprehension question.

A summary of the refinement process that I undertook to arrive at the final seven categories is displayed in Figure 6. I made decisions to replicate, establish, keep, or remove a category based on a constant comparison of collected data to evidentiary standards set by the literature and how participants were expressing metacognition in joint reading.

Judgment of Learning. Reliable judgments of learning are not expected before five years of age (Tang, Bartsch, & Nunez, 2007). However, this area of research is limited in the preschool population, and I anticipated that the mediation of the joint reading procedure and the physical availability of the book might have supported an earlier performance. That was not the case. Future studies may find sufficient evidence through extended time for data collection or different data collection techniques. Some evidence suggested that these metacognitive

capacities may be within the reach of 4-year-olds, though these two categories were not directly relevant. Figure 6 recounts the coding schemes that I worked through before arriving at my final seven categories.

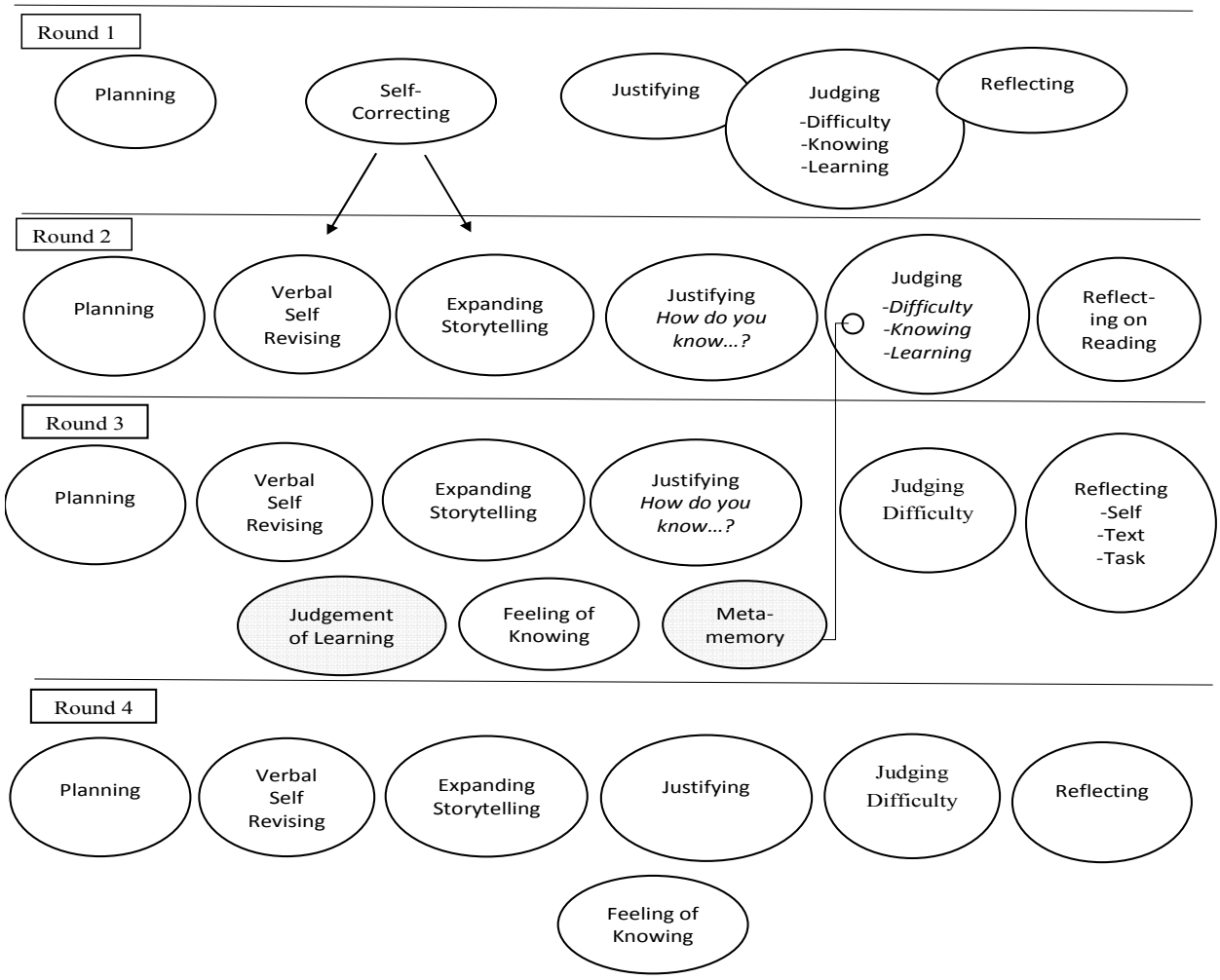

Figure 6. Refinement of thematic categories through iterative rounds of coding.

Table 10 presents the final categories grouped as Metacognitive Knowledge, Metacognitive Experience, and Metacognitive Regulation. This grouping is based Whitebread et al.'s (2009) groupings of data and the essence of participants' metacognitive behaviors.

Table 10

Forms of Metacognition Categorized as Knowledge, Experience, and Regulation

Category	Description	Example
Knowledge *Reflecting on Reading*	Demonstration of knowledge of self as reader, text as something to be read, and/or reading as a task	"I don't know the words, so what about if we just look at it?"
Experience *Feeling of Knowing* *Story Content*	Verbalization concerning whether or not key knowledge in the text is known	*"Is this the lonely firefly?"* (points to firefly in group)
Judging Difficulty	Rating difficulty of text or task at conclusion of reading session	R: Was that story easy, medium, or hard to understand? Bert: *Easy.* R: Why was it easy? Bert: *'Cause the pictures.*
Justifying Verbalizations	Explaining why a prior statement was made or why it was a good answer	R: How do we know that's the momma? Bert: *She looks like that. (points to Mother bird)*
Regulation *Task Planning*	Verbalizing intent to engage in task in a certain way	"How 'bout we go to the end, so it can be quick?"
Verbal Self-Revising	Contradicting or correcting a prior statement	"Roost-, a chicken."
Expanding Storytelling	Adding more information to a prior statement	2nd: "[T]hen she got something from the man." vs. 3rd: "Then she got syrup from the man who sells syrup."

Fit with theoretical model. The final seven categories are manifestations of early metacognition that were situationally relevant to the joint reading task. This finding is consistent with Flavell's (1985, 1991) model, in which metacognition is a situational resource for readers in reading situations (Rosenblatt, 1978; Snow, 2002). For example, the lowest frequency of spontaneous metacognition was associated with a boy, while the second lowest frequency was associated with a girl. Metacognition could have been manifested for a wide range of reasons – to further enhance understanding that was already sufficient – or to modify an opinion about a matter open to interpretation. Therefore, consistent with Flavell's model, I did not interpret the amount of metacognition as evidence of a child's metacognitive status. Rather, the totality of my findings suggest that the most promising analysis of emergent metacognition is through the person-task-action approach. This commitment to an integrated, transactional analysis is consistent with the work of Flavell (1981), Vygotsky (1978), Rosenblatt (1978), and Kintsch (1991). However, it differs from the approach taken in some of the preschool studies reviewed herein, in which pre-defined metacognitive utterances were examined out of context of the activity data (Fang & Cox, 1999; Skarakis-Doyle & Dempsey, 2008). Research may ultimately demonstrate that outward manifestations of metacognition (e.g., my seven categories) may be enabled by multiple underlying dimensions (Fang & Cox, 1999). This finding would fit with Flavell's model.

Theory of Mind and Use of Metacognitive Language

In addition to my seven metacognitive categories, I also documented evidence of reliance on *Theory of Mind* and *Use of Metacognitive Language*. Flavell (2004) and Williams and Atkins (2009) encouraged co-consideration of theory of mind and metacognition. Therefore, I defined these two distinct categories, separate from the seven metacognitive categories, in order to

maintain a robust distinction between these capacities and emergent metacognition while noting inter-relationships. Theory of mind concepts and use of metacognitive language are closely related, adjunct capacities for both narrative comprehension processes and reading-relevant metacognition.

Typical 4-year-olds use basic *Metacognitive Language* such as *think*, *know*, and *remember* in their expressive and receptive language; however, we do not know their approximate understandings of the mental states that are labeled by these everyday terms (Flavell et al., 1985; Flavell et al., 1993; Peskin & Astington, 2004). Therefore, use of these terms alone could not count as metacognition per se. However, these terms were often used to express metacognition. In sum, in addition to being related to metacognition, these two constructs are related to each other, as one would use metacognitive terms to discuss one's thoughts or the inferred thoughts of a character.

Theory of Mind was implicated in all study texts when ascribing thoughts, emotions, and/or motivations to story characters (Flavell, et al., 1993). In *Pancakes for Breakfast*, a special text feature, thought bubbles, appeared twice. On page 3, the thought bubble illustrates the little old lady's desire for pancakes. Across pages 20-21, a series of thought bubbles shows the little old lady's anticipated next steps in making pancakes. As investigated by Flavell et al. (1993), this text feature created an ecologically relevant opportunity to assess whether the child knew that the little old lady was taking actions or thinking about them in the context of comprehension of a story. As shown in Table 11, six out of seven participants spontaneously mentioned the presence of the intention thought bubbles and also recognized their representational role. Four out of seven seemed to understand that the second set of bubbles represented thoughts versus real-time actions. A comparison of responses to the two thought bubbles in *Pancakes* was done

due to the connection to the investigation by Flavell et al. (1993). In addition to thought bubbles, the narrative content of each story offered differing opportunities to work with theory of mind.

Table 11

Responses to Two Types of Thought Bubbles in Pancakes for Breakfast

	Depiction of Relatable Goal (p. 3)	Depiction of Planned Actions (p. 20-21)
Bert	"She wanted something for breakfast."	2nd reading: "Um, um, doing it." 3rd reading: "Making – um, thinking about it."
Chris	Not mentioned, not questioned	Tapping bubbles: "We need to do all these."
Dylan	"She wanted to make pancakes."	"She was dreaming about doing pancakes."
Erin	"She was thinking about pancakes!"	Confirming insistence that bubbles were real time actions: "Actually, it's happening, and then she ate."
Fiona	"She wanted pancakes."	Tapping bubbles: "And she's making and making … and suddenly it was all ready."
Gabby	"They want food."	Tapping bubbles: "She's getting the pancakes ready."
Helen	"That's what she was thinking about for breakfast."	"Then she's thinking."

Each participant used *Metacognitive Language*, though the youngest ones tended to do so only in response to question stems that contained metacognitive terms. The range of metacognitive terms used included *think*, *know*, *remember*, *dream*, and *learn*. All participants seemed to understand what these terms meant and could use them in reply to the researcher. However, only one participant spontaneously used the term *learn*. Even Helen, the most advanced participant, could not use the term *learn* in relation to learning something from the

text. When asked what she learned from reading the text, she reported that she already knew everything there was to learn at preschool—counting and the alphabet. Bert and Erin provide contrasting cases in use of metacognitive language. Though their comprehension was comparable, Bert often offered "Mmm-hmm," "Umm.." or shrugged, whereas Erin spontaneously said that the little old lady "decided" to make pancakes based on a picture and that the little old lady was "dreaming." To discuss her own mental processes, Erin spontaneously said, "I think" and "I mixed up." In reply to conversational prompts, she explained the she "forgot" and said, "I mean" to preface a self-correction. However, Erin did not report learning anything, either spontaneously or in response to a prompt. One instance emerged in which Erin could have reported that she learned something new, but she still did not. Erin wanted to know what the plaque on the wall in the last scene of *Pancakes* said. Immediately after I read the saying ("If at First You Don't Succeed - Try, Try Again"), I asked her if she learned anything new while reading with me. She replied "no." I did not ask Erin whether she changed her mind about anything. Peskin and Astington (2004) said that stories provide preschoolers with ample opportunities to use metacognitive and mental state language. An examination of when and how participants in the present study used metacognitive language confirmed this finding, though individual differences clearly existed.

Coding Processes and Results

Through a constant comparative process, I began transcribing and coding early in the process of data collection. After typing transcripts of reading sessions, I checked their accuracy and inserted field notes. Coding was iterative; I completed four full rounds of thematic coding. Using a combination of open and closed codes, I coded until saturation was reached (i.e., 100% of the data received at least one code) and no new codes were needed to categorize, describe, or

explain child data. Each participant demonstrated some form of metacognition with each book. This iterative process helped me distinguish what type of metacognition I had observed.

Frequencies. As shown in Table 12, I recorded 219 instances of metacognition, the majority of which were prompted through my situationally-posed questions. Most metacognition in the study could be characterized as metacognitive experiences. This finding is consistent with developmentally-appropriate expectations for emergently-literate participants. Flavell (1981) explained that experiences drive the development and coordination of metacognitive knowledges and regulatory activities, as one gains experience with and training in formal tasks and intellectual domains. Contextualized examples are discussed in the next sections.

Table 12

Total Instances of Spontaneous (S) and Prompted (P) Metacognition by Category

	Regulation						Experience						Knowledge				
	Planning		Revising		Expanding		Justifying		Difficulty		Knowing		Reflecting		Totals		
	S	P	S	P	S	P	S	P	S	P	S	P	S	P	S	P	Total
Bert			1	2	1			10		5	1	5	2	1	5	23	28
Chris	1	1	1				1	1		2		1	3	2	6	7	13
Dylan	8	4	9					3		5	1	1	11	3	29	16	45
Erin	6	1	9		2		1	7		2	2	1	5	1	25	12	37
Fiona	1		2	2	1			6		2	1	21			5	31	36
Gabby			1		1			3		4	3	7			5	14	19
Helen	2		4					9		6	7	8	4	1	17	24	41
Totals	18	6	27	4	5		2	39		26	15	44	25	8	92	127	219
	24		31		5		41		26		59		33				
	60						126						33				
	219																

Coding examples. I categorized each coding as done with highest, medium, or relatively lower confidence in inferences made during coding. The majority of codings were made with high confidence in the inferences I made from the data. In other words, the participant's coded utterance was metacognitive on the verbal surface and also matched what I observed in the moment through an additional verbal or non-verbal data point. Medium confidence decisions concerned the ongoing debate about the trustworthiness of counting utterances that sound metacognitive as metacognition; robust analysis casted a small degree of doubt about whether the child's words truly expressed a second-level, inner cognitive state. A little more information than what could be collected through the short and noisy sessions in the preschool classroom could have placed medium confidence data into the highest confidence category. Lower confidence categorizations reflected the reality that one more data point, in addition to the issue of word/mental state match, called into question the metacognitive nature of a verbalization. I attributed the small number of these ratings to communication limitations such as articulation issues or non-standard syntax.

Due to the threat of fatigue, I could not always seek clarification of unclear verbalizations within a reading session. For example, Dylan had a disproportionate share of lower confidence codings since he did not always articulate clearly and sometimes showed abrupt changes in tone and activity. These characteristics posed challenges to coding his verbalizations and joint reading behaviors with higher confidence. Table 13 reports the relative proportions of codings in each of the three confidence-in-inference levels.

Table 13

Proportions of Inference/Confidence Levels in Codings of Metacognitive Data from Preschoolers

	Higher Confidence	Medium Confidence	Lower Confidence
Bert	77%	23%	0%
Chris	85%	14%	1%
Dylan	75%	1%	24%
Erin	98%	0%	2%
Fiona	86%	10%	4%
Gabby	80%	20%	0%
Helen	96%	4%	0%

The initial toy playing sessions and sixty-four reading sessions took place in fall 2015, and the remaining sessions occurred in spring 2016. I was present as a classroom volunteer before, during, and after data collection and was therefore able to build rapport with participants and classroom teachers. Ostensibly, seven more months of development and exposure to dialogic reading tasks could have resulted in more metacognitive behaviors later in the study. By the spring, some participants were more articulate and more aware of print. However, no obvious differences in metacognition were noted in the spring sessions. Indeed, there was not a clear pattern of an increase in metacognition from the first to second to third reading, regardless of the time that passed between these events. Likewise, though all participants were technically four years of age at the start of the study in September 2015, some were closer to five. Therefore, I compared results by age at start of study. Younger fours were 4 years 0 months to 4 years 5 months old and older fours were 4 years 6 months old to 5 years 0 months old at the start of the study in September 2015. Coincidentally, all female participants were in the younger group and

all male participants were in the older group. As seen in Table 14, though the female participants were younger, less inference was required to code their data.

Table 14

Proportion of Coding Confidence Levels by Participant Gender/Age

	Higher Confidence	Medium Confidence	Lower Confidence
4.0-4.5 years *all female	91%	7%	2%
4.6-5.0 years *all male	78%	12%	10%

In the next series of tables, I present excerpts from coded data for each participant. These excerpts represent a range of codes and include an example of data from each participant that may have been compelling but was not metacognitive in nature. I discuss these excerpts and the inferences made in coding them.

As shown in Table 15, Bert's high confidence example communicated his knowledge that the thought bubble in *Pancakes* represented the little old lady's thoughts. The metacognition in this scenario was his ability to report that as a reason for a prior claim. Thus, this example illustrated a connection among metacognition (e.g., *Justifying*), metacognitive language (e.g., think, want), and theory of mind (e.g., character is thinking about an absent object). This example and the others illustrate the roles that metacognition can play during naturalistic picture book reading with pre-reading preschoolers.

Table 15

Bert's Examples of Coding Confidence Levels and Excluded (Not Metacognition) Data

Higher Confidence *(Justification)*	Medium Confidence *(Justification)*	Lower Confidence *(Justification)*	Not Metacognition *(Critical thinking)*
Bert: She wanted something for breakfast. R: What does she want? Bert: Pancakes. R: How do you know that? Bert: Because it's up here (points to thought bubble).	R: One morning, a *Mother* bird sat on her egg. How do we know that's the momma? Bert: She looks like that. (Bert points to the picture of the *Mother* bird.)	R: How'd you know that was a lantern? Bert: 'Cause it looks like one. R: Do you have one at your house? Bert: No.	R: Was it a happy book or a sad book? Bert: Um, both. R: Really? Why do you say that? Bert: Because they had a big breakfast at the end.

In the medium confidence example, Bert did not provide enough detailed information about how he knew the pictured bird was the *Mother* bird. Therefore, I did not have any way of knowing if he was simply pointing to a likely picture of the *Mother* directly in front of him or reporting on his internal mental state. His answer may not have been truly metacognitive, though it was on the surface. The medium confidence example was less specific. Though Bert pointed to the picture, his answer had a rhetorical tone about standard representations of a mother.

In the lower confidence example, Bert provided a general answer that may or may not have reported on his mental state, and he was not able to discuss the matter further. He replied that he did not have a lantern at his house, yet he did not mention where he had seen a lantern before or other information that would confirm that he knows what a lantern is. Therefore, in this example, two points of data called into question the metacognitive nature of his statement. The

lower confidence example was even less specific than the medium confidence example; it did not indicate that Bert knew what a lantern was or that he considered why he answered that way.

I coded the example of excluded data as critical thinking as opposed to metacognition. In this example, Bert shared a relevant insight about the story beyond what was requested by the researcher or suggested by the book. This excerpt showed notable constructive thinking; Bert appeared to apply his background knowledge to make holistic sense of the story. I provided this excerpt to show that I did not code all constructive thinking as metacognition.

In Table 16, Chris' higher confidence excerpt was a straightforward example of self-correcting a statement mid-stream, due to monitoring of what one intended to say versus what one actually said. Though this example did not involve a dramatic change in beliefs about the story, it showed second-level processing in cooperation with his stream of verbal storytelling. Chris' medium example could have been a communication of a sensation that the story was long based on his meta-awareness of how much time and effort it took to complete that story versus others. However, without additional information, such as commentary on why it felt long, this statement may or may not have indicated a profound *Reflection on Reading*. Chris' lower confidence example in Table 16 can be interpreted as an act of *Task Planning* - an exertion of intentional control of his engagement in the task based on his knowledge of how books are laid out - but it is not known if he wanted to end the session on the last page of the book or if he was just announcing that he had reached the last page. Chris' example of excluded data was coded as a macro-level statement and an indication of an understanding of the firefly's false belief that lights could be other fireflies. This false belief drove the plot—the firefly made many misguided attempts before reaching its goal. This data also exemplified that theory of mind and metacognition were distinct yet related.

Table 16

Chris's Examples of Coding Confidence Levels and Excluded Data

Higher Confidence *(Self-Revision)*	Medium Confidence *(Reflection on Reading)*	Lower Confidence *(Task Planning)*	Not Metacognition *(Theory of Mind)*
R: Then he came to a … (invited Chris to complete my sentence) Chris: Roost-, a chicken.	Chris: That was a long story.	Chris noticed the fireflies on the last page and immediately stopped storytelling to go that page. Chris: And, that's the end. R: Wait, not yet. Is this really the end? Chris: [Looking at fireflies on last page] The end!	Chris: It was. a car. light. [Chris used emphatic pauses to communicate the macro level idea that contrary to the firefly's false belief, the light we see is actually a car's headlight.] [Reference to false belief structure]

As shown in Table 17, Dylan's lower confidence rating of an *Expansion* was impacted by his low speech output. Dylan did not enjoy putting forth the effort of speaking or leading the conversation, except for instances of high personal interest. Therefore, it was often difficult to feel certain of his meaning. The medium example showed Dylan's persistent preference to participate in a way that was more passive than the other participants. The lower confidence example concerned whether he was truly *Expanding Storytelling* or just speaking more. Dylan's excluded example exemplified his expressive and receptive proficiency with metacognitive language used to discuss a theory of mind concept— the thought bubble. However, it did not manifest metacognition.

Table 17

Dylan's Examples of Coding Confidence Levels and Excluded Data

Higher Confidence *(Judgment of Difficulty)*	Medium Confidence *(Task Planning)*	Lower Confidence *(Expanding Storytelling)*	Not Metacognition *(Theory of Mind)*
R: Was that story an easy story, a medium story, or a hard story? Dylan: A medium story. R: What made it medium? Dylan: The pages. R: What about them? Dylan: Because they were all big.	Dylan: I'm not gonna read the words. R: We can tell the story from the pictures.	Dylan: (softly) It was shaking. (2nd) vs. Dylan: She heard wiggling. My baby must ... want food. (3rd)	R: Show me where she's dreaming about pancakes. Dylan points to the thought bubble. Dylan: In her brain. [Dylan explains theory of mind concepts]

In Table 18, Erin's high confidence example exemplified her active participation in joint storytelling. She often took initiative. Only one of Erin's instances necessitated a lower confidence rating. Erin's example was the only less-than-high confidence rating for *Judgment of Difficulty*. I assigned that rating because she estimated the physical length of the book's cover when asked to rate the difficulty of its content. Since her answer did not include selection of a difficulty category, it was difficult to know if she really thought that the measurement of the physical book was an aspect of its difficulty.

Table 18

Erin's Examples of Coding Confidence Levels and Excluded Data

Higher Confidence *(Task Planning)*	Medium Confidence	Lower Confidence *(Judgment of Difficulty)*	Not Metacognition *(Scene-level storytelling)*
Erin: I'm gonna make up my words now. R: You're gonna make up your words now? Erin: Yeah, because there's no words.	n/a	R: Was it an easy story, a medium story, or a really hard story to understand? Erin: (mumbling numbers as she leans across the closed book) It's 12 inches.	Erin: She maked and maked and maked and maked until she could say "Here you go."

Table 19 shows that Fiona's medium confidence example of *Expanding Storytelling* was downgraded from high confidence because of her use of the word "girl" in a story with only animal characters. Like the other participants, she recognized the mother duck, yet used the term "girl" for an unknown reason. Despite that, the second sample showed *Expansion* of important details versus her first accounting of the same page. Fiona's excluded example demonstrated her frequent application of her personal experiences and priorities to the text. Though she used metacognitive language, she was not metacognitive in that moment. Furthermore, her personal reference did not seem to be constructive as she did not connect her experience with the story.

Table 19

Fiona's Examples of Coding Confidence Levels and Excluded Data

Higher Confidence *(Judgment of Difficulty)*	Medium Confidence *(Expanding Storytelling)*	Lower Confidence	Not Metacognition *(Metacognitive Language)*
R: Was that easy, medium, or hard? Fiona: Hard.	R: What's happening here? There's no words.. Fiona: She's swimming. And the turtle.	n/a	R: What were you thinking? Fiona: I was thinking about my family….

Higher Confidence *(Judgment of Difficulty)*	Medium Confidence *(Expanding Storytelling)*	Lower Confidence	Not Metacognition *(Metacognitive Language)*
R: Why was it so hard? Fiona: [No response.] R: Was it too hard for little kids? Fiona: Because I don't know how to read.	vs. Fiona: There's the baby chick back to the mom. The turtle's bringing it to the girl.		R: That when you're born you're with your family and not alone. Fiona: No. I'm always with my family.

Table 20 provides examples of Gabby's five medium-rated codings in the *Justification* and *Feeling of Knowing* categories. I attributed these outcomes to Gabby's lack of familiarity with the representational nature of the questions that I posed. Gabby spoke as much as she could during the sessions, but she may have been so unfamiliar with abstract questions or thinking that she interpreted and answered the questions in a concrete manner. Gabby's example of excluded data did not meet evidentiary standards (due to a Yes/No response without elaboration) for *Metamemory for Text*, before that entire category was excluded. The tendency to receive Yes/No responses without elaboration was a primary reason that *Metamemory for Text* was cancelled as a category of metacognition in this study. Overall, participants were not able to name, report on, or otherwise discuss their metamemorial capacities or experiences in a self-referential manner, and they did not engage in metamemorial strategies to participate in joint reading.

Table 20

Gabby's Examples of Coding Confidence Levels and Excluded Data

Higher Confidence *(Judgment of Difficulty)*	Medium Confidence *(Justification)*	Lower Confidence	Not Metacognition *(Metamemory)*
R: Is that easy, medium, or hard? Gabby: *Medium.* R: Why's it medium? Gabby: Because it's a short book.	R: What's the baby bird thinking right now? *Gabby: His mother!* R: How do you know he's thinking about his mother? Gabby: *'Cause, he's gonna lay down in the nest soon. The nest.* R: He's gonna land in the nest soon? Gabby: *Yeah.*	n/a	Gabby: *He look up. And down.* R: You remember that? Gabby: *Yeah.* [yes/no answer]

In Table 21, Helen's higher confidence example exemplified why she came the closest to being able to engage in a *Judgment of Learning*, though that category was eventually excluded. It is reasonable to think that remembering content frees up mental energy for processing it. Helen's medium confidence example demonstrated that though she was capable of extensive verbal dialogue, she sometimes fixated on her unique interpretations, leading to disappointing replies. Helen's excluded data exemplified that not all answers with metacognitive language were counted as metacognition. Metacognitive terms such as *because*, *'cause*, *I know*, and *I don't know* spoken in isolation were not counted as metacognition without additional evidence.

Table 21

Helen's Examples of Coding Confidence Levels and Excluded Data

Higher Confidence *(Judgment of Difficulty)*	Medium Confidence *(Judgment of Difficulty)*	Lower Confidence	Not Metacognition (*Metacognitive Language*)
R: Is it an easy, medium, or hard story? Helen: Easy. R: What makes it easy? Helen: All the things that I remember in it.	R: Was that easy, medium, or hard? Helen: Medium. R: What made this one medium? Helen: Because she slept without it (the missing duckling).	n/a	R: They're talking about that duckling's running away? How do you know that? Helen: 'Cause! [Squeals and guffaws] I know that.

Prompted versus Spontaneous. During dialogic reading, it is normal for the adult to ask questions and prompt reading behaviors. In the present study, a child could have provided data spontaneously or in response to a question. Questions and prompts focused the child's attention and encouraged cognitive and metacognitive processing. I categorized data as prompted if the child's talk or actions responded to my question or prompt within the same speech turn or within one additional speech turn. All other data was considered spontaneous. Table 22 provides a breakdown of spontaneous versus prompted data by coding category.

Table 22

Proportion of Prompted versus Spontaneous Metacognitive Instances

Category	Prompted	Spontaneous
Task Planning	25%	75%
Verbal Self-Revising	13%	87%
Expanding Storytelling	0%	100%
Reflecting on Reading	24%	76%

Category	Prompted	Spontaneous
Justifying Verbalizations	95%	5%
Feeling of Knowing Story Content	75%	25%
Judgment of Difficulty	100%	0%

Four out of the seven categories of metacognition in the present study (*Planning, Revising, Expanding,* and *Reflecting)* were more likely to be spontaneously communicated, meaning that I did not directly prompt that type of statement or behavior in the present or a prior speech turn. This degree of spontaneity lends credence to the conclusion that such young children were not mimicking. On the contrary, their verbalizations were very much in their own words. For example, Dylan said "I mean" or "I said [that] by accident" when he spontaneously revised himself. Erin's unique self-correction language included "I mixed up."

Three of seven categories (*Justifying*, *Feeling of Knowing*, and *Judging Difficulty*) were much more likely to have been prompted—evinced in response to a question from the researcher. Prompted metacognition was not necessarily less metacognitive. Due to the lack of a social model for and practice with expressing thoughts about the difficulty of a book, I was not surprised that *Judgments of Difficulty* had to be prompted. However, I was somewhat surprised that *Feelings of Knowing* and *Justifying* were mostly prompted, as these actions have analogues in the social world of the preschooler. In the final analysis, these three categories were the most tangential to the act of reading itself, and that may explain the need for prompting. Since the proportion of spontaneous to prompted metacognition occurred in the context of an exploratory study without standardized procedures, more research must be conducted to determine if some metacognition is consistently more likely to be evinced spontaneously.

All metacognitive prompts resulted in an intelligible verbal response. Most metacognitive prompts resulted in a metacognitive response. Other outcomes included codable utterances that were not metacognitive or no response. Though data collection was interrupted by activity in the classroom, environmental interruptions only affected Fiona. I attributed this outcome to coincidence. As shown in Table 23, participants had varying response rates to prompts, from 60% to 91% of metacognitive prompts returning metacognitive utterances. Failed prompts represented all categories except *Planning*, *Expanding Storytelling*, and *Feeling of Knowing*. I also posed at least one *Metamemory* prompt to each participant. This coverage increased confidence that the exclusion of this category was due to failure to meet evidentiary standards and not limited data.

Table 23

Participants' Responses to Questions Meant to Prompt Metacognition

	Prompts Posed	Codable - Utterance Metacognitive	Codable Utterance - Not Metacognitive	No Response	Environmental Interruption	Unintelligible Response
Bert	28	23	5			
Chris	9	7	*2			
Dylan	22	16	4	2		
Erin	20	12	*7	1		
Fiona	42	31	6	3	2	
Gabby	20	14	*6			
Helen	24	22	2			

Note. * indicates that participant had one response of “I don’t know” that was considered a deflection as opposed to an introspective self-report.

Case Impressions of Participants' Metacognition During Joint Storybook Reading

Returning to Flavell's model, I composed narrative impressions for three categories of results for each participant: an impression of emergent literacy status based on book handling and pretend and dialogic reading behaviors (Clay, 1991; Sulzby, 1985), an impression of emergent comprehension of the structured information presented in the storybooks (Kintsch, 1998; Stahl, 2014), and an impression of the child's emergent metacognition based on my coding scheme (Whitebread et al., 2009). These divisions allow me to discuss not only metacognition, but also each participant's emergent literacy knowledge and repertoire of actions applied to the study's task.

Bert: 4 Years, 8 Months at Start of Study

Bert was a serious participant and focused on the task at hand. I did not have to repeat any questions or prompts or redirect any off-task behavior. Bert seemed comfortable in the preschool classroom setting, and he willingly participated in reading sessions during free-choice center time. Though Bert was not loquacious, when he did speak, he mostly used conventional syntax and only occasionally confused verb tenses. All of his speech was intelligible, though he sometimes spoke very quietly, as he did in general in the classroom.

Bert's emergent literacy behaviors. Bert handled books with ease, waiting politely for an introduction based on the cover and then turning page by page from front to back. He evinced his knowledge that print carries meaning when he asked, "What does that say?" with interest and energy while pointing to a picture of a cookbook in *Pancakes for Breakfast*.

Bert thought of a book as a "meaning container" and thought of himself as a "meaning maker" (Dooley & Matthews, 2009, p. 29). In addition to his own informative storytelling and dialogue, he noted that the little old lady "read" a cookbook to achieve her goal of making

pancakes. Bert provided pretend readings for all books, but he typically did not volunteer more information than what was requested through questions or prompts. Bert did spontaneously report that he could read and that he had read from his children's prayer book. However, Bert did not conventionally read text during this study. Contrary to Sulzby's (1985) concerns about print awareness resulting in refusal to pretend read from the pictures, Bert's awareness of print and understanding of the role that print plays in reading did not hinder his rendering of stories from the pictures.

Bert's emergent comprehension. Bert showed some sophistication with story comprehension. However, his quiet nature resulted in less data available to analyze the true depth of his understanding. In *Pancakes for Breakfast,* Bert confidently pointed to thought bubbles as a display of the little old lady's thoughts, and he also communicated his insight that not many books have thought bubbles. Bert expressed two misconceptions (that the little old lady did not know how to make pancakes and that the animals did) while working with *Pancakes.* These isolated misconceptions did not undermine his comprehension of the gists, and he corrected one of them.

Bert was better able to form renderings of scenes across repeated readings without direct instruction or cues from the researcher. The sample of joint reading data below compares Bert's rendering of page 18 of the wordless *Pancakes* from his 2nd and his 3rd reading. I coded this exchange as an example of Bert engaging in *Expanding Storytelling*, one of the seven final categories of metacognition in this study:

2nd Reading
Bert: And then she got something from the man.
R: What'd she get?

Bert: I don't know.

R: What does it look like she got?

[Interrupted by another child. Bert flips to the next page instead of answering my question.]

3rd Reading

Bert: Then she got syrup from the man who sells syrup.

Bert's third reading demonstrated a better integration of important information in this scene. Between the second and third reading, without redirection or training, Bert *Expanded* his storytelling to account for the fact that the sought object was syrup and the pictured man was a syrup salesman. Though Bert did not report on his change in storytelling (and probably could not - though I did not try to find out), I concluded that some internal drive to reconsider the text spurred his change in storytelling.

Bert's emergent metacognition. Bert was not necessarily loquacious or ambitious in his storytelling, but he was still metacognitive. Bert did not make many spontaneous comments of any type, and two-thirds of his metacognition was prompted. Though Bert did not provide extensive verbal data, he could be metacognitive on his own or when prompted. Bert's case impression thus supports the use of methods that distinguish a young child's quantity and quality of talk from the relevance of metacognition to whatever task the child is working on. Bert's quieter nature, however, did necessitate more questions and prompts from me. Overall, Bert evinced every type of metacognition except *Planning*.

Reflecting on Reading. Bert engaged in both spontaneous and prompted *Reflection*. One of his spontaneous examples was social in nature. While I was working with Helen, Bert joined the conversation and announced that he could read and that he reads his prayers at night. Bert

saw Helen "reading" and wanted to let us know that he could do it, too. Bert and Helen were able to discuss being in a community of readers.

Feeling of Knowing. The esoteric pictured objects in *Pancakes* offered plentiful opportunities to be stumped or to learn about new words or ideas. For example, on page 4 of *Pancakes*, the little old lady puts on an apron before she begins cooking. During his initial session with *Pancakes*, Bert interrupted his story construction to try to obtain a name for this unknown object that the protagonist was taking an action with:

> Bert: What's that? (points to little old lady's white apron)
> R: That's an apron.
> [Bert doesn't seem satisfied and continues to look at the apron versus continuing with his rendering of the story.]

Though the majority of Bert's *Feelings of Knowing* were prompted, this one spontaneous example indicated that he was actively monitoring whether he knew what he needed to know to tell the story, and that he was willing to change his text interaction behavior mid-stream to do something about not knowing.

Judgment of Difficulty. The five times that I could pose a *Judgment* prompt with Bert (the others were skipped due to low stamina at the end of sessions), Bert always ruled that the books were "easy." However, his varying explanations for why a book was easy referenced different aspects of readings: "the words," "the pictures," and specific content such as "the fireflies." His explanations referenced different, real sources of difficulty and suggested active meta-processing of his experience of reading the text.

For example, during the first reading of *Pancakes*, Bert indicated that the pictures made it easy to understand the storyline. Since pictures are a main source of information for a pre-reader,

and since Bert spent time looking at and discussing the pictures in this wordless picture book, I assumed that he was reporting on his ease of making sense out of this story:

> R: Was that story easy, medium, or hard to understand?
> Bert: Easy.
> R: Why was it easy?
> Bert: 'Cause the pictures.

Task-Related Planning. Bert did not evince any *Planning*. His lack of *Planning* may have resulted from a tendency to accept tasks as an adult presents them and not necessarily from a lack of ability to actively plan his interactions with a book.

Verbal Self-Revising. Many instances of verbal monitoring were straightforward corrections of verbalizations mid-stream. These instances were interpreted as indicative of monitoring of a mental model of the story and one's intended communication about the story. Children sometimes misspeak, and they do not always express their ideas with verbal fluidity. Though the substance of verbal self-corrections were not necessarily profound, *Self-Revising* still indicated monitoring of performance or communication relative to an intention. For example, when asked to retell *Duckling* after the third reading, Bert started to say that the baby ducks were looking for the errant ducking, but then he self-corrected his verbalization mid-stream to indicate that the mother duck was doing the searching:

> R: Can you tell me in your own words what it was about?
> Bert: They was tryin' to find, um, [pause], um, the mama duck was trying to find the baby duck, so she found all of them.

Expanding Storytelling. Bert engaged in one spontaneous *Expansion of Storytelling* as a metacognitive act. During his second reading of Mother, on page 35, Bert spontaneously added that he thought the baby bird was thinking, following our discussion about the baby bird being

sad. I interpreted this vignette as resulting from Bert's desire to communicate the details that he felt were important. Adding that the baby bird was pensive in the middle of the story provided a fuller accounting of this character's inner state as he strived to resolve his conflict:

R: Look at his eyes, yeah. Let's see what happens next.

Bert: And, he's thinking.

Bert had other instances of providing more details that were not necessarily metacognitive. For example, he progressed from picture shyness and refusal on the first reading of *Firefly* to commenting during the third reading that he wanted to add to my read aloud that other fireflies are coming. He was able to provide more information or elaborate when prompted to do so. For example, from his second to third reading of *Pancakes*, Bert accounted for more information when asked what the book was about while looking at the front cover:

2nd reading
R: You said we read this before. What's it called?
Bert: Um, pancakes.

3rd reading
Do you remember what it's about?
Bert: Making pancakes.
R: Who does that?
Bert: The lady and, and all the animals.

Justifying Verbalizations. During the second reading of *Mother*, Bert explained that he knew which bird the Mother was based on her scarf. Later, during the third reading, Bert supplied a second way to know which bird was the *Mother* bird—because she was the larger of the two birds. These varying answers showed that Bert was reasonably responding to different

sources of information to make sense of the story. In response to the *Justifying* prompts, he was able to report this information.

During his third reading of *Duckling*, Bert paraphrased the text's refrain ("Have you seen my duckling?") as a source of meaning in this picture book with few words:

> Bert: It says, "Have you saw my duckling?"
> R: Yeah, [the Mother duck] says, "Have you seen my duckling?" How'd you know she keeps saying that?
> Bert: Because the words.

Bert's varying replies served to triangulate the conclusion that Bert understood my request for justification and engaged in second level processing of his first level claims.

Theory of Mind and Metacognitive Language. Stories that present the perspectives of multiple characters can naturally invoke a child's theory of mind. Across texts, Bert was able to see things from the perspective of the main characters. He communicated the false belief leading the firefly to approach glowing objects. He knew that thought bubbles are representational. In another example, during the third reading of *Are You My Mother?,* Bert spontaneously articulated not only the baby bird's uniquely limited perspective, but the reason for it:

> R: Does he know that he has a Mother?
> Bert: No, because he was in the egg. And the Mother was not.

Bert understood the metacognitive language that I used, and he used the metacognitive terms *know* and *think* spontaneously in his dialogue with me. In his third reading of *Pancakes*, Bert demonstrated how hard it can be to ascertain the validity of a child's use of metacognitive language – i.e., whether using a mental state term is truly metacognitive. At the very least, the second part of this exchange represented a reflective exchange about reading and learning:

R: How'd you know that milk makes butter?

Bert: Because – you have to stir it up – like that (pointing to butter churning page).

R: OK, did you learn that from the book or did your mommy tell you?

Bert: Umm, I think I learned it in the book.

Chris: 4 Years, 6 Months at Start of Study

Chris was an energetic and willing study participant, though somewhat unaware of the format of dialogic reading. He frequently requested to read a book other than the one presented. Once, when I asked him what the Snort in *Mother* was really called, he excused himself from the table to ask his classroom teacher. He enjoyed reading with me and spontaneously contributed many comments, some of which were relevant. However, Chris exhibited some communicative immaturity. For example, after I told him my name was "Mrs. Faust" he called me "Mr. Fow." His syntax was still developing, resulting in verbalizations such as "the mama comed" to the baby ducks. Chris' volume and rate of speech seemed appropriate, yet a portion of his verbal data had to be coded as "unintelligible" due to pronunciations influenced by his immature articulation.

Chris's emergent literacy behaviors. Chris slid books across tabletops as if they were toy trucks. After I taped down the end pages of *Mother*, Chris forced the pages apart again, resulting in ripping that was a little louder than my attempts to redirect him. Despite Chris' rambunctious book handling, however, he did not have any page turning difficulties, and he adroitly rotated *Duckling* to correspond to the underwater scene and rotated the book back on the next page without interrupting the flow of his storytelling.

Although Chris was not yet reading conventionally, he noticed print and responded by asking "What that say?" Chris also showed concept of word. For example, on the first page of

Duckling, he pointed to each word in the phrase "Early one morning" while saying "Have you seen my duckling?" Sometimes, Chris divided his attention between naming the letters he knew and pretend reading from the pictures. Chris' budding print awareness also resulted in searching for text that wasn't present, though not a refusal to engage in pretend reading when he didn't find it:

> Chris: [Peruses the wordless pages 2-3 with a quizzical expression but does not speak.]
> Chris: You say it.
> R: There's no words anywhere. You gotta tell me what's happening.
> Chris: The momma's coming.

Overall, Chris shifted between attending to print, pointing to words, and providing pretend readings based on the pictures. These behaviors were part of his emergent literacy repertoire and worked together, not against each other.

Chris's emergent comprehension. On multiple occasions, Chris showed a sort of behind-the-curtains meta-awareness of the story as a produced work. For example, he took on a Darth Vader voice to make his storytelling more interesting and feigned shock at the picture of the airplane with eyes in Mother. However, Chris' understanding was hard to assess through traditional question and answer procedures, due to his variant response patterns. In addition to providing unintelligible responses, Chris would often simply ignore comprehension questions that I posed. Occasionally, however, he would provide an unexpected outpouring of verbal data that provided glimpses into his macro-level comprehension:

> R: The baby bird could not what though?
> Chris: [No response.]
> R: What could he not do?
> Chris: I think….
> R: Yeah, what ….?

Chris: I think… he looking for mama. I think a lot of "aminal" you can miss seeing but my mama know I am.

Chris's emergent metacognition. Chris had a correspondingly rambunctious metacognitive profile characterized by instances of metacognition that indicated conscious control of the task and some self-monitoring. However, these moments did not necessarily enhance comprehension or meaningful dialogic participation.

Reflecting on Reading. When Chris was initially presented with the wordless *Pancakes*, he studied the first few pages before responding that he was not sure if he was familiar with this story. The fact that he said that he was not sure showed that he was reflectively aware; sometimes a reader has to hear more before recalling familiarity. For example, adults can realize several pages into a book or several minutes into a movie that they recall a previous encounter.

Feeling of Knowing. Chris had seven instances of *Feeling of Knowing* across two books (*Firefly* and *Mother*). Three of these were spontaneous. For example, twice during *Mother*, he stopped his storytelling mid-stream to ask what the hen and the bulldozer were. These spontaneous statements indicated that he wanted to know key information in accordance with his desire to understand what was represented in the book. The hen and bulldozer play important roles in the story; it was responsible to ask what these things were. His prompted *Feelings of Knowing* revealed more about his orientation to the task. Chris replied during the introduction of the first reading of *Firefly* that he was not sure if he had read the book before.

Judgment of Difficulty. It was unclear if Chris was familiar with study texts, which might affect difficulty. Based on his perceived lack of stamina at the end of each session, I was only able to pose the *Judgment* prompt twice. In response to one prompt, he claimed that his second

reading of *Firefly* was hard "because of all the pages." Additionally, as we neared the conclusion of the first reading, he spontaneously indicated that *Pancakes* was a "long" story:

> R: So, what was that whole story about? You went so fast…
> Chris: It was because it's pancakes. (Unintelligible.) That was a long story.

Task-Related Planning. Chris, a young participant in terms of literary and communicative proficiency, exhibited *Planning* in each study text. I concluded that his *Planning* was a form of conscious and active control over the task. From this perspective, Chris' instances of physical roughness with books that were associated with both announcing and taking control could have been a form of active engagement, not simply unwelcome immaturity. For example, during his first reading of *Firefly*, Chris wanted to focus on the glowing fireflies on the last page of the book instead of finishing the last few pages. He claimed that the story was over so he could be released from the task and look at the glowing firefly page on his own terms:

> Chris: And, that's the end.
> R: Wait, not yet. Is this really the end?
> Chris: Hey, you glow. [Chris is fascinated by the fireflies on the last page with the glowing tails. Instead of acknowledging my question, he enjoys looking at them for a few moments.]
> Chris: The end.

Verbal Self-Revising. Chris consistently intended to refer to the hen in *Mother* as a chicken. I was unable to convince him to say hen over the course of three readings. Since "chicken" was his intended label, he corrected both the researcher and himself for saying anything different. For example, in the second reading of *Mother*, this exchange took place:

> R: Well, then he came to a hen. And what did he say to the hen?
> Chris: That's not a hen. That's a chicken.

Then, during his third reading of *Mother*, Chris almost said rooster but caught himself and said "chicken":

R: Then he came to a … (invited Chris to complete my sentence)

Chris: Roost-, a chicken.

Expanding Storytelling. Chris added comments, yet he did not engage in metacognitive *Expansion of Storytelling*. His lack of *Expansion* seemed to conflict with his inventive and high energy interpretations of stories. However, his energetic participatory style did not equate with this type of metacognition. The energy that Chris expended on off-task comments and behaviors may have lessened his ability to more deeply understand the stories through each reading.

Justifying Verbalizations. Chris was able to justify his verbalizations, even though I found it was hard to pose a *Justification* prompt due to his distractibility. Chris engaged in two *Justifications*. However, this count could have been affected by study procedures or environmental conditions and might therefore belie his ability to justify his thoughts. For example, during his second reading of *Duckling*, Chris *spontaneously* explained why he claimed that the story was over:

Chris: There is my duckling.
Chris: The end.
R: Oh, so, how did it end?
Chris: I said 'the end' because he found his ducky because I didn't see because he got back. He was just right … Look…

Another exchange, from Chris' third reading of *Mother*, provided additional evidence of his ability to justify his answers:

R: How do you know he has a Mother? He doesn't think he has a Mother.
Chris: He know … I know it because she's getting him a worm and her comes to the nest.

Chris understood that I wanted him to report on his thought process. He provided a reasonable explanation as to how he knew something. He referenced his internally-held, macro-level knowledge of the story to provide details yet to come, in order to make sense of his claim about the present scene. In other words, he said he knew something because he knew how the story ended. Chris' internal mental model of the story functioned as a mental resource that he could access and report on.

Theory of Mind and Metacognitive Language. In his initial reading of *Firefly*, Chris acknowledged the unique perspective of the humans in the story who keep hearing a noise outside they can't explain (the firefly). This example shows that Chris also used metacognitive language as a natural part of his fluent storytelling from the pictures when reading *Firefly*:

> Chris: Why you guys are talking?
> R: Why you guys are talking?
> Chris: No, why you guys are thinking something's in here?

In his third reading of *Duckling*, Chris acknowledged the limited knowledge of the mother duck versus his omniscience as a reader:

> Chris: So, have you seen my duckling? And the turtle said "no."
>
> Chris: (Leans in and whispers as if he's telling a secret) But there's a duckling behind that turtle…

This recognition of the false belief at the heart of the story enabled him to convey the gist. However, in other exchanges, Chris either did not respond to my question, or his response was at least partially unintelligible, precluding my ability to assess his understanding of theory of mind issues important to the plot:

> R: Why'd [the firefly] go up to the lightbulb?
> Chris: Because…because (unintelligible). It wasn't a lightbulb.

and

Chris: He's thinking it was a lightbulb.

R: But did he know that at first?

Chris: No response.

Dylan: 4 Years, 9 Months at Start of Study

Dylan chose to participate in his sessions, yet he didn't seem to take much joy in the experience. He followed directions and focused on the texts, though sometimes there were awkward moments of silence when he didn't respond to a question or continue a pretend reading already in progress. Sometimes Dylan would state that he didn't want to "read." In these exchanges, he asked the researcher to "read," and then he would listen attentively and even engage in dialogue. Dylan asked the researcher to not only read the books with words but also the first reading of the wordless *Pancakes*. He bounced back in the second reading however, reaching for the book and stating, "I want to read it." By the third reading, he simply commenced telling the story from the pictures without any requests to do so. Dylan's request that I tell the story in the first reading of *Pancakes* could have been due to lack of familiarity with a wordless book and/or the dialogic scenario of study sessions. Based on variant performances such as his sessions for *Pancakes*, I attributed Dylan's refusals to construct the story throughout the study to a lack of engagement, not an internal tension between seeking meaning from print versus pictures. Furthermore, though Dylan's syntax was typical for his age, his verbalizations had a dispirited quality, making them difficult to understand among the din of classroom noise.

Dylan's emergent literacy behaviors. Dylan knew that the cover announced the title and that pages are turned from front to back. However, Dylan naively claimed that "everything

turned yellow" upon seeing the blank yellow end pages of *Duckling*. Dylan did not yet read conventionally. However, he demonstrated concept of word even when he was prompted to look at the pictures in the low-word-count text *Duckling* [R: There's no words. Can you tell me this story from the pictures? Dylan: "There is words!" (pointing to "*Early one morning"* on page 1)]. As he read *Duckling*, Dylan pointed to the sentence and requested to be told what the text said. Upon being told, he repeated the interrogative refrain "Have you seen my duckling?" or a paraphrase of it as part of his storytelling - when that phrase appeared. He also intuited that this text was a refrain; he did not ask what the text on each page said but instead proceeded as if he had the information he needed. In sum, his awareness that meaning comes from print was in workable harmony with his ability to tell the story from the pictures. His picture reading was mostly in short sentences that conveyed the main action of the scene (e.g., "She woke up") but also frequently included concern for the internal states of the characters that drove the plots (e.g., "She wanted to make pancakes.")

Dylan's emergent comprehension. Across repeated readings, Dylan's renderings remained the same or increased in sophistication. However, Dylan's low tolerance for playing the role of reader in the sessions precluded the posing of many questions during and after reading. Dylan was the only participant who recognized the characteristic work of children's author and illustrator Eric Carle, and he relied on this early author schema to relate *Firefly* to *The Very Hungry Caterpillar*, another popular picture book by Eric Carle. Dylan spontaneously used storybook language such as "One day there's a little house" to start his storytelling for *Pancakes* and "the end" to conclude it. He also used the phrase "and then" to connect actions across pages.

Dylan knew that the errant duckling was hiding on each page, that the firefly was looking for other fireflies, that the bird made it home to the nest safely, and that the little old lady finally

got to eat pancakes. Dylan grasped the gist even when singular propositions escaped him. For example, he originally thought that all the characters in *Duckling* were asking "Have you seen my duckling?" In the same reading where he expressed this idea, however, he also accounted for the fact that the duckling was indeed purposefully hiding. Incomprehension of a proposition did not prevent him from grasping the gist. When he wanted to listen to me read to him without any dialogue, I was less able to assess his understanding of specific plot points and devices.

Dylan's emergent metacognition. Dylan had a complicated metacognitive profile. Though he had metacognitive data in all categories except *Expanding Storytelling*, and the highest percent of spontaneous metacognition, he was not the most metacognitive about making meaning from study texts. Dylan's emergent metacognitive profile exemplified how verbal data is an imperfect medium for the reporting of mental processes, especially for novice readers and communicators. Dylan's high percentage of spontaneity co-occurred with a lack of verbalizations; neither finding can be assumed to indicate a lack of thought. A comparison illustrates this point; Bert's low percentage of spontaneous metacognition was most likely due to his quiet personality and not a lack of metacognitive capacities. Dylan's spontaneity cannot be inferred to represent above-average metacognition, as he expended much of his metacognitive efforts on abdicating his role as an active participant in joint reading and transferring the responsibility for storytelling back to the researcher.

Reflecting on Reading. Dylan had 14 instances of *Reflecting*, in all books except the wordless *Pancakes*. Eleven of these came from his interest in the large, simple refrain of *Duckling*. Overall, Dylan knew that reading is about making meaning, and that meaning can come from the printed text, illustrations, and/or thoughts from within. Dylan used the term "reading" to refer to the variable mental work of meaning-making: telling the story from the

pictures, reading printed text, and even answering questions about the book. Whereas Dylan's preferences for *who reads* were coded as *Planning*, his multiple requests to be told *what the text said* were coded as *Reflecting on Reading*. *Reflecting* concerned what he thought reading was, what a reader should do, and how that text should be read as distinct from controlling *who* did this work. Dylan's 11 *Reflections* during *Duckling* varied. In the first and third readings, he constantly asked what the text said, though the text says the same thing on each page once past the introductory "Early one morning…" In his second reading however, Dylan actually did something with his *Reflections*. He requested to know what the titular refrain said, internalized it upon being told, and repeated it verbatim or in a paraphrased form in subsequent storytelling. Dylan also expressed a different dimension of *Reflecting* in his third reading of *Firefly*, wherein he spontaneously articulated his emerging author schema for Eric Carle. The following exchange exemplifies this form of active, self-reference to his inner world while reading:

> R: Did you like that book?
> Dylan: [Nods yes.]
> R: Why?
> Dylan: I saw the little caterpillar on Netflix.
> R: It's the same author; his name is Eric Carle. He wrote The Very Lonely Firefly and The Very Hungry Caterpillar.
> R: What happened in The Very Hungry Caterpillar?
> Dylan: He ate food, and he turned into a butterfly.
> R: Is he (pointing to firefly) going to turn into a butterfly?
> Dylan: No.

Dylan did not confuse the two books; rather, he recognized a common format from the same author. This spontaneous connection from his long-term memory also indicated that Dylan

was actively listening and tacitly participating, even when being read to because he didn't "want to read."

Feeling of Knowing. Dylan had two instances of *Feeling of Knowing*. Both occurred while reading *Firefly* and one was prompted and one spontaneous. Though the text and illustrations in all study texts likely posed some moments of not knowing, participants could choose a variety of mental processes to cope with that challenge. In *Duckling*, Dylan called a pictured boat dock a "bridge" and a "house" —presumably because he didn't know what a dock was. His lack of hesitation or delay in using these terms as part of his storytelling suggested that he was not aware that he did not know what was pictured or did not know the term "dock." Either way, he did not stop to ask. Dylan's two *Feelings of Knowing* concerned not knowing which firefly was the titular lonely firefly and a plot point from *The Very Hungry Caterpillar*. Dylan's spontaneous *Feeling of Knowing* concerned the stylistic visuals of Eric Carle:

> Dylan: (pointing to a firefly in a group of identical fireflies on pages 25-26) Is this the lonely firefly?

Dylan's prompted *Feeling of Knowing* concerned his own memory of related content:

> R: What happened in *The Very Hungry Caterpillar*?
> Dylan: He ate food and he turned into a butterfly.
> ….
> R: Why did [he] turn into a butterfly?
> Dylan: I don't remember.

In the first example, Dylan made the rare extra effort of asking what something was because he didn't know and wanted to know relative to his own desired level of understanding. It was not clear how these metacognitive behaviors affected his comprehension, though these instances provided evidence that Dylan did have some form of active working concept of knowing and understanding as relevant to reading a book.

*Judgment of Difficulty***.** Dylan often lost patience for the reading sessions, regardless of the book. Dylan was typically ready to change activities quickly when the book was over or announced that he was done as soon as we finished the last page of the book. To not keep him longer than he wanted to be there, I chose not to pose the *Judgment of Difficulty* prompt in seven out of 12 opportunities. However, Dylan did provide a categorical response each of the five times that I did pose the *Judgment* prompt, three of which he explained further. Two of his explanations referenced specific story content, and one referenced the size of the pages. In this example from his third reading of *Mother*, Dylan provided a plot point that was not accurate as spoken but may simply indicate pronoun confusion. However, since I perceived that he was not interested in conversing further, I did not seek clarification:

> R: So, was that easy, medium, or hard?
> Dylan: Hard.
> R: Why was it hard?
> Dylan: 'Cause she was trying to find him.

Being able to pose the *Judgment* prompt at the end of each reading allowed for comparison across readings. For his first reading of *Firefly*, Dylan claimed that the book was of "medium" difficulty because "the pages were all big." At the end of his second reading, however, Dylan claimed that the book was "medium" because "the firefly was there."

Various factors such as interest, familiarity, layout, and content can affect the difficulty of a text and/or task for conventional readers, and it appears that Dylan's sense of difficulty was affected by at least three types of factors—story content, physical layout, and his memory of relevant information.

Task-Related Planning. On 12 occasions, eight of which were spontaneous, Dylan made a conscious choice about how he wanted to interact with the storybook. Though these exchanges

were not necessarily profound, they were conscious and articulated decisions about whether and how to start, stop, or proceed through a task backed up by behaviors. Thus, they were a form of meta-control of cognitive effort which matched his mood and energy level. For example, he asked me to "read" if he didn't feel like saying anything. He would variably insist that he be allowed to "read" when he felt like it. His *Planning* suggested a form of assertive self-management concerning how he wanted to interact with the study texts. These instances also suggest that he felt comfortable with doing more than just responding to what was in front of him; he expressed preferences for how to participate in a book reading experience, even variable preferences within one reading session.

Verbal Self-Revising. Dylan had nine instances of *Self-Revision*, which represented nascent self-monitoring. All were spontaneous but were limited to *Mother* and *Pancakes*. In the below example from the third reading of *Mother*, Dylan's simple verbal self-correction suggested that he had a representational mental intention as to what to communicate; if he misspoke, he wanted to correct himself:

Dylan: He said to a kitten "Where is my ... are you my Mother?"

In his third reading of *Pancakes*, Dylan insisted on correcting his storytelling and backed up his verbalizations with a reexamination of the text:

R: How do you know she needed syrup? It's not like she told you.
Dylan: I mean it's cat, I mean she needed milk.
[Dylan flipped back one page to where he had claimed she needed syrup to say the correct line for that page (in terms of what he thought it was) even though he already mentioned his mistake.]
Dylan: She needed milk, so she milked the cow.

In his second reading of *Pancakes*, Dylan yet again corrected himself, this time using the word "accident" to label his behavior:

Dylan: She needed syrup. I said butter by accident.

Expanding Storytelling. Although Dylan's nine instances of revising showed that he was willing and able to revisit his stream of verbalizations, *Expanding* storytelling across distinct sessions may have posed a different type of challenge. Dylan may have provided more correct information on subsequent readings, as shown in the example below, but he did not have clear instances of metacognitive *Expansion of Storytelling*. In his first reading of *Duckling*, Dylan erroneously claimed that all the characters were asking where the missing duckling was. However, in his second reading, his response to my question showed corrected - but not necessarily expanded - understanding:

Dylan: Have you seen my duckling?
R: Yeah, who said that?
Dylan: The mudder duck.

It is not known if Dylan had any conscious connection whatsoever between his first claim concerning this matter and his second; therefore, it cannot be coded as *Expansion*. The metacognitive nature of *Expansion* does rest upon the reader's capacity for growth. However, not all growth is known to occur for metacognitive reasons. Dylan learned or realized; he was wrong one time and right the next. He changed his reading, even if he could not discuss doing so.

Justifying Verbalizations. Dylan was not always willing or able to provide a justification in response to a prompt to do so. Dylan had three *Justifications*—two from *Mother* and one from *Pancakes*. For example, in his first reading of *Mother*, Dylan justified his answer without hesitation by referring to specific facts from earlier in the story:

R: So, all these animals are not his Mother. How do you know he has a Mother?
Dylan: ‘Cause he hatched from her egg.

In his second reading of *Pancakes*, Dylan rooted his justification in self-reference:

R: (starts the session with the book on page 1) What happens at the beginning of the story?
Dylan: She was gonna make pancakes.
R: Really? How do you know that?
Dylan: I read (present tense) the book before.

The examples above represent high confidence coding, wherein Dylan’s data appears to match what he was really thinking. However, one of his three *Justifications* (on page 4 of his first reading of Mother) had to be coded with lower confidence due to a lack of specificity:

R: How do you know that’s the mommy?
Dylan: In the picture.

In addition to ignoring five prompts for *Justification* throughout the study or not providing expected specificity, some of Dylan’s responses to this prompt did not even meet the threshold for a low-confidence coding and were therefore excluded. For example, during his third reading of *Pancakes*, Dylan’s use of the metacognitive term *know* had to be excluded from consideration as an instance of *Justification* because of the generality of his verbalization:

R: How did you know she needed butter?
Dylan: ‘Cause I know.

Theory of mind and metacognitive language. Dylan used varied metacognitive language, such as “dream” and “know,” across reading sessions. For example, in his third reading of *Pancakes*, Dylan spontaneously said that dreaming occurs in the brain and is represented by the

text feature of thought bubbles. Dylan seemed to use these words knowingly, in a manner that showed he understood a character's thinking and feeling as distinct from his own.

> Dylan: And she was sleeping. Then she woke up. Then she was dreaming about pancakes.
> R: You said she was up then you said she was dreaming about pancakes.
> Dylan: Yes.
> R: Show me where she's dreaming about pancakes.
> Dylan: (Points to thought bubbles.)

While reading *Mother*, Dylan replied that the kitten was thinking "That's a baby bird" and that he was thinking about the baby bird's "mama." Dylan provided both of these answers in the midst of turning the page, indicating that they seemed to come from his internal stream of thoughts. Dylan accounted for the perspective of various characters. For example, he easily switched between speaking as the mother bird at the beginning of *Mother* and then speaking as the baby bird once the mother left the nest. Dylan showed proficiency with false belief by recognizing that the duckling was hiding from his family even though the character of the mother duck did not know that.

Erin: 4 Years, 1 Month at Start of Study

Erin was an eager reader who enjoyed putting words to pages. She enjoyed storytelling for its own sake but was quick to express her desire to return to free choice centers when the story was over. Erin mixed colloquial expressions such as "lil" for little with more impressive expressive vocabulary for her age such as "supposed to" and "eighth". She did not read conventionally, but she did identify letters, words, and sentences. For example, she correctly named the letter *F* on the labeled bag of "Flour" in *Pancakes for Breakfast*. Erin attended to print and often used a finger to trace sentences with a left to right sweep, but not with one-to-one

correspondence. When she spontaneously requested to "read," she would perform finger sweeps of text versus telling the story from the pictures. She was equally adept at constructing the story from the pictures, though she did not refer to this behavior as reading. She was a prolific pretend reader and often embellished her re-enactments by acting out imagined dialogue representing the perspectives of multiple characters in a scene and inserting stress and tone to communicate meaning. It was easy to understand Erin, even though her age showed through with expressions such as "bittle" for little and "wibbled" for wiggled. She typically spoke in full sentences, corresponding to her rendering of full scenes, and often used speech connectors such as "so" and "then." She also used storybook language such as "the end."

Erin's emergent literacy behaviors. Erin had no problems handling a book. On her first reading of *Pancakes*, she even took the initiative to confirm that she did not have to account for the content on the copyright pages [Erin: (pointing at print on the copyright page facing page 1) This one's not for you to read? When told no, Erin moved on to page 1.] Erin understood that she could exert control over the joint reading task, and she frequently made spontaneous requests to only read certain parts versus the whole book. Erin was distracted by the camera, but when she was engrossed, she provided compelling verbal data. Erin knew that her words were interesting to the researcher, and she treated the reading sessions as a favor and a duty that she sometimes enjoyed doing.

Erin's emergent comprehension. Erin recognized the gist of each story and focused on main ideas. For example, very early in her first reading of *Duckling*, Erin spontaneously stated a main idea that drives the plot: "Mommy duck came and saw one duck was missing." The only text she had heard at that point was the title, *Have You Seen My Duckling*?, and "Early one morning." She denied prior familiarity with the text. Later in her first reading of *Duckling*, Erin

independently offered another macro level idea that drives the plot: "They swim by and they saw the other baby duck, but the mommy *couldn't* see her." Since the plot of *Duckling* rests upon the *Mother* duck's limited knowledge about the location of her duckling hiding nearby, Erin also communicated her proficiency with the false belief aspect of theory of mind required to truly understand the plot.

Erin applied her world knowledge and vocabulary to accurately name the objects in the stories or to provide reasonable mistaken names. For example, Erin fluently used the animal names that she knew to name the pond animals in *Duckling* (e.g., toucan and catfish). Though a toucan belongs in a different ecosystem, Erin's use of this specific word can be taken as evidence of active application of world knowledge. Constructing the story in the wordless *Pancakes* gave Erin an opportunity to say that a character was "disappointed" and that unknown people were the little old lady's "neighbors." In *Mother*, she spontaneously used terms such as "wiggled," "zero," and "towards."

However, even though Erin grasped the main ideas and often checked to be sure of her claims, she still had some uncorrected misconceptions. For example, in *Duckling*, she did not recognize that the errant duckling returned on pages 20-21. Despite this mishandling of one critical proposition, she still articulated that the story ended with a predictable family reunion. This finding suggested that story grammar may have been a scaffold for Erin, though in this case it seemed to lead to a rhetorical statement versus evidence of comprehension of each proposition that led to the story's outcome. Additionally, in the second reading of *Duckling*, Erin contradicted herself by saying that the runaway duckling never made it home (2nd reading) and then that he made it home by sneaking back with the group (3rd reading). I did not cue Erin to

change her mind; the prompt that led Erin to provide the correct information in the final reading was "Speak up so I can hear you."

Erin made reasonable inferences that enhanced her story construction and comprehension. For example, she assigned reasonable emotional states to characters, including "worried," "scared," and "sad." Erin used inferences to fill in gaps and thus create a holistic story. When asked to explain the problem at the conclusion of *Pancakes*, Erin replied that the little old lady scrambled the eggs for too long. The problem was actually that the little old lady's pets ruined her assembly of ingredients to make pancakes. Erin's reply was incorrect yet coherent.

Erin's emergent metacognition. Though one of the youngest participants, Erin was quite metacognitive. Her ease with talking and with switching modes from joint book reading to joint book discussion may have enabled her to not only be more metacognitive but also communicate her metacognition. Though Erin was both communicative and metacognitive, she was not necessarily verbally sophisticated. Through the joint reading methodology, she evinced metacognition through her everyday discourse.

Reflecting on Reading. Erin had five spontaneous and one prompted instances of *Reflection*. For example, during her third reading of *Pancakes*, Erin indicated that she forgot the word "cookbook," and asked for the word. She was reflectively aware that she forgot a word she knew (Erin: I mean... ughh...what's that called again?). She knew that she knew the word but couldn't produce it at that moment. This example is akin to an adult reporting having a tip of the tongue moment, one of Flavell's (1979) classic examples of everyday metacognition.

Feeling of Knowing. Erin was actively concerned with whether she knew important information or aspects of the task. She had both spontaneous and prompted *Feelings of Knowing*. She did not hesitate to ask what a pictured object was or what the text said. In her second reading of *Pancakes*, she asked about whether she should attend to the copyright page, also the start of the pictures that tell the story. While reading *Duckling*, she said that the ducks swam "toward the thingy – whatever you call it …" (a boat dock).

Judgment of Difficulty. A *Judgment* prompt was planned for the end of each reading. However, due to the child's perceived stamina for that session, the prompt was not always given. Erin was prompted to make a *Judgment of Difficulty* for each text except *Mother.* Out of four prompts, Erin replied twice, both times indicating that the *Firefly* and *Duck* books were "easy." After her second reading of *Firefly*, Erin explained that it was easy "because I know the way it goes." This reasonable reply contrasted with how she responded to the *Judgment of Difficulty* prompt in the first reading—by estimating the length of the book cover in inches.

Task-Related Planning. During the first reading of *Mother*, the longest book in this study, I requested that Erin tell the story from the beginning. Erin countered with "It's going to take too long. I like this part" and turned to pages 20-21 (the scene where the baby bird unknowingly walks past his *Mother*). Erin, who generally relished reading with the researcher, was cajoled into some dialogic reading from the beginning. However, aware that she did not have the patience on this day to cover the remainder of the book page by page, she spontaneously requested: "How 'bout we go to the end, so it can be quick?" This incident also indicated task awareness and an awareness of a story as comprised of a beginning, middle, and end – both physically and in terms of content.

Verbal Self-Revising. During the third reading of *Are You My Mother*, Erin announced for pages 42-43 "Are you my air…I was about to say, 'Are you my airplane?'" Erin chuckled at her mistake and restarted her storytelling with "Are you my mommy?" Through repeated readings of *Are You My Mother?* (pages 20-21), Erin exhibited a more nuanced form of self-correction that can occur over time as the child has more opportunity to approximate what the author intended. In her second reading, she nodded affirmatively in response to my question to indicate that the baby bird knew what his mom looked like. In contrast, her response to this question during the third reading showed an expanded and more nuanced interpretation of the story:

> 2nd Reading
> R: Even if he could see her, does he know what she looked like?
> Erin: [Nods yes.]
> R: He does?
> Erin: [No response.]
>
> 3rd Reading
> Erin: …he couldn't see him – her– because he was behind this plug rock (taps rock)
> R: Does he know what she looks like?
> Erin: No.
> R: Why not?
> Erin: Because he haven't seen him [her].

Expanding Storytelling. Fewer than half of participants engaged in true metacognitive *Expansion*; Erin was one of them. Erin's *Expansions* involved spontaneously adding more details to her story constructions. The details she added were meaningful and accurate but not necessarily profound. For example, in a subsequent reading of *Mother*, she added that the car was "broken." The fact that the car appeared broken helped to explain why it was stationary in a field. Also, though the setting of the book was modern enough to feature a jet plane, the car was antique. Since I did not cue the participants to tell me more, I interpreted Erin's two spontaneous

Expansions as evidence that she became increasingly engrossed in the story across readings due to some internal drive to know, understand, integrate, and explain more.

Justifying Verbalizations. In her second reading of *Mother*, Erin volunteered information in the second sentence to explain the first: "Yeah, and he's scared of the boom. *Because he's a baby*." This unique spontaneous justification provided the same content that would have been sought by the *Justification* prompt "Why do you think that?" The rest of Erin's Justifications were in response to my prompts. For example, in her second reading of *Duckling*, when asked, Erin articulated why she counted the ducklings in the pictures:

> Erin: Mommy ducking came … and she … counted 1,2,3,4,5,6,7 and the eighth is gone.
> R: The eighth one is gone?
> Erin: Uh-huh. [Erin counts again to confirm.]
> Erin: Yes.
> R: How'd you know how to count to figure out who was gone?
> Erin: Because - if I say the number, I try to count, so I can know if it's right.

In her third reading of *Pancakes*, Erin explained, in response to my inquiry, that she makes up the words in her brain. In the two prior readings, I had simply asked her to tell me the story. In the initial reading, she focused on the lack of words. In the second reading, she accepted the task of making up the words. In the third and final reading, she gave the following metacognitive explanation of how she knows what to say to tell a story without words:

> Erin: I'm gonna make up my words now.
> R: You're gonna make up your words now?
> Erin: Yeah, because there's no words.
> R: Now how do you know what words to say, though?
> Erin: I just think of them in my brain.

Theory of Mind and Metacognitive Language. Erin masterfully communicated the false beliefs essential to story plots. In *Duckling*, Erin correctly answered that the other ducklings did not know the whereabouts of the missing duckling and that the *Mother* just wasn't looking where he was hiding. In *Firefly*, Erin spontaneously communicated the essential false belief through these scene-level page renderings from her first reading: "Is that a firefly? No, that's just a light." And "Is that a firefly? A very lonely firefly? No, that's just a candle." These readings, not from rote memory of the printed text, were triangulated with her macro-level response during this exchange from page 3 of the second reading:

> R: Anything you want to add?
>
> Erin: He thinks some of these lights, um, are the um, fireflies, but they're just some others, but then he found the firefly.

This exchange also exemplified her use of metacognitive language – "*think"* – to convey a theory of mind concept.

In her third reading of *Mother*, Erin explained the limited perspective of the baby bird:

> Erin: He looked right past his Mother.
> R: Why?
> Erin: Because, he couldn't see him – her- because he was behind this plug rock (demonstratively taps picture of rock).
> R: Does he know what she looks like?
> Erin: No.
> R: Why not?
> Erin: Because he haven't seen him.

Revisiting this vignette illustrated Erin's reliance on her developing theory of mind and false belief capabilities to attain comprehension of this narrative. Erin had to integrate

information that was spread across multiple pages and then rely on this insight to arrive at her answer. Holding this information in mind should help any reader of this story better understand the obstacles to goal attainment that the baby bird faced. In sum, this relatively small answer indicated a larger amount of comprehension processing than what is expressed on the verbal surface. This vignette illustrated that young children may be thinking much more than is expressed in any one answer.

Erin correctly interpreted the first thought bubble in *Pancakes* but not the second. Again, she used the term *think* in conjunction with her expression of theory of mind through the first thought bubble:

> Erin: She was thinking about pancakes!
> R: How'd you know she was thinking about pancakes?
> Erin: [Taps thought bubble.]

Erin used the most and the greatest range of metacognitive language in the wordless *Pancakes*, to both tell the story and to report on her storytelling processes. For example, she spontaneously stated that the little old lady "decided" that she would make pancakes. She also explained that she "mixed up" when she made a mistaken verbalization, said "I mean" when correcting herself, and explained that she "forgot" what the cookbook was called. These instances of metacognitive language were associated with the cognitive function of storytelling and the metacognitive functions of *Reflecting on Reading*, *Self-Revising*, and *Feeling of Knowing*.

Erin responded to one open-ended thinking prompt by confirming her thorough and nuanced understanding of the plot of *Firefly*. Her response, which is an accurate and integrated relaying of the plot line in her own words, suggested that open-ended thinking prompts facilitated comprehension processing just as well as comprehension questions:

> R: I'm thinking in my head "He's flying around by himself!" What are you thinking?
> Erin: I'm thinking the sun's going down and he comes out at night and he doesn't see nothing and there's no fireflies for him to play with.

Fiona: 4 Years, 1 Month at Start of Study

Friendly and agreeable, Fiona politely agreed to attend all reading sessions to which she was invited. However, she often invited her close friend Gabby to accompany her. Though Fiona willingly participated in the reading sessions, it seemed that her inexperience with the dialogic format may have limited her output. Her syntax was often immature and non-standard, yet her verbalizations were still logical and interpretable. For example, "And then she maked pancakes" was easily understood to mean "and then she made pancakes." Her verbal output also hinted at connections between syntax and comprehension; she used the conjunction "and" to connect discrete ideas in her storytelling versus integrating ideas into a more complex sentence that would relay a scene (e.g., Fiona: There's the pancakes and she's wanting to eating them).

Fiona's emergent literacy behaviors. Fiona handled books properly but not necessarily efficiently. She turned the pages front to back at a leisurely pace. Fiona was not yet reading conventionally, and she displayed inconsistency in her concepts about print and words. *Pancakes* features a cookbook with an actual pancake recipe and several labeled objects, such as a bowl labeled "eggs" and a sack labeled "flour." Fiona recognized that the cookbook was a book, but she did not show any concern for the abundant labels or letters. However, when introduced to *Mother*, Fiona showed concept of print by pointing to the title on the cover and announcing, "It says 'Are You My *Mother*?'" She did not hesitate to tell a story from the pictures, though her verbal data did not always provide detailed information, such as seen in her first reading of Pancakes when she said, "And she's making it and making it and making it."

Fiona's emergent comprehension. Fiona's storytelling varied within and across readings. She frequently labeled discrete elements or actions in the illustrations (without any sense of a uniting story structure) and then suddenly articulated the gist or otherwise engaged in

talk that was semantically connected across discrete scenes or pages. Fiona represented dialogue between characters and used the connecting phrase "and then…" to connect her rendering across pages. Fiona struggled with misconceptions and lack of available background knowledge to make complete sense of study texts. For example, she initially claimed that the nocturnal firefly goes to sleep at night and that the old car in *Mother* was a "tractor." She never figured out that the little old lady was making butter in the churn or more globally that she never successfully made pancakes. Had she been tasked with multiple choice comprehension questions about these matters, she might have performed very poorly. Her difficulty with details could have functioned as impetuses for *Expansion* or *Verbal Self-Revision*, but they typically did not. Instead, they remained discrete points of incomprehension that did not prevent her from grasping the gists and formulaic endings—that the little old lady did eat pancakes (even if she did not make them) and that the unknown vehicle was one more thing that was not the baby bird's mother (whether it was a car or truck). Since comprehension of the gists did not rest on mastery of each detail, Fiona's story renderings were not deterred by her areas of weaknesses. However, Fiona's difficulties with details appeared to create missed opportunities for metacognition to enhance her story renderings and comprehension.

Fiona often coped with the content of texts and tasks by referring to her personal schema. For example, to start the initial reading of *Firefly*, I told her that "This is a story about a lonely firefly. I wonder why he's lonely and what he will do about it." Fiona immediately provided the autobiographical explanation that the firefly was lonely because "his mom and sisters are going to work and they're going to school." She also showed a nuanced appreciation of a hard-working mother's perspective, claiming that the mother bird falls asleep at the end of the long

ordeal in *Mother*. This approach also allowed her to add value through the following inference made about the internal state of the mother bird in her third reading of *Mother*:

> Fiona (spontaneously launching into pretend reading immediately upon sitting down): Here's the egg and she's waiting for a crack.
>
> R: How long has she been waiting?
>
> Fiona: A long time.
>
> Fiona: She's sad and she's really mad and it's not cracking.

Fiona's active reliance on her personal life experiences, what might be called text-to-self connections for conventional readers (Randi, Grigorenko, & Sternberg, 2005) showed active and constructive responsiveness. She did not passively observe text; she actively applied what she could to make sense of the story. Fiona's response to an open-ended thinking prompt posed after the opening exposition of *The Very Lonely Firefly* corroborated this interpretation:

> R: I'm thinking in my head that …he [the lonely firefly] can't live all by himself. What were you thinking about?
>
> Fiona: I was thinking about my family.

Fiona's story renderings while interacting with the wordless book *Pancakes for Breakfast* provided more examples of her active and constructive creation of a mental model of the text. *Pancakes* is a wordless book; no refrains restate macro-level information. The main character never says, "I'm so frustrated because I can't make the pancakes that I want for breakfast." A lack of words lessens the likelihood that participants could pretend read from their memory of an adult reading the text. This reality lends credence to the idea that statements of macro-level information would have to arise from a mental model of the text based on some understanding of the gist. During her third reading of *Pancakes*, Fiona exemplified this idea when she stated that the little old lady "wants to eat breakfast with pancakes after bedtime" while viewing the

opening scene of a cabin in the woods. Memory of prior joint readings could not explain this result, as the three ideas embedded in Fiona's statement were spread across pages and were never presented as a unit. Fiona processed them into a unit as she built her mental model of the text.

Though Fiona showed evidence that she was actively seeking to understand the stories, her capacity for expressing inferential understanding was inconsistent. Her responses to comprehension questions indicated straightforward, concrete understandings of textual content. Fiona's orientation towards the concrete was illustrated in this example of her explanation of what *Pancakes for Breakfast* is all about:

> R: Do you remember Pancakes for Breakfast?
> Fiona: Yes.
> R: What's it about?
> Fiona: Pancakes.
> R: What about pancakes?
> Fiona: You eat them. For breakfast.

However, when asked *how* the little old lady obtained pancakes, Fiona offered the reasonable inference that "Gramma" and "Papa" provided them. Additionally, Fiona sometimes inferred incorrect information to convey a holistic scene (e.g., *She's shaking it and putting frosting in there*.") Through this particular study design, there was no way to know if Fiona was not making inferences when she should have or if she did not think that inferential information was what was expected in response to certain comprehension questions.

In conclusion, evidence of story comprehension was not consistently related to the verbal sophistication of the story rendering. Similar to her age-peer Gabby, when Fiona failed to understand, it was not due to her inability to recognize whole scenes, verbalize connections across pages, or engage in monologic storytelling. Comprehension failures appeared to be a function of the various reasons at the root of conventional readers' comprehension problems:

missing or poorly activated schema, a failure to focus on what is most important, or an inability to simultaneously weigh multiple pieces of information (see Baker & Brown, 1984).

Fiona's emergent metacognition. Fiona was a novice preschooler with pre-conventional grammar. She never articulated the false belief structure at the root of the plots of *Firefly*, *Duckling*, or *Mother*. She was, however, metacognitive in multiple ways and at multiple moments. I identified 28 instances of metacognition across Fiona's reading data, 17 of which were spontaneous. Though 28 is a meaningful number, it is important to also note that Fiona had more than 28 opportunities to be metacognitive. Fiona often responded to metacognitive questions with "I don't know." I interpreted these responses as a deflection of prompted introspection and not mindful statements of *Feeling of Knowing*. Multiple limitations may have constrained Fiona's ability to comfortably report on her understanding and her understanding of her understanding. These included lack of familiarity with the type of dialogue in the reading sessions and perhaps lack of experience with extended verbal expression of her ideas. Despite these, Fiona had 28 compelling moments of metacognition, mostly due to her *Expansions of Storytelling* in second and third readings. These not only added more details, but also conveyed increasingly macro-level integration of information.

*Reflecting on Reading***.** Fiona did not seem inclined towards reflection on herself as a reader or reading as an experience. For example, when asked "Does this little old lady make you think about anybody?" Fiona simply replied "No." When I asked her what she thought about the little old lady who wanted pancakes, Fiona replied that "She wants to eat them for breakfast." Requests for reflection, like comprehension questions, returned concrete responses that did not transcend the text or the content of prior discussion.

Feeling of Knowing. Fiona had one spontaneous and two prompted *Feelings of Knowing*. Based on her emergent literacy profile, I suspected that Fiona might not know some content featured in the stories. As discussed earlier concerning her difficulty with accurately naming pictured details (e.g., car vs. truck), she fulfilled this presupposition. Concerning *Feelings of Knowing*, Fiona did not spontaneously express her internal condition of not knowing what she needed to know. In other words, in contrast to Erin, she did not make meta-level statements about her struggle with details. She did not articulate that she did not know certain details and that this reality was affecting her reading experience. It is possible that the novelty of both task and text consumed all of Fiona's mental resources, which meant that she might not have been aware that she did not know or that she was unable to discuss this experience. During her 2nd reading of *Pancakes*, Fiona gave a response to a *Feeling of Knowing* prompt that exemplified her tendency to deflect additional processing by stating that she didn't know, as opposed to articulating the fact that she didn't know or spontaneously offering a reasonable guess:

R: So, what came out of the big wooden thing? [a butter churn]
Fiona: I don't know.
R: What's that stuff? (indicating yellow butter)
Fiona: Oil.

Oil is a reasonable guess for butter; it is yellow and is often used in the process of making pancakes. However, Fiona required an additional prompt to share that she was thinking that it could be oil. This example might indicate that Fiona was not comfortable with devoting internal attention to or discussing *Feelings of Knowing*.

Judgment of Difficulty. Fiona rated *Pancakes* as "hard" because, in her words, she didn't "know how to read." This response is interesting for a wordless text and may indicate her newness to the task of joint meaning making. Due to perceived exertion, I did not prompt Fiona

to provide a *Judgment of Difficulty* at the conclusion of each reading. However, for the two additional times that she replied and explained her Judgment, she rated the second reading of *Firefly* as "not hard" and the third reading as "a long book." This final original response lends credence to the assumption that Fiona was expressing her true opinion; it was not an arbitrary or mimicked response.

Task-Related Planning. Fiona did not exhibit planning behaviors. Since one can participate without planning, this finding does not necessarily indicate that she was less interested or less invested in the reading sessions. However, a lack of Planning is consistent with an inability or a preference not to engage in a meta-level of processing if it was not necessary or interesting at the moment.

Verbal Self-Revising. Fiona did not demonstrate a proactive commitment to resolving unknowns or contradictions and rarely revised her statements. She did have two instances of *Verbal Self-Revising* throughout the study. During her third reading of pages 21-22 of *Firefly*, she prematurely claimed "He found his family!" Realizing that she spoke a few pages too soon, she stared and pointed at the fireworks contemplatively before offering "Not yet." During her third reading of *Pancakes*, she also revised herself:

Fiona: You need eggs too, because that's what goes in eggs.

R: OK

Fiona: I mean pancakes.

However minor, these two spontaneous instances of revision indicated self-monitoring and at least some extra capacity to recall, discuss, and revisit her prior efforts. I did not prompt Fiona to revise herself due to concern that she might be overwhelmed by this task or feel that her rendering was somehow being discounted.

Expanding Storytelling. In some ways, Fiona's reading of *Pancakes* became more sophisticated over time. Once, I attributed this change to an elaborated mental model that she tacitly *Expanded* upon. Other elaborations added details but for unknown reasons. Her first reading of pages eight to nine of *Pancakes* yielded the isolated and disjointed comment "There's chickens in the coop." However, her second reading of these pages yielded the fully explanatory "She had to get eggs from the farm to make pancakes." Her change was not prompted; I never asked participants to speak in full sentences. Her variable performance could be described as becoming more oriented towards macro-level information. Overall, subsequent readings matched or exceeded the sophistication of prior ones, by either providing more plot-dependent details or by expanding from discrete labeling to scene-level re-enactment.

Justifying Verbalizations. Fiona did provide *Justifications* for statements she made during the reading sessions, although these tended to be of a lower quality. When she did justify an answer, her justification was limited and concrete or reliant on her constant internal stream of thought about family and togetherness. In the excerpt below from her second reading of *Firefly*, Fiona responded to a *Justification* prompt by referring to themes of family life. Though her statement is not inaccurate, it reflects a failure to account for the immediate internal motivation of a story character pursuing its goal. However, it explained why she answered the way she did; she reported the contents of her mind:

R: Where's the lantern?
Fiona: *Right here* (points to lantern).
R: How'd you know that was the lantern?
Fiona: *'Cause he wants his family.*
R: 'Cause he wants his family?
Fiona: *Yes.*
R: Why'd he go up to the lantern?

Fiona: *'Cause he loves his family so much.*

Theory of Mind and Metacognitive Language. Fiona spontaneously offered that the content of a thought bubble represented the little old lady's thoughts. Fiona also used the metacognitive terms "think" and "decide" spontaneously in her constructed reading of the pictures of *Pancakes*. For her first reading of page 4 of *Pancakes,* Fiona offered "And she decide to put that on (the apron) and she maked and maked it." During her second reading, when confronted with the little old lady's struggle to churn butter (page 16), Fiona offered the following integrative explanation that alluded to the fundamental tension of the plot: "And then she tiny little mess. I think she couldn't do it." For Fiona, unsophisticated sentences co-occurred with use of more advanced terms such as "decide" to convey the internal motivation driving the little old lady's actions and tying them together. Fiona's use of metacognitive terms to account for the internal states of characters helped her to relay the narrative structure of the story. To triangulate my interpretation of her verbalizations as true appreciation of characters' internal states, I asked Fiona what the little old lady was thinking. Fiona's reply of "She want pancakes" corroborated that she used metacognitive terms to articulate internal states of the fictitious characters as she read about them. Her pre-conventional sentences and picture labeling behaviors contrasted with her moments of metacognition, nuanced storytelling, use of metacognitive language, and her working theory of mind. Though Fiona showed developing theory of mind, she never articulated the false belief structure at the root of the plots of *Firefly*, *Duckling*, or *Mother*. In the example from Firefly discussed above, Fiona referred to personal schema instead of the character's false belief that objects giving light could be the other fireflies he was searching for. Fiona's results may suggest that theory of mind development is uneven, in that use of this skill in one part of the story may not correlate with use throughout the story. In

conclusion, a lack of verbal sophistication or an immature storytelling profile, per Sulzby's schemata, did not result in the absence of storytelling prowess or metacognition. However, in Fiona's case, less verbal sophistication did co-occur with less and less productive metacognition during joint reading.

Gabby: 4 Years, 1 Month at Start of Study

Gabby was a friendly, agreeable, and content participant. She was one of the youngest children in the study. She seemed to understand the study tasks in general, yet she had difficulty in different areas. On multiple occasions, books slid from under her hands. Gabby consistently started with the front cover and turned the book's pages from front to back, just not always one by one. Physical page-turning difficulties had cognitive and metacognitive implications when they resulted in missing information or opportunities to self-revise. Additionally, Gabby's syntax was still developing (e.g., "He say, 'Are you my mudder?'"); her use of gender pronouns and verb tense and number were irregular. Her speech was clear, however, and she provided a sufficient amount of verbal and behavioral data for analysis.

Gabby's emergent literacy behaviors. Despite isolated page-turning difficulties, Gabby was very engaged in reading sessions. She focused on the pages and provided pretend readings without hesitation. She seemed genuinely delighted to drink in the illustrations and provide her commentary, which was mostly in the form of labeling—e.g., "There's the mommy and there's the egg"; "Here's the chick…" Gabby's budding print awareness was integrated into her overall text interaction repertoire. For example, at the beginning of her third reading of *Firefly*, Gabby spontaneously pointed out "Those are the words!" Gabby was excited to share her print knowledge but did not insist that we attend to the print. Instead, she happily accepted a listening role as I continued with a read aloud. Gabby did not read conventionally, name specific letters,

or engage in finger sweeping of printed text during pretend reading. She had no problems with constructing stories from pictures and did not hesitate or refuse to do so. Though she mostly labeled distinct objects, she occasionally gave scene level readings such as "The sun is going down because it's nighttime."

Gabby's emergent comprehension. Similar to Fiona, Gabby's responses to questions meant to assess or elicit comprehension typically returned straightforward, concrete statements. Gabby's orientation towards the concrete was illustrated in her reading of page 15 of *Pancakes*: "There's two clocks, and she's making pancakes!" The clock is shown in two different mini scenes to show the passage of time as the little old lady churns butter – a strenuous and time-intensive task. Gabby would not be expected to tell the exact time from an analog clock face; however, she did not interpret the presence of clocks on the same page as an exasperated little old lady as indicating the passage of time. Gabby simply provided a descriptive report of the presence of two clocks with no further synthesis or inference. When Gabby did make inferences, they were not necessarily insightful or helpful. For example, when asked during the second reading of *Duckling* why the duck family was in a huddle, Gabby offered that they were "reading a story about her ducklings." However, no books are featured in the pictures, and reading, books, or related terms were not mentioned in the text. This inference was reasonable and may have referenced personal schema and positive attitudes towards shared reading. However, it was not supported by textual evidence and did not facilitate comprehension.

Gabby may have also struggled with the subtle logic of question words. For example, when asked *how* the little old lady obtained pancakes, Gabby answered "because she was hungry." Gabby may not have understood the logical structure of the question or she may not have had the ability to report on her understanding, much less her understanding of her

understanding. Skarakis-Doyle and Dempsey (2008) cautioned about this possibility when posing questions to preschoolers. Gabby also struggled with more complex questions. Questions that referenced the notion of a book as a created work seemed to cause the most trouble. When asked how the author of *Mother* tells us that the baby bird is sad, Gabby answered "'Cause he wants his mudder." When asked "What are the pancakes doing there?" while she pretend read *Pancakes*, Gabby replied matter-of-factly that they were "in a picture" versus commenting on their role in the plot.

Though Gabby typically pretend read by labeling pictured objects, her performances varied unexpectedly. She might label discrete items in illustrations without any sense of a uniting story structure, and then suddenly articulate the gist. For example, Gabby's spontaneous verbalization in the voice of the little old lady "I can't make pancakes! Will I ever get pancakes?" can be interpreted as the main idea that drives the plot. In this example, Gabby's assumption of the little old lady's voice communicated that she was expressing the main character's thoughts. Furthermore, Gabby's verbalization also communicated her comprehension of an idea relevant to the macrostructure of the story – that the goal, despite all of the setbacks, is to make pancakes. She frequently supplemented her serial labeling of each page with "and then…" as a cross-page connector (e.g., "and then they're going back" for pages 20-21 of *Duckling* followed by "and then it was nighttime..." on the next page spread). In conclusion, comprehension did not appear to be solely a function of not being able to articulate whole scenes. Gabby's isolated vocabulary errors (e. g., truck for car and helicopter for airplane) and misconceptions (e. g., the firefly is in a cave; the little old lady gives pancakes to the syrup salesman) did not prevent her from grasping the gist of each story. These vocabulary errors and misconceptions were unrealized opportunities

for metacognition and contrasted with the moments when she stopped her flow of pretend reading to ask for the name of something that she didn't know how to name.

Gabby's emergent metacognition. Gabby evinced metacognition representing four out of seven possible categories. As part of my analysis, I counted speech turns taken by myself and each participant, as we engaged in the joint reading session. Demonstrating a back-and-forth conversation between two participants was important to the integrity of my study design. Since both researcher and participant provided data in each session, focusing on the child's speech turns provided perspective on the relative presence of metacognition in the child's contributions to the conversation. Gabby's instances of metacognition were present in a range from zero to 31% of her speech turns within any one session. In other words, during her most metacognitive sessions, metacognitive talk did not take up more than approximately one-third of her oral contributions. However, the only one of her 12 readings that lacked any metacognition was her first reading of *Pancakes*. In this reading, she did not have any spontaneous metacognition, and she did not *Justify* her thoughts though prompted to do so. Across successive readings of Pancakes, she had a steady increase in instances of metacognition (n = 6, 8, 11), but this pattern did not exist across repeated readings for each text. The totality of this extra analysis suggested that Gabby, one of the least sophisticated participants, was metacognitive in ways that were situationally relevant. This finding suggested that there may not be forms of metacognition that are always easier or harder, but rather that metacognition is situationally accessible, relevant, and useful, even for the most nascent of participants.

Reflecting on Reading. Gabby did not exhibit reflective awareness of reading as a task. Though she did have print awareness, she did not reflect on the role that print plays. In other words, she identified letters as print and text, but she did not articulate any need to question or

reference the print to render a story. Likewise, she accepted the task of picture reading without sharing any reflections on the experience. In sum, she did not reflect on reading as a task, herself as a reader, or the text as something to be understood. However, in the *Judgment of Difficulty* vignette discussed below, Gabby did seem to be close to associating reading with personal mental labor.

Feeling of Knowing. Gabby had both spontaneous and prompted *Feelings of Knowing*. For example, during her second reading of *Mother*, Gabby seemed to be having a tip of the tongue moment, which she quickly corrected. These moments revealed a respectable active engagement that was not apparent from her difficulty with answering questions, her frequent reply of "I Don't Know," and her tendency toward storytelling through simplistic labeling.

Judgment of Difficulty. Due to the challenge of just getting dialogic data from Gabby, *Judgment of Difficulty* prompts were only given four times across twelve readings. Gabby provided explanations for her difficulty ratings three out of the four times, revealing interesting insights about her active internal response to study texts. For example, after her initial reading of *Mother*, Gabby provided a rating of difficulty with a reference to the hard, mental work of reading:

R: Was this easy, medium, or hard?
Gabby: Hard.
R: Why was it hard?
Gabby: Because I read it.

After her third reading, Gabby downgraded *Mother* to "medium" difficulty but did not provide any explanation. Finally, Gabby rated *Pancakes* as "medium" at the conclusion of her second reading because it was a "short book." Though I did not consider Gabby to have evinced

Reflection, her *Difficulty* ratings could indicate that she might evince *Reflection* under different circumstances, such as a reading session in which only *Reflection* prompts were given.

Task-Related Planning. Gabby did not exhibit any planning behaviors.

Verbal Self-Revising. Gabby seemed comfortable with her renderings of the stories, even when she was incorrect, and she therefore did not correct or revise herself, with one exception. This result may not be due to less self-awareness or self-monitoring, but rather a lack of awareness or feeling the need to follow up on being mistaken. Consider Gabby's 3rd reading of page 6 of *Pancakes*, wherein a bag labeled *Flour* is pictured on a kitchen table with mixing bowls and other cooking supplies: Gabby: *Sugar again* (pointing to bag marked "Flour"), *then milk, then cream.* In other interactions, Gabby indicated that she was familiar with the letter F. However, she did not use this information as a clue as to what was in the bag. It is possible that Gabby could visually recognize the letter F without knowing the sound that it made. Many emergent literacy skills are implicated in the joint reading of a picture book. Knowledge of letter names and letter sounds are relevant discrete skills for pre-readers. A letter name and letter sound probe could have been administered as part of the study. However, given the range of discrete emergent skills that could be relevant, the number of assessments needed to determine an exhaustive explanation of each reading problem was unrealistic.

Expanding Storytelling. Gabby had one instance of *Expanding Storytelling*, which was spontaneous. This example was an important form of metacognition for Gabby, who struggled with handling books and answering comprehension questions. In her first reading of *Mother*, Gabby offered the following sing-song labeling for pages 20-21: *There's his mommy and there she is.* Three days later, without any prompting or feedback, she integrated more information in her rendering for this page spread: "There's his mudder! She was getting his breakfast!" As

opposed to her initial reading, her subsequent reading was no longer redundant, provided more information, and integrated information at a macro level.

Justifying Verbalizations. Gabby typically responded to requests for justifications through no response, a mumbling noise, or a reference to concretely pictured elements or personally-held world knowledge, as in this exchange from the first reading of *Pancakes*:

Gabby: She's making pancakes.
R: She is making pancakes. How did you know that?
Gabby: [Made a noise that seemed to indicate that she didn't like the question.]

However, Gabby did provide one *Justification* each during her second and third reading of *Mother*, and one during her third reading of *Pancakes*. The varying content of her justifications seemed to be reports of her inner thoughts behind her storytelling and corresponding dialogue. For example, during her second reading of *Mother*, Gabby's justification referenced her notion of a what a mother would do in the situation depicted:

R: A mother bird sat on her egg. Did I leave anything out?
Gabby: It's a baby bird in there!
R: I know! How do you know that's the mommy?
Gabby: She sat on her big white bottom waiting on her baby to come out.

During her third reading of *Mother*, Gabby's *Justification* referenced her knowledge of what comes next in the plot:

R: What's the baby bird thinking right now?
Gabby: His mother!
R: How do you know he's thinking about his mother?
Gabby: 'Cause, he's gonna lay down in the nest soon.

During her third reading of *Pancakes*, Gabby's justification referenced her understanding of the protagonist's internal motivation:

Gabby: ..she's doing a lot of work to make pancakes.

R: Yeah, how'd you know she's doing a lot of work?

Gabby: 'Cause she wants to eat pancakes for breakfast.

Gabby's varying references in the content of her *Justifications* seemed to indicate that she was able to rely on different types of processing relevant to narrative comprehension—e.g., integrating information into a coherent plot and understanding the character's internal motivations to act. These examples also demonstrated the interconnectedness of narrative comprehension and metacognition, in that the content of *Justifications* were constructive acts of narrative comprehension.

Theory of Mind and Metacognitive Language. In *Pancakes*, Gabby didn't seem to associate metacognitive language with thought bubbles, and she didn't question their presence. Gabby tended to provide concrete interpretations of characters that indicated either a less developed theory of mind or lack of experience with discussing her empathy for and understanding of the characters' unique perspectives and limitations. Like Fiona, Gabby expressed emotional sympathy for the characters, but she did not always fully articulate their internal knowledge bases and states that were relative to the plot. For example, when asked what the mother bird was thinking, the mother bird's purported thoughts did not transcend a concrete plot point—Gabby reported that the mother bird thought that the egg would hatch. For Gabby, the baby bird's thoughts did not waver from the generic state of wanting his "mudder." In addition to wanting to reunite with his mother as his overarching goal, the baby bird had several specific moments of false belief as he approached animals and things that he believed to be his

mother. Gabby did not articulate any element of false belief when rendering the story for or answering questions about *Mother*. However, in her second reading of pages 5-6 of *Firefly*, she spontaneously articulated the false belief structure at the heart of the plot: "There's the firefly and there's the light, but it's not a firefly!"

Finally, when prompted to share her personal thoughts, Gabby did not go beyond what she knew would happen next. Gabby typically responded by restating my model sentence, stating what was pictured on the page, or referencing the topic of the book. However, Gabby started to add spontaneous statements such as "I think the owl" on the page preceding the appearance of the owl in *Firefly*. Multiple exposures to open-ended thinking prompts may have sensitized Gabby to her internal thoughts over the course of the study. This finding is consistent with the proleptic nature of joint reading. This type of discourse also increased her spontaneous use of metacognitive language (e.g., *think*) within the joint reading conversation.

Helen: 4 Years, 5 Months at Start of Study

Helen was a mature participant in many ways. She seemed to enjoy reading in a one-to-one setting, where she could express her ideas and show off her skills. She typically had high interest in and endurance for the reading sessions. Speaking with Helen was often like speaking with an adult; she was easily understood and verbally sophisticated. She chatted about any topic or book with ease and understood both the substance and the nuances of the stories and my questions about them. She understood study tasks and used verbal and non-verbal emphasis to communicate what she meant. For example, when I asked if she had read *Firefly* (to confirm her earlier denial of familiarity with the book from her personal life but exposure to it during the study), she replied, with a corresponding head nod, *"not* at home".

Helen's emergent literacy behaviors. Helen had no difficulties handling books. However, she wasn't as comfortable constructing a story from the pictures as less sophisticated participants were. For example, in response to my first request to tell the story from the pictures for the wordless *Pancakes*, Helen exclaimed "I don't know how to tell the story from the pictures." However, one act of modeling on page one launched her into engaged picture reading for the rest of the story. On her third reading of *Duckling*, Helen demonstrated not just print awareness but also awareness that meaning comes from print: R: What happened, early one morning? Helen: Is that what that says? (pointing to the text "Early one morning"). Helen accepted my confirmation of what the text said and continued with the task of constructing a story from the pictures. Helen had to balance her knowledge about print and reading with the fact that she could not yet read the printed word. Helen's detailed awareness of print and her global awareness that meaning comes from the printed word sometimes divided her attention while she was trying to construct a story from the pictures. Characteristically, Helen developed a solution that worked for her unique situation. While I was setting up the camera for her third reading of the low-word count *Duckling*, Helen announced that she would tell the story from the pictures since she *might* not know the words. She then proceeded to finger point and read the print that she felt she could read (the short refrain in *Duckling*) yet did not waste energy on print she had no hope of deciphering (the extensive text of *Firefly* and *Mother*.) Helen also used storybook language such as "one day" and cross-page connectors such as "then," and she typically spoke in full sentences that conveyed whole scenes. These characteristics resulted in storytelling constructions such as "One day the little lady lived in a house. Then she was sleeping in her bed and she decided she wanted to make pancakes." Her storytelling also accounted for the internal motivations of the protagonists (e.g., R: What does [the little old lady] want? Helen: Pancakes,

‘cause that’s what she was thinking about for breakfast”.) Helen appreciated that a picture book is a created work and suggested that the illustrator of *Pancakes* could have made the kitchen wall black such that specks of white flour could be easier to recognize.

Helen’s emergent comprehension. Helen was an advanced participant who understood the texts and tasks. She may have understood them too well and become bored on subsequent readings. Helen added the most inferences to her story constructions, such as “She (the mother duck) was up late trying to look for her duckling”). Her rich inferences provided nuanced and holistic interpretations of the plots and indicated that she was likely able to process more sophisticated and complicated plot structures than what was offered in the study. In addition to articulating her inferred frustration of the mother duck, Helen also proposed that the mother duck was not looking hard enough, that the errant duckling might not have wanted to come home due to being angry at the mother duck, and that the errant duckling might have wanted to return home on his own terms. These inferences were offered in addition to her articulation of the basic plot points that the errant duckling swam away because of his interest in the butterfly, that he is hiding from his family on each page, and that the turtle escorts him home at the end. Helen also communicated an element of danger for the protagonists that was not represented or suggested by the printed text or illustrations. While reading *Duckling*, she expressed that the woodpecker might try to attack the duckling. While reading *Firefly*, she stated her concern that the cat might eat the young firefly. Like many other participants, Helen was confused by the meaning of the picture of the winged eggs flying away on pages 22-23 of *Pancakes*, yet she was able to grasp the meaning below the surface: “It means that she can’t get her pancakes!”

Operating under the assumption that Helen was not being sufficiently challenged by the texts or tasks, I requested that Helen tell me what the stories were about at the conclusion of

certain sessions. Helen's responses were neither adequate retellings nor summaries, as exemplified in this exchange from the end of her third reading of *Mother*:

R: What's this story about?

Helen: It's about a bird.

R: What happens to the bird?

Helen: He lost his mom.

R: But is that how it ends?

Helen: No.

R: How does it end?

Helen: (bored) A happy ending.

In contrast, at the conclusion of her first reading, Helen had given the specific summary statement "It ended up with his mother coming back." The generic reply detailed above could have been attributed to boredom or a sense that she had already provided the requested information.

Helen's application of her world knowledge was not as robust as her propensity to engage in inferencing. She did rely on her knowledge to make internally consistent sense of texts. For example, she stated in her second reading of *Duckling* that the woodpecker wanted to eat the duckling because "It's 'cause this is a woodpecker and woodpeckers like to peck and eat stuff." This original story construction corresponded with the four-word refrain that she invented for the low word count book *Duckling*: "Don't. Hurt. My. Babies." Later, I told her that those five words of text actually said, "Have you seen my duckling?"

Helen's emergent metacognition. Helen evinced metacognition in six of seven possible categories in this study. As the most verbally sophisticated participant, metacognition was still

present in only 6% to 23% of her turns in joint reading dialogue. As opposed to Gabby however, Helen's metacognition referenced more profound text processing. In many ways, Helen was less metacognitive than might be expected for a precocious talker and critical consumer of children's literature. Helen's familiarity with study texts and the limitations on dialogue posed by simplistic plots may have artificially curtailed demonstration of her metacognition, as the way the books were presented may not have been challenging or novel enough for her. This finding suggests that similar to conventional readers, metacognition is most relevant when the task poses some degree of cognitive challenge.

Reflecting on Reading. Helen's advanced print awareness could not necessarily be interpreted as an advanced awareness of herself as a reader or reading as a task. Due to her relative maturity, blanket claims that she could not read could have resulted from overthinking the task or being concerned about the parameters for task success, as she also claimed that she did not know how to tell a story from the pictures— until a quick modeling of how to do so launched prolific picture reading. Helen appeared to learn more about study expectations while simultaneously growing her emergent literacy skill set. These two sources of influence seemed to lead to a range of types of responses to the task. When initially presented with *Firefly* early in the study, Helen claimed "I just don't know how to read." Later in the study, when I introduced *Mother* to her, Helen offered the more specific statement "I don't know the words, so what about if we just look at it?" During her third reading of *Mother* near the end of the study, Helen exhibited a third type of response:

> R: Do you remember what it's called?
> Helen: Are. You. My. Mother? (points with one-to-one correspondence; makes two taps for moth-er)
> R: How'd you know that?

Helen: (emphatically) Because. I. Can. Read.

These vignettes support the idea that Helen was becoming more print oriented over the course of the study and that she was aware of this change. In addition, Bert overheard Helen's comment while he was playing nearby and commented that he could read too, and that he had read his prayers the previous night. An increased awareness of the ability to visually recognize printed words or decode them as what reading is was always present in the classroom. By the end of the pre-kindergarten year, some participants could accurately report whether or not they could read basic or familiar print. This capacity changed the contours of *Reflecting on Reading as a Task* for those participants. It also expanded the range of what *Reflection* behaviors could look like during emergent literacy.

One of Helen's *Reflections* suggested the possibility that she might be able to state that or when learning new content had taken place. At the conclusion of her second reading of *Mother*, a book that she claimed familiarity with, Helen was not able to explain that she didn't learn anything new because she already knew the story front to back:

R: So, did you learn anything knew when we read it today?
Helen: I already know everything. Like my ABC's and how to count.

Helen understood the question and used the metacognitive term *know* in her response. However, her response indicated that she might not be able to consistently rely on or discuss familiarity with the plot. In contrast to her response to the Reflection prompt above, Helen did articulate recognizing stories or smaller units of information, such as sentences. These examples are discussed under *Feeling of Knowing* and *Judgment of Difficulty*. Different responses may indicate that prompts or questions will not always induce the target behavior. For this age group,

situational demands may contextualize prompts and result in a more robust reply than prompts to self-report that are perceived as separate from the story.

Feeling of Knowing. Since Helen was comfortable with study texts and tasks (e.g., "I already know that sentence), I pressed her to explain whether she knew key content and how she knew it. Helen had multiple spontaneous and prompted *Feelings of Knowing*. The following excerpt from her third reading of *Firefly* illustrated that Helen understood this line of questioning, yet she still did not offer extensive commentary about connections between story content and her world knowledge:

> Helen: (spontaneously pretend reading) And he went by a light. And it wasn't a firefly. It was a light.
> R: Did you know that was called a lightbulb or did the story tell you?
> Helen: Because I knowed that.
> R: Yeah, 'cause it's at your house?
> Helen: Yeah.

Judgment of Difficulty. Helen provided six *Judgments of Difficulty* after readings, all of which were "Easy" or "Medium." Her lack of "Hard" as a difficulty rating was consistent with my conclusion that she was not sufficiently challenged by study texts and tasks. For example, at the conclusion of her second reading of *Mother*, Helen indicated that she found the story easy to understand due to her familiarity with it:

> R: When you read this book, do you ever feel like it's easy, medium, or hard?
> Helen: Easy.
> R: Why is it easy?
> Helen: Because I have it at my house.

Task-Related Planning. Helen's *Planning* behaviors suggested that she was a willing and actively engaged participant; she was vested in the joint reading dynamic, even if she was

underwhelmed by the simple texts. For example, as I was setting up for her third reading of *Duckling*, Helen requested that we complete the session in a certain way. As I was turning on the camera, Helen announced that she would tell the story from the pictures, because she might not know the words. She announced her preference before she saw the book, based on an understanding of the task and how she wanted to proceed.

Verbal Self-Revising. In her initial reading of *Mother*, Helen corrected herself during her rendering of pages 36-37, when the baby bird made a declaration of determination to find his mother. She started to say, "I do have enough," stopped abruptly, and resumed with "I do have a mother." Helen had four spontaneous *Revisions*. Because her storytelling was accurate, it was not appropriate for me to prompt her to revise. I did not consider Helen's alternative interpretations (e.g., when she mentioned that the baby characters were in danger alone in the world) as inaccurate; these were valid alternative interpretations.

Expanding Storytelling. Helen did not provide the story *Expansions* that might be expected from a sophisticated participant. This result may be due to being bored and underwhelmed with the study texts. Across readings, it can be concluded that tasks that are too hard or too easy may not produce the required cognition or metacognition. Helen's third reading of *Mother* exemplified this idea:

> Helen: It's about a bird.
> R: Uh-huh and what happens to the bird?
> Helen: He lost his mom.
> R: He lost his mom. But is that how it ends?
> Helen: No.
> R: How does it end?
> Helen: (bored) A happy ending.

Justifying Verbalizations. Helen had nine instances of *Justification*, the same number as Erin, and the second highest frequency for this category in the study. However, not all of her *Justifications* were coded with the highest confidence. In the example below from Helen's second reading of *Duckling*, Helen provided less sophisticated *Justification* data than might be expected:

> Helen: They're talking about like that duckling is trying to run away.
> R: …How do you know that?
> Helen: 'Cause! [Squeals and guffaws] I know that.

During her third reading of *Pancakes*, Helen's tone when replying to my "Why?" elaboration prompt (closely related to *Justification*) suggested that had Helen not been underwhelmed by texts and tasks, she might have provided more robust data in response to *Justification* prompts:

> Helen: And then she got a bowl, to fill it up for her cats and dogs.
> R: OK.
> Helen: She went out, to find eggs.
> R: Why?
> Helen: So, she could make her pancakes, remember? (tone indicates boredom with the obvious)
> R: Oh OK, I forgot.

Theory of Mind and Metacognitive Language. Helen demonstrated a proficient theory of mind and understood the false belief structures within the plots of the four study texts. For example, in her third reading of *Duckling*, Helen indicated her understanding of her omniscient perspective versus that of the *Mother* duck looking for a runaway duckling hidden on each page.

> R: But why can't the mommy see [her missing duckling]? If we can see it, why can't the mommy see it?

Helen: Because, it's not looking very well.

Helen used the metacognitive terms *learn*, *know*, and *remember* in her dialogue to discuss her reading-related cognition. Helen had varied responses to open-ended thinking prompts. Near the end of her third reading of *Firefly*, Helen responded to my question "What are you thinking right now?" with "Ah, that he thinks all the lights are fireflies." This original statement conveyed the fundamental false belief structure of the plot in her own words. Furthermore, during her third reading of *Pancakes*, Helen let me know that as the manager of her own mind, she did not have to share everything that she was thinking:

R: When you saw this page (22-23), did it make you think of anything?
Helen: Nothing! Only except some weird stuff.
R: Like what?
Helen: A secret.
R: Like what?
Helen: A secret, secrets are secret, so it's a secret.

Summary of Case Narratives

I reported the frequencies of occurrence of each of the seven types of metacognition in Table 12. I discussed participants' metacognition, comprehension, and emergent literacy behaviors through case impressions. I intended for these displays of data to highlight the range of constructive and metacognitive processing that 4-year-olds engaged in across four texts.

All of this data was collected in the context of joint reading, which is a dialogic and informal procedure. Some metacognition was spontaneously manifested, and some was documented in response to questions that I posed to encourage metacognitive processing. I posed these questions when metacognition seemed relevant and would fit in the conversation. For

example, I always posed *Judgment of Difficulty* prompts at the conclusion of reading, as this prompt required a holistic review of the task just completed. I issued prompts for other categories, such as *Justifying* or *Feeling of Knowing*, when I deemed them to be most relevant in the moment. Therefore, each reading session had a unique profile. Given that characteristic of the study, I reviewed the data again to search for the "antecedents and outcomes" of instances of metacognition (Flavell, 1981, p. 51).

Antecedents and Outcomes

Flavell (1981) pointed out that outcomes of metacognition may be immediate or may occur over a longer term. Since many forms of learning take place over time, metacognition may not immediately produce comprehension or any other insight or benefit. It is possible that many experiences with a defined task, goal, or action will have to take place before a learner has a metacognitive breakthrough or is able to coordinate her or his metacognitive abilities with cognitive ones. Metacognition reveals incremental insights to the learner that should facilitate comprehension over time. There are benefits to noticing and verbalizing this information, whether in internal monologue or out loud for the benefit of an observer.

In sum, expecting a range of causal or temporal antecedents and outcomes is consistent with Flavell's conceptualization. Not always being able to identify a clear antecedent or outcome is also consistent with Flavell's conceptualization. Since mental processing may not be thoroughly understood or exhaustively reported by the young child, discrete data collection events, however interactive, may not manifest visible antecedents and outcomes as well as the metacognition itself. Flavell (1981) thought that recognizing metacognitive experiences alone had value, especially for the young learner.

Table 24 thus displays the temporal antecedents and outcomes for Bert's metacognitive vignettes across his three readings of *Are You My Mother*? I chose this data set for this type of analysis based on its 100% inter-rater agreement on the coding of metacognitive categories. This table provides additional information by reporting antecedents and outcomes for spontaneous and prompted metacognition. As shown in the final column, an inter-relationship often existed between metacognition and various processes that incrementally facilitated comprehension.

Table 24

Observable Antecedents and Outcomes for Bert's Metacognition while Reading Are You My Mother?

Reading (Pages)	Observable Antecedent(s)	Metacognitive Vignette	Coding Category	Observable Outcome(s)
1 (44-45)	Read aloud ↓ "What" literal comprehension question	R: Well, just then, the baby bird saw a big thing. What's this called? Bert: Umm.. R: A bulldozer or something? Bert: [Nods yes.] R: Do you remember what the book calls it? Bert: Shakes head no.	Feeling of Knowing (Prompted)	Revelation that he did not know a key word
1 (48-49)	Read aloud ↓ *Justification* prompt	R: But the big thing just said, "Snort." "Oh, you are not my mother," said the baby bird. "You are a Snort. I have to get out of here!" R: What's the baby bird thinking now? Bert: Um, he thinks he's scared. R: How do you know that? Bert: 'Cause, there's loud noises. R: Is there anything about what the baby bird looks like that tells you he's scared? Bert: Mmm-hmm. 'Cause his beak and his eyes are different. And sweat is dripping out.	Justifying (Prompted)	Reported on flexible and constructive meaning making
2 (35-36)	Read aloud ↓	R: How's [the baby bird] feeling right now?	Justifying (Prompted)	Revealed how he obtained

Reading (Pages)	Observable Antecedent(s)	Metacognitive Vignette	Coding Category	Observable Outcome(s)
	Justification prompt	Bert: Sad. R: Sad, yeah, how do you know? Bert: 'Cause, look at his eyes.		knowledge of character's internal state
2 (35-36)	Dialogic interaction ↓ Spontaneous verbalization	R: Look at his eyes, yeah. Let's see what happens next. [R. begins to turn page.] Bert: And, he's thinking.	Expanding Storytelling (Spontaneous)	Revealed knowledge of character's internal state that led to plot event
2 (44-45)	Read aloud ↓ "What" literal comprehension question	R: Well, just then, the baby bird saw a big thing. This must be his mother! "There she is!" he said. "There is my mother!" R: What's that big thing really called? Bert: Mmm, I don't know.	Feeling of Knowing (Prompted)	Communicated accurate evaluation of lack of knowledge
2 (50-51)	Read aloud ↓ Request for joint storytelling	R: But the baby bird could not get away. The Snort brought him up and up and up. Brought him way up. R: Then what happened? Bert: Um, um, I don't know.	Feeling of Knowing (Prompted)	Communicated accurate evaluation of lack of knowledge of plot on second reading
3 (3-4)	Read aloud ↓ *Justification* prompt	R: A mother bird sat on her egg. R: How do you know she's the mama? Bert: Because she's big.	Justification (Prompted)	Revealed inference made about meaning of character traits
3 (54-55)	Read aloud ↓ "Why" inferential comprehension question	R: Just then, the Snort came to a stop. What's the Snort going to do? Bert: Um, drop him into his home. R: So, is the Snort good or bad? Bert: Um, good. R: He's good? Why? Bert: Because he put him where he wasn't before.	Expanding Storytelling (Prompted)	Communicated his ability to reference his mental model of the text (i.e., plot synthesis)

Additional Evidence of Constructive Comprehension Processes

As discussed in the case impressions, participants exemplified constructive, flexible, and sometimes whimsical thoughts and behaviors during the process of interacting with four narrative picture books. All participants grasped the gist of each main character's struggle, even when misconceptions marred comprehension of certain details or parts of the plot. Empathizing with a main character and understanding goal-driven behavior is at the heart of narrative comprehension. Additionally, I identified two major categories of constructive comprehension processes in their text interactions: constructing alternative interpretations and applying factual knowledge. Participants independently brought these efforts to the joint reading task.

Constructing internally-consistent, alternative interpretations. Multiple participants provided alternative interpretations of parts of the stories. These were more whimsical or inventive renderings than a standard reading of the story. These versions often explained missing information that would be valuable to any reader striving to achieve holistic understanding. For example, when reading *Mother*, both Dylan and Erin claimed that the mother bird was inside of the bulldozer, presumably to use this piece of equipment to find and return her baby to the nest. The actual text did not explain or picture the driver of the bulldozer. Since the story did not suggest that the baby bird began to fly in the process of searching for his mother, this alternative interpretation is a valid inference concerning the method by which the baby bird could return to its nest high in the tree. This inference was consistent with both world knowledge and the text, and it therefore represented constructive meaning-making.

The three study texts with words featured a baby protagonist who was alone in the world. Across these texts, multiple participants articulated an element of danger above and beyond what was suggested by text or pictures. For example, the darkness of Eric Carle's night in *Firefly* was

interpreted as an ocean or a cave, and the firefly was said to be in danger of being injured by the cat and dog. The runaway duckling (in *Duckling*) was in danger of being pecked by a woodpecker, and the baby bird (in *Mother*) could have been eaten by the various animals it approached or injured by the prongs on the bucket of the bulldozer. These interpretations indicated a profound personal response to literature that could have been missed since it did not occur in the form of sophisticated verbal data. This information likely represented empathy for the main character and application of a 4-year-old's schema for going out into the world. These two actions – feeling empathy and applying personal experience- are related and often implicated when reading stories. In other words, these responses to the text represent the type of response one would expect from a reader of any age to a character in an epic situation (Mar & Oatley, 2008).

Applying background knowledge. The picture books used in this study depicted various types of information: facts (and assumed facts) about the natural world (e.g., that fireflies come out at night), routines of daily living and corresponding discourses (e.g., how to make pancakes from scratch), and esoteric references (e.g., a butter churn and iron stove). Different types of information make varying demands on comprehension processes, such as schema compatibility, relevant conceptual vocabulary, and the opportunity to learn new information (Baker & Brown, 1984; Kintsch, 1998). These processes can be spaces for metacognition (Baker & Brown, 1984). Participants were not expected to know all possible facts depicted in the stories, though toy-playing sessions showed that they had sufficient familiarity with major ideas. The more important analysis concerned how a participant utilized his or her recognition of familiar information or how a participant coped with the presentation of the unknown. Both processes are at the heart of comprehension monitoring as an enterprise and disposition (Markman, 1977).

Furthermore, according to Kuhn (2000), awareness that one has learned is a fundamental role for metacognition. Thus, though participants were not able to discuss learning from the texts, the nexus of reader and information still occurred and might produce different results in a different research design.

Are You My Mother? included factual information about the developmental stages of baby birds: hatchling, nestling, and fledgling (Massachusetts Audubon Society, 2017). Only fully-feathered fledglings (two weeks or older) can safely leave the nest, though they must hop or walk until they can fly (Massachusetts Audubon Society, 2017). The baby bird in *Mother* must be a fledgling since he cannot yet fly. Indeed, as many participants implied, he should not have been away from the nest without parental supervision. Participants' story renderings took this fact into account. No lesson was given on the stages of bird development, yet no one questioned why the baby bird couldn't just fly home.

Have You Seen My Duckling? accurately depicted animals found in a pond ecosystem. Two duck species are accurately illustrated: a typical Mallard duck and a plumed Merganser duck (The Cornell Lab of Ornithology, 2015 a, b). Illustrations also accurately depict a salamander, fish, beaver, and turtle. This package of information created an opportunity to assess the child's use of a consistent schema for a pond – and the inclusion of reasonable animal residents versus a "toucan" (as stated by Erin) and a "shark" (as stated by Helen). Helen's and Erin's animal names may be out of place, but they still indicate active application of world knowledge from a nearby schema. Thus, the realistic presentation of animals in their natural eco-system offered opportunities to choose how to cope with factual information in a book—by expressing a *Feeling of Knowing*, calling up and applying a vocabulary word within the real time of reading, by using non-specific language (e. g., that one), or by simply not accounting for the

unknown in storytelling. In the present study, it was not possible to document internal decisions to just not mention unknown objects. In future studies, a researcher could ask the participant why an object was not mentioned.

Through Eric Carle's collage style of illustration (The Official Eric Carle Website, n.d.), *The Very Lonely Firefly* depicts both information and assumptions about fireflies. Fireflies are bioluminescent and prefer warm, dark locations (Boston Museum of Science, 2017). Therefore, it would not be surprising to see glowing fireflies on the night of a fourth of July fireworks festival, as suggested by the book. Fireflies can glow from their larval stage, so a very young firefly could glow (Boston Museum of Science, 2017). However, the idea that fireflies are attracted to common sources of light is more myth than fact. Since artificial light interferes with the interpretation of flashing patterns, fireflies tend to gravitate towards dark backgrounds (Boston Museum of Science, 2017). It is not known if children were aware of any cognitive dissonance between their experience of fireflies and the storyline. However, the opportunity presented itself.

Pancakes for Breakfast was the only study text with a human as the main character. It also features information that is esoteric relative to modern culture such as cooking with an old-fashioned iron stove, churning butter in a wooden churn, and sifting flour in a hand sifter. Though typical food preparation is separated from the steps from farm to table, eggs come from chickens, milk comes from a cow, and maple syrup comes from trees, as pictured in this book. Furthermore, cookbooks provide printed recipes to be read in the kitchen and aprons are placed over clothing so one won't get soiled while cooking. The representation of these unfamiliar objects and activities created opportunities to learn, be aware of learning, and report learning.

The information profile of each story underscores the importance of analyzing texts as created works instead of artificially implanting errors for detection. The texts "as is" offered many opportunities to recognize familiar information or scenarios, learn something new, or just be confused and choose how to proceed. Text "as is" can also be subtly inaccurate, thus creating an opportunity for cognitive dissonance and an opportunity to choose how to cope. Texts have to be analyzed as a party to the transaction, and the information profile of a narrative is one feature to be taken into consideration.

Analysis of Metacognition across Repeated Reading Sessions

McGee and Schickedanz (2007) suggested repeated interactive readings for preschool literacy instruction, to improve comprehension, allow for more exposure to textual claims, and provide more processing time. In the present study, comparisons across repeated readings could not be standardized since each session may have featured different scripting, tasks, prompts, and environmental interruptions. However, comparing metacognition across readings opened a conversation about the role of metacognition in repeated reading, as improvements across readings have been thought to be a function of comprehension alone.

As Table 24 shows, most metacognition occurred in the third reading condition. In joint reading, the frequency of metacognition is only on dimension of the phenomenon of interest. Frequency alone does not explain whether a participant's metacognition was beneficial. Depending on the type of metacognition, more could have occurred due to more prompts to think deeply and reflexively versus correcting errors or expanding retellings as more information is gathered from each successive exposure to the text. A more insightful number is the ratio of metacognition to the researcher's prompts for it or reading situations that called for it.

Table 25

Proportion of Metacognitive Instances by Book and Reading

	First Reading	Second Reading	Third Reading
Mother	30%	40%	30%
Duckling	12%	29%	59%
Pancakes	32%	25%	43%
Firefly	23%	23%	54%

Tables 24 and 25 show that both the distributional proportion and the type of metacognition that was most frequent in each reading of each book varied without a clear pattern. This result is due in part to the researcher's original intention of obtaining a picture walk reading on the first reading and to ask increasingly abstract questions as the child became more familiar with each text. The overall pattern was not true for each participant. For example, Bert had the most spontaneous metacognitive statements while reading *Duckling*, and he had the greatest range of categories of metacognition and the most metacognition overall while reading the wordless *Pancakes*. In sum, these findings support the conclusion that metacognition was relevant in ways that were transactional and situational for each combination of child, text, and transaction characteristics. The number of occurrences of a certain type of metacognition was ultimately a function of multiple sources of influence on the joint reading dialogue, including my questions.

The frequency of occurrence of each category during each reading, as shown in Table 26, is therefore a descriptive detail of what occurred in the joint reading dynamic.

Table 26

Modes of Metacognition by Book and Repeated Reading

	First Reading	Second Reading	Third Reading
Are You My *Mother*? (N)	Planning	Judging	Justifying Expanding Reflecting
Have You Seen My Duckling? (LWN)	Planning	Judging	Justifying
Pancakes for Breakfast (WN)	Judging	Justifying	Justifying
The Very Lonely Firefly (N)	Judging	Justifying	Judging

Borrowing from Dooley and Matthews' (2009) application of RAND's transactional model of reading to emergent literacy experiences, my analysis included consideration of characteristics of the child as participant, the four stories as texts, and contextual influences. This approach afforded comparison of the subtle differences in similar moments across readers and texts. For example, Gabby (4 years 0 months at start of study) was a naïve participant in many ways. She demonstrated page-turning difficulties, and her primary mode of pretend reading was pointing to and labeling the pictures. She had the least occurrences of metacognition. However, she *could be metacognitive* when it mattered. In contrast to Gabby, Helen was a more cognitively and socially sophisticated participant. Helen not only skillfully handled a book, but also offered literary criticisms of plot lines and illustrations. Like Gabby, Helen also justified her thinking, but she did so through a nuanced understanding of the baby bird's perspective as the explanation for why she held the idea that the Snort is good. Both engaged in reasonable emergent metacognition; the differences between them illustrate how metacognition was differentially relevant for comprehension. Gabby just referred to her knowledge of the text whereas Helen

demonstrated that not only did she know the story, but that she was also aware of the knowledgeable position of the reader versus the limited knowledge of the baby bird.

Analysis of Metacognition by Text and Text Type

What participants did to make sense of text is best explained by reference to the content that was in the text to be understood (Kintsch, 1998; Kinnunen et al., 2009). In the four stories used in this study, printed text and illustrations variably contributed meaning. They did so by directly communicating or indirectly implying information and using varying text features. For example, in *Pancakes for Breakfast*, thought bubbles represented the protagonist's thoughts and thus required a working theory of mind (as well as familiarity with the text feature of thought bubbles) to understand what was communicated. The four study texts were true narratives with elements of story that can be plotted on a narrative arc. Table 27 recaps these structural elements of story. Toy playing sessions revealed that participants were familiar with the critical content (e.g., essential to the main idea) of study texts. Esoteric content that was not essential to the plot, such as the butter churn in *Pancakes*, was not addressed in toy playing sessions. However, this type of content did provide interesting challenges for the participants and opportunities for metacognition to be immediately relevant.

Table 27

Story Elements as Macrostructures along the Narrative Arc

	Main Character(s)	Narration	Exposition	Goal or Conflict	Failed Attempts	Climax	Falling Action
Firefly	Lonely young firefly	Printed text tells story in third person	Lonely firefly; born at night	Locate other fireflies to live with	7 acts of approaching light sources that were not other fireflies (3 living, 4 inanimate)	Firefly locates other fireflies	Firefly joins other fireflies

	Main Character(s)	Narration	Exposition	Goal or Conflict	Failed Attempts	Climax	Falling Action
Duckling	Naughty duckling, *Mother* duck	First or third person (Scant printed text does not limit narration; illustrations suggest third person)	Pond scene	Locate missing duckling to reunite family	4 unproductive inquiries posed to other pond residents about whereabouts of hiding duckling	Turtle escorts duckling back to family	The duck family tucks in for a cozy night's sleep together
Mother?	Baby bird	Printed text tells story in third person	Baby bird hatches from egg in tree nest	Locate the missing *Mother* bird	8 futile acts of approaching targets that were not the *Mother* bird (4 living, 4 inanimate)	Snort (bulldozer) returns baby bird to nest for reunion with *Mother*	The *Mother* and baby are together in the nest as they should be
Pancakes	Little old lady	No printed text; illustrations suggest third person	Setting is cabin on cold winter morning	Obtain pancakes to eat for breakfast	5 failed attempts to make pancakes	Little old lady eats her neighbors' pancakes	The little old lady is full and content

Microstructures and macrostructures. Since the four study texts were true narratives, I created nodes to code instances where a child articulated or referenced information that constituted a microstructure or macrostructure of the text or referred to the text base (i.e. whole story) (Kintsch, 1998). Per Kintsch and Rawson (2008), the content of structured texts (such as a true narrative arranged along a narrative arc) can be classified as discrete propositions, microstructures made from relationships among propositions, and ultimately a macrostructure, which is formed from overarching topics and their inter-relationships. The microstructure plus

the macrostructure equals the text base—what the author and/or text said. Finally, a reader forms a situation model—a mental model of the text based on an existential interpretation of what the author communicated. Across the totality of verbal data recorded from 83 reading sessions with seven preschoolers, I coded 149 references to macrostructure. This finding is significant because even children who seemed to have inchoate pretend and/or dialogic reading skills referred to macrostructure level information (e.g., main ideas). This type of information was not likely to have been reproduced from memory or spoken as a result of discrete picture reading. Rather, it was more likely articulated from comprehension of structured information.

Misconceptions. Since the stories posed a variety of ideas, some simple and some complicated, the potential for misconceptions existed, requiring coding of when a child expressed a misconception. I assumed that a misconception would be a likely basis for metacognition in the form of self-correction. Misconceptions were not moments of "not knowing" or whimsical alternative interpretations. Rather, they represented problematic interpretations of story content that conflicted with the author's intended meaning. Depending on the grain size of the misconception, it may or may not have affected the child's grasp of main ideas or the gist. Misconceptions were assumed to be opportunities for metacognition, especially in the form of self-correction.

World knowledge. Though study texts were narratives, they featured information about the natural and built worlds that ostensibly tasked application of background knowledge. Applying one's knowledge to one's processing of a story is an active and constructive comprehension process. The study texts featured information about the natural world and information about the routines of daily living. *Pancakes for Breakfast* featured esoteric information that twenty-first century 4-year-olds might not be familiar with (e. g., a butter

churn). Therefore, since the texts featured not only a story but also information, I considered whether and how a participant utilized any relevant knowledge. The information in the stories was not guaranteed to be familiar to participants. I expected that 4-year-olds might refer to their world knowledge to justify their answers to comprehension questions.

Rival Explanations for Results

Potential rival explanations for results could be mimicking the researcher or other children or learning from repeated readings, especially of the same text. I intended for my study design to lessen the likelihood of each. However, the interactivity of any form of participant observation likely adds social aspects to the research dynamic that could affect data collection and analysis in subtle ways.

Mimicking researcher or other children. It was important to establish that children did not simply mimic metacognitive language that I used. The ten most frequently-spoken words in the totality of the transcripts were, respectively: *Mother*, bird, baby, firefly, little, old, duckling, lady, dog, and pancakes. My reading aloud the print of the three books with words constituted a significant proportion of the data. This breakdown of time and talk indicates that naturalistic, semi-structured, dialogic reading actually occurred, as opposed to the delivery of an experimental script. Within this context, I used metacognitive language as the more skilled member of the dynamic (Vygotsky, 1978), but I did not explicitly teach or rehearse it.

Learning from repeated readings. Since I could not reasonably give a neutral response to participants' verbalizations in a joint reading scenario, participants may have been influenced by subtle cues about what I considered to be correct, interesting, or worthwhile. However, the range

of responses in second and third readings and multiple instances of less sophisticated performances over time or in subsequent readings cast doubt on this threat.

Repeated readings have cognitive benefits (McGee & Schickedanz, 2007), however, and these could be confused for metacognition. Until more is known about the relationship between cognition and metacognition, the nature of this threat is not clear. It is possible that metacognition has always been a latent factor in the cognitive benefits observed from repeated readings. More research is needed. In the present study, repeated readings did not always produce more sophisticated storytelling, calling into question the validity of inferring literary sophistication from pretend reading. Consider the diminishing quality of Bert's reading of page one of *Pancakes* across three readings:

1st Reading of page 1
Bert: (right away with confidence) One day it was snowing, and it was cold.

2nd Reading of page 1
Bert: A snowy day for a house.

3rd Reading of page 1
Bert: A house on a cold morning.
R: A house on a cold morning! And then what?

It is unlikely that Bert and the other participants who provided stagnant or even lower quality readings over time were regressing in their emergent literacy. Rather, unfulfilling data from this age group may not be a valid or reliable indicator of constructs under study. It could just mean that preschoolers are not mature enough to always do their best in accordance with spoken and unspoken task demands. On the contrary, increasingly sophisticated data over readings or time should be recognized as trustworthy, unless it was simply mimed from another child or adult.

Prompts providing cognition or metacognition. Brown (1980) expressed concern that metacognitive prompts supply the actual metacognition that is attributed to participants. I did pose many prompts that could be said to contain comprehension processing or metacognitive processing. However, participants also provided impressive verbal data from open-ended prompts that did no convey any information. When asked "What are you thinking about?" participants provided varying responses. Even within each child, the response to this prompt seemed to vary situationally or just coincidentally. Participants variably referenced pictured objects, rhetoric about the gist, alternative interpretations, inferences about the internal state of characters, articulation of a false belief, and rudimentary plot summaries. Though they may not have provided mature "think aloud" data, their responses revealed whimsical, constructive, and/or insightful discourse that was not likely to be obtained through other means. For example, Helen responded to this prompt by reporting that she keeps some thoughts to herself as secrets. Helen apparently made conscious choices about which thoughts she felt like sharing. In another example, Dylan typically ignored this open-ended prompt or replied that he was thinking about one thing pictured on the page in front of him. However, after his third reading of *Mother*, he responded to the *"What are you thinking about"* prompt by sharing an original thought about the safety of the baby bird:

R: What were you thinking while you were reading this book to me?
Dylan: (deliberately) I was thinking about him falling out of the nest.
R: You were worried about him falling out of the nest?
Dylan: Yes.

CHAPTER 5: DISCUSSION OF FINDINGS, LIMITATIONS, AND IMPLICATIONS FOR THEORY AND FUTURE RESEARCH

I found that 4-year-old preschoolers with varying verbal abilities and varying levels of emergent literacy sophistication manifested seven forms of early metacognition during joint picture book reading. These forms of metacognition were highly relevant to their individual experiences of joint reading as a task, enabling them to correct their mistakes, manage and adjust their efforts, and report on their reading experiences. Even in instances wherein metacognition did not produce a clear and immediate advantage, the capacity to report metacognitive knowledge, metacognitive experiences, and metacognitive actions was a meaningful finding. Flavell (1981) explained that metacognitive experiences are worthwhile in and of themselves. That these experiences were articulable and highly relevant to the task is another important and exciting observation. Through instruction and experience, metacognition should become more beneficial over time.

My findings suggest that research on the metacognitive capacities of preschoolers should continue. My findings also suggest that metacognitive theory should be open to the inclusion of young children, who appear to have qualitatively different early metacognitive capacities that are no less relevant to the literacy tasks important for their age. Joint reading was a context for encountering pancakes, ducklings, fireflies, and baby birds. In the words of 4-year-old Erin, it was also a context for "thinking in your brain." Metacognition was as much a part of participants' joint reading efforts as other age-typical cognitive actions.

My findings ranked in order of importance are as follows:

1. Most joint reading sessions with preschoolers featured at least one instance of meaningful metacognition. This finding encourages reconsideration of the status quo, wherein metacognition has not been considered central—or even possible—during joint reading or other emergent literacy activities and experiences. Metacognition appears to be an unconstrained skill that is relevant to emergent literacy.

2. Preschool participants were metacognitive in both spontaneous and prompted ways. In fact, approximately 40% of their observed metacognition was spontaneous in nature. Furthermore, the 60% of metacognition manifested in response to a prompt was within their zone of proximal development. Prompting facilitated application and expression.

3. Each 4-year-old participant had a unique personality and emergent literacy repertoire, and each 4-year-old participant was metacognitive. Each participant had multiple moments of metacognition, many of which were clearly relevant to their understanding of study texts. Each participant was metacognitive in at least five of seven possible ways. The least sophisticated participant, Gabby, manifested 19 instances of metacognition in five of seven categories.

4. Each of the four commercially-available, mass-market narrative picture books used in joint readings supported opportunities for metacognition. These well-structured narratives presented participants with implied information, new vocabulary words, motivated characters, and plot twists. Accordingly, six of seven participants manifested a variety of forms of metacognition as they encountered difficult plot points and coped with task demands (e.g., “I just can’t read.”). Helen, the most sophisticated participant, found it easy to understand these

scenarios. This match of reader and text did not preclude metacognition, but rather made metacognition relevant in ways that made sense for the reader. Helen's metacognition was concentrated in functions such as *Reflecting* and *Justifying* as opposed to *Knowing*. This finding from analysis of the texts and the reader-text interactions further suggests the unrecognized relevance of metacognition to typical emergent literacy experiences with narrative picture books.

5. Metacognition was relevant to multiple cognitive actions and various emergent literacy behaviors. Participants' metacognition helped them to update their understandings, change their minds, and articulate valuable insights into their emerging thought processes. The frequency and range of metacognition in my data set strongly suggested the overall relevance and appropriateness of metacognition to the joint book reading experience during preschool emergent literacy.

Discussion of Findings

My results demonstrated that preschoolers were regularly metacognitive within the context of joint picture book reading, and that their metacognition was evidenced by and through different emergent behaviors and related verbalizations. Consider the two vignettes below, from two participants who varied strongly in their demonstration of emergent literacy skills. The scenarios are different, yet metacognition was just as relevant to each.

During Dylan's second reading of *Pancakes*, he provided the following spontaneous verbal self-revision: "She needed syrup. I said butter by accident." I did not use the word accident in my contributions to the joint reading dialogue. Dylan spontaneously used this word to signify a self-revision. This instance of metacognition has high clarity. However, considering that both butter and syrup were pictured as pancake toppings, this metacognitive act corrected

misspeaking versus a deep-seeded structural error. This observable *Revision* manifested self-monitoring and allowed him to correct a detail, thus increasing accuracy and comprehension. Though misspeaking may not be a profound error to be revised, the meaningfulness of this exchange concerned the evidence of a 4-year-old independently monitoring his storytelling—while storytelling. My presence as a reading partner enabled a situation in which Dylan spontaneously articulated his introspection that he knew he made a mistake. I was also able to observe his correction and resumption of storytelling. Mistakes, small and large, are part of the reading process. Dylan's example indicated that flexibly noticing and responding to mistakes is also a part of reading, even for the emergently literate.

As opposed to misspeaking, an exchange from Erin's third reading of *Pancakes* exemplified a structural correction. On the fourth page of *Pancakes*, as part of her storytelling, Erin offered the following:

Erin: Then she picked out a book … I mean.. ughh..what's that called again?

R: I think that's a cookbook, right?

Erin: Yeah, I forgot. Then she pulled out her book and made her recipe of pancakes.

I coded this exchange as manifesting *Feeling of Knowing*. Per Flavell's model, I presumed that integrated cognitive and metacognitive processing undergirded this observable data. Erin likely made a decision that the cookbook was important, that she knew the name of it but forgot, and that she could interrupt storytelling to ask for help and then resume from the same point. Erin was presumably monitoring her storytelling relative to her intentions and mental model. Erin used original metacognitive language to report real introspection. Erin decided that she needed certain information and shouldn't proceed without it. Erin engaged in all of the above

within 10 seconds of joint reading. Reading interactively with an adult conversational partner enabled documentation of her metacognition and connected, constructive literacy behaviors.

According to Kintsch and Rawson, "the situation model for a literary text may require construction at more than one level of analysis; to understand a story, the reader may have to infer the protagonists' motivations; to understand an argument, the exact relations between its components may have to be analyzed. Deep understanding always goes beyond the text in non-trivial ways, requiring the construction of meaning and not just passive absorption of information" (2005, p. 221). This constructive lens on comprehension complemented Flavell's person-task-action model of metacognition and prioritized the formation of meaning versus expectations for discourse. Through this lens, how closely a child can mimic an adult when "reading" a storybook is less important than how she or he engaged with and responded to nuanced narrative scenarios and novel information. My results showed that metacognition was a meaningful dimension of these experiences.

Though different, Dylan's and Erin's scenarios illustrated the appropriateness of Flavell's person-task-action model for the study of metacognition in joint storybook reading. They also illustrated that metacognition could not be solely attributed to any singular factor in any one of three readings, during the reading of any one of four books, or at a certain time of the year (fall or spring). Metacognition can play different roles in Flavell's model, and it did in this study of joint reading. These vignettes also illustrated that though categories of metacognition used in this study were mutually exclusive, they were not necessarily equal. A *Self-Revision* could have been limited in scope while an *Expansion* could have indicated deep processing. *Self-Revisions* could have perfunctorily resulted from not paying attention at first. Children who had "more" metacognition did not necessarily have more profound or more beneficial metacognition. Rather,

study texts presented information to be understood, and in each reading a complicated process unfolded that was influenced by multiple reader, text, and task characteristics. Studying the reader, text, or task in isolation would have yielded limited information about metacognition and related comprehension and emergent literacy skills and experiences.

The rich scenarios that occurred in joint reading may have been overlooked by a traditional study of independent pretend storybook reading. Sulzby (1985) conducted her seminal study of pretend storybook reading by having children pretend read a picture book from home that parents selected as familiar. Children's ability to read the text as an adult would was judged to be a marker of emergent literacy sophistication. However, my results indicated that comprehension processing and metacognition can occur in the absence of advanced verbal storytelling. Kintsch's ideas may explain why my results differ without being in conflict. I employed interactive prompts and questions to document the actions of preschoolers presented with the myriad of characters, actions, events, and other details found in study texts. I used well-structured narratives chosen for my purpose. In sum, I took multiple steps to make comprehension and metacognition visible through the proleptic and dynamic task of joint picture book reading (Vygotsky, 1978).

Yet, as mentioned earlier, I did not observe an obvious benefit for each instance of metacognition. Preschool-aged children's thinking skills can be fragmented (Dowling, 2014), meaning that preschoolers may have the multiple skills they need to perform a task but not be able to integrate them. A lack of metacognition may be at the root of the inability to integrate skills, or metacognition may be a present skill that is not integrated (Garner, 1987; Veenman et al., 2006). Text comprehension requires an integration of many thinking skills (Tompkins et al., 2013). For example, the distinct but related skills of inference generation, monitoring, and

knowledge of story structure predict later overall reading comprehension (Cain & Oakhill, 2012, as cited in Stahl, 2014). Therefore, I intended to investigate not only the presence of metacognition while interacting with texts, but also whether a 4-year-old's metacognition enhanced understanding of the story. However, since I did not employ a standardized design, and since participants were allowed to participate in each session in non-standard ways, information that would allow for an analysis of complete story constructions (i.e., independent re-enactments) was not obtained. Also, I could not analyze responses to a consistent set of questions that covered the major points of each text. However, I could provide a situational analysis of each instance of metacognition, and I could make careful inferences about whether it enhanced understanding. Enhancing understanding was not the only possible benefit of metacognition. Metacognition also aided planning such that the task was more comfortable for the learner and enabled reports about the self as a reader or person on the verge of reading.

A lack of standardization was a design choice and not a limitation. It featured affordances and consequences as would any design choice. This exploratory study had maximum relevance in that it resembled the informality of participants' typical experiences with commercially-available picture books in their familiar preschool classroom. Sessions were of a developmentally-appropriate duration (ranging from three to six minutes), and results were not attributable to mimicking. Jointly reading with 4-year-olds in their regular preschool classroom—for the purpose of collecting data about abstract thinking—posed unique commitments and challenges. These challenges did not undercut the trustworthiness of my interpretations. Logic dictates that it would be more difficult for a preschooler to articulate cognition and metacognition under such conditions, not less. My loosely structured approach to joint reading made sense in a classroom environment with distractions and interruptions. Thus,

the moments of comprehension and metacognition documented in this study can be assumed to be a part of participants' repertoires of thinking and communicative skills that are comfortable for use in the regular preschool classroom environment.

I intended for this study to be the first of my studies on this topic. Open-ended methods were appropriate to investigate what would happen versus replicating prior research, manipulating an isolated variable, or implementing an error detection scenario that would not be repeated at home or school. Below, I summarized my main conclusions from my findings for further discussion.

Metacognitive sophistication does not depend on verbal sophistication. Participants produced a lower volume of verbal output than I anticipated based on prior studies of pretend storybook reading (e.g., Holdaway, 1979; Sulzby, 1985). I attributed this finding to the intersection between developmental characteristics of preschoolers and the multi-faceted nature of my study design. Four-year-olds have biological limits on their attention, working memory, and short and long term memories (Brown, 1978). These characteristics can complicate the study of preschoolers' metacognitive processing during joint reading by influencing their observable performances in ways that are challenging to isolate and document. For example, in the middle of a challenging task, such as jointly reading and discussing a book, 4-year-olds might not have enough working memory to fully render the story and also fully engage in interaction, self-reflection, and self-reporting. It is possible that participants would have provided more purely "metacognitive data" if that had been the only focus of the study or fuller "story constructions" if that had been the only focus of the study. However, consistent with its purpose, my study examined these constructs in conjunction, in a dynamic situation. Collecting less data than anticipated on one particular construct collected through a multi-faceted design is reasonable.

My results distinguished verbal sophistication from worthwhile verbal data and emergent literacy sophistication from comprehension and metacognitive capabilities. I intended for these findings to contribute to the understanding of what metacognition is and advocate for the inclusion of preschool participants in future studies. Less verbal data does not necessarily equate with less comprehension or metacognition. Even in a children's picture book, not all information is essential. Since some information is expendable, omitting some content in a story construction may not indicate a lack of comprehension (Baker & Brown, 1984; Kintsch, 1998) or a need for metacognition. Therefore, omissions and limited verbalizations may or may not have indicated literary, cognitive, or metacognitive immaturity. In fact, for at least one participant, limited verbal responses may have indicated a preference for efficiency versus lesser understanding. Bert, an older four, was consistently concise. During his third reading of *Firefly*, Bert replied to the question "What happens now?" (on pages 7-8) with "a candle." This terse reply may have been Bert's efficient way of saying that the false belief/failed attempt pattern that defines *Firefly* repeated yet again on the page with a candle. Offering the term *candle* instead of a verbose rendering of the scene may have simply been Bert's shorthand.

Likewise, less articulated metacognition than expected could be explained by greater comprehension. In conclusion, limited verbal data will result in a lower rating on Sulzby's scale of pretend storybook reading sophistication, but it does not preclude meaningful and constructive cognitive and metacognitive processes that need to be appreciated.

It is also important to note that participants' verbal data was not that different from that of Martin and Kragler's (2011) kindergarteners, who gave generic responses to metacognitive prompts, such as "I was reading," versus articulating more specific insights into mental processes. In the present study, participants were only rarely silent or replied that they didn't

know how to answer a question. These results show that the challenge in working with young participants may not be silence in response to questions, but rather asking children with limited vocabulary and world knowledge to communicate exactly what they are thinking and doing while reading. Limitations on self-reporting are not limited to the young (Brown, 1987). Mokhtari and Reichard (2002) noted limitations in the 6th through 12th grade students they asked to report their use of reading comprehension strategies. Therefore, if self-reporting can be limited at any age, and if poor metacognition can be a problem at any age (Baker & Brown, 1984; Flavell, 1979), then age and its developmental correlates should not preclude or downplay the use of verbal reporting to investigate metacognition.

This study's results demonstrated that preschoolers can provide meaningful verbal data and that lesser verbal data does not necessarily indicate lesser processing. A next step could be to explore whether they can think aloud in real time or engage in a joint think aloud. True think aloud prompts would be more open-ended than some of my pre-planned questions and would open up new possibilities for more data and a freer form of articulation (i.e., initiating a thought versus responding to a prompt).

Making inferences about the "impact" of metacognition. Determining the impact, value, or outcome of each instance of metacognition within the joint reading task was challenging. A more robust analysis of the impacts of metacognition would require additional interaction with participants who, by and large, exhausted their stamina in the reading sessions as is. Future studies could address this aspect of a transactional analysis by using shorter texts and/or texts with content that invites a stark reaction in a specific location, such as a plot twist or a chance to finally learn a new word or idea that had been important to the story. Alternatively, observation of independent reading could be compared with observations during joint reading to

determine if the metacognitive prompting of the researcher enhanced comprehension processing. This approach would be most productive with unfamiliar text such that constructive-integrative processing could be observed versus reliance on memory.

Different terminology is appropriate for different scenarios. I intended for the results of this study to contribute to the literature on reading-related metacognition. However, this study did not necessarily use the same terminology as other studies in this area. Due to my presumptions and commitments, I did not rely on two terms often found in the lexicon of reading-related metacognition research— *strategy* and *self-regulation*. A *strategy* is a specific, consistent, and formally defined behavior that was likely taught through academic instruction (Palincsar & Schutz, 2011). Neuman and Roskos (1997) claimed that their preschool participants were strategic in that they acted intentionally in pursuit of a goal. I interpreted their use of the word strategy to imply that the child's intentionality occurred within a context of cognitive and social agreement of what reading and writing are and how one should perform them. However, my study did not include observation of home or school reading experiences. In the end, I did not have enough information to verify whether any child's behaviors were truly strategic per the definition above. Even if my participants' metacognitive behaviors were strategic, I am not claiming that they were defined behaviors that could be replicated at will. I am only claiming that metacognitive behaviors occurred in the context of joint reading during this study. Since the preschool curriculum did not officially include comprehension instruction, it is likely that participants' performances were influenced by a variety of reading practices experienced at school, at the library, and at home. Furthermore, I was open to unique and whimsical interpretations of the texts and the task. These commitments legitimized my study of intelligent actions during reading without referring to them as strategies.

I also did not emphasize the term *self-regulation*. Fox and Riconscente explained that "understanding metacognition and self-regulation as aspects of human behavior, learning, and development requires situating them within the broad context of all activities for humans of all ages and points of development, while self-regulated learning is, by most definitions, limited to students in academic contexts (e.g., Zimmerman, 2008)" (2008, p. 374). Fox and Riconscente (2008) connected this distinction to Vygotsky's notion that children in any society are taught formal, academic, or "scientific concepts" through formal institutions such as school (1978, p. 35). Before that, they use "natural concepts" (1978, p. 35) to navigate the world and all of its informal learning situations. In this study, it would have been inappropriate to look for implementation or self-regulation of formal strategies that conventional readers are taught to use. Had this study used pure observation (Neuman & Roskos, 1997), then the child data could have been interpreted as a form of folk strategies for accomplishing tasks. However, I intended to explore what happened during joint reading as a form of interactive participant observation. Though participants engaged in actions that could be interpreted as strategic and/or self-regulated attempts to make meaning from text (e.g., counting pictured objects, turning back through pages, and closely examining illustrations for meaning), I preferred to language their behaviors using terms such as constructive, cognitive, and metacognitive.

Discussion of Limitations

Two limitations impeded my ability to fully answer my research question through my study design: the influence of joint reading practices on collected data and the influence of the study environment on collected data.

Influence of joint reading practices. Younger and older participants may not spontaneously engage in, benefit from, and/or share metacognitive knowledge, thoughts, and

experiences. I therefore designed this study to collect both prompted and unprompted data (Lee & Schmitt, 2014) and both verbal and non-verbal data (Whitebread et al., 2009). However, this study's procedures may have influenced data collection and analysis and therefore the conclusions drawn. Brown (1980) drew attention to an almost unanswerable question relevant to any study in which a researcher interacts with a young participant – if it was prompted, was it metacognitive at all? This question goes beyond assuming that children actually have more sophisticated internal thoughts that they can't articulate and calls into question whether any metacognition took place at all.

Though I did not implement a formal intervention, some aspects of my procedures could be considered influential. Since children can internalize both explicit and implicit scaffolding (Lee & Schmitt, 2014) from the adult party to joint reading, distinguishing truly independent data was difficult. In other words, though some data was clearly spontaneous in accordance with my operational definition, it was not necessarily truly independent.

Nonetheless, my truth claims in this study concern what participants did in the context of a procedure that is interactive, unpredictable, and proleptic by design. By treating each reading session as an embedded unit of analysis and by richly describing not only what the child did, but also what I did, and what the text offered, I accounted for the influences of my prompts and other verbal input within my narrative impressions. It is possible that my questions and prompts helped set a base for future metacognitive growth for the participants. The questions and prompts were scaffolds to make the invisible visible. The totality of data and the results of my search for rival explanations suggested that the abilities to understand and respond to these scaffolds belonged to the preschoolers. Thus, salient questions and prompts appeared to create a space that may help to

document and describe the beginnings of metacognition in joint readings and perhaps throughout emergent literacy. I discuss this idea further in my suggestions for future research.

Implementing a challenging, novel procedure in a naturalistic setting. Implementing a novel procedure in a naturalistic setting posed some difficulties. Participants were given prompts that ostensibly challenged them to concentrate and articulate their thinking while being distracted by the normal activities of the classroom. Most reading sessions experienced at least one interruption by other children or by a teacher. These likely interrupted concentration and precluded collection of some verbal and nonverbal data. I also had to forego data collection opportunities when I perceived fatigue or boredom, by not posing preplanned questions or by allowing participants to skip pages. Also, many participants were distracted by my visible use of a small video camera to record sessions versus use of a hidden camera. Many participants requested to start and stop the recording or to view the recording of their session in real time. In sum, conducting sessions in the regular preschool classroom posed a tension between rigor and ecological relevance. In future studies, I intend to not have to make this tradeoff, by selecting a more spacious site and working with staff members to set up a reading area that is less likely to be interrupted.

Implications for Theory

My findings suggest two main implications for continued metacognitive theory building. The first is that seeking to understand situational, functional relationships among meta-capacities that emerge during the preschool years is more important than searching for a start year or a pre-determined developmental sequence. In this study, theory of mind, use of metacognitive language, and metacognition functioned as distinct yet related phenomena. It would not have been fruitful to think of these three areas as sequential. For example, participants who recognized

the representational nature of the thought bubbles did not necessarily demonstrate the most metacognitive engagement during joint reading. Second, my findings suggested that young metacognitive agents can have meaningful metacognition without being able to recall or discuss the experience. The task of joint storybook reading invited metacognition actions, enabled metacognitive experiences, and presumably built metacognitive knowledge.

Implications for Future Research

My findings suggested three main implications for continued research. First, future research on preschoolers' interaction with stories before they can conventionally read print should include metacognition. The canon of emergent literacy research has addressed topics such as familiarity with storybook language (Dooley & Matthews, 2009; Purcell-Gates, 2001; Sulzby, 1985), acquisition of meaning vocabulary (Blamey et al., 2012), or proficiency in various code-based skills (NELP, 2008). Tompkins et al. (2013) and Hannon and Frias (2012) added focus on the capacities of pre-readers to engage in higher order comprehension processes such as inferencing. Studies of higher order processes have included preschoolers' proficiency with false belief scenarios (Riggio & Cassidy, 2009) and their use of metacognitive language (Peskin & Astington, 2004). As suggested by this range of topics, the totality of emergent literacy research has established that both lower and higher order meaning making processes are relevant to emergent literacy (Clay, 1991; Dooley & Matthews, 2009; van den Broek et al., 2011). The present study began to examine how metacognition may work in concert with these processes during joint book reading.

Second, research on reading-related metacognition should include preschoolers as participants. Four-year-olds shouldn't be excluded from the study of comprehension or metacognition based on age or pre-conventional literacy status. However, it should be studied

through developmentally-appropriate and ecologically-relevant methods. In the present study, metacognition was not necessarily a function of emergent literacy sophistication. Neither was it consistently a function of interacting with a particular book, or responding to a particular prompt, or engaging in a repeated reading. Furthermore, the quantity of metacognition alone did not indicate cognitive or metacognitive proficiency. The implication is that future studies of preschoolers' metacognition should respect these complexities and avoid concluding that absence of pre-defined metacognitive behaviors equates with an absence of metacognition. Another subtle implication for research design is that story construction and story comprehension are not necessarily the same thing. Children may retell familiar stories from memory, an issue Sulzby (1985) was aware of but did not control for in her seminal study. Therefore, when studying metacognition in relation to comprehension of structured information in a narrative text, care must be taken to distinguish between these two functions (Kintsch, 1998). In a similar vein, theory of mind, understanding of false beliefs, and expressive and receptive familiarity with metacognitive language are organic components of story comprehension and can be direct objects of or partners with metacognition (Peskin & Astington, 2004). Therefore, these constructs are best studied in concert, transactionally.

Third, metacognition research with preschool participants should embrace storybook reading methods using actual children's picture books and without the use of error detection. Joint storybook reading is a recognizable task that can be implemented with or without prompting. Multiple storybooks may yield more reliable information, as text characteristics can affect whether and how metacognition is relevant. The gists of the four texts in the present study were salient. Participants could fail to grasp multiple main ideas without undermining their ability to articulate a refrain, state an internal motivation or goal, and evaluate whether the goal

was reached. Future research may benefit from working with texts that are conceptually challenging or texts that cannot be understood without comprehension of a meaningful number of constituent propositions. Real texts could be understood or not for any number of reasons, meaning that metacognition could be relevant in any number of ways. There is no need to add metacognitive vocabulary (Peskin & Astington, 2004) or implant errors (Skarakis-Doyle & Dempsey, 2008). Stories invite understanding, and understanding invites metacognition (Baker, 2017). As observed in the reading of *The Very Lonely Firefly*, when students do encounter errors in texts, they may not be obvious, and what to do about them even less so.

Expanding study of the most productive questions and prompts to use during joint reading would also be a fruitful area for future research. Joint reading, as a form of dialogic reading, is already considered a best practice in emergent literacy (NELP, 2008). However, what exactly adults should say and how they should interact with children is a topic of ongoing research. In the present study, open-ended prompts tended to produce impressive responses (sophisticated and/or metacognitive). Although metacognitive and thinking prompts may have been a novel form of discourse for the participants, they often produced higher order processing or critical insights. Thus, these interaction patterns can be comfortably added to the informal routines of shared or joint reading. In fact, Rosemary and Roskos (2002) noted that adults can send implicit messages about thinking, learning, communicating, and reading through classroom talk about literacy functions and through the special "sustained verbal interaction" (p. 225) of adult-child book reading. The facilitative mechanisms of questions and prompts could be a fruitful space for related future study.

The study of questions and prompts could also gather information on the relationships between theory of mind concepts and metacognition. My analysis of participants' responses to

the thought bubbles in *Pancakes* provided an example. The text feature of thought bubbles also seemed to play a special role by connecting emerging skills in the related areas of narrative comprehension, theory of mind, and metacognition. Not all participants understood that thought bubbles represented the character's thoughts; some thought they were just a page cut out showing another action sequence. However, they all understood my question about thought bubbles and could earnestly answer. Thus, the mere presence of thought bubbles encouraged the focus of attention to the main character's internal experiences, such as the abstract acts of thinking, planning, wishing, or imagining. Thought bubbles also provided a reason to use metacognitive language within the joint reading discourse. Finally, thought bubbles exemplified the idea of documenting and sharing thoughts as defined objects. The language of my questions about thought bubbles also provided cues about how to react to them.

Conclusions

The results of this study demonstrated that particular forms of reading-related metacognition are comfortably within the zone of proximal emergent literacy development for typical 4-year-olds. In the present study, preschool participants were metacognitive in at least seven ways. These results concurred with Whitebread et al.'s conclusion that underappreciation of the metacognitive capabilities of preschoolers is becoming an "increasingly untenable" position (2009, p. 64). From birth, children accumulate knowledge, beliefs, and routines concerning language, communication, print, texts, reading, and writing (IRA & NAEYC, 1998). This emergence of literacy includes the formation of ideas about the act of reading (Strommen & Mates, 1997) and about the self as an active participant in literate communication (Clay, 1991; Neuman & Roskos, 1997; Rowe, 1989).

In the present study, metacognition was a meaningful feature of the joint reading of picture books; articulating internal meaning-making processes co-occurred with talk about pancakes and ducklings. Preschool participants were constructively responsive meaning-makers; they went through many of the same cognitive and metacognitive meaning-making processes that readers of any age do. These results should bring attention to the relevance of metacognition to the joint reading of picture books and inspire curiosity about the importance of metacognition to emergent literacy experiences.

Appendix A

Table 28

Summary of Metacognitive Codes Represented in Literature Review

	Reflect	Feel Know	Judge Diff	Judge Learn	Meta Mem	Justify	Plan	Revise	Expand	Monit
Present Study	+	+	+	-	-	+	+	+	+	n/a
Reading Tasks										
Brown et al. (2014)		(+)					(+)	(+)		+
Brenna (1995)	+	(+)	+				+	+		+
Holdaway (1979)	(+)						(+)	(+)	(+)	+
Hsieh et al. (2013)								+		+
Skarakis-Doyle & Dempsey (2008)										+
Strommen & Mates (1997)	+									
Writing Tasks										
Fang & Cox (1999)							+	+	(+)	+
Rowe (1989)	+	(+)		(+)			+	+		+
Learning Center Tasks										
Neuman & Roskos (1997)	(+)	(+)					+	(+)		+
Whitebread et al. (2009)	(+)	(+)		(+)		(+)	(+)			+
Relevant, Non-Literary Tasks										
Cultice et al. (1983)		+								
Ghetti et al. (2013)		+								
Hembacher & Ghetti (2014)		+								
Schneider et al. (2000)			-							
Revelle et al. (1985)		(-)								-

Note. + = This capacity could be a part of preschool emergent literacy. (+) = Interpreted from other forms claimed by the author(s). - = Preschoolers' performances did not suggest that this capacity could be a part of emergent literacy. +/- = Mixed evidence of the relevance of this capacity to emergent literacy.

References

Afflerbach, P. P. (2000). Verbal reports and protocol analysis. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, and R. Barr (Eds.), *Handbook of Reading Research, Vol. III*, (pp. 163-179). New York, NY: Routledge.

Afflerbach, P. P., Holmberg-Masden, L., Ozturk, N., & Faust, B. (December 2014). *An examination of metacognition's "place" in state education agency rhetoric and policy*. Paper presented at the meeting of the Literacy Research Association, Marco Island, FL.

Afflerbach, P. P., & Cho, B. (2011). The classroom assessment of reading. In M. L. Kamil, P. D. Pearson, E. B. Moje, & P. P. Afflerbach (Eds.), *Handbook of reading research, Vol. IV*, (pp. 487-514). New York, NY: Routledge.

Alexander, P. A., & Fox, E. (2004). A historical perspective on reading research and practice. In N. J. Unrau & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (5th ed.) (pp. 33-68). Newark, DE: International Reading Association.

Altheide, D. L., & Johnson, J. M. (1994). Criteria for assessing interpretive validity in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 485-499). Thousand Oaks, CA: Sage Publications.

Annevirta, T., Laakkonen, E., Kinnunen, R., & Vauras, M. (2007). Developmental dynamics of metacognitive knowledge and text comprehension skill in the first primary school years. *Metacognition and Learning, 2*, 21-39.

Annevirta, T., & Vauras, M. (2001). Metacognitive knowledge in primary grades: A longitudinal

study. *European Journal of Psychology of Education, 16*(2), 257-282.

Arizpe, E. (2013). Meaning-making from wordless or near wordless picture books: What educational research experts and what readers have to say. *Cambridge Journal of Education, 43*(2), 163-176.

Atkinson, P., & Delamont, S. (2008). Analytic perspectives. In N. K. Denzin & Y. S. Lincoln (Eds.), *Collecting and interpreting qualitative materials* (3rd ed.) (pp. 285-311). Los Angeles, CA: Sage Publications.

Baker, L. (2005). Developmental differences in metacognition: Implications for metacognitively-oriented reading instruction. In S. E. Israel, C. C. Block, K. L. Bauserman, & K. Kinnucan-Welsch (Eds.), M*etacognition in literacy learning* (pp. 61-79). Mahwah, NJ: Erlbaum.

Baker, L. (2017). The development of metacognitive knowledge and control of comprehension: Contributors and consequences. In K. Mokhtari (Ed.), *Improving reading comprehension through metacognitive reading strategies instruction* (pp. 1-32). Lanham, MD: Rowman & Littlefield.

Baker, L., & Beall, L. C. (2009). Metacognitive processes and reading comprehension. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 373-388). New York, NY: Routledge.

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In P. D. Pearson, R. Barr, M. L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research* (pp. 353-394). Mahwah, NJ: Erlbaum.

Baker, L., & Cerro, L. C. (2000). Assessing metacognition in children and adults. In G. Schraw & J. C. Impara (Eds.), *Issues in the measurement of metacognition*. Lincoln, NE: Buros Institute of Mental Measurements (pp. 99-145). Retrieved from http://digitalcommons.unl.edu/burosmetacognition/4/.

Berliner, D. C. (2002). Educational research: The hardest science of all. *Educational Researcher*, *31*(8), 18-20.

Blamey, K., Beauchat, K. A., & Sweetman, H. (2012). Supporting preschool teachers' vocabulary instruction during storybook reading. *NHSA Dialog, 15*(3), 233-245.

Bogden, R., & Biklen, S. K. (2007). *Qualitative research for education: An introduction to theories and methods* (5th ed.). Boston, MA: Pearson.

Boston Museum of Science. (2017). Firefly watch: Environmental factors. Retrieved from https://legacy.mos.org/fireflywatch/environmental_factors.

Boulware-Gooden, R., Carreker, S., Thornhill, A., & Joshi, R. M. (2007). Instruction of metacognitive strategies enhances reading comprehension and vocabulary achievement of third-grade students. *Reading Teacher, 61*(1), 70-77.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press. Retrieved January 1, 2014 from http://www.nap.edu/openbook.php?isbn=0309070368.

Braten, I. (1991). Vygotsky as precursor to metacognitive theory: II. Vygotsky as metacognitivist. *Scandinavian Journal of Educational Research*, *35*(4), 305-320.

Bredo, G. J. (2006). Philosophies of educational research. In J. L. Green, G. Camilli, & P. B. Moore (Eds.), *Handbook of complementary methods in educational research* (pp. 1-32). Mahwah, NJ: Erlbaum.

Brenna, B. (1995). The metacognitive reading strategies of five early readers. *Journal of Research in Reading, 1*, 53-62.

Britto, P. R., Fuligni, A. S., & Brooks-Gunn, J. (2006). Reading ahead: Effective interventions for young children's early literacy development. In D. K. Dickinson & S. B. Neuman, (Eds.), *The handbook of early literacy research* (Vol. II) (pp. 311-332). New York, NY: Guilford Press.

Brown, A. (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65-116). Hillsdale, NJ: Erlbaum.

Brown, A. L. (1978). Knowing when, where, and how to remember: A problem of metacognition. In R. Glaser (Ed.), *Advances in instructional psychology* (pp. 77-165). Hillsdale, NJ: Lawrence Erlbaum Associates.

Brown, A. L. (1980). Metacognitive development and reading. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), Theoretical issues in reading comprehension. (pp. 458-482). Hillsdale, NJ: Erlbaum.

Brown, A. L., & DeLoache, J. S. (1978). Skills, plans, and self-regulation. In R. S. Siegel (Ed.), *Children's thinking: What develops?* (pp. 3–35). Hillsdale, N.J.: Erlbaum.

Brown, A. L., & French, L. A. (1976). Construction and integration of logical sequences using causes or consequences as the point of departure. *Child Development, 47*, 930-940.

Brown, J., Garzarek, J., & Donegan, K. (2014). Effects of a narrative intervention on story retelling in at-risk young children. *Topics in Early Childhood Special Education, 34*(3), 154-164.

Bui, Y., Pyc, M. A., & Bailey, H. (2018). When people's judgments of learning (JOLs) are extremely accurate at predicting subsequent recall: the "Displaced-JOL effect." *Memory, 26*(6), 771-783.

Cain, K., & Oakhill, J. V. (1999). Inference making ability and its relation to comprehension failure in young children. *Reading & Writing: An Interdisciplinary Journal, 11*, 489-503.

Carle, E. (1995). *The very lonely firefly*. New York, NY: Philomel Books.

Cazden, C. (2002). *Classroom discourse: The language of teaching and learning* (2nd ed.) (pp. 81-108). Portsmouth, NH: Heinemann.

Chi, M. T. H., Glaser, R., & Rees, E. (1982). Expertise in problem solving. In R. J. Sternberg (Ed.), *Advances in the psychology of human intelligence* (Vol. 1, pp. 7-75). Hillsdale, NJ: Erlbaum.

Clay, M. M. (1991). *Becoming literate: The construction of inner control.* Portsmouth, NH: Heinemann Education.

Coffey, A., & Atkinson, P. (1996). *Making sense of qualitative data: Complementary research strategies*. Thousand Oaks, CA: Sage Publications.

Council of Chief State School Officers. (2014). Common Core State Standards Initiative. English language arts standards. Retrieved June 1, 2014 from http://www.corestandards.org/ELA-Literacy/.

Cox, B., & Sulzby, E. (1982). Evidence of planning in dialogue and monologue by five-year-old emergent readers. *National Reading Conference Yearbook*, *31*, 143-150.

Crain, W. (1992). *Theories of development: Concepts and applications*, (3rd ed.). Englewood Cliffs, NJ: Prentice Hall

Crotty, M. (1998). *The foundations of social research*. Thousand Oaks, CA: Sage Publications.

Cultice, J. C., Somerville, S. C., & Wellman, H. M. (1983). Preschoolers' memory monitoring: Feeling-of-Knowing Judgments. *Child Development, 54*(6), 1480-1486.

DeBruin-Parecki, A., & Squibb, K. (2011). Promoting at-risk preschool children's comprehension through research-based strategy instruction. *Reading Horizons, 51*(1), 41-62.

De Paola, T. (1978). *Pancakes for breakfast*. Orlando, FL: Harcourt Brace and Company.

Desoete, A. (2008). Multi-method assessment of metacognitive skills in elementary school children: How you test is what you get. *Metacognition and Learning, 3*, 189-206.

Dinsmore, D. L., Alexander, P. A., & Loughlin, S. M. (2008). Focusing the conceptual lens on metacognition, self-regulation, and self-regulated learning. *Educational Psychology Review, 20*, 391-409.

Dooley, C. M. (2010). Young children's approaches to books: The emergence of comprehension. *The Reading Teacher, 64*(2), 120-130.

Dooley, C. M., & Matthews, M. W. (2009). Emergent comprehension: Understanding comprehension development among young literacy learners. *Journal of Early Childhood Literacy, 9*(3), 269-294.

Dorl, J. (2007). Think aloud! Increase your teaching power. *Young Children, 62*(4), 101-105.

Dunlosky, J., & Lipko, A. R. (2007). Metacomprehension: A brief history and how to improve its accuracy. *Current Directions in Psychological Science, 16*(4), 228-232.

Dowling, M. (2014). *Young children's personal, social, and emotional development* (4th ed.). Washington, DC: Sage Publications.

Eastman, P. D. (1960). *Are you my mother?* New York, NY: Random House, Inc.

Eisenhart, M. (2006). Representing qualitative data. In J. L. Green, G. Camilli, & P. B. Moore (Eds.) *Handbook of complementary methods in educational research* (pp. 567-581). Mahwah, NJ: Lawrence Erlbaum Associates.

Emrath, P. (2013). National Association of Home Builders special studies: Spaces in new homes. Retrieved from https://www.nahb.org/en/research/housing-economics/special-studies/spaces-in-new-homes-2013.aspx.

Ericsson, K. A., & Simon, H. A. (1984/1993). *Protocol analysis: Verbal reports as data*. Massachusetts Institute of Technology: Author.

Fang, Z., & Cox, B. E. (1999). Emergent metacognition: A study of preschoolers' literate behavior. *Journal of Research in Childhood Education, 13*(2), 175-187.

Feuerstein, R., Feuerstein, R. S., & Falik, L. H. (2010). *Beyond smarter: Mediated learning and the brain's capacity for change*. New York, NY: Teachers College Press.

Fisher, R. (1998). Thinking about thinking: Developing metacognition in children. *Early Child Development and Care, 141*, 1-13.

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), *The nature of intelligence* (pp. 231-236). Hillsdale, NJ: Lawrence Erlbaum Associates.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist, 34*(10), 906-911.

Flavell, J. H. (1981). Cognitive monitoring. In W. P. Dickson (Ed.), *Children's oral communication skills* (pp. 35 - 60). New York, NY: Academic Press.

Flavell, J. H. (1987). Speculations about the nature and development of metacognition. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 21-29). Hillsdale, NJ: Lawrence Erlbaum Associates.

Flavell, J. H. (1992). Cognitive development: Past, present, and future. *Developmental Psychology, 28*(6), 998-1005.

Flavell, J. H. (1993). Young children's understanding of thinking and consciousness. *Current Directions in Psychological Science, 2*(2), 40-43.

Flavell, J. H. (2004). Theory of mind development: Retrospect and prospect. *Merrill Palmer Quarterly (50)*3, 274-290.

Flavell, J. H., Friedrich, A. G., & Hoyt, J. D. (1970). Developmental changes in memorization

processes. *Cognitive Psychology,1*, 324-340.

Flavell, J. H., Green, F. L., & Flavell, E. R. (1995). Young children's knowledge about thinking. *Monographs of the society of research in child development, 60*(1), 1-113.

Flavell, J. H., Miller, P. H., & Miller, S. A. (1993). *Cognitive development* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Flavell, J. H., & Wellman, H. M. (1977). Metamemory. In R. V. Kail & J. W. Hagen (Eds.), *Perspectives on the development of memory and cognition* (pp. 3-33). Hillsdale, NJ: Erlbaum.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry (12)*2, 219-245.

Fountas, I. C., & Pinnell, G. S. (1996). *Guided reading: Good first teaching for all children*. Portsmouth, NH: Heinemann.

Fountas, I. C., & Pinnell, G. S. (2012). Guided reading: The romance and the reality. *The Reading Teacher, 66*(4), 268-284.

Fox, E., & Riconscente, M. (2008). Metacognition and self-regulation in James, Piaget, and Vygotsky. *Educational Psychology Review, 20*, 373-389.

Garner, R. (1987). *Metacognition and reading comprehension*. Norwood, NJ: Ablex Publishing Corporation.

Geertz, C. (1973). *The interpretation of cultures*. New York, NY: Perseus Books Group.

Ghetti, S., Hembacher, E., & Coughlin, C. A. (2013). Feeling uncertain and acting on it during the preschool years. *Child Development Perspectives, 7*(3), 160-165.

Griffith, P. L., & Ruan, J. (2005). What is metacognition and what should be its role in literacy instruction? In S. E. Israel, C. C. Block, K. L. Bauserman, & K. Kinnucan-Welsch (Eds.), *Metacognition in Literacy Learning* (pp. 3-18). Mahwah, NJ: Lawrence Erlbaum Associates.

Guba, E. G., & Lincoln, Y. S. (2005). Paradigmatic controversies, contradictions, and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed.) (pp. 191-215). Thousand Oaks, CA: Sage Publications.

Hacker, D. J. (1998). Introduction. In D. J. Hacker, J. Dunlosky, & C. Graesser (Eds.), *Metacognition in educational theory and practice*. Mahwah, NJ: Erlbaum.

Hannon, B., & Frias, S. (2012). A new measure for assessing the contributions of higher level processes to language comprehension performance in preschoolers. *Journal of Educational Psychology, 104*(4), 897-921.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Publishing.

Hembacher, E., & Ghetti, S. (2014). Don't look at my answer: Subjective uncertainty underlies preschoolers' exclusion of their least accurate memories. *Psychological Science, 25*, 1768-1776.

Holdaway, D. (1979). *The foundations of literacy*. New York, NY: Scholastic.

Hsieh, W., Ku, Y., & Chen, Y. (2013). Young children's metacognition in the context of telling a written story. *Early Child Development and Care, 183*(12), 1796-1810.

Institute of Education Sciences. (2015). What works clearinghouse: Shared book reading. Retrieved from https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_ sharedbook_041415.pdf.

International Literacy Association. (2018). What effective pre-k literacy instruction looks like [Literacy leadership brief]. Newark, DE: Author.

Jacobs, J. E., & Paris, S. G. (1987). Children's metacognition about reading: Issues in definition, measurement, and instruction. *Educational Psychologist, 22*, 255-278.

Jalongo, M., Dragich, D., Conrad, N. K., & Zhang, A. (2002). Using wordless picture books to support emergent literacy. *Early Childhood Education Journal, 29*(3), 167-178.

Karably, K., & Zarbucky, K. M. (2009). Children's meta-memory: A review of the literature and implications for the classroom. *International Electronic Journal of Elementary Education, 2(*1), 32-52.

Kendeou, P., Bohn-Gettler, C., White, M. J., & van den Broek, P. (2008). Children's inference generation across different media. *Journal of Research in Reading, 31*(3), 259-272.

Kendeou, P., van den Broek, P., Helder, A., & Karlsson, J. (2014). A cognitive view of reading comprehension: implications for reading difficulties. *Learning Disabilities Research & Practice, 29*(1), 10–16.

Kinnunen, R., Vauras, M., & Niemi, P. (1998). Comprehension monitoring skills in beginning readers. *Scientific Studies of Reading, 2*(4), 353-375.

Kintsch, W. (1998). *Comprehension: A paradigm for cognition.* New York, NY: Cambridge University Press.

Kintsch, W. (2004). The Construction-Integration model of text comprehension and its implications for instruction. In R. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed.). Newark, DE: International Reading Association

Kintsch, W., & Rawson, K. A. (2005). Comprehension. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 209-226). Malden, MA: Blackwell Publishing.

Kolb, S. M. (2012). Grounded theory and the constant comparative method: Valid research strategies for educators. *Journal of Emerging Trends in Educational Research and Policy Studies, 3*(1), 83-86.

Kucan, L., & Beck, I. L. (1997). Thinking aloud and reading comprehension research: Inquiry, instruction, and social interaction. *Review of Educational Research, 67*(3), 271-299.

Kuhn, D. (2000). Metacognitive development. *Current Directions in Psychological Science, 9*(5), 178-181.

Lai, E. R. (2011). Metacognition: A literature review. Retrieved from https://images.pearsonassessments.com/images/tmrs/Metacognition_Literature_Review_Final.pdf.

Larkin, S. (2009). *Metacognition in young children*. New York, NY: Routledge.

Lather, P. (2006). Paradigm proliferation as a good thing to think with: Teaching research in education as a wild profusion. *International Journal of Qualitative Studies in Education, 19*(1), 35-57.

Lee, P., & Schmitt, M. C. (2014). Teacher language scaffolds the development of independent strategic reading activities and metacognitive awareness in emergent readers. *Reading Psychology, 35*(1), 32-57.

Leslie, L., & Caldwell, J. S. (2010). *Qualitative reading inventory* (5th ed.). Boston, MA: Pearson.

Lockl, K. & Schneider, W. (2002). Developmental trends in children's feeling-of-knowing judgements. *International Journal of Behavioral Development, 26*(4), 327-333.

Lockl, K., & Schneider, W. (2006). Precursors of metamemory in young children: the role of theory of mind and metacognitive vocabulary. *Metacognition & Learning, 1*(1), 15-31.

Lynch, J. S., van den Broek, P., Kremer, K. K., Kendeou, P., White, M. J., & Lorch, E. P. (2008). The development of narrative comprehension and its relation to other early reading skills. *Reading Psychology, 29,* 37-365.

Lysaker, J., & Hopper, E. (2015). A kindergartener's emergent strategy use during wordless picture book reading. *The Reading Teacher, 68*(8), 649-657.

Mar, R., & Oatley, K. (2008). The function of fiction is the abstraction and simulation of social experience. *Perspectives on Psychological Science 3*(3), 173-192.

Markman, E. (1977). Realizing that you don't understand: A preliminary investigation. *Child Development (48)*3, 986-992.

Markman, E. (1981). Comprehension monitoring. In W. P. Dickson (Ed.), *Children's Oral Communication Skills* (pp. 61-84). New York, NY: Academic Press.

Martin, L., & Kragler, S. (2011). Becoming a self-regulated reader: A study of primary-grade students' reading strategies. *Literacy Research and Instruction, 50*(2), 89-104.

Marulis, L. M. (2014). *Conceptualizing and assessing metacognitive development in young children* (doctoral dissertation). University of Michigan.

Marulis, L. M., Palincsar, A. S., Berhenke, A. L., & Whitebread, D. (2016). Assessing metacognitive knowledge in preschoolers: The development of a metacognitive knowledge interview (McKI). *Metacognition and Learning, 11*, 1-30.

Massachusetts Audubon Society. (2017). Baby birds out of the nest. Retrieved from http://www.massaudubon.org/learn/nature-wildlife/birds/baby-birds-out-of-the-nest.

McGee, L. M., & Schickedanz, J. A. (2007). Repeated interactive read-alouds in preschool and kindergarten. *The Reading Teacher, 60*(8), 742-751.

Mokhtari, K., & Reichard, C. A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology, 94*(2), 249-259.

Morrison, G. S. (2008). *Fundamentals of early childhood education* (5th ed.). Upper Saddle River, NJ: Pearson.

Mukherji, P., & Albon, D. (2010). *Research methods in early childhood: An introductory guide*. Washington, DC: Sage Publications.

Munoz, L. & Santa Cruz, J. (2016). The preschool classroom as a context for cognitive development: Type of teacher feedback and children's metacognitive control. *Electronic Journal of Research in Educational Psychology, 14*(1), 23-44.

National Association for the Education of Young Children. (1998). Learning to read and write: developmentally appropriate practices for young children. A joint position statement of the International Reading Association and the National Association for the Education of Young Children. Retrieved from https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/PSREAD98.PDF.

National Association for the Education of Young Children. (2012). The Common Core State Standards: Caution and opportunity for early childhood education. Washington, DC: National Association for the Education of Young Children. Retrieved from http://www.naeyc.org/files/naeyc/11_CommonCore1_2A_rv2.pdf.

National Center for Education Statistics. (2015). Table 5.1. Compulsory school attendance laws, minimum and maximum age limits for required free education, by state: 2015. Retrieved from https://nces.ed.gov/programs/statereform/tab5_1.asp.

National Early Literacy Panel. (2008). Developing early literacy: Report of the National Early Literacy Panel. Executive Summary. Washington, DC: National Institute for Literacy.

National Institute of Child Health and Human Development. (2000). Report of the National Reading Panel. Teaching children to read: an evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups (NIH Publication No. 00-4754). Washington, DC: U.S. Government Printing Office.

Neuman, S. B., & Roskos, K. (1997). Literacy knowledge in practice: Contexts of participation for young readers and writers. *Reading Research Quarterly*, *32*(1), 10-32.

Oakhill, J., Hartt, J., & Samols, D. (2005). Levels of comprehension monitoring and working memory in good and poor comprehenders. *Reading & Writing, 18*(7/9), 657-686.

Palincsar, A. S., & Brown, D. A. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 1*(2), 117-175.

Palincsar, A. S. & Schutz, K. M. (2011). Reconnecting strategy instruction with its theoretical roots. *Theory into Practice*, *50*(2), 85-92.

Paris, A. H., & Paris, S. G. (2003). Assessing narrative comprehension in young children. *Reading Research Quarterly (38)*1, 36-76.

Paris, S. G. (2005). Reinterpreting the development of reading skills. *Reading Research Quarterly, 40*(2), 184-202.

Paris, S. G. (2011). Developmental differences in early reading skills. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (Vol. III) (pp. 228-241). New York, NY: Guilford Press.

Pellegrini, A. D. & Galda, L. (2003). Joint reading as a context: Explicating the ways context is created by participants. In A. Van Kleeck, S. Stahl, & E. Bauer (Eds.), *On reading books to children: Parents and teachers* (pp. 321-335). Mahwah, NJ: Erlbaum.

Peskin, J., & Astington, J. W. (2004). The effects of adding metacognitive language to story texts. *Cognitive Development*, *19*, 253-273.

Piaget, J. (1929/1997). The child's conception of the world. New York, NY: Routledge.

Pieschl, S., Stallmann, F., & Bromme, R. (2014). High school students' adaptation of task definitions, goals and plans to task complexity – the impact of epistemic beliefs. *Psychological Topics, 23*(1), 31-52.

Pressley, M., & Afflerbach, P. P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Pressley, M., & Gaskins, I. W. (2006). Metacognitively competent reading comprehension is constructively responsive reading: How can such reading be developed in students? *Metacognition and Learning*, 1, 99-113.

Purcell-Gates, V. (1995). *Other people's words: The cycle of low literacy*. Cambridge, MA: Harvard University Press.

Purcell-Gates, V. (2001). Emergent literacy is emerging knowledge of written, not oral, language. *New Directions for Child and Adolescent Development, 92*, 7-22.

Randi, J., Grigorenko, E. L., & Sternberg, R. J. (2005). Revisiting definitions of reading comprehension: Just what is reading comprehension anyway? In S. E. Israel, C. C. Block, K. L. Bauserman, & K. Kinnucan-Welsch (Eds.), M*etacognition in literacy learning* (pp. 17-39). Mahwah, NJ: Lawrence Erlbaum Associates.

Revelle, G. L., Wellman, H. M., & Karabenick, J. D. (1985). Comprehension monitoring in preschool children. *Child Development*, *56*, 654-663.

Richards, L. (1999). *Using NVIVO in qualitative research*. Thousand Oaks, CA: Sage Publications.

Richardson, L., & St. Pierre, E. (2005). Writing: A method of inquiry. In N. Denzin & Y.

Lincoln (Eds.), *Handbook of qualitative research* (3rd ed.) (pp. 959-978). Thousand Oaks, CA: Sage Publications.

Riggio, M. M., & Cassidy, K. W. (2009). Preschoolers' processing of false beliefs within the context of picture book reading. *Early Education & Development, 6*, 992-1015.

Rosemary, C. A., & Roskos, K. A. (2002). Literacy conversations between adults and children at child care: Descriptive observations and hypotheses. *Journal of Research in Childhood Education*, *16*(2), 212-231.

Rosenblatt, L. M. (1978). *The reader, the text, the poem: The transactional theory of the literary work*. Southern Illinois University Press: Author.

Rowe, D. (1989). Preschooler's use of metacognitive knowledge and strategies in self-selected literacy events. *National Reading Conference Yearbook*, *38,* 65-76.

Schickedanz, J. A., & McGee, L. M. (2010). The NELP Report on shared story reading interventions (Chapter 4): Extending the story. *Educational Researcher*, *39*(4), 323-329.

Schmitt, M. C. (2001). The development of children's strategic processing in reading recovery. *Reading Psychology, 22*, 129-151.

Schneider, W. (2001). Metacognitive Development: Educational Implications. *International Encyclopedia of the Social & Behavioral Sciences, 10*, 282-288.

Schneider, W., Visé, M., Lockl, K., & Nelson, T. O. (2000). Developmental trends in children's memory monitoring: Evidence from a judgment-of-learning (JOL) task. *Cognitive Development, 15*, 115-134.

Scholastic. (2018). Kids and Family Reading Report, 7th ed. Retrieved from

https://www.scholastic.com/readingreport/home.html.

Schraw, G., & Moshman, D. (1995). Metacognitive theories. Educational psychology papers and publications. Paper 40. Retrieved from http://digitalcommons.unl.edu/edpsychpapers/40.

Skarakis-Doyle, E., & Dempsey, L. (2008). The detection and monitoring of comprehension errors by preschool children with and without language impairment. *Journal of Speech, Language, and Hearing Research*, *51*, 1227-1243.

Snow, C. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: RAND Corporation. Retrieved December 1, 2013 from http://www.rand.org/pubs/monograph_reports/MR1465.

Snow, C., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

Stahl, K. (2014). Fostering inference generation with emergent and novice readers. *The Reading Teacher, 67*(5), 384-388.

Stein, N. (1986). Knowledge and process in the acquisition of writing skills. *Review of Research in Education*, *13*, 225-258.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Thousand Oaks, CA: Sage Publications.

Strauss, A., & Corbin, J. (1994). Grounded theory methodology: An overview. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 273-285). London: Sage Publications.

Strommen, L. T., & Mates, B. F. (1997). What readers do: Young children's ideas about the nature of reading. *The Reading Teacher, 51*(2), 98-107.

Sulzby, E. (1985). Children's emergent reading of favorite storybooks: A developmental study. *Reading Research Quarterly, 20*(4), 458-481.

Sulzby, E. & Otto, B. (1982). 'Text' as an object of metalinguistic knowledge: A study in literacy development. *First Language*, *3*(9),181-199.

Sulzby, E., & Teale, W. (1991). Emergent literacy. In R. Barr, M. L. Kamil, P. B. Mosenthal, & P. D. Pearson, (Eds.), *Handbook of Reading Research* (2nd ed.) (pp. 727-757). White Plains, NY: Longman.

Tafuri, N. (1984). *Have you seen my duckling?* New York, NY: Greenwillow Books.

Tang, C. M., Bartsch, K., Nunez, N. (2007). Young children's reports of when learning occurred. *Journal of Experimental Child Psychology*, 97, 149-164.

The Cornell Lab of Ornithology. (2015a). All About Birds. Retrieved from https://www.allaboutbirds.org/guide/Mallard/id.

The Cornell Lab of Ornithology. (2015b). All About Birds. Retrieved from https://www.allaboutbirds.org/guide/Hooded_Merganser/id

The Official Eric Carle Website. (n.d.). Frequently Asked Questions. Retrieved from http://www.eric-carle.com/home.html.

Thorndyke, P. W. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive Psychology, 9*, 77-110.

Tompkins, V., Guo, Y., & Justice, L. M. (2013). Inference generation, story comprehension, and language skills in the preschool years. *Reading and Writing, 26*(3), 403-429.

Touroutoglou, A., & Efklides, A. (2010). Cognitive interruption as an object of metacognitive monitoring: Feeling of difficulty and surprise. In A. Efklides & P. Misailidi (Eds.), *Trends and prospects in metacognition research* (pp. 171-208). New York, NY: Springer.

Trawick-Smith, J. (2006). Early childhood development: A multi-cultural perspective (4th ed.). New York, NY: Pearson.

United States Census Bureau. (2016). Quick Facts. Retrieved from https://www.census.gov/quickfacts/fact/table/US/PST045216.

U.S. Department of Education (1999). National Center for Education Statistics. Fast Facts. Retrieved from http://www.nces.ed.gov/fastfacts/display.asp?id+56.

U.S. Department of Education. (2014). Programs: Reading First. Retrieved from http://www2.ed.gov/programs/readingfirst/index.html.

U.S. Department of Education. (2018). National Center for Education Statistics. *The Condition of Education 2018* (NCES 2018-144). Home literacy activities with young children. Retrieved from https://nces.ed.gov/fastfacts/display.asp?id=56.

van den Broek, P., Kendeou, P., Lousberg, S., & Visser, G. (2011). Preparing for reading comprehension: Fostering text comprehension skills in preschool and early elementary school children. *International Electronic Journal of Elementary Education, 4*(1), 259-268.

Van Kleeck, A. (2008). Providing preschool foundations for later reading comprehension: The importance of and ideas for targeting inferencing in storybook-sharing interventions. *Psychology in the Schools, 45*(7), 627-643.

Veenman, M. V. J. (2014). *Metacognition*. In P. Afflerbach (Ed.), *Handbook of individual differences in reading: Text and context*, pp. 26-40. New York: Routledge.

Veenman, M. J. V., Van Hout-Wolters, B. H. A. M., & Afflerbach, P. (2006). Metacognition and Learning: Conceptual and methodological considerations. *Metacognition and Learning, 1*, 3-14.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language*. Cambridge, MA: The Massachusetts Institute of Technology.

Wang, M. C., Haertel, G. D., & Walberg, H. J. (1990). What influences learning? A content analysis of review literature. *Journal of Educational Research, 84*, 30-43.

White, R. T. (1988). Metacognition. In J. P. Keeves (Ed.), *Educational research, methodology, and measurement: An international handbook* (pp. 70-75). New York, NY: Pergamon.

Whitebread, D., Coltman, P., Pasternak, D. P., Sangster, C., Grau, V., Bingham, S., Almeqdad, Q., & Demetriou, D. (2009). The development of two observational tools for assessing metacognition and self-regulated learning in young children. *Metacognition and Learning, 4*(1), 63-85.

Wiersma, W., & Jurs, S. G. (2009). *Research methods in education: An introduction.* (9th ed.). Boston, MA: Pearson.

Williams, J. P., & Atkins, J. G. (2009). The role of metacognition in teaching reading comprehension to primary students. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Handbook of metacognition in education* (pp. 26-43). New York, NY: Routledge.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Yopp, R. H., & Yopp, H. K. (2000). Sharing informational text with young children. *The Reading Teacher, 53*(5), 410-423.

Zevenbergen, A. A., & Whitehurst, G. J. (2003). Dialogic reading: A shared picture book reading intervention for preschoolers. In A. Van Kleeck, S. A. Stahl, & E. B. Bauer (Eds.), *On reading books to children: Parents and teachers (*pp. 170-192). Mahwah, NJ: Erlbaum.