HEAD START PRESCHOOL TEACHERS' COMMENTING PRACTICES DURING SHARED

BOOK READING SESSIONS: DESCRIBING LEARNING OPPORTUNITIES FOR

CHILDREN WITH VARYING VOCABULARY ABILITIES

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Introduction

Children begin developing the skills necessary to become proficient readers long before school entry. Indeed, language development measured at the early years of schooling has been identified as one of the strongest predictors of later reading comprehension through multiple studies (Kendeou, White, van Dden Broek, & Lynch, 2009; Tilstra, McMaster, Van den Broek, Kendeou, & Rapp, 2009; Vellutino, Tunmer, Jaccard, & Chen, 2007). Language is a complex system of interwoven elements, one of which is vocabulary knowledge. Helping children develop rich and diverse vocabularies at young ages may pave the way to later academic success as the size of early vocabulary is related to the size of later vocabulary, and early vocabulary ability has been related to later reading ability. Therefore, the development of strong language and vocabulary skills at an early age may be essential for later academic success.

Statement of the Problem

Children's vocabulary measured at preschool has been directly related to later vocabulary size and ability. Storch and Whitehurst (2002), using a sample of 626 children from low-income homes, found that receptive vocabulary measured by the Peabody Picture Vocabulary Test (PPVT) during preschool was predictive of vocabulary in kindergarten through fourth grade. This long-term predictiveness of early language underscores the importance of strong vocabulary skills prior to

formal school entry, particularly given that rates of vocabulary growth are relatively stable over time.

Children's vocabularies have also been linked to later reading ability, both directly and indirectly. Direct relationships begin as early as preschool, as oral language predicts 48% of the variance in code related skills (Storch & Whitehurst, 2002). Longitudinal effects are also evident, as oral language measured in pre-K accounts for 7% of the variance of reading comprehension measured in grades 3-4 (Storch & Whitehurst, 2002). A large-scale meta-analysis found that preschool vocabulary predicts later decoding and reading comprehension skills (National Early Literacy Panel, 2008). Indirect effects on reading comprehension through decoding and phonological awareness (Dickinson & Porche, 2011), and kindergarten code-related skills (Storch & Whitehurst, 2002) have also been found.

Children's vocabulary acquisition is largely dependent on input, with differences in input being related to differences in children's vocabularies (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Rowe, 2008). Children who are exposed to more overall language are more likely to have larger vocabularies. Twenty- and thirty-month-old children who had more speech addressed to them by proficient, adult speakers of their language were able to access words from memory more quickly, which was related to larger vocabulary sizes (Fernald, Perfors, & Marchman, 2006; Hurtado, Marchman, & Fernald, 2008). In addition to the amount of speech, the type of speech is also important. Knowledge of academic language, or sophisticated vocabulary is also related to academic success (Schleppegrell, 2012). Academic language pertains to the register of speech typically spoken in classrooms

that contains complex grammatical features as well as content-specific vocabulary.

Even though children may possess large vocabularies, and may have experienced plentiful and diverse vocabulary spoken by competent adult speakers at home, this vocabulary may not be consistent with the academic language that they will encounter upon school entry. The degree of match between home and school language can be an important factor for school success. Children with smaller funds of academic vocabulary may not have the prerequisite vocabulary that will allow them to fully access instruction. Classroom texts and teacher language may be rich with academic vocabulary, hence children who do not possess this particular type of vocabulary may be starting out behind their peers with larger funds of academic vocabulary knowledge. Children may be required to quickly learn academic vocabulary in order to understand the conversations and interact with classroom materials on a daily basis. Standardized measures of vocabulary are indicators of children's knowledge of academic vocabulary, therefore, children with lower scores on these measures may have smaller funds of the type of vocabulary that they will encounter in their classrooms.

There is evidence of systematic variability in the language children hear when at home as children arrive at preschool with varying degrees of academic vocabulary knowledge (Huttenlocher et al., 1991). By three years of age, differences in academic vocabulary have emerged between children from different social classes and children of different races (Farkas & Beron, 2004). Standardized measures that assess academic vocabulary indicate that the differences in vocabulary sizes of five year olds will not change for the next eight years (Farkas &

Beron, 2004). Therefore, children who start with smaller funds of academic vocabulary will remain behind their peers with larger funds of academic vocabulary. Children from homes with lower socio-economic status, and Black children tend to score lower on standardized measures of vocabulary than children from homes with higher SES or White children (Farkas & Beron, 2004). This does not indicate that these children are without language, or have been language deprived, but rather that the vocabularies they possess are not necessarily those assessed by standardized measures. Socio-economic status is of particular importance to Black children, as gaps between social classes widen between 36 and 60 months of age (Farkas & Beron, 2004). This widening was not observed among the social classes for White children (Farkas & Beron, 2004). Hence, young Black children from low-SES homes may enter kindergarten with smaller academic vocabularies and may be at greater risk for later academic failure than their more affluent peers. Providing vocabulary interventions at the preschool age may be of critical importance for this population of children.

Schooling does appear to have some impact on children's vocabulary growth, as being in school relates to more rapid language development than not being in school (Huttenlocher, Levine, & Vevea, 1998). Therefore, it is essential to identify the practices utilized in preschool classrooms that maximize children's potential for vocabulary and language growth.

Shared book reading (SBR), an interaction whereby an adult reads and discusses a book with a young, non-reading child (van Kleeck, Gillam, Hamilton, & McGrath, 1997), has been related to children's language and vocabulary growth

through observational (Dickinson & Smith, 1994; Haden, Reese, & Fivush, 1996) and intervention studies (Neuman, Newman, & Dwyer, 2011; Pollard-Durodola et al., 2011; Whitehurst et al., 1994; Whitehurst et al., 1988).   These studies indicate great variability in shared book reading events, which may be related to children's vocabulary and language growth.

Shared book reading is a much-studied topic. Overall, research demonstrates that shared book reading is an effective practice for improving children's vocabulary, however, the extent of its effectiveness has been debated. An early meta-analysis evaluated the variability of parent-preschooler shared book reading experiences in relation to children's oral language abilities (Scarborough & Dobrich, 1994). In contrast to conventional wisdom, only moderate correlations were found (d= .28). Book reading interventions did strengthen children's oral language skills, but not to the expected extent. The authors did assert that altering the quantity or quality of shared book experiences could facilitate the development of oral language, but that other factors, such as socioeconomic background and early attitudes towards literacy, also played essential roles in later achievement.

A second meta-analysis revealed somewhat larger effect sizes for book reading on the language skills of preschoolers (d= 0.67) (Bus, van IJzendoorn, & Pellegrini, 1995). Bus and colleagues analyzed many of the studies utilized by Scarborough and Dobrich (1994), however, a different statistical method was used. The study addressed Scarborough and Dobrich's concerns that socioeconomic status may function as a mediator, but found that SES was not associated with the effects of shared book reading between parents and children and language outcome

measures. Similar to Scarborough and Dobrich (1994), Bus and colleagues (1995) found that shared book reading accounted for 8% of the variance in language outcome measures, however, a more positive stance was taken when presenting the results. While the previous meta-analysis presented shared book reading as a minor factor in children's language development, Bus and colleagues (1995) asserted that it was a necessary element in preparing children for reading instruction upon school entry.

A more recent meta-analysis further examined the relationships between shared book reading experiences and children's oral language development using more rigorous criteria and statistical analysis, while also evaluating the factors identified by Scarborough and Dobrich (1994) and Bus and colleagues (1995) as being influential in children's later academic achievement (National Early Literacy Panel, 2008). The National Early Literacy Panel (NELP) conducted a meta-analysis that included 19 intervention studies, which were either randomized control trials or quasi-experimental designs. The preschool and kindergarten-aged children received book reading interventions that were delivered by parents, teachers, or a combination of parents and teachers. Overall effect sizes show that shared reading interventions have positive effects on children's language development (d= .57). Breaking down this statistic demonstrates that specific elements of the studies impacted the overall effect size. The nature of the experiment impacted the strength of the effect as the less rigorous quasi-experimental studies had larger effects than the more stringent randomized control trials (d= 2.87 vs. 0.56). Differences were found based on the outcome measure also, with vocabulary assessments yielding an

effect size of d= 0.60, and composite measures of oral language showing a weaker impact of d= 0.35. Likewise, the administrator of the intervention impacted the strength of the results, as parent-delivered interventions were significantly stronger than teacher-implemented interventions (d=1.35 vs. 0.84). Interventions that provided specific books for use in the reading sessions had stronger effects than those that did not (d=0.78 vs. d=0.55). In addition, the type of shared book reading experience influenced child outcomes. Dialogic reading interventions, which prescribe specific forms of interaction between the adult and child, were found to have a greater impact on student oral language development (d= 0.59) when compared with other interactive book reading interventions (d= 0.41).

The NELP report (2008) also examined the effects of book reading on different portions of the population to examine for whom this type of instruction was the most potent. Book reading had similar effects on children's oral language skills regardless of their parents' economic status. The difference in effect sizes for low-SES and not low-SES students (d= .79 vs. d=.85) was small and not significant. However, a significant difference was unearthed when comparing the effects of book reading on at-risk to not at-risk students. The effect size is nearly double for not at-risk children (d= .82) as for at-risk children (d=.47). This finding indicates that children's prior knowledge, ability, and experience may influence the benefits they derive in shared book reading settings.

While large scale meta-analyses have demonstrated positive relationships between shared book reading practices and children's vocabulary growth overall, little is known about the mechanism that causes this growth, or how this mechanism

may differentially effect different populations of children. Identifying the

mechanism(s) is of great importance due to the emergence of the Matthew effect,

whereby children with larger vocabularies receive greater benefit than children

with smaller vocabularies from shared book reading. Many of the studies reporting

Matthew effects have examined book reading styles using holistic measures that

gauge entire book reading sessions (Ewers & Brownson, 1999; Penno, Wilkinson, &

Moore, 2002). These descriptions may not adequately capture the distinct

instructional moves that teachers utilize. Studies that have employed fine-grained

measures have detected relationships between teachers' utterances and children's

vocabulary growth. A nuanced examination of instructional practices at the

utterance level may identify how children are differentially affected based on their

vocabulary abilities, and may permit the field to individualize instruction based on

children's needs.

Objectives of Current Study

This paper focuses on how preschool teachers may support children's

vocabulary growth through a typical classroom interaction, shared book reading.

Children's vocabulary learning is strongly related to the input they receive,

however, not all children profit equally. Different levels of support are needed

based on the children's present levels of vocabulary ability. Teachers who are able

to provide varied levels of support may be most capable of meeting the needs of all

of the children in their classroom (Tomlinson et al., 2003). Supporting vocabulary

growth may come through the instructional strategies that teachers use, as well as

the content of their talk. Instructional strategies refer to how the content is taught. Strategies are distinct moves made by the teacher to support children in achieving learning objectives, and the methods used by teachers to help students develop understanding of content. Instructional content refers to the topic or focus of instruction, or what is being taught.

This study used utterance level measures of teacher talk to predict children's end-of-the-year vocabulary gains, and to determine how input might differentially affect children with low and typical language ability. The first objective of the study was to describe preschool teachers' commenting practices during shared book reading sessions to explore the content and instructional strategies employed. In addition, differences between curriculum assignments were explored to determine if children were receiving similar types of instruction across conditions.

The second objective of the study was to examine how teachers' instructional comments were related to children's end-of-year vocabulary scores, hypothesizing that increases in the amount of instructional comments would be positively related to children's growth, regardless of their vocabulary ability. This hypothesis asserts that the quality of teachers' comments is an important factor in facilitating children's vocabulary growth.

The third objective of the study was to determine if different types of instructional strategies were related to children's end-of-year vocabulary scores. Strategies were coded based on the level of cognitive distancing required of the child, with three categories being employed: low, medium, and high. It was hypothesized that children would benefit from strategies that fell within their zones

of proximal development, with children with low language scores benefitting from low and medium level strategies, and children with typical language ability profiting from medium and high level strategies. This hypothesis emphasizes the importance of differentiation of instruction based on student need.

The final objective of the study was to perform a close examination of book-focused utterances to determine if different levels of instructional strategies focused on the book would differentially relate to vocabulary growth for children with low and typical language ability. Similar to objective two, it was hypothesized that strategy levels would align with children's zones of proximal development, such that children with low language would benefit from low and medium strategies, while children with typical language would benefit from medium and high level strategies. This hypothesis acknowledges that different types of content may require different levels of instructional strategies based on children's vocabulary abilities. Content that is less familiar to children may be best instructed through more supportive instructional strategies.

This study sought to add to the growing body of literature by identifying the mechanisms driving vocabulary growth during shared book reading sessions for children with varying levels of vocabulary ability. Through the identification of instructional strategies and content, targeted instruction may be developed that will assist in maximizing children's opportunities to learn, regardless of their vocabulary ability.

Chapter II

Review of the Literature

Components of Shared Book Reading

Classroom read alouds may be considered as socially constructed events that result in student learning (Teale, 2003). There are three components that make-up a shared book reading experience: the text, the teacher's comments and discussion meant to engage children, and the student response to the text (van Kleeck, 2003). From a constructivist perspective, the conversations between the adult and child are seen as experiences, which promote the construction of meaning in a shared context (Halliday, 2004). The text provides the platform for this discussion, influencing the topic and level of complexity of the conversation. Therefore, the nature of the interaction provides different opportunities for the child's language learning.

Textual influences. The text is the bedrock of shared book reading experience as it provides linguistic input for children, and serves as an object of joint attention between the adult and child. The words in the text may expose children to rich language that otherwise may not be available to them in common conversation. Both the amount and diversity of linguistic input appear to impact children's vocabulary growth, therefore, reading texts rich in vocabulary may further facilitate growth. Texts may introduce sophisticated vocabulary, or terms that are not contained in the corpus of 3,000 most commonly known words. On average, books contain five times as many sophisticated vocabulary terms as what would be found in a typical conversation (Snow, 1983), and may expose children to

decontextualized or abstract words (Snow, 1991). One evaluation of preschool books found them to contain an average of 16.3 rare or sophisticated words per 1000 words, which makes them similar to a conversation that would occur between two college graduates (Hayes & Ahrens, 1988).

The text plays a key role in the nature of the adult's talk during the shared book reading, as it frames the surrounding talk through the establishment of context. Specific features of the text, such as the linguistic composition, syntactic complexity, and genre, may influence the manner in which the adult reads the text and interacts with the child (Price, van Kleeck, & Huberty, 2009; Zucker, Justice, Piasta, & Kaderavek, 2010). Adults' book reading styles influence the amount of child engagement, the nature and amount of extratextual talk, and opportunities for children to learn new vocabulary words. Therefore, different reading styles may move students along different paths in their literacy development.

Adults' roles in shared book reading. The adult functions as the mediator of text for young non-readers as she scaffolds the interaction between the child and the text (Vygotsky, 1978). Extratextual conversations between an adult and child may be essential to maximizing the benefits of shared book reading (De Temple & Snow, 2003). For example, the frequency with which mothers engaged their children in extratextual talk was more strongly associated with children's receptive vocabularies than the frequency of book reading events (J. Roberts, Jurgens, & Burchinal, 2005).

The discussions involved in interactive storybook readings may be similar to instructional conversations (Goldenberg, 1992) in that they seek to engage students

in the development of meaning (Barrentine, 1996). The instructional conversation model contains instructional and conversational elements (Goldenberg, 1992). Instructional elements include a thematic focus, the activation of relevant schemata, direct teaching, promoting the use of complex language, and eliciting student positions or opinions (Goldenberg, 1992). Conversational elements include the use of fewer known-answer questions, responding to student contributions, promoting connected discourse, providing a challenging atmosphere within the child's zone of proximal development, and encouraging general participation (Goldenberg, 1992). Interactions are considered to be developmentally appropriate if the teacher responds quickly, directly and warmly; provides a variety of opportunities for two-way communication; and identifies and elaborates on feelings, activities and interests of children (Bredekamp, 1987). The use of instructional conversations, or elements thereof, has the potential to facilitate levels of engagement that are beneficial for children's language development. Embedding instructional conversations into language rich experiences such as shared book reading may maximize children's opportunities for vocabulary development.

Theoretical Framework

A theoretical model that is of value when considering language learning is the Emergentist Coalition Model (Hollich et al., 2000). It was developed to explain language learning mechanisms found in mother-child interactions, however, the basic process of language learning may be extended to school settings as well. The Emergentist Coalition Model (ECM), is built on the developmental lexical principles

framework (Hirsh-Pasek, Golinkoff, Hennon, & Maguire, 2004), and acknowledges the influences of global attention mechanisms, socio-pragmatic factors, and cognitive constraints involved in young children's language learning experiences (Hollich et al., 2000). The model asserts that children utilize multiple inputs *over time*, and that these inputs are given different weights *over time*. Hence, children with differing levels of vocabulary may differentially utilize instructional practices in shared book reading settings.

Previous models have emphasized or relied on specific cues with parsimony in mind, however, each has failed to account for a child's developmental trajectory. The Emergentist Coalition Model builds on the strengths of previous models, and places them into a developmental trajectory, which seeks to account for the appearance of behaviors acquired from social interaction, without the stipulation that neural circuitry be hard-wired prior to learning.

The model asserts that children begin as associationists and become social sophisticates between ten and twenty-four months of age. Children begin learning language through attentional cues such as temporal contiguity and perceptual salience. Children are associationists when they attach labels to perceptually salient items, attaching labels to novel items. They do not pay attention to social or linguistic cues yet, which can lead to an occasional mis-mapping of label to referent. Children at this stage are conservative word learners who do not easily extend a label to a category of objects.

As children develop, social and linguistic cues move to the forefront. Children at this social sophisticate stage of language learning use cues such as eye gaze and

social context. They are able to take the speaker's point of view into consideration, and have learned to follow the speaker's gaze to determine the referent for the label. The shift to relying more heavily on social cues occurs at the same time as the word spurt, when children's vocabularies grow at a fast pace. This is also the time period where children develop a theory of mind, which allows them to understand that people have thoughts, feelings, and ideas that are different from their own. This noted difference provides motivation for children to learn and use language for social interaction.

The final stages of language acquisition involve learning language from language through linguistic cues. At this point, children are able to use grammar, syntax, and prosody to learn new words. Social cues are still crucial to word learning, however, perceptual salience is relied upon to a lesser degree. The overlap of cues aid younger children as the multiple forms of input serve to test and constrict the number of competing hypotheses. As children develop, they learn that words don't refer to a single example, but rather to groups of objects. Children weave together the words to develop a conceptual understanding of a topic. For example, a child may initially understand "chair" as what a person sits upon in the dinning room. Eventually, this category is extended to include multiple representations of chairs such as recliners and beanbags through exposure and adult guidance. Younger children require more perceptual and social support, with a greater number of exemplars in order to develop conceptual representations.

Shared book reading is an experience that contains the attentional, social, cognitive, and linguistic cues included within the Emergentist Coalition Model.

Children's attention is directed toward a storybook, which contains rich illustrations

designed to attract children's interests. The visual aspects of the book assist

children with following the story, and provide visual cues or representations of the

text. These perceptually salient cues may assist children with mapping new terms.

In addition, the adult engages the child in social interaction through episodes of

joint attention. The adult may use eye gaze, clarification, or expansion in order to

facilitate a child's word learning opportunities. Adults mediate the text for the child,

and may scaffold learning through the direction of attention to specific aspects of

the text. Finally, the language provided within the text or by the facilitating adult

serves as cognitive or linguistic cues that children may use to learn novel terms. In

summation, book reading serves to cue children's attention while providing them

with social support that allows access to linguistic and cognitive cues that promote

language development.

Opportunities for Differentiation

The ECM clearly indicates that children benefit from different input based on

their present levels of performance. Any classroom will include children with

varied levels of language, who may not be drawing on the same support systems for

vocabulary learning. As children are grouped into preschool classrooms by age, it

cannot be expected that they will all possess similar funds of vocabulary knowledge.

These differences among children require teachers to be able to differentiate their

instruction in order to meet the needs of the diverse learners in their classrooms.

Differentiation should emphasize placing the instruction within the child's

zone of proximal development (Vygotsky, 1978), which is the level at which a child may learn with support from an adult. Instruction should be neither too hard nor too easy, but rather should provide a challenge that asks the child to stretch her thinking with an appropriate level of support. Differentiating instruction according to each child's zone of proximal development may require teachers to provide a wide variety of learning opportunities through a single shared book reading experience.

Two factors should be taken into consideration when teachers are planning to differentiate instruction: the amount of support provided via instructional strategies, and the degree of match between the instructional content and children's prior knowledge (Tomlinson et al., 2003). Instructional strategies are how the teacher supports children's learning, they describe the manner in which teaching occurs. Modeling, demonstrating, labeling, and hypothesizing are all instructional strategies. These strategies may vary in the amount of support that is provided for the child. Content refers to the topic of the instruction, or what is being taught. Content include topics such as books, print, science, math, etc. The amount of prior knowledge that an individual child possesses about a variety of content areas may vary dramatically, and this variation may also occur between children as well. Teachers may differentiate instruction by tapping into children's existing funds of background knowledge, or through making connections to topics of interest to the child.

Opportunities to Teach through Commenting

As language and vocabulary are learned primarily through social interaction (Huttenlocher et al., 1991; Rowe, 2008) opportunities for adults to teach children vocabulary must be maximized. Teaching may be evaluated at the utterance level, as previous studies involving utterance level measures have revealed links between teachers' talk and children's vocabulary and language outcomes (Dickinson & Porche, 2011; Gerde & Powell, 2009; van Kleeck, Vander Woude, & Hammett, 2006). This close examination of teacher talk may reveal the variety of instructional strategies and content that children are exposed to within shared book reading, and may provide a glimpse into the mechanisms that differentially affect children's vocabulary learning.

Previous studies have largely focused on questions, with little attention being paid to comments. These different types of utterances may serve different purposes. Questioning during book reading has been used as a means for assessing children's knowledge (Kintsch, 2005), eliciting cognitively challenging interactions or inferential thought (Dickinson & Smith, 1994; Girolametto, Verbey, & Tannock, 1994; Massey, Pence, Justice, & Bowles, 2008; van Kleeck et al., 1997), creating episodes of extended discourse (de Rivera, Girolametto, Greenberg, & Weitzman, 2005; van Kleeck et al., 2006), and prompting child engagement (Diehl & Vaughn, 2010; Girolametto et al., 1994; Wasik & Hindman, 2009). All of these uses have been associated with children's vocabulary gains.

While questions may serve to probe children's understanding, comments serve as instructional tools. Commenting provides opportunities for engagement

between adults and children, thus creating opportunities for vocabulary practice and growth. Comments are utterances that give or explain information, or that respond to or clarify an utterance from a child. Comments do not require a response from the listener, but may promote conversation nonetheless. Indeed, studies of parent-child interactions show that increasing parents' use of comments during shared book reading is related to increases in children's language use as measured by total utterance count (Hockenberger, Goldstein, & Haas, 1999). Comments place fewer restrictions on children's verbalizations than questioning, which may allow for responses that are more creative and varied (Hockenberger et al., 1999; Kertoy, 1994). Questions place obligatory demands on the child, and may require an answer from a restricted set of choices.

Teachers may use instructional strategies through their commenting that range from contextualized (low-level) to decontextualized (high-level) talk. Inferencing, predicting, reflecting, defining, classifying, generalizing, labeling, sequencing, describing, and demonstrating may be modeled in teachers' extratextual comments, which is talk that occurs outside of the reading of the text. These instructional strategies may assist children with the development of skills that are related to vocabulary and language growth.

Commenting also supports the development of children's conceptual knowledge through the provision of additional content that relates the vocabulary terms to concrete concepts within the story, to other academic subject areas, or to the child's life (Elley, 1989; Kertoy, 1994).   In addition, comments may direct children's attention to target vocabulary terms contained within the story. Linking

vocabulary to children's existing knowledge via commenting supports depth and breadth of vocabulary knowledge, and is associated with improved oral language skills for young children (Hockenberger et al., 1999).

In spite of their potential as instructional vehicles, little is known about the effects of commenting in preschool classrooms. To date, there is little research examining the effects of teachers' commenting practices during shared book reading and children's vocabulary and language outcomes. Some parent-child studies have demonstrated positive relationships between adults' commenting practices and child language outcomes (Ard & Beverly, 2004; Hockenberger et al., 1999; Kertoy, 1994), however, these have yet to be replicated in preschool classrooms. Given the potential benefits of using comments for instruction during shared book reading, further investigation is merited. A fine-grained lens may be useful for evaluating comments as has been demonstrated through studies of teachers' questioning practices (Ewers & Brownson, 1999; van Kleeck et al., 2006), where differentiating between types of questioning practices revealed differences in growth for children with typical and low levels of vocabulary knowledge (Walsh & Blewitt, 2006). Questions that involved different levels of cognitive distancing, such as literal and inferential questions, produced different effects on children with differing levels of vocabulary knowledge (Blewitt, Rump, Shealy, & Cook, 2009; van Kleeck et al., 2006; Walsh & Blewitt, 2006), with higher levels relating to more vocabulary growth (van Kleeck et al., 2006; Walsh & Blewitt, 2006). Evaluating comments for their levels of instructional strategies and content may shed light on practices that are beneficial for children who differ in vocabulary knowledge.

Instructional Strategies

Teachers' comments may be categorized by the instructional strategies used. Instructional strategies relate to how teaching occurs during shared book reading, or the practices used by teachers to convey content. They may vary in their degree of cognitive demand, which is determined by the level of distancing required for the child to separate herself from the present environment, or in the case of book reading, the text. These strategies may be differentiated by determining whether or not the topic of conversation is visually present, such as being featured in an illustration. In addition, the amount of background knowledge necessary for comprehension serves to delineate the strategies. Background knowledge may include language and vocabulary knowledge, such that lower level strategies have lower language requirements for comprehension. Similarly, low-level strategies require little background knowledge due to the contextualized nature of the talk. High-level strategies require the child to make inferences or predict outcomes using hypothetical reasoning (Sigel, 1986). An assumption of background knowledge is made, such that the child must have some degree of prior knowledge in order for comprehension to occur. Varying the level of demand provides different opportunities for children to engage in vocabulary practice.

Debate exists in regards to which level of strategy use results in the greatest benefit for children with smaller funds of vocabulary knowledge. Presently, the field has dichotomized instructional strategies into only two levels. Some overlap of the levels exists, as some researchers place giving additional information or extended

explanations into the high-level category (Dickinson & Porche, 2011; Dickinson & Smith, 1994), while others categorize it as a low-level strategy (Justice, Meier, & Walpole, 2005; Silverman, 2007) . This overlap may account for some of the debate that exists in regards to what strategies are best suited for children with varying levels of vocabulary knowledge. While some argue for the use of low-level, contextualized talk for children with low levels of vocabulary ability (Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Reese & Cox, 1999), others contend that high-level, decontextualized talk may produce greater results (Gerde & Powell, 2009; Hindman, Connor, Jewkes, & Morrison, 2008).   Each level has benefits, however, the extent of the benefits may vary based on the initial vocabulary of the children receiving the instruction. In order for teachers to differentiate instruction, they will need to match the strategy level to the needs of the children within their classroom.

Previous studies that provided differentiation found that a range of strategies was related to vocabulary growth (Elley, 1989; Coyne et al., 2004). These studies examined the effects of direct instruction of vocabulary on the vocabulary growth of low language children.   Elley's (1989) description of direct instruction involved low to medium level instructional strategies, while Coyne and colleagues (2004) included low to high-level strategies. Both studies found that low language children responded positively to instruction that included a range of strategies, as they experienced significant growth on measures of receptive vocabulary.

Low-level strategies. Low-level strategies include labeling items or concrete descriptions of items that are visually present in the book. These literal

uses of language do not require the listener to supply background knowledge or reasoning skills, as the needed information is visually present within the text or illustrations (Sigel, 1986). *Demonstrating, describing, labeling, sequencing*, and *enumerating* have been related to children's vocabulary gains (Dale, Crain-Thoreson, Notari-Syverson et al., 1996; Reese & Cox, 1999; Silverman & Crandell, 2010; Wasik, Bond, & Hindman, 2006).

Highly contextualized instructional techniques provide concrete representations that may not require extensive vocabulary knowledge, thus potentially allowing for more learning opportunities for children with smaller funds of vocabulary knowledge. Contextualized talk has been associated with greater vocabulary growth for children with smaller funds of vocabulary knowledge (Coyne, Simmons, Kame'enui, & Stoolmiller, 2004; Elley, 1989; Justice et al., 2005; Pollard-Durodola et al., 2011). Instructional strategies such as acting out vocabulary terms, presenting visual images of the target vocabulary terms, and the use of synonyms for previously known terms have been associated with increased vocabulary growth for children with low language abilities (Coyne et al., 2004; Elley, 1989; Justice et al., 2005; Pollard-Durodola et al., 2011). Indeed, four-year-old children from working class homes in New Zealand profited more from books read in a describer style, which emphasized low-level strategies such as labeling and describing in a correlational study (Reese & Cox, 1999). Parents of children with low language ability or language delays also tend to adopt styles that are less responsive and more directive, including the use of low-level strategies, to the benefit of their children (Mahoney & Powell, 1988). Providing high levels of instructional support

may be necessary for observable vocabulary growth to occur for children with language delays.

Labeling and describing use contextualized references to build children's knowledge. Findings from a correlational study showed that children with lower levels of vocabulary skills demonstrated greater gains from less challenging comments, such as labeling, from their parents during shared book reading when compared with their peers with larger funds of vocabulary knowledge (Dale, Crain-Thoreson, & Notari-Syverson, 1996). Similarly, the contextualized reading style that emphasizes describing, an approach characterized by a use of low-demand descriptive comments, was found to be more effective for children with smaller vocabularies, while children with larger vocabularies experienced greater growth from book reads containing higher levels of cognitive distancing (Reese & Cox, 1999).

Allowing children to link vocabulary terms to demonstrations , where teachers act out or physically demonstrate a vocabulary term, has also been related to vocabulary growth. Low-language kindergarteners in classrooms where teachers acted out or demonstrated vocabulary terms experienced greater growth on standardized measures of receptive vocabulary than their typical language peers (Silverman & Crandell, 2010). A similar effect was found in preschool classrooms, as at-risk African American children experienced expressive and receptive vocabulary growth when exposed to an intervention that taught teachers to demonstrate the meanings of vocabulary words in addition to a variety of other language-promoting strategies (Wasik et al., 2006). Significant correlations

between teachers' use of demonstrations or acting out vocabulary terms and children's receptive (r = .59) and expressive (r = .48) vocabulary growth were found (Wasik, Bond, & Hindman, 2006).

The use of event *sequencing* has been effective for enhancing children's language growth and linguistic comprehension (Robbins & Ehri, 1994; Senechal, Thomas, & Monker, 1995; Wasik & Bond, 2001), and has been related to vocabulary growth for preschool-aged English language learners from at-risk homes (T. Roberts & Neal, 2004). Sequencing typically occurs during picture walks, whereby the teacher and children reconstruct the story order through the use of the story's illustrations. Children are naturally curious about story sequences, and have been observed to ask their parents questions to facilitate their understanding of event sequences (Yaden, Smolkin, & Conlon, 1989). Indeed, the sequence of story events is essential for the comprehension of narrative stories, and emerges naturally during language development (Snow, Burns, & Griffin, 1998). Adults may facilitate children's understanding of story sequencing through contextual cues such as story illustrations, and may use *enumeration* or ordinalization (first, next, finally) (Roberts & Neal, 2004), that may not be typically encountered in casual conversation.

Medium-level strategies. Many studies investigating strategy usage have dichotomized the construct into contextualized (low) and decontextualized (high) talk, however, Sigel (1986) included a middle level in his description of cognitive distancing strategies. Medium level strategies ask the child to transcend what is immediately available in the surrounding environment (Sigel, 1986). Strategies

such as *defining, giving* information*,* and *explaining* are located at the intersection of low and high-level talk. They build on what is presented in the text, and provide additional information that may extend children's understanding of the world, or assist them with linking new vocabulary terms into existing conceptual frameworks. Medium level strategies use language to extend understanding, but do not have high expectations of background knowledge.

Providing extended *explanations* and *definitions* of target vocabulary has been associated with increased learning (Penno et al., 2002).   Explanations of vocabulary words beyond what was presented in the text increased first grader's gains from 15% to 40% (Elley, 1989), and kindergartner's thru second grader's gains from 12% to 22% (Biemiller & Boote, 2006). Ard and Beverly (2004) found that preschool-aged children exposed to vocabulary-related comments were able to produce more of the target vocabulary terms than children who did not receive such instruction, resulting in greater growth on expressive vocabulary measures. Reading styles that contain analytic talk relating to word meanings may be highly beneficial for children who have limited funds of vocabulary knowledge as it facilitates comprehension as well as word learning. Analytic talk has been related to receptive vocabulary growth for children from low-income homes (Dickinson & Porche, 2011; Dickinson & Smith, 1994).

Similarly, the provision of additional information about vocabulary terms that supplements the text proved to be beneficial for children with smaller funds of vocabulary knowledge (Coyne et al., 2004; Justice et al., 2005). Two intervention studies found that at-risk preschoolers and kindergartners with low levels of

receptive or expressive vocabulary made greater gains than their typical language peers when provided with elaborated explanations of vocabulary terms during repeated readings (Coyne et al., 2004; Justice et al., 2005). Elaborated explanations included extended definitions, examples, and descriptions of vocabulary terms found within the text. Similar results have emerged from studies of parent-child book reading as a correlational study examining the effects of mothers' use of sophisticated vocabulary on five year olds' vocabulary growth from a group of low-income families found that children benefitted from adult interactions focused on extending the understanding of sophisticated vocabulary terms (Weizman & Snow, 2001). Instructive or helpful interactions provided by the mother accounted for an additional 35% and 29% of the variation in children's receptive vocabulary scores in kindergarten and second grade (Weizman & Snow, 2001). These elaborations may have served to extend the conceptual knowledge of children with smaller funds of vocabulary knowledge, thus providing them with new frameworks into which novel vocabulary terms could be embedded.

Giving additional information about the story themes or concepts may be of particular importance for children with smaller funds of vocabulary knowledge as it may extend children's conceptual frameworks into which they may insert new vocabulary knowledge. Vocabulary knowledge may be used as a broad indicator of conceptual understanding, therefore children with smaller funds of vocabulary knowledge may also have smaller funds of conceptual knowledge. Analytic discussions of the text following a book reading may help children develop a stronger conceptual base into which they may insert new vocabulary knowledge,

and have been demonstrated to be related to receptive vocabulary growth

(Dickinson & Smith, 1994). One book reading style, performance oriented, which is

characterized by extended discussion about the themes and plot of the story after a

reading, was found to have positive effects on the vocabulary growth of children

from low-income homes (Dickinson & Smith, 1994). Similarly, the comprehender

style of book reading, which is characterized by emphasis on the plot, inference

making, and predicting, was also related to the receptive vocabulary growth of

preschool-aged children (Haden, Reese, & Fivush, 1996). The use of talk focused on

comprehension may allow children to develop strong frames of reference into which

new vocabulary terms may be inserted. The development of these frameworks may

facilitate future word learning.

   High-level strategies. High-level strategies involve decontextualized talk

that requires children to separate themselves from the present environment, or in

the case of book reading, the text. The child is asked to transcend what is

immediately available in the surrounding environment to classify or compare forms,

or to make inferences or predict outcomes using hypothetical reasoning (Sigel,

1986). This talk goes beyond elaborated explanations as it primes children for

future word learning experiences, helping them to understand the relationships

between words and concepts, thus building depth and breadth of vocabulary

(Senechal et al., 1995). High-level strategies frequently involve the use of mental

state verbs such as ponder and wonder, thus more complex or sophisticated

vocabulary knowledge is required to understand these comments. In addition, the

child may be required to access long-term memory in order to recall or reflect upon previous experiences or knowledge.

Modeling *predicting, inference making, and reflecting* has been related to children's gains in vocabulary knowledge (Dickinson & Smith, 1994; Haden et al., 1996; van Kleeck et al., 2006; Wasik & Hindman, 2009). Holistic book reading styles that contain these high-level strategies have been related to vocabulary growth. Children in classrooms where teachers used interactive book reading styles that involved predictions, inferences, and reflections made greater growth on measures of receptive vocabulary than their peers in classrooms where texts were read with limited commenting (Dickinson & Smith, 1994; Haden, Reese & Fivush, 1995). At the utterance level, teachers' use of inferential questions was related to receptive vocabulary growth for at-risk children in Head Start classrooms, such that greater use of inferential questions was associated with greater receptive vocabulary growth (van Kleeck et al., 2006). The use of high-level talk may also influence the type of talk that children produce. A study of an intervention curriculum that encouraged teachers to use inferential questions found that this type of high-level talk provided children with opportunities to make predictions and reflections (Wasik & Hindman, 2009).

The manner in which instructed vocabulary terms are semantically related may be related to children's word learning (Booth, 2009). According to the Emergentist Coalition Model of language learning, as children develop, they learn that words don't refer to a single example, but rather to groups of objects. Children develop a conceptual understanding of a topic and include multiple representations

to define category membership (Hollich et al., 2000). Indeed, improvements in children's abilities to *categorize* have been correlated with their word learning abilities (Borovsky & Elman, 2006), however, this may be a bi-directional relationship (Gopnik & Meltzoff, 1987). In order for children to develop richly-structured categorizations, they must utilize *generalizations* and *classifications* (Gelman et al., 1998). Interventions that have instructed children using methods that place words in taxonomic (Neuman et al., 2011)and conceptual (Pollard-Durodola et al., 2011) categorizations have produced significant growth in children's vocabularies.

In addition, high-level strategies serve to expose children to the sophisticated vocabulary needed to express states of mind (ponder, meditate) or used in inference making (predict, infer). Helping children to tune into language may facilitate word learning, thus including analytic talk into any style of book reading may be beneficial to long-term vocabulary growth.

Adults' use of decontextualized talk was associated with the greatest amount of vocabulary growth for children who entered preschool with the lowest levels of vocabulary knowledge in three studies involving preschool-aged children (Gerde & Powell, 2009; Hindman et al., 2008). Hindman and colleagues (2008) examined parent-child book reading sessions, while Gerde and Powell (2009) and Dickinson and Porche (2011) evaluated teacher-child interactions within Head Start preschool classrooms. Results indicate that no relationship was found between adults' use of contextualized meaning talk and children's end-of-year vocabulary scores (Hindman et al., 2008). However, a positive association between adults' use of

decontextualized talk and end-of-year expressive vocabulary scores was found,

contributing substantially to the amount of explained variance in the vocabulary

outcome measure (Hindman et al., 2008). Gerde and Powell (2009) found that

children experienced greater receptive vocabulary growth across one year when

teachers used analytic instruction, particularly with those students who began with

the lowest levels of receptive vocabulary knowledge. Teachers' use of analytic talk

relating to the storybook was associated with variations in children's receptive

vocabulary growth, with those children who heard more analytic talk experiencing

greater growth across the preschool year. Similarly, Dickinson and Porche (2011)

found that Head Start teachers' use of analytic talk about books predicted children's

fourth grade vocabularies, as mediated by kindergarten receptive vocabulary.

Instructional Content

 While examining how teachers are providing instruction during shared book

reading is important, it is also critical to examine the content teachers are focused

on as well. Studies focused on the content instructed during preschool shared book

reading sessions have shown relationships with children's language and vocabulary

growth and the subject matter discussed (Dickinson & Porche, 2011; Fivush, Haden,

& Reese, 2006; Gerde & Powell, 2009; Neuman, 2011; Pollard-Durodola et al., 2011).

Additionally, differentiation encourages teachers to discuss a variety of topics with

students, and to make links to topics that are of interest.

 Adults may facilitate word learning during shared book reading through the

use of talk that links new vocabulary terms to children's funds of knowledge (Elley,

1989; Kertoy, 1994), or through the development of new conceptual frameworks. When information about a novel word is acquired, neural networks are formed that link it to other previously known words or experiences (Perfetti, 2007). Vocabulary learning may be facilitated through instruction that links words within conceptual or taxonomic categories as categorization is a tool that children use for word learning (Gopnik & Meltzoff, 1987). Linking novel words to frameworks allows for efficient storage and retrieval. As vocabulary may be seen as a proxy for conceptual knowledge, children who have larger vocabularies may be better prepared to learn novel words as they have developed wider frameworks into which they may insert new knowledge. Text-driven talk, talk about academic subjects, and talk making personal connections to children's lives may allow children to develop and extend conceptual frameworks, thus promoting opportunities for vocabulary and language development. These comments are considered to be instructional in nature as they make connections to the text, the world at large, and children's prior knowledge. Similar to the reading comprehension strategies of text-to-text, text-to-self, and text-to-world, these strategies would be expected to produce vocabulary growth as they develop and strengthen children's neural networks. Vocabulary is not acquired in isolation, but rather through rich content that may be found in instructional comments.

Comments that do not focus on instructional content, but rather address on-going activity or behavior management are non-instructional, and would not be expected to produce vocabulary growth. Therefore, the number of instructional comments would be more influential for children's vocabulary development than

the total number of comments, as total comments may include non-instructional talk.

Text-driven talk. Text-driven talk provides an anchored context into which the child may insert new knowledge. Text-driven talk includes discussion pertaining to the plot, characters, theme, print, or vocabulary contained within the text read aloud during shared book reading. Talk about the book expands the child's understanding of the story and provides a framework into which new vocabulary terms may be inserted. It is considered to be best practice for promoting language development (Neuman, Copple, & Bredekamp, 2000), and has been linked to vocabulary growth (Gerde & Powell, 2009).

Preschool teachers' use of book-focused utterances, which includes talk about vocabulary and expanding the text with additional information, has been related to children's receptive vocabulary growth, and is a particularly powerful practice for children who possess smaller funds of vocabulary knowledge (Gerde & Powell, 2009). Children enrolled in Head Start classrooms who had smaller receptive vocabularies at the beginning of the school year demonstrated growth that exceeded their peers with larger funds of vocabulary knowledge when in classrooms where teachers used more book-focused utterances (Gerde & Powell, 2009). A longitudinal study from Dickinson and Porche (2011) also found that talk about books and vocabulary was predictive of preschool children's vocabulary at the end of kindergarten ($r = .39$) and fourth grade ($r = .31$). Indeed, multiple, empirical studies have shown that the number of teacher utterances related to vocabulary found within the text is related to children's vocabulary growth (Connor,

Morrison, & Slominski, 2006; Dickinson & Smith, 1994; Wasik et al., 2006). The type of book-focused utterances described by these studies would contain medium-level strategies due to the emphasis on defining, giving, and explaining.

Academic subject comments. Recent meta-analyses (NRP, 2000; Elleman et al., 2009) and policy governing curriculum indicate that teaching vocabulary through content area instruction, such as science, math, or social studies, is beneficial for children regardless of their previous vocabulary ability. Content instruction can result in vocabulary growth and conceptual development, and rich instruction in the content areas may promote the type of deep understanding that is linked to later reading comprehension (Ouellette & Beers, 2010). Two recent intervention programs, World of Words (*WOW*: Neuman, Newman, & Dwyer, 2011 and Words of Oral Reading and Language Development (WORLD: Pollard-Durodola et al., 2011) instruct scientific vocabulary terms that are conceptually or taxonomically linked in shared book reading sessions. At-risk preschoolers provided with the WORLD curriculum made substantial gains on receptive and expressive vocabulary when measured by a researcher-developed assessment (Pollard-Durodola et al., 2011). Children in the intervention group made four times as much growth as those in the control condition on the researcher-developed receptive measure, and nearly twice as much growth on researcher-developed expressive measures (Pollard-Durodola et al., 2011). Children attending Head Start preschool programs who received the *WOW* intervention significantly outperformed their peers in the control conditions (Neuman et al., 2011). In addition, these children from low-income homes closed the gap on vocabulary assessments with

the children from more economically advantaged homes. An effect size of d=.44, as measured by standardized assessments, was achieved (Neuman et al., 2011).   These studies demonstrate that linking scientific content to shared book reading sessions may bolster children's vocabulary through increasing children's conceptual knowledge. Academic subject talk may fall into the medium to high levels of strategy instruction, and may serve to expand children's conceptual development.

Personal connection comments*.* Allowing children opportunities to connect a word to their lives shows them the relative usefulness of the word, and may activate relevant conceptual knowledge (Beck et al., 2002). Studies investigating maternal reminiscing strategies have repeatedly shown that extended discourse which makes connections to children's past histories, feelings, or emotions are beneficial to the development of children's complex language and vocabulary skills (Fivush et al., 2006; Peterson, Jesso, & McCabe, 1999; Tampoepeau & Reese, 2010). Highly elaborative maternal reminiscing styles have been particularly beneficial for children from low-income homes and for children with lower levels of language ability (Peterson et al., 1999; Tampoepeau & Reese, 2010).

Similar results have emerged through studies investigating personal connection talk in early childhood classrooms. Children in classrooms where teachers make comments about personal connections are more likely to respond with connections to their own lives, which may lead to extended discourse (Moschovaki, Meadows, & Pellegrini, 2007), and has been related to children's language growth. An intervention study investigating interactive reading showed the benefits of making connections between a storybook and classroom experiences

as it bolstered children's expressive and receptive vocabulary growth (Wasik &

Bond, 2001). Dickinson and Smith (1994), using data from the Home School Study

of Language and Literacy Development, found that two reading styles, co-

constructed and performance-oriented, contained teacher utterances making

personal connections. While this study does not directly associate the making of

personal connections to children's vocabulary growth, it does lend support to the

hypothesis that preschool teachers are capable of incorporating this style of talk

into their book reading practices, and that it may be beneficial to children's

vocabulary growth. Medium and high level instructional strategies are commonly

used for talk involving personal connections.

 Non-instructional comments. Preschool classrooms are busy places, thus

teachers must employ non-instructional talk that addresses children's behaviors

and on-going activities. Some studies have demonstrated that brief comments that

help teachers maintain children's attention are beneficial (Dickinson & Porche,

2011), while others have found behavior management talk to be distracting

(Gianvecchio & French, 2002). The use of behavior management talk in preschool

classrooms during shared book reading was not found to be helpful in re-gaining the

attention of those children who had lost focus, and may have actually been a

distraction to those who were still engaged in the reading (Gianvecchio & French,

2002). Similarly, Dickinson and Smith (1994) found that frequent use of behavior-

focused utterances was not predictive of children's receptive vocabularies in

kindergarten. Indeed, Dickinson and Porche (2011) found that teachers' abilities to

keep children focused may not be related to their ability to foster conceptual

learning and language development. While talk relating to behavior management

may be useful for assisting children with the development of self-regulation skills, it

may not be linked directly to children's language growth.

Curriculum Influences

The curriculum that teachers are asked to use may influence both the content

and instructional strategies included in their comments. Some curricula may

provide scripting that includes models of language use as well as methods for

implementing instructional strategies. Given that great variety exists in teachers'

knowledge of language instruction, the provision of scripting may scaffold teachers'

abilities to implement language-bolstering strategies.   While some have criticized

scripted instruction, several studies have shown scripting to be associated with

improved language instruction (Bierman et al., 2008; Diehl & Vaughn, 2010; Justice

et al., 2010; van Kleeck et al., 2006).

Curricula may also impact the instructional content that is covered. Across-

the-day interventions such as Opening the World of Learning (Schickedanz &

Dickinson, 2005), and targeted interventions such as World of Words (Neuman et

al., 2011), and Words of Oral Reading and Language Development (Pollard-Durodola

et al., 2011) have integrated content area topics, such as science and social studies.

The use of such curricula has been associated with growth in children's language

and vocabulary across preschool (Neuman et al., 2011; Pollard-Durodola et al.,

2011; Wilson, Dickinson, & Rowe, in press). These intervention curricula typically

introduce vocabulary through the books read during shared book reading, thus the

curricula may also influence the type of text that is presented to children. The type of text has been related to differences in children's vocabulary gains, with those containing science or social studies related content producing longer, more interactive readings (Moschovaki et al., 2007), and readings that contain higher amounts of decontextualized, inferential conversations (Zucker et al., 2010).

Conclusions and Hypotheses

Adults play a pivotal role in shared book reading as they bring the child and the text together. This is accomplished through extratextual talk that may encourage the child to participate and interact. Extratextual talk may also serve as an opportunity to teach through comments that clarify or extend children's understanding of the text and the words that comprise it.

Fine-grained and utterance level measures of teacher talk have been related to vocabulary gains in young children through studies of parent-child and teacher-child shared book reading experiences. Two features of extratextual talk, the instructional strategy and content, have been associated with language gain in preschool-aged children. Yet not all children profit equally from shared book reading. Child characteristics such as funds of knowledge or vocabulary ability play key roles in how children learn from various types of instruction. Given the diversity that exists among children in pre-kindergarten settings, teachers must be able to vary and differentiate their instruction so as to meet the needs of all students.

The present study addresses how teachers vary the use of instructional strategies and content within their comments during shared book reading sessions, and how this variation relates to children's end-of-year vocabulary growth. It addresses the following hypotheses:

Hypothesis I. *The number of instructional comments used by teachers, rather than total comments, will be related to children's vocabulary growth across one year of preschool.*

Hypothesis II. *Children with differing levels of vocabulary knowledge will profit differently from instructional strategies that contain different levels of cognitive demand. Strategies within the child's zone of proximal development will have the greatest effects, such that children with low language will profit from low and medium-level strategies, while children with typical language will benefit from medium and high-level strategies.*

Hypothesis III. *Differing levels of cognitive demand contained within teachers' instructional strategies that are text-driven meaning comments will differentially affect children's end-of-year vocabulary scores. Comments that are within the child's zone of proximal development will produce the greatest growth. Children with low language ability may profit the most from low and medium levels of text-driven meaning content, while children with typical language ability may profit the most from medium and high levels of text-driven meaning content.*

The present study will answer the following questions:

1. How do teachers vary their use of instructional strategies and content of comments during shared book reading? What differences, if any, exist among curriculum conditions?

2. How does the number of teachers' comments involving instructional content relate to children's vocabulary gains across one year of preschool? How does the number of teachers' total comments relate to children's vocabulary gains across one year of preschool?

3. How does the level of instructional strategy embedded in teachers' comments relate to children's vocabulary growth across one year of preschool? Does this differ based on children's initial levels of vocabulary ability?

4. How does the level of instructional strategy embedded in teachers' comments pertaining to the meaning of the text relate to children's vocabulary growth across one year of preschool? Does this differ based on children's initial levels of vocabulary ability?

CHAPTER III

Methods: Research Design and Analyses

Study Description

The sample for this study is a convenience sample drawn from a larger randomized control trial that evaluated the effects of the *Opening of World of Learning* (*OWL*) (Schickedanz & Dickinson, 2005) curriculum on at-risk children enrolled in Head Start preschool classrooms. Videos of teachers conducting shared book reading sessions were collected in the fall of the school year. The videos were transcribed, and teachers' comments were coded for instructional strategies and content. The resulting data were used to describe teachers' support for vocabulary learning during shared book reading, and the relationship between the support provided and children's vocabulary growth as measured by several instruments.

Curriculum Conditions

The data are drawn from a larger randomized control trial investigating the effects of three curriculum conditions on the vocabulary growth of children housed in Head Start preschool classrooms located in a southern metropolitan area. The fifty-two classrooms that participated in the study were divided into six clusters. Seventeen classrooms in four clusters were assigned to use *Opening the World of Learning* (*OWL*; Schickedanz & Dickinson, 2005) curriculum only. Four centers with nineteen classrooms were assigned to *OWL* plus *Enhanced Milieu Teaching* (Hancock & Kaiser, 2006), for use with low-language children. Sixteen classrooms in five centers were assigned to use business as usual, the *Creative Curriculum* (Dodge,

Colker, & Heroman, 2001).   Randomizing was done at the cluster level. Clusters

were developed by the research team in conjunction with the Head Start director to

accommodate the assignments of language specialists already employed by Head

Start and in place. A single language specialist was assigned to each cluster, thus six

clusters were created. Each language specialist worked with classrooms that had

been assigned to a single curriculum condition to prevent contamination (*OWL*,

OWL+EMT, Control). Geographic continuity was also considered so that the

language specialists would service classrooms in the same buildings or centers. The

curriculum intervention was introduced to teachers during year one of the study,

however, data were not collected until the second year of the study. Information

regarding training and professional development provided to teachers is described

below.

Opening the World of Learning

Opening the World of Learning (Schickedanz & Dickinson, 2005) is a

comprehensive preschool curriculum, which emphasizes early language and literacy

development through conceptually-rich instruction. *OWL* systematically builds

conceptual knowledge associated with target vocabulary terms, which are

introduced through shared book reading sessions. The vocabulary terms are

reinforced in group content instruction, small group instruction, and centers time.

The sequenced curriculum is designed to increase teachers' expectations

throughout the year. Six thematic units, which are four weeks in length, cover

family and friends, wind and water, world of color, shadow and reflection, and

growing things. Teachers assigned to the *OWL* or *OWL+EMT* conditions received multiple days of professional development training prior to the start of the school year, as well as coaching on a bi-weekly basis throughout the school year.

In *OWL*, the teacher reads one or two of the provided texts during story time, with each book being read up to four times. *OWL* texts averaged 556 words, with 16 sophisticated vocabulary word types per book. The curriculum provides guidance for the style of each reading, as well as recommendations for comments and questions to be used in extratextual conversations. Each reading of the story should differ, with early readings providing more support for vocabulary and literal comprehension, and later readings encouraging more inferential thinking.   The Teacher's Guide provides a brief summary of the story, methods for linking the story to the unit of study or current instructional theme, and child-friendly definitions for key vocabulary terms from the story. The teacher introduces the book each time, and orients the children to the text while giving a general sense of the story. Teachers are encouraged to point to the illustrations to confirm children's responses, and pair this with a verbal explanation "The chipmunk came (point) and the blue jay (point) on his bough in the tree, and the rabbit (point). And who is this coming out of his hole? (point to the snake.) Yes, the snake" (Schickedanz & Dickinson, 2005, Shadows and Reflections, pp. 34).

The first reading of the text emphasizes vocabulary and literal comprehension. The teacher supplies meanings of words during the reading, as well as providing support for comprehension through the use of comments and interpretation of key aspects of the plot. The teacher is encouraged to vary the tone

and pitch of her voice, as well as the use of gestures and illustrations to promote understanding. A general discussion of the story follows the completion of the reading, with the curriculum guide providing prompts and conversation starters to assist teachers with post-read discussions.

The second reading may involve a reconstruction of the story. The Teacher's Guide encourages the linking of emotions to characters, and prompts teachers to make connections to children's lives as well as providing models of how they can link their experiences to the story. Teachers should extend children's understanding of the main idea of the story. In addition, they should prompt children's memories, and continue to provide definitions or prompt recall of key vocabulary terms, as well as encourage more discussion during the read through direct questioning and confirmation. Additional details are given to help children understand the plot and characters "Frogs and grasshoppers both have pretty big and strong rear legs" (Schickedanz & Dickinson, 2005, Shadows and Reflections, pp. 33). A discussion of the current theme occurs at the end of the story, and may involve a picture walk through the story to point out specific details in the text.

Enhanced Milieu Teaching

Enhanced Milieu Teaching (*EMT*) (Hancock & Kaiser, 2006) is a one-on-one, play-based tutorial designed to promote language growth in children with low language ability. Four children identified as low language received 60 ten-minute individual *EMT* sessions over the course of the school year. *EMT* sessions were conducted outside of the book reading sessions, typically occurring during nap or

centers time. Each child received instruction of vocabulary terms targeted at her

present level of performance. Thematic play materials representing the target

vocabulary terms were utilized in the sessions. Teachers were trained to model and

prompt vocabulary usage. *EMT* encourages teachers to set up opportunities for

children to request materials and actions, to respond to children's utterances and

model balanced turn-taking, and to follow the least to most support sequence which

included time delay, open-ended questions, choice questions, and modeling.

Teachers assigned to the *OWL+EMT* condition received professional development

prior to the opening of the school year and during the winter break in January. In

addition, teachers were supported by instructional coaches who met one-on-one

with them fifteen times over the course of the year, on average. While the *EMT*

sessions did not occur during the book reading time, the use of a text along with

specific instructional strategies may have influenced the teachers' practices during

OWL story time sessions.

Creative Curriculum

The business as usual condition utilized an enhanced version of the *Creative*

Curriculum (Dodge et al., 2001), which emphasizes language, cognitive, physical and

social-emotional development. Head Start Literacy specialists developed ten theme-

based units for use with the *Creative Curriculum*, and provided teachers with

instructional materials, recommended activities, and core concepts for each

thematic unit. The classrooms had well-stocked libraries of children's literature

relating to the thematic units. The flow of the day was similar to *OWL*, with all

children receiving instruction in small groups, large group content instruction, songs and word play, and shared book reading. Teachers were permitted to self-select texts for use during story time. No specific guidelines for how to read texts were provided to the teachers, hence each teacher could develop a distinct style of reading. Many teachers selected short, predictable texts that could be read repeatedly during a single session. These texts were markedly different from the *OWL* texts in that they averaged 297 words with only 4 sophisticated vocabulary word types. Teachers would have students recall the plot verbally, or have them practice "reading" the predictable text from a big book.

Please see Appendix A for a list of book titles and authors.

Participant Sample

Children

This study involved students from fifty-two Head Start classrooms located in a Southern Metropolitan area. The Head Start agency assigned children to their classrooms. All students were four years old before school began in September, and came from English speaking homes. The analyzed sample included 489 students, the majority were African American (97.3%; 2.5% Caucasian and 0.2% Hispanic) and from primarily low-income households. Fewer than 5% of the sample had Individualized Education Plans at the start of the school year. The sample is comprised on 264 boys (54%), and 225 girls (46%). The average age of the sample was 4.6 years at pre-test. Descriptive statistics are provided in Table 1.

At the onset of the school year, 699 students were assessed for early expressive and auditory language skills using the Preschool Language Scale III (Zimmerman, Steiner, & Pond, 1992), which is described fully in the measures section of this paper. Using the PLS-III total score, children were categorized as low language (PLS score < 75; more than 1.5 standard deviations below the normative mean) or typical language (PLS score > 85). The research team selected four low language and four typical language children from each classroom for monitoring. Typical and low language children were matched on gender and age. The low language group was comprised of 247 children (140 boys, 107 girls), with an average age of 4.6 years at pre-test. The typical language sample included 242 children (124 boys, 118 girls), with an average age of 4.6 years at pre-test. The average age of children at the pre-intervention PLS-III screening assessment was 4.4 years.

Table 1

Child Demographics

		Low Language		Typical Language	
		Frequency	Percent	Frequency	Percent
Gender					
	Female	107	43.3	118	48.8
	Male	140	56.7	124	51.2
Race/Ethnicity					
	African-American	242	98	234	96.7
	European-				
	American	4	1.6	8	3.3
	Hispanic	1	0.4	0	0
IEP Status*					
	Yes	20	8.1	4	1.7
	No	224	90.7	237	97.9
			Standard		Standard
		Mean	Deviation	Mean	Deviation
Age in Months		53.6	3.5	52.5	3.5
PLS-II Screener		65	7.2	90	9.9

*Missing data from 3 for low, and 1 for typical

Teachers and Classrooms

Fifty-two lead teachers participated in this study. All were female, and self-identified as African American (96.2%; 3.8% European American). Of the fifty-two teachers, 48 had earned a CDA. Nine teachers held Bachelor's degrees, only one of which was in the field of education or child development. Forty teachers reported having completed an Associates' Degree, of which 37 were in child development. The highly experienced staff averaged 16. 3 years teaching (SD=8.55), with an average of 10.89 years in Head Start (SD= 6.57). Descriptive statistics are provided in Table 2.

Table 2

Teacher Demographics

	Frequency	Percent	
Gender			
Female	52	100.00	
Male	0	0.00	
Race/Ethnicity			
African-American	50	96.20	
European			
American	2	3.80	
Highest Degree Obtained			
CDA	7	13.50	
Associate's Degree	36	69.20	
Bachelor's Degree	9	17.30	
	Minimum	Maximum	Mean	Standard Deviation
Months Teaching in Head Start	12	396.00	130.62	78.892
Age in years	21	65.00	44.4118	10.76323

Measures

Four outcome measures were used in this study to evaluate children's

growth on general language (PLS), receptive vocabulary (PPVT), and expressive

vocabulary (EVT and NDW50). Children were assessed twice during the preschool

year. The initial testing was completed in the fall, and the second round of testing

was completed in the spring. The spring assessments will be used as outcome measures, while the fall assessments will serve as pretest and screening measures.

Children's general language ability was assessed by the Preschool Language Scale-III (Zimmerman et al., 1992). The Preschool Language Scale-III (PLS-III) was administered at the beginning and end of the preschool year. The auditory comprehension and expressive communication subtests were administered individually to children. The auditory comprehension subscale assesses children's receptive language including semantics, vocabulary concepts, structure, morphology, and syntax. The expressive communication subscale evaluates expressive language in the areas of social communication, semantics, vocal development, vocabulary, morphology, structure, and syntax. Children were initially assessed with the PLS prior to the beginning of the school year as a screening measure for the larger study. This was many children's first attempt at a standardized assessment, therefore, the gain experienced between the first and second administrations may not fully reflect children's language gains, but may also include a component of familiarity with testing situations.

Students were administered the Peabody Picture Vocabulary Test (Dunn, Williams, Wang, & Booklets, 1997) individually in the fall and spring as an indicator of gain in receptive vocabulary. The PPVT is a standardized assessment that asks the participant to point to one of four pictures that match the stimulus word. Children's expressive vocabulary was measured by the Expressive Vocabulary Test (Williams, 1997). The EVT is also a standardized assessment that asks children to verbally identify illustrations with appropriate vocabulary terms. Scored in a

conventional manner, the PPVT and EVT yield raw and standardized scores, with raw scores being utilized in this study.

Standardized language samples were collected from the children during the fall and spring of the preschool year. Trained examiners collected three ten-minute samples of children's expressive vocabularies in three contexts: narrative recall, book reading, and play. A total of thirty minutes of child speech was recorded, transcribed and verified by a second coder. The protocol for admission and scoring of each context was standardized. The narrative recall task had the examiner read the *Renfrew Bus Story* (Cowley & Glasgow, 1994). The child was asked to retell the story while looking at the illustrations from the story. The book reading task required the child to look at a wordless picture book, while the play context encouraged the child to play with a set of standard toys. Linguistic measures were derived from the transcripts, with the number of different words in fifty complete utterances (NDW50) being utilized in the present analyses. This measure counts the number of different words produced by the child in a sample of fifty complete utterances. This measure has proved to be a reliable assessment of children's productive vocabulary (Hoff, 2003). Table 3 presents means and standard deviations for the four outcome measures.

Table 3

Children's Outcome Measures

		Low Language		Typical Language	
		Mean	Standard Deviation	Mean	Standard Deviation
PPVT-4					
	Pre-test	75.4	11.7	88.7	11.8
	Post-test	81.6	10.2	94.7	11.1
EVT-4					
	Pre-test	80.7	8.8	93.7	8.7
	Post-test	87	10.6	98.1	9.4
NDW50					
	Pre-test	66.7	23.5	74.6	22.7
	Post-test	89.8	19.9	95.8	19.9

Additional Measures

Child measures. The Leiter International Performance Scale- Revised (Roid & Miller, 1997), a measure of children's non-verbal intelligence, was administered at the end of first grade. The test is a reliable measure for individuals between the ages of two and twenty. The individually administered assessment includes game-like tasks that assess reasoning, visualization, memory, and attention. Nonverbal intelligence is considered to be a stable trait, hence the administration of the Leiter post intervention should not confound the results. Table 4 presents the minimum,

maximum, mean, and standard deviations for the Leiter International Performance
Scale-Revised.

Table 4
Leiter International Performance Scale-Revised, Standard Scores

	Minimum	Maximum	Mean	Standard Deviation
Low Language	54	131	86.5	11.4
Typical Language	67	131	94.2	11.6

Teacher and classroom level measures. Teachers' years of experience
were self-reported, and were measured in months of teaching at the preschool level
in Head Start classrooms. Models were run using curriculum condition as a factor.

Procedures

Transcription and Coding

Data collection. In the fall of the school year, each teacher was video taped
during a book reading session in her classroom. A single book reading session was
analyzed for each teacher as previous work has demonstrated relative stability in
caregiver speech over time (Huttenlocher, Vasilyeva, Waterfall, Vevea, & Hedges,
2007) and book reading styles (Martinez & Teale, 1993). The recording included
the entire oral reading of the story, as well as talk before and after the reading.
Teachers wore a lapel microphone to provide greater audio clarity.

Transcription. Transcripts of the readings were composed in the Codes for

Human Analysis of Transcripts (CHAT) format from CHILDES (MacWhinney, 2000).

Analysis was conducted using the Child Language Analysis (CLAN) computer

program (MacWhinney, 2000). Transcription began with the announcement that

the class would begin shared book reading, and concluded with the announcement

of a new activity, thus including any pre- and post reading discussions. Transcripts

ranged from 3.62 to 21.93 minutes, averaging 12.19 minutes (SD= 4.17). Speech

was parsed into utterances based on pausing and intonation, and was attributed to

the appropriate speaker. Texts read aloud by the teacher were coded separately

from teacher talk as the purpose was to capture the teachers' natural talk.

Therefore, only extratextual talk was attributed to the teacher. Texts read aloud

were coded on a separate tier. The focus of the larger study was on teacher

implementation of the intervention curriculum, therefore, the video and audio were

focused on the teacher. Children were not recorded individually, and therefore

speech cannot be accurately attributed to individual children. All children were

coded simply as child. All transcripts were verified by a second coder, and checked

with the CLAN program for transcription accuracy. Only utterances spoken by the

teacher will be analyzed for this study. Coded comments were aggregated through

the use of the CLAN program. The FREQ +t*TCH command counted the number of

each individual code as well as the combination codes within each transcript.

Coding. Only comments will be coded for the proposed study. A comment is

defined as a teacher utterance that gives or explains information, or expands or

responds to a child's utterance. Questions, commands, requests for attention, and

undecipherable speech will not be included in the present analysis. The larger

randomized control study had previously coded each utterance for function, and the

CLAN program was utilized to filter out those utterances coded as give, explain,

expand, or respond. Figure 1 provides a visual representation of the coding scheme.

Figure 1

Coding Scheme
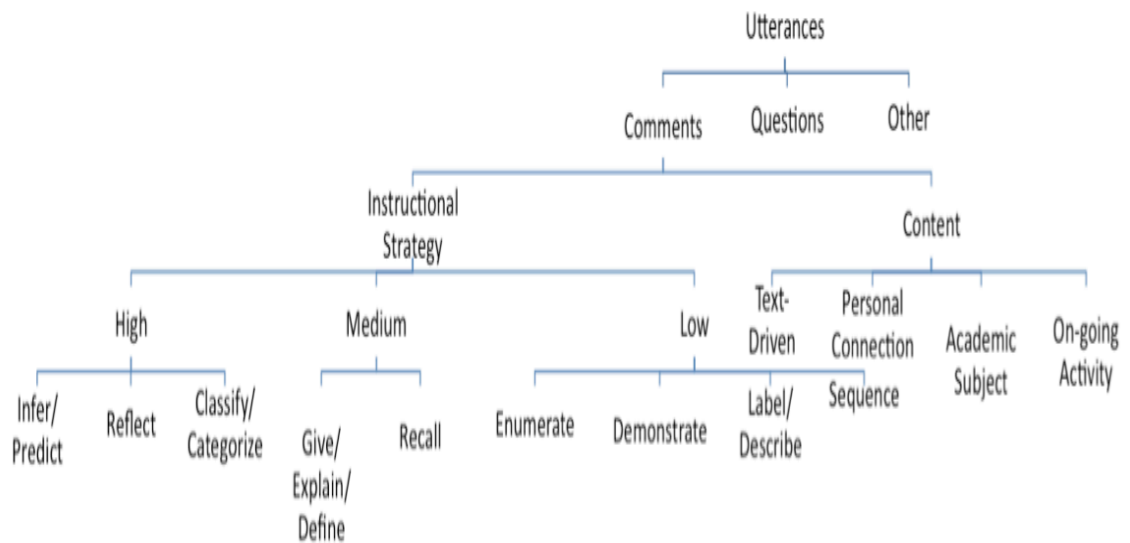
Table 5 provides definitions and examples of comments included in the present study. An utterance was coded as give if it described a situation, or communicated an idea, opinion, or experience. Explaining included utterances that provided an explanation of a cause and effect relationship, such as a motivation, cause, or process. Expanding utterances rephrased a child's utterance to make the content more comprehensible in either form or with a slight variation of content. Responding occurred immediately after a child utterance that provoked or initiated a response. Responses could occur following an elicitation, fill-in-the-blank utterance, or direct question. These utterances are considered as comments for the proposed analyses.   Please see Appendix B for the complete coding manual, and Appendix C for samples of coded transcripts. Each comment was then coded for the instructional strategy, content, and a combination code that includes both the strategy and the content of the comment.

Table 5
Comments

	Description	Example
Give	Statement that describes a situation, communicates an idea, experience, or opinion. Voluntary information that is provided without prompting.	TEACHER: it was written by Soyung Pak and illustrated by Susan Kathleen Hartung.
Explain	Statement or response that provides an explanation such as a motivation, cause, or process.	TEACHER: the giraffe closed the door because she didn't recognize him.
Expand	Rephrase of a child utterance that contains a correction or expansion, making the utterance more comprehensible, conventional, or precise.	CHILD: his dog. TEACHER: his dog Sam playing up under the tree
Respond	Statement that responds to a question, inquiry, or fill-in-the blank utterance. Gives information as a direct response.	CHILD: what's that? TEACHER: sombreros

      Instructional strategies*.* Each comment was coded for the instructional

strategy that the teacher employed. Instructional strategies describe how the

instruction occurred, and fall into three broad categories: high, medium, and low.

The coding system distinguished categories based on a modified version of a

cognitive distancing framework (Sigel, 1986). Comments were distinguished into

the categories based on three factors: whether the comment made reference to

something visually present in the text such as an illustration, whether the comment

extended on the print to provide additional information that was not immediately visible, and whether the comment was decontextualized and assumed deep understanding on the part of the listener. Similar coding systems have been employed by Gerde & Powell (2009), Silverman and Crandall (2010), and Dickinson and Smith (1994), however, these studies included only two levels. The three levels of instructional categories presented in the current study are reflective of the three levels of support posited by the Emergentist Coalition Model that asserts that children may draw on different levels of support based on their present levels of development. Please see table 6 for descriptions and examples of each strategy.

Low level include describing or labeling text features, demonstrating vocabulary or concepts, or sequencing or enumerating events or items. Comments were coded as describing and labeling (DL) if the teacher pointed to or directed children's attention to the texts' illustrations. These comments described actions that occurred within the illustration, labeled characters, or highlighted portions of the print. Language was used to describe a visibly present feature of the text. Demonstrating (DE) occurred when teachers used gestures or facial expressions to act out vocabulary words or story elements. In this case, language was used to describe movement or action. When the teacher counted items on a page, the comment was labeled as enumerate (EN). Language was used to demonstrate one-to-one correspondence. If teachers did a picture walk of the story, the comments were labeled as sequence (SE). Sequencing involved ordinal language and referenced events that were visually present.

Medium level strategies extend the information provided in the text by using language to explain concepts that are not visually present. These strategies use language to describe language, and may "translate" the text to make the terminology more child-friendly. No assumption of prior knowledge is made, but rather, these strategies are used to provide the child with additional information. Comments that provide additional information that is not visibly present in the illustrations or explicitly stated in the text were coded as give/explain/define (GE). Language is used to provide a definition or example of a construct introduced within the text. Medium level strategies also made connections within the book reading session. A strategy was coded as recall (RC) when the teacher retold the story without the use of the illustrations. These comments typically occurred after the teacher had completed the reading a page or the entire story, and may have included ordinal language (first, next, last). The teacher used language to string together the events in the story that would be fresh in the children's memories.

High-level strategies include high level of cognitive distancing due to the decontextualized nature of the talk. These strategies require the child to transcend what is visibly present and make connections to prior knowledge or conceptual frameworks. High-level strategies include making predictions, inferences, or reflections, or categorizing, generalizing, or classifying items or concepts. Teachers' comments were coded as infer/predict (IP) when the teacher forecast the future or drew connections between events. Inferences and predictions typically include a mental state verb such as "believe, predict, foresee," and require the child to use high level thinking skills to understand the comment. Comments were coded as

reflect (RF) when the teacher reflected on past events that occurred prior to the shared book reading experience. Reflections could include discussion of past feelings or emotions. These comments went beyond the immediate "here and now," requiring the listener to draw on memories. Comments were coded as categorize/classify/generalize (CC) when the teacher drew connections between items, themes, or events, linking them to superordinate categories. These comments went beyond visible descriptions, and made explicit the connections or properties that are essential to category membership.

Table 6
Instructional Strategies

Code	Description	Example
Describe/ Label (DL)	Teacher points to, or directs attention to the text's illustrations in order to identify characters/illustrations, describe an action in a picture. Uses language to describe illustration. Teacher may re-orient the book for better viewing.	Label: "Here's Mary Ann" (points to steam shovel). Describe: "She's laying the train tracks" (points to illustration)
Demonstrate (DE)	Teacher uses gesture/facial expressions to act out vocabulary words or story elements. Uses language to describe movement.	"The bird flaps his wings" (teacher moves hands in flapping motion. "The lion grimaces" (teacher frowns)
Enumerate (EN)	Teacher points to illustrations and counts them. Uses language to count objects on page.	Teacher counts aloud while pointing to illustrations in book.
Sequence (SE)	Teacher does picture walk of story to sequence events. Must use illustrations for sequencing events. Sequencing must involve ordinal language (first, next, then). If recalling the sequence of events without using illustrations will be considered a recall. Uses language to sequence events that are visibly present.	"First the bear went into the house" points to illustration
Recall (RC)	Teacher retells the story **without** using illustrations. May be indicated by ordinal language (first, next, then). Uses language to recall events not visibly present. Strings together events that are not visibly present. Recall typically occurs at the end of a story, or at a later point in the story.	He said that one of the Meanies put somethin(g) in the other Meanie's mouth that made him sick
Give/ Explain/ Define (GE)	Translate language from text to make it more comprehensible and child-friendly. Provide additional information that is not visibly present in illustration or stated explicitly in text. Provide definition for word provided in text. May include personal preferences that are current (I like the way Matthew and Tilly are sharing). Uses language to explain language. Makes connections between story and real world information.	A line of bushes, that's what a hedge is, a line of bushes. So that means they get really really wet.
Infer/ Predict (IP)	Teacher forecasts the future or draws connections between events. Typically involves a mental state verb "believe, predict, foresee"	"I believe that the lion and the little red bird are friends" "I predict that the cat has gone into the dark night to retrieve another kitten"

Reflect (RF)	Teacher recalls past event that has been directly experienced, witnessed, or is related to a member of the classroom. Includes discussion about **past** feeling and emotions. Talk that goes beyond the immediate here and now, and does not include an immediate reference to the text.	"You felt sad when you lost your dog." "Just like this morning when we sailed boats at the water table."
Categorize/ Classify/ Generalize (CC)	Teacher draws connections between items, themes, events and uses a superordinate category. Must go beyond a visible description. Uses a non-visible superordinate category.	Categorize:Bushes and shrubs are types of shelter for woodland animals. Generalize: Plants that photosynthesize are green. Classify: Raccoons, deer, and bears are woodland animals"

Content of comments. In addition to a strategy code, each comment was also assigned one mutually exclusive content code. Content codes were considered to be instructional, if the talk focused on the text, academic subjects or personal connections. Comments were considered to be non-instructional if they were related to on-going classroom activity or management. Table 7 presents the content coding categories and descriptions.

Text-driven talk referred to the story being read presently, or other texts that had previously been read. Text-driven talk was divided into two categories: meaning and print. Text-driven meaning (TDM) comments referred to the theme, author, genre, or content of the text being read. In addition, comments that provided or discussed word meanings, labeled or discussed vocabulary words, or named objects from the text were coded as text-driven meaning. Comments that were coded as text-driven print (TDP) involved talk about phonemic awareness, phonics, letters, print, and spelling.

Content that relates to science, math, or social studies was coded as Academic Subject (ASC). These comments included timeless information that would be found in typical preschool curricula. Math content could contain talk about numbers, operations, patterns, relationships, functions, geometry, spatial relationships, and measurement. Science content could contain inquiry, physical science, earth science, space, and life science. Social Studies content may pertain to human interdependence (family, community, jobs, personal relationships), citizenship, governance, culture, history, or geography.

Personal Connection (PEC) talk discussed feelings and emotions, or made connections to children's lives. It could describe preferences or dislikes, reminisce about previous experiences, or make connections to planned events. Personal Connection talk could also involve the teacher sharing a personal memory or narrative.

Non-instructional talk was coded as On-going Activity (OAC) if the comments related to activities occurring in the classroom that were not related to shared book reading. These comments may include a teachers' response to a child's request to use the bathroom, leave the room, get a tissue, etc. It could also pertain to talk about the daily schedule, behavior management, classroom routines, or transitions to other activities.

Table 7
Content of Comments

Code	Description	Example
Text-Driven Meaning (TVM)	Content that relates to the theme, author, genre, or content of the text being read. Comments that provide or discuss word meanings, label or discuss vocabulary words, or name objects.	The lion and the little red bird are friends. The angry look on Tilly's face tells me she must be mad at Matthew.
Text-Driven Print (TVP)	Content that relates to print, phonics, letters, phonemic awareness, or writing.	This is the letter "p." I just said two rhyming words, "sack and pack."
Academic Subject (ASC)	Content that relates to science, math, or social studies. Timeless information. Math: numbers, operations, patterns, relationships, functions, geometry, spatial relationships, measurement. Science: inquiry, physical science, earth science, space science, life science. Social Studies: human interdependence (family, community, jobs, personal relationships), citizenship, governance, culture, history (past events), geography.	The grasshopper is not harmful to us at all, it's just the spider and the bee. Letters can be mailed at a post office.
Personal Connection (PEC)	Comments that discuss feelings and emotions, describe preferences or dislikes, reminisce about previous experiences, or make connections to the children's lives	We saw a bear at the zoo on the field trip. It was rainy and storming last night.
On-going Activity (OAC)	Comments that describe activities currently happening in the classroom, but that are not related to the text. May include teachers responding to children's requests to use the bathroom, teachers informing the children about the daily schedule or classroom rules, etc., behavior management talk.	Julie is sitting with pretzel legs. You may go to the bathroom when I'm done reading this page.

Development of composite variables. Composite variables were developed

for instructional strategies and content for the analyses. The instructional strategies

were divided into three levels based on the three levels of the Emergentist Coalition

Model and Sigel's framework for cognitive distancing (1986): high, medium, and

low. High-level strategies include infer/predict, reflect, and compare/classify/categorize. Give/explain/define and recall are medium-level strategies. Low-level strategies include describe/label, demonstrate, enumerate, and sequence.

In addition, a second composite variable, total strategies, was developed to determine the number of different strategies employed by the teacher during a single book reading session. There were nine total strategies that teachers could employ during a shared book reading session: describe/label, enumerate, demonstrate, sequence, recall, give/explain/define, categorize/classify/compare, reflect, or infer/predict. This variable ranged from 0 (no strategies used) to 9 (all 9 strategies used).

A third composite, instructional comments, represented the total number of comments that were coded as text-driven meaning, text-driven print, academic subject, or personal connection. Comments coded as on-going activity (OAC) were not considered to be instructional in nature, and were not included in this variable. The raw counts from the above mentioned codes were summed to create the composite variable, instructional comments.

Additional composites that describe both the instructional strategy and content of the comment were developed. These codes captured what was being taught, as well as how it was instructed. Instructional strategies were aggregated at the low, medium, and high levels, and then paired with the content resulting in fifteen new codes (low TDM, medium TDM, high TDM, low ASC, medium ASC, high ASC, etc.). These codes were developed to determine if the combination of content

and instructional strategy influenced children's growth, such that content taught with different levels of instructional strategies might differentially influence children's vocabulary growth.

Reliability. A random selection of twenty percent of the transcripts were double-coded by a second graduate student to ensure reliability. The author trained the second coder, and transcripts were double coded until an acceptable level of reliability was achieved (Cohen's kappa > .80). When reliability was reached, the second coder coded twenty percent of the transcripts to maintain reliability. To ensure that coder drift did not occur, reliability checks were conducted after every four transcripts coded by the author. If reliability was not met initially, the coders reached agreement through discussion until consensus was made. A Cohen's kappa of .81 was achieved for strategy and .80 for content.

Data Analyses

Data analyses were conducted in SPSS version 20, which allowed for multi-level models to be constructed. Descriptive data were analyzed in two forms: raw counts and counts per minute in order to provide a density of exposure measure. Preliminary analyses of the data were conducted to check for the normality of the distribution of the data. Outliers were identified and winsorized. Variables and outcome measures were checked for co-linearity. Outcome measures were assessed to determine the degree of nesting, and to account for this in the multi-level models.

Hypothesis testing utilized multi-level analyses to account for the nested nature of the data. The use of multi-level models allows for the inclusion of

variables at the child and teacher levels. Models were analyzed separately for low

and typical language children. Separate models were necessary due to the original

sampling measures that selected for children based on initial vocabulary ability.

Therefore, there are no children in the sample with standard scores between 75 and

85 on the PLS-II. Theoretically, it is also hypothesized that differential effects will

emerge based on the interactions between teachers and children with differing

levels of vocabulary ability. Each child vocabulary outcome measure was a

residualized preschool gain, indicating that end of preschool scores were evaluated

controlling for fall pre-test scores. Raw scores were utilized for standardized

measures.

Additional information regarding the analyses, as well as the results, are

presented in Chapter IV.

Chapter IV

Results

Teachers were video recorded during a single Shared Book Reading session during the fall of the school year. It is believed that a single session will adequately describe teachers' practices as previous research has demonstrated that teachers' book reading practices are relatively stable across time (Martinez & Teale, 1993). Additionally, the larger randomized control trial found no significant differences across measures of book reading fidelity between fall and spring data collections. In the following sections, descriptive data for teachers' instructional strategies and content of comments are presented.

Descriptions of Teachers' Commenting Practices

A total of 7,356 utterances were coded for this study. A total of 2,782 utterances were considered to be comments (38%), 2,532 were questions (34%), and 2,042 were other types of utterances such as included indecipherable speech, praise, repetitions, attention-seeking utterances, and corrections (27%). Teachers produced approximately 145 utterances per book reading session, and averaged 56 comments per transcript. Raw counts were used for hypotheses testing analyses to account for the language that children actually heard. Variations in the language directed towards children has been related to children's language development, hence, raw counts may capture these meaningful differences (Hoff, 2003). Teachers varied the lengths of their book reading sessions, with longer sessions tending to have greater amounts of teacher talk, and therefore, teacher comments.

Instructional strategies. Tables 8, 9, and 10 present the findings for teachers' instructional strategies contained within their comments. Table 8 provides raw counts and a density measure (strategy use per minute) for strategies by level (low, medium, high).

Teachers used medium-level instructional strategies with the greatest frequency, averaging 44 medium-level strategies per book reading session (3.54 per minute). In stark contrast, teachers seldom used high-level strategies averaging only 4.4 per session, or 0.39 per minute. Low-level strategies occurred more frequently than high-level strategies, however, the average use of 7.77 per session, or 0.67 per minute, provided children with only limited exposure to this most supportive type of comment.

Table 8

Teachers' Instructional Strategies by Level

	Minimum		Maximum		Mean		Standard Deviation	
	Raw Counts	Density Measure	Raw Counts	Density Measure	Raw Counts	Density Measure	Raw Counts	Density Measure
Low	0	0	32	2.76	7.77	0.67	6.82	0.6
Medium	6	0.72	163	10.15	44.02	3.54	28.48	1.85
High	0	0	22	1.62	4.4	0.39	5.02	0.44

Table 9 shows the frequencies and density measures for each instructional category. Breaking the levels down into their distinct codes reveals that teachers

use the majority of their comments to give, explain, or define (GE), averaging 37.90, or 3.15 give/explain/define (GE) comments per minute. However, this varied greatly among teachers as the number of give/explain/define (GE) comments ranged from 5-112 per book reading session. All teachers used this strategy within their shared book reading sessions. Teachers were also likely to provide comments that recalled information from the story after the read, averaging 4.54 per book reading session, however, nearly half of the teachers did not do so (24 of the 52). Teachers described or labeled approximately six times per book reading session. While this is the second most prevalent strategy, teachers gave/explained or defined six times more often than described and labeled. Other low level strategies such as enumerate, sequence, and demonstrate were rarely employed by teachers, averaging less than one instance per book reading session. Indeed, only twelve teachers enumerated, six teachers sequenced information, and thirteen demonstrated information. Little variability was observed within these measures.

High-level strategies were also used rarely by teachers. On average, teachers made inferences or predictions only 2.17 times per book reading session, and reflections appeared only 1.94 times. Some variability was reflected by the ranges of two categories, as inferring and predicting ranged from 0-18, and reflecting ranged from 0-19. Only half of the teachers made an inference or prediction (28), or reflected on the text (27), indicating that many teachers did not include these strategies as part of their normal practices. Categorizing, classifying, and comparing were almost never used by teachers as they averaged only 0.29 per session. Little variability was demonstrated with this strategy as indicated by a range of zero to

four.   Only seven of the 52 teachers included a comment that categorized, classified,

or compared information within their shared book reading session.

Table 9

Teachers' Instructional Strategies, Raw Counts and Per Minute

	Minimum		Maximum		Mean		Standard Deviation	
	Raw Count	Density Measure	Raw Counts	Density Measure	Raw Counts	Density Measure	Raw Counts	Density Measure
Low Level								
Describe/ Label (DL)	0	0	31	2.76	6.06	0.53	6.4	0.6
Demonstrate (DE)	0	0	8	0.59	0.63	0.05	1.47	0.11
Enumerate (EN)	0	0	10	0.98	0.83	0.07	2.19	0.19
Sequence (SE)	0	0	6	0.49	0.25	0.02	0.93	0.08
Medium Level								
Recall (RC)	0	0	75	6.62	4.54	0.38	11.77	1.02
Give/ Explain/ Define (GE)	5	0.46	112	7.98	37.90	3.15	21.07	1.64
High Level								
Infer/ Predict (IP)	0	0	18	1.32	2.17	0.19	3.52	0.31
Reflect (RF)	0	0	19	1.6	1.94	0.18	3.26	0.32
Categorize Classify (CC)	0	0	4	0.32	0.29	0.02	0.85	0.07

Table 10 presents strategy use by teachers by condition. Again, strategies were divided into three levels (high, medium, and low). Examining strategy use by curriculum condition reveals significant differences among teachers. Teachers in the *OWL* condition used significantly more total strategies than teachers assigned to the control condition (t =4.03, p = .001), averaging two more strategies per session (5.00 vs. 3.13).   Similarly, teachers in the *OWL* condition used high-level strategies significantly more than their peers in the control condition (t = 2.08, p = .04). *OWL* teachers also used medium-level strategies twice as often as teachers in the *OWL+EMT* condition (t = 3.58, p = .001). Similar amounts of low-level strategies were used by teachers across conditions.

Table 10
Teachers' Instructional Strategies by Curriculum Condition

	Control		OWL		OWL+EMT	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Low	8.25	9.31	8.65	6.02	6.58	5
Medium	45.19	23.35	60.29	34.67	28.47	16.38
High	2.25	3.26	5.18	4.65	5.53	6.11
Total Strategies	3.13	1.51	5	1.12	4.11	1.6

Correlations among the instructional strategy variables were calculated to eliminate concerns for multi-collinearity. Results are presented in Table 11. Very few codes were significantly correlated, and those that were correlated were only modestly so. Give/explain/define (GE) was correlated with describe/label (DL) (r =.33, $p < .05$), and with infer/predict (IP) ($r = .28, p < .05$). Only two correlations were significant at the $p < .01$ level, demonstrate (DE) and reflect (RF) (r =.39, p <.01), and enumerate (EN) and compare/classify/categorize (CC) ($r = .40, p < .01$). Given the relatively low number and strength of correlations, there are no concerns regarding multi-collinearity.

Table 11

Pearson's Correlations among Teachers' Strategy Use (n=52 teachers)

	DE	EN	SE	RC	GE	IP	RF	CC
Describe/ Label (DL)	0.14	-0.1	-0.11	-0.06	.33*	0.24	-0.09	-0.01
Demonstrate (DE)		-0.06	-0.12	-0.05	0.22	0.07	.39**	0.07
Enumerate (EN)			-0.02	0.14	0.05	0.13	-0.02	.40 **
Sequence (SE)				0.03	-0.05	-0.01	-0.12	0.01
Recall (RC)					-0.07	0.13	0.04	0.25
Give/ Explain/ Define (GE)						.28*	0.06	0.23
Infer/ Predict (IP)							-0.03	0.25
Reflect (RF)								0.11
Categorize/ Classify/ (CC)								1

* $p < .05$, ** $p < .01$

Content. Teachers' comments were coded for instructional and non-instructional content, revealing the focus of teachers' instruction. There were five

content codes in all. Instructional codes included text-driven meaning (TDM), text-driven print (TDP), academic subject (ASC), and personal connection (PEC). Non-instructional talk included on-going activity (OAC), which related to any talk that was not focused on the book reading event such as behavior management, transition routines, etc. All teachers used at least two types of content during a single shared book reading session. Teachers averaged 3.8 different types of content per session, with over 65% of the teachers using at least four of the five types of content.

Table 12 presents the raw counts and density measures (content per minute) for the content of teachers' comments. The majority of teachers' comments contained text-driven meaning talk, averaging 33.08 per session, or 2.76 per minute. Approximately 60% of teachers' comments fell into the text-driven meaning category. Tremendous variation existed among the amount of text-driven meaning talk by teachers as depicted by a wide range of four to ninety-four per book reading session. Teachers were less likely to use text-driven print comments, averaging only 2.6 comments per book reading session. Similar amounts of academic subject and personal connection talk were utilized by teachers (means of 3.75 and 3.88 respectively). These types of comments each accounted for approximately 7% of the total comments in a shared book reading session. In addition to instructional comments, non-instructional comments relating to on-going classroom activity comprised approximately 21% of teachers' comments, averaging 11.83 per book reading session. Great variability existed within the category as indicated by a range of 0-55 non-instructional comments per session.

Table 12

Content of Teachers' Comments, Raw Counts and Per Minute

	Minimum		Maximum		Mean		Standard Deviation	
	Raw Counts	Density Measure	Raw Counts	Density Measure	Raw Counts	Density Measure	Raw Counts	Density Measure
Text-Driven Meaning (TDM)	4	0.22	94	8.3	33.08	2.76	20.99	1.67
Text-Driven Print (TDP)	0	0	20	3.2	2.6	0.22	4.98	0.54
Academic Subject (ASC)	0	0	21	2.27	3.75	0.33	4.9	0.44
Personal Connections (PEC)	0	0	19	1.37	3.88	0.31	4.3	0.34
On-going Activity (OAC)	0	0	55	4.78	11.83	0.91	12.03	0.84

Table 13 presents the content of teachers' comments by curriculum condition. Investigating the content of teachers' comments by curriculum condition reveals significant differences among teachers. Teachers in the *OWL* condition used twice as many text-driven meaning comments as their peers in the control condition (t = 4.03, p = .001). *OWL* teachers had the highest averages for text-driven print (mean = 5.75), and academic subject (mean = 4.30), however, they had the lowest

average use of personal connection comments (mean = 3.06). Teachers in *OWL+EMT*

almost never commented on print-related aspects of the text (mean= 0.16), and had

the lowest average for non-instructional comments (mean = 6.05). Teachers

assigned to the control condition used the most personal connection comments

averaging 5.35 per book reading session.

Table 13
Content of Teachers' Comments by Curriculum Condition

	OWL		OWL+EMT		Control	
		Standard		Standard		Standard
	Mean	Deviation	Mean	Deviation	Mean	Deviation
Text-Driven Meaning (TDM)	48.65	20.04	28.32	16.68	22.19	17.47
Text-Driven Print (TDP)	5.75	6.5	0.16	0.5	2.35	4.69
Academic Subject (ASC)	4.63	5.64	2.74	4.87	4.06	4.22
Personal Connections (PEC)	3.06	3.84	3.26	4.78	5.35	4
On-going Activity (OAC)	10.47	9.54	6.05	4.96	20.13	15.76

Table 14 presents the correlations among the content of teachers' comments.

Correlations among the content of teachers' commenting practices were calculated

to eliminate concerns regarding multi-collinearity. Few, modest correlations were found. Teachers' use of personal connection talk was related to text-driven meaning (r =.31, p < .05), and to academic subject talk (r = .32, p < .05). Text-driven print was correlated with on-going activity comments to a higher degree (r = .38, p < .01). Given the few existing correlations, and the lack of relative strength of associations, no concerns regarding multi-collinearity exist.

Table 14

Pearson's Correlations among Content of Teachers' Comments (n= 52 teachers)

	TDM	TDP	ASC	PEC	OAC
Text-Driven Meaning (TDM)	1	-0.06	0.21	.31*	0.15
Text-Driven Print (TDP)		1	0.18	-0.09	.38**
Academic Subject (ASC)			1	.32*	0.22
Personal Connections (PEC)				1	0.05
On-going Activity (OAC)					1

* p< .05; ** p < .01

Table 15 presents the correlations between instructional strategies and content. Several significant correlations between the instructional strategy and content of teachers' comments were found. Text-driven meaning (TDM) comments had the highest number of correlations, as it was significantly correlated at p < .01 with describing/labeling (DL), demonstrating (DE), recalling (RC),

giving/explaining/defining (GE), and inferring/predicting (IP). These strategies

span all three instructional levels. Personal connection comments (PEC) were

related to give/explain/define (GE) at $p < .05$, and to reflect (RF) and demonstrate

(DE) at $p < .01$. Academic subject comments (ASC) were related to the enumerate

(EN) and categorize/classify/compare (CC) at $p < .05$. On-going activity (OAC) was

correlated with describe/label (DL) and give/explain/define (GE) at $p < .05$ and $p <$

.01, respectively. Only one relationship was found for text-driven print (TDP), as it

was related to give/explain/respond (GE) at the $p < .01$ level. None of these codes

were correlated to the extent that multi-collinearity would be an issue.

Table 15

Pearson's Correlations between Instructional Strategy and Content (n=52)

	TDM	TDP	ASC	PEC	OAC
DL	.490**	0.067	0.066	0.024	.283*
DE	.322*	-0.165	0.224	.443**	-0.029
EN	-0.035	0.127	.588**	0.085	0.214
SE	-0.057	0.171	-0.094	-0.116	0.027
RC	.523**	-0.043	0.25	0.018	-0.096
GE	.528**	.479**	0.268	.320*	.734**
IP	.587**	-0.13	0.258	0.083	0.096
RF	0.16	-0.156	0.265	.711**	-0.15
CC	0.246	0.112	.490**	0.079	0.015

- Note: DL= describe/label, DE= demonstrate, EN= Enumerate, SE= sequence, RC= recall, GE= give, explain, respond, IP= infer/predict, RF= reflect, CC= categorize, classify, compare, TDM= text-driven meaning, TDP= text-driven print, ASC= academic subject, PEC= personal connection, OAC= on-going activity.
  *Significant at $p < .05$; ** Significant at $p < .01$

Hypotheses Testing

Multi-level models were developed to examine the relationship between teachers' commenting practices and children's end of preschool vocabulary scores. The models tested hypotheses for separate groups of children as designated by the children's initial language ability.

Preliminary analyses. The data were checked for normality and outliers prior to the main analyses. All variables had approximately normal distributions, although some variables showed floor effects as teachers did not utilize some of the instructional strategies with great frequency (SE, IP, CC, EN). No skew or kurtosis

were noted. A visual examination of the data for outliers was conducted through the use of box plots. In addition, the interquartile range IQR (75th – 25th percentiles) was calculated for each variable of interest. Values that fell above the outer bounds (Q_3 + 3*IQR), and those that fell below the lower bounds (Q_1 – 3*IQR) were considered to be extreme outliers. Few extreme outliers were found for the content of teachers' comments (1 OAC, 6 TDP). As these variables were not used for hypothesis testing, no transformations were completed. A larger number of extreme values were found for the teachers' instructional strategies, as eight of the nine strategies included extreme outliers. Many of these strategies were used less than one time per book reading session. No analyses were conducted using these individual variables, hence no modifications were made. In addition, aggregate variables such as high, medium, low (instructional strategy levels), total comments, and instructional comments were examined for extreme outliers. None were found, and the data demonstrated normal distributions with no skew.

The data for this study were collected as part of a larger randomized control trial evaluating three curriculum conditions, hence, differences in variables by condition were evaluated. Randomization was completed at the cluster level, hence models contained three levels, cluster, center, and classroom (teacher). Given the previously reported findings of significant differences among variables by condition, sensitivity analyses were conducted with condition included and excluded for each of the child level outcomes. Condition was included in the final model to account for variance found between teachers based on assignment to curriculum condition.

Intraclass correlation coefficients (ICC) were calculated at the center and cluster levels for each child outcome to account for the nested nature of the data (children nested in classrooms, nested in centers, nested in clusters). The ICC's indicate whether or not sufficient variance is found at each level to necessitate its inclusion in the final model. The ICC's are presented in Table 16. Unconditional models were run for each of the four outcome measures using the split samples (low and typical language). No significant variance was accounted for at the center or cluster level. As the sample was randomized at the cluster level, this level was maintained in the final model, however, the center level was eliminated due to the lack of significant variance.

Table 16

Intercorrelation Coefficients for Outcome Measures (ICC's)

		Variance		Standard Error		ICC		P-value	
		Low	Typical	Low	Typical	Low	Typical	Low	Typical
PPVT									
	Cluster	NS	1.35	NS	NS	NS	0.01	NS	NS
	Center	NS	90.5	NS	781.48	NS	0.28	NS	0.91
	Classroom/ Teacher	16.21	7.16	13.86	NS	0.07	0.03	0.24	NS
EVT									
	Cluster	NS	NS	NS	NS	NS	NS	NS	NS
	Center	3.7	2	4.64	3.05	0.04	0.02	0.43	0.66
	Classroom/ Teacher	4.12	NS	5.36	NS	0.05	NS	0.44	NS
NDW50									
	Cluster	5.56	NS	9.89	NS	0.01	NS	0.57	NS
	Center	NS	NS	NS	NS	NS	NS	NS	NS
	Classroom/ Teacher	NS	37.18	NS	NS	NS	0.09	NS	0.18
EVT									
	Cluster	NS	NS	NS	NS	NS	NS	NS	NS
	Center	4.48	1.3	6.84	2.08	0.05	0.03	0.51	0.53
	Classroom/ Teacher	7.52	NS	7	NS	NS	NS	NS	NS

Note: NS= Non-significant. PPVT= Peabody Picture Vocabulary Test, EVT= Expressive Vocabulary

Test, PLS= Preschool Language Scale, NDW50= Number of different words in fifty utterances

In order to determine that each child level outcome measure was a single construct, correlations among the measures were calculated. Table 17 presents the correlations among outcome measures. The Expressive Vocabulary Test (EVT) and Number of Different Words in Fifty Utterances (NDW50) are both measures of productive or expressive vocabulary, however, the EVT is a standardized measure, while NDW50 is a more naturalistic measure that utilizes a speech sample. The low correlations among the NDW50 and the PPVT and EVT may be accounted for by the differences in assessments as language samples provide different information regarding children's vocabulary abilities. The Expressive Vocabulary Test was also correlated with the Peabody Picture Vocabulary Test (PPVT). The PPVT measures children's receptive vocabulary, while the EVT measures expressive vocabulary, hence some degree of correlation would be expected. The PLS was also correlated with the other measures of vocabulary. This standardized assessment is a more global measure of overall language ability, and contains elements of receptive and expressive vocabulary. As the measure also evaluates elements of language, such as syntax and grammar, some degree of correlation with the other outcome measures would be expected.

Table 17

Pearson's Correlations among Outcome Measures

	PPVT	EVT	NDW50	PLS
PPVT	1	.735 ***	.160***	.702***
EVT		1	.177***	.680***
NDW50			1	.780***
PLS				1

Note: PPVT= Peabody Picture Vocabulary Test, EVT= Expressive Vocabulary Test, NDW50= Number of different words in fifty utterances, PLS= Preschool Language Scale

*** $p < .001$

Hypothesis I. *The amount of instructional comments, rather than total comments, used by teachers will be related to children's vocabulary growth across one year of preschool*. This hypothesis was tested by linear mixed level modeling to account for the nested nature of the data. Three level models (children nested in classrooms nested in clusters) were run for the split sample, low and typical language children. Level one represents the relationship of child-level variables to the outcome of interest, while level two and level three predictors explain differences in the significant relationships found at level one. A separate model was built for each of the four outcome measures, PPVT, EVT, PLS, and NDW50. A total of eight models were run to evaluate the impact of teachers' instructional comments

on children's end of preschool vocabulary growth. Child level covariates included

fall pre-tests for each of the outcome measures, as well as non-verbal intelligence as

measured by the Leiter-R. Teachers' experience instructing in Head Start preschool

classrooms was a covariate at the classroom/teacher level. Condition was a factor

at the cluster level. The following model was built to examine the relationship

between teachers' instructional commenting practices and children's end-of-year

expressive vocabulary scores. Similar models were developed for each of the

outcome measures. The outcome, children's expressive vocabulary ability, was the

ability of child *i* in classroom *j* and cluster *k* to produce vocabulary terms at the end

of the preschool year.

EVT_post$_{ijk}$ = γ $_{000}$ + γ $_{010}$ Instructional Comments$_{jk}$ + γ $_{100}$ Non-verbal IQ$_{ijk}$ + γ $_{200}$ PreK

experience$_{ijk}$ + γ $_{300}$ EVT_pre$_{ijk}$ + Condit$_{jk}$ + r$_{0jk}$ + u$_{00k}$ + e$_{ijk}$

Please see Appendix D for full models for each outcome measure.

A random intercept and fixed slope model was used for these analyses,

including Instructional Comments, the predictor of interest. As no variation was

expected between classrooms in terms of the association between this type of input

and children's learning, this approach fixed the relationship between the outcome

measures and the predictors. Estimated marginal means were generated and tested

for statistical significance. Unstandardized betas, standard errors, and significance

values for the relationships between teachers' use of instructional comments and

the residualized preschool gain on each of the vocabulary outcome measures are

presented in Table 18.

Table 18

Relationships between Teachers' Instructional Comments and Children's End- of-

Preschool Vocabulary Scores

	b	SE	P
Low Language			
PPVT	0.05	0.04	0.205
EVT	-0.02	0.02	0.297
NDW50	-0.03	0.06	0.64
PLS	0.03	0.02	0.251
Typical Language			
PPVT	0.08	0.04	.03**
EVT	-0.01	0.02	0.605
NDW50	0.12	0.07	0.097*
PLS	0	0.02	0.994

Note: PPVT= Peabody Picture Vocabulary Test, EVT= Expressive Vocabulary Test, NDW50= Number

of different words in fifty utterances, PLS= Preschool Language Scale. *b*= unstandardized regression

coefficient, SE= standard error, p= p-value

* *p* < .1; ** *p* < .05

A significant, positive relationship was found between teachers' use of instructional

comments and receptive vocabulary as measured by the PPVT for typical language

children only (*p* = .03). Variations in the receptive vocabulary scores of children

with typical language abilities were related to teachers' increased use of instructional comments. There were no significant relationships found for children with low language ability, and no significant relationships were found for typical language children on the EVT, NDW50, or PLS at the $p < .05$ level. When evaluating at the $p < .1$ level, and additional relationship emerged. Children with typical language ability in classrooms where teachers used more instructional comments had higher end-of-year expressive vocabulary scores as measured by NDW50 than children who heard fewer instructional comments ($p = .097$).

Hypothesis I is partially supported by the results, as typical language children in classrooms where teachers used more instructional comments gained more on the PPVT than their peers in classrooms where fewer instructional comments were used. As no significant relationships were found for typical language children on the other outcome measures, and no significant relationships were found for low language children on any of the outcome measures, the hypothesis cannot be fully supported. Standardizing the scores allows for a direct comparison of the effects of instructional comments to total comments. Results are presented in Table 19.

Table 19

Standardized Scores for Relationships between Instructional and Total Comments on

Children's PPVT Scores

	Total Comments			Instructional Comments		
	ß	SE	*P*	ß	SE	*P*
Low Language	0.34	0.61	0.579	1.64	1	0.108
Typical Language	1.18	0.62	0.058*	1.98	0.96	0.04**

* *p* < .1, ** *p* < .05

Only instructional comments were significantly related to typical language children's end-of-year receptive vocabulary as measured by the PPVT at the *p* = .05 level, with a standardized score of 1.98. Total comments is significantly related to the receptive vocabulary growth of typical language children at the *p* = .1 level, indicating that the relationship is not as strong as the standardized score is only 1.18. This finding supports the hypothesis that instructional comments have stronger effects on vocabulary growth.

Hypothesis II. *Children with differing levels of vocabulary knowledge will profit differently from instructional strategies that contain different levels of cognitive demand. Strategies within the child's zone of proximal development will have the greatest effects, such that children with low language will profit from low and medium-level strategies, while children with typical language will benefit from medium and high-level strategies.* Separate models were run for low and typical language children. A separate model was built for the level of cognitive demand of

the instructional strategy (high, medium, low), and for each outcome measure. A total of twenty-four models were developed and tested. Again, multi-level models were utilized to account for the nested nature of the data. Unstandardized betas, standard errors, and significance values for the relationships between teachers' use of instructional strategy levels and the residualized preschool gain on each of the vocabulary outcome measures are presented in Table 20.

Table 20

Relationships between Instructional Strategy Levels and Children's Residualized Vocabulary Scores

	Low			Medium			High		
	b	SE	*p*	*b*	SE	*p*	*b*	SE	*p*
Low Language Sample									
PPVT	0	0.11	0.98	0.03	0.04	0.44	0.03	0.17	0.86
EVT	0.01	0.07	0.867	-0.02	0.02	0.25	-0.05	0.11	0.624
NDW50	-0.15	0.18	0.402	-0.01	0.06	0.914	-0.03	0.29	0.908
PLS	0.03	0.07	0.63	0.02	0.02	0.256	0.1	0.1	0.348
Typical Language Sample									
PPVT	0.15	0.12	0.19	0.08	0.04	.02**	0.28	0.16	0.07*
EVT	-0.06	0.08	0.501	0	0.02	0.877	0.03	0.1	0.739
NDW50	0.01	0.23	0.966	0.07	0.06	0.252	0.46	0.29	0.129
PLS	0.03	0.06	0.579	0	0.02	0.903	-0.07	0.07	0.333

Note: PPVT= Peabody Picture Vocabulary Test, EVT= Expressive Vocabulary Test, NDW50= Number of different words in fifty utterances, PLS= Preschool Language Scale

* $p < .1$; ** $p < .05$

No significant relationships between low language children's residualized vocabulary scores and the level of cognitive demand contained within teachers' comments were found. Only one significant and positive relationship was found for children with typical language ability at the $p < .05$ level. Typical language children in classrooms where teachers used more medium level strategies had higher residualized receptive vocabulary scores as measured by the PPVT at the end of one year of preschool. When evaluating at the $p < .1$ level, an additional relationship emerges for children with typical language ability. Typical language children in classrooms where teachers used greater amounts of high-level strategies had higher end-of-year receptive vocabulary scores as measured by the PPVT than children in classrooms where fewer high-level strategies were used. Therefore, hypothesis II was partially supported in that children with typical language benefited from less supportive strategies (medium and high) on measures of receptive vocabulary. However, low and medium level strategies did not significantly impact the vocabulary gains of children with low language ability.

Hypothesis III. *Differing levels of cognitive demand contained within teachers' instructional strategies for comments that are text-driven meaning will differentially affect children's end-of-year vocabulary scores. Comments that are within the child's zone of proximal development will produce the greatest growth. Children with low language ability may profit the most from low and medium levels of text-driven meaning content, while children with typical language ability may profit the most from medium and high levels of text-driven meaning content.* The variable of

interest, instructional strategy used to convey text-driven meaning, is a composite

variable. All text-driven meaning comments were sorted based on the level of

instructional strategy: 1) low level strategies with text-driven meaning content

(Low-TDM); 2) medium level strategies with text-driven meaning content (Medium-

TDM); and 3) high-level strategies with text-driven meaning content (High-TDM).

Again, the sample was split into typical and low language children for analyses. A

separate model was built for each outcome measure, PPVT, EVT, NDW50, and PLS,

for each of the three variables of interest, Low-TDM, Medium-TDM, and High-TDM,

resulting in 24 models.   Unstandardized betas, standard errors, and significance

values for the relationships between teachers' use of instructional strategy levels of

text-driven meaning comments and the residualized preschool gain on each of the

vocabulary outcome measures are presented in Table 21.

Table 21

Relationships between Instructional Strategy Level of Text-Driven Meaning Comments

and Children's Residualized Vocabulary Scores

	Low-TDM			Medium-TDM			High-TDM		
	b	SE	*p*	*b*	SE	*p*	*b*	SE	*p*
Low Language Sample									
PPVT	-0.11	0.12	0.359	0.12	0.06	0.031**	0	0.23	0.993
EVT	0.01	0.08	0.878	-0.04	0.04	0.264	-0.06	0.15	0.668
NDW50	-0.23	0.2	0.237	-0.05	0.09	0.554	-0.07	0.38	0.852
PLS	0.02	0.08	0.816	0.06	0.03	0.06*	0.11	0.14	0.444
Typical Language Sample									
PPVT	0.2	0.13	0.111	0.09	0.05	0.078*	0.03	0.19	0.892
EVT	-0.02	0.09	0.853	-0.02	0.04	0.606	-0.16	0.13	0.229
NDW50	-0.03	0.24	0.893	0.02	0.11	0.824	0.51	0.39	0.204
PLS	0.03	0.06	0.594	-0.01	0.03	0.661	-0.06	0.09	0.533

Note: PPVT= Peabody Picture Vocabulary Test, EVT= Expressive Vocabulary Test, NDW50= Number

of different words in fifty utterances, PLS= Preschool Language Scale

* $p < .1$; ** $p < .05$

This hypothesis was minimally supported as only one significant relationship

emerged at $p < .05$. Variation in low language children's PPVT scores was related to

the amount of medium-level text-driven meaning talk employed by their teachers.

Low language children in classrooms where teachers used greater amount of

medium-level text-driven meaning talk achieved higher receptive vocabulary scores

as measured by the PPVT at the end of the preschool year than their peers in

classrooms where teachers used less medium-level text-driven meaning talk. No other significant relationships were found for low language children on the three other outcome measures at the $p < .05$ level. Interestingly, no significant relationships emerged for typical language children on any of the outcome measures, PPVT, EVT, NDW50, or PLS for any level of text-driven meaning talk at the $p < .05$ level.

When evaluating at the $p < .1$ level, two additional relationships emerged. Low language children in classrooms where teachers use greater amounts of medium-level text-driven meaning comments had higher end-of-year scores on the PLS than children in classrooms where fewer medium-level text-driven meaning comments were made. Similarly, typical language children in classrooms where teachers used greater amounts of medium-level text-driven meaning comments had higher end-of-year scores on the PPVT than children in classrooms where fewer medium-level TDM comments were made.

Exploratory analyses. Previously reported results indicated that variation in end-of-year receptive vocabulary scores for children with typical language ability were related to teachers' use of medium-level comments. Exploratory analyses were conducted to determine if patterns existed relating to the content of these medium-level comments. Similar to the primary analyses, multi-level models were developed for the two samples of children, low and typical, for the outcome of interest, children's end-of-preschool receptive vocabulary as measured by the PPVT. A separate model was constructed for each variable of interest: medium-level text-driven meaning (Medium-TDM), medium-level text-driven print (Medium-TDP),

medium-level academic subject (Medium-ASC), and medium-level personal

connection comments (Medium-PEC). A total of eight models were analyzed. Non-

verbal IQ and fall PPVT scores were covariates at the child level, and teachers'

experience in Head Start classrooms was a covariate at the classroom level.

Curriculum condition was a factor at the cluster level. Unstandardized betas,

standard errors, and significance values for the relationships between teachers' use

of instructional content comments and the residualized preschool gain on the PPVT

are presented in Table 22.

Table 22

Relationships between Medium-Level Content Use and Children's Residualized PPVT

Scores

	Low Language			Typical Language		
	b	SE	*p*	*b*	SE	*p*
Medium-TDM	0.12	0.06	0.031**	0.09	0.05	0.078*
Medium-TDP	0.16	0.23	0.486	0.15	0.26	0.558
Medium-ASC	0.36	0.22	0.099*	-0.01	0.23	0.978
Medium-PEC	0.01	0.31	0.983	0.59	0.28	0.041**

 * $p < .1$; ** $p < .05$
Note: TDM= Text-driven meaning; TDP=Text-driven print; ASC= Academic Subject; PEC= Personal
Connection

Only two significant relationships were found between the content of

teachers' medium level comments and children's end of preschool PPVT scores at

the $p < .05$ level, medium-level PEC ($p = .041$) for typical language children, and

medium-level TDM (p = .031) for low language children.   Hence, children with typical language ability in classrooms where teachers used more medium level personal connection comments had higher end-of-year receptive vocabulary scores as measured by the PPVT than children in classrooms where fewer medium level personal connection comments were made. Children with low language ability in classrooms where teachers used more medium-level text-driven meaning comments had higher end-of-year receptive vocabulary scores than children in classrooms where fewer medium-level text-driven meaning comments were made.

When evaluating at the p < .1 level, two additional categories were related to children's end-of-year receptive vocabulary scores. Medium-level academic subject talk was related to end-of-year receptive vocabulary for children with low language (p = 0.099). Medium-level text-driven meaning talk was related to end-of-year receptive vocabulary for typical language children (p = .078).

CHAPTER V

Summary, Discussion, and Conclusions

This study examined Head Start preschool teachers' commenting practices during shared book reading sessions, and how these practices related to children's end-of-year vocabulary scores. A sample of African-American preschoolers from low-income homes was divided based on initial vocabulary ability. Children were assessed during the fall and spring of the preschool year on standardized measures of receptive vocabulary (PPVT), expressive vocabulary (EVT), general language ability (PLS), and an expressive language sample (number of different words in fifty utterances). Teachers' comments, which included statements that gave or explained information, responded to children's inquiries, or expanded on children's utterances, were the focus of the study. The instructional strategies and content of teachers' comments were coded and analyzed to provide descriptive statistics of teachers' commenting behaviors, and to predict children's end-of-year vocabulary scores. Instructional strategies were the methods by which the teacher provided instruction. These strategies were divided into three categories based on the level of support provided to the child: low, medium, and high. The content of teachers' comments included text-driven, academic subject, personal connection, and on-going activity talk. Combination codes that included both the instructional strategy and the content were also used as predictors of children's end-of-year vocabulary scores. This chapter provides a summary of the results of the study, as well as discussion and conclusion based on the findings. Implications, limitations, and future directions for research are also addressed.

Summary

Descriptive analyses. Approximately one-third of the nearly 7,500 utterances spoken by teachers were comments. Differences in the use of instructional strategies and content emerged in relation to curriculum condition. In contrast to the variability between teachers, little within-teacher variability was observed. On average, teachers used only half of the strategies that were coded in the study. Teachers were most likely to use medium-level strategies that contained text-driven content, and seldom used low or high level strategies. Several strategies were almost never used by teachers, occurring less than one time per session. In contrast, about one-fifth of teachers' comments were coded as on-going activity, or roughly 11 per transcript. Teachers used similar amounts of academic subject and personal connection talk, averaging 3.75 and 3.88 per session respectively.

Hypothesis testing. Three hypotheses were tested using multi-level models to account for the nested nature of the data. Children with low language received less benefit from shared book reading than children with typical language, as indicated by fewer significant relationships between teachers' comments and their language growth. Receptive vocabulary scores, as measured by the PPVT, indicate that children with low language benefitted from teachers' use of medium-level text-driven meaning comments ($b = 0.12$, $p = 0.02$). There is also a trend suggesting that medium-level academic subject comments may have fostered vocabulary growth as measured by the PPVT for low language children ($b = 0.36$, $p = 0.09$). These findings suggest that explicit instruction consisting of defining and explaining that expanded

children's understanding of the text or built conceptual knowledge was helpful to low language children.

More effects of measured features of book reading were found for children with typical language ability. The use of medium-level strategies were positively related to growth on the PPVT (b = 0.08, p = .02) and use of high level stragies approached being significantly associate with PPVT growth, b = 0.28 p = .07). The content of comments also played an important role as instructional comments were significantly related to receptive vocabulary growth (β= 1.98, p= .04) and there was a trend suggesting possible association with expressive vocabulary growth as measured by the NDW50 (b =0.12, p = 0.097). Examining contents for the combined impact of strategy and content reveals a significant relationship between medium-level comments personal connection comments (Medium-PEC) and PPVT growth (b=0.59, p= 0.041), and a trend reflecting an association between PPVT and medium-level text-driven talk (Medium-TDM) (b =0.09, p = 0.078). Thus, there are general patterns of results that include statistically significant associations and trends that, as a constellation, suggest that children were helped by teachers' comments that facilitated story comprehension and made explicit connections to prior knowledge.

Discussion

This study revealed several links between teachers' commenting practices during whole-group shared book reading and children's vocabulary growth. In addition, descriptive analyses indicate that curriculum may have influenced

teachers' commenting practices. Differences in curricula are discussed first because it is helpful first to understand possible factors that shaped the discussions being analyzed.

Curriculum Differences

Differences by curriculum assignment were found, hinting at potential curriculum effects that should be explored further. Teachers in the *OWL* condition used more of the types of comments that were associated with children's vocabulary growth (Dickinson & Smith, 1994; Gerde & Powell, 2009; Hockenberger et al., 1999). *OWL* teachers used a wider variety of instructional strategies, more high-level strategies, a larger number of instructional comments, and twice as many text-driven meaning comments. *OWL* teachers had the highest average use of text-driven print and academic subject comments as well. These differences may reflect curriculum effects, as they are consistent with the guidance provided by the curriculum. However, caution must be exercised as these differences were not assessed using multi-level models, and other variables may be associated with the differences among conditions.

My findings are consistent with those from other studies that have examined scripted curricula that have been effective for elevating teachers' talk (Bierman et al., 2008; Dickinson, Darrow, Ngo, & D'Souza, 2009; Justice et al., 2010)}. The *OWL* curriculum provides "semi-scripted" examples of extratextual talk within the Teachers' Guide. It may be that these suggested comments in the curriculum influenced the amount and content of the instructional comments provided by *OWL*

teachers.   These examples model comments and questions that teachers may wish

to utilize during the readings, while encouraging teachers to provide extratextual

talk for each page of the storybook. An examination of two typical books from the

OWL curriculum demonstrates the similarities between teachers' comments and the

suggestions provided in the Teachers' Guide.   The Teachers' Guide suggested 56

comments for the book *Gilberto and the Wind* (Ets, 1978), which is 28 pages long,

and 57 comments for the 30-page long text, *One Dark Night* (Hutchens, 2001). The

number of suggested comments is strikingly similar to the average number of

instructional comments used by *OWL* teachers (mean = 60.41, SD= 24.03). This

similarity may indicate that teachers in the *OWL* condition are referring to the guide,

and adjusting their practices accordingly.

The curriculum also provided guidance for the content of comments that

teachers might use in their extratextual comments. Teachers in the *OWL* curriculum

were more likely to use academic subject comments. The instructional units in *OWL*

frequently had science or social studies related themes, and the vocabulary

emphasized in the storybooks was related to these themes. For example, the unit

"Wind and Water" contained the story *Gilberto and the Wind* (Ets, 1978), where the

teacher is encouraged to expand on children's responses by using the following

suggested comment, "Yes, apples are falling off of the tree. It's fall. That's when

apples are ripe- ready to eat" (Schickedanz & Dickinson, 2005, Wind and Water, pp.

37). The teacher is encouraged to begin discussing a feature of the illustration,

apples falling off of a tree, and then to make a connection to science content by

explaining that this phenomenon happens seasonally. Comments such as this may

facilitate conceptual development, as the teacher connects the text to the world at large.

My findings are also consistent with previous studies showing that shared book reading interventions combined with professional development opportunities designed to enrich teachers' language use can be effective in producing richer conversations (Bierman et al., 2008; Hsieh, Hemmeter, McCollum, & Ostrosky, 2009; Justice et al., 2010; Wasik & Bond, 2001; Whitehurst et al., 1994). Previous studies have also demonstrated that providing coaching or professional development support has yielded measureable benefits for teacher language use (Bierman et al., 2008; Hsieh et al., 2009; Wasik & Bond, 2001). The professional development provided to the teachers assigned to the *OWL* curriculum may have impacted their commenting during shared book reading. Teachers assigned to the *OWL* curriculum received professional development targeted at developing shared book reading practices, with an emphasis on the inclusion of extratextual talk. Teachers also received coaching support that provided feedback, as well as modeled shared book reading practices.

Yet, in many of the studies showing the benefits of professional development and curriculum influence, increases in teacher performances were not sufficient to result in measureable language gains between children in different curricula, as was the case in the randomized control study (Kaiser et al., 2010). Teachers in the *OWL* condition did produce more of the types of comments that are associated with children's vocabulary growth, however, no significant differences between the curricula were found in terms of children's vocabulary growth (Kaiser et al., 2010).

For detectable vocabulary growth to occur in children, teachers may need to surpass the level of commenting done by teachers in the *OWL* condition. Changing practice during only one period of the day may not be sufficient to foster language growth among all children, either. Other studies that have produced measureable growth in children's language included instruction that occurred outside of the shared book reading experience (Bierman et al., 2008; Neuman, 2011; Wasik & Bond, 2001). Nonetheless, the shift in teachers' commenting practices indicates that this feature of teacher talk may be malleable.

Variability in Teacher Commenting Practices

There was considerable variability in the commenting practices of teachers. Some teachers commented as little as 8 times per book reading session, while others commented more than 125 times.   There also was considerable variability in the content of comments as indicated by ranges of 4-94 for text-driven meaning, 0-21 for academic subject, 0-19 for personal connection, and 0-55 for on-going activity comments. Similarly, there was diversity in the instructional strategy as low-level comments ranged from 0-31, medium from 5-112, and high from 0-22. The diversity is consistent with the results of previous research (Connor et al., 2006; Dickinson & McCabe, 2001; Wasik & Bond, 2001).

In spite of diversity among teachers, little within-teacher variability in the type of comments used by a given teacher was found as indicated by the fact that the majority of comments were medium-level. On average, teachers used 4.07 (*SD=*

1.58) of a possible nine strategies. None of the teachers used all nine strategies in a single book reading session.

Some strategy codes were almost never used, thus resulting in a restriction of range. A similar skewing towards zero was reported by Silverman and Crandell (2010). However, Silverman and Crandell (2010) also found that when teachers used one instructional strategy they were also likely to use others as well. While some significant correlations among strategies emerged in the present study, no pattern among the use of varied strategies emerged. Teachers used relatively few strategies per book reading session overall. The difference between my results and those of Silverman and Crandell's (2010) study could be because they investigated a 90-minute language arts block. The extended time and inclusion of other settings may have allowed teachers to utilize a wider variety of strategies than during a shared book reading session alone. The teachers in the present study were only observed for one book reading session averaging 12 minutes in length. This relatively short period of time may not have been sufficient for enough varied strategies to be used.

The variation in the instructional content of teachers' talk may play a more important role in children's language growth than the use of varied instructional strategies as evidenced by the fact that even the relatively low frequency of personal connection and academic subject comments were found to relate to vocabulary growth. Teachers used a wider variety of content, as more than 65% used at least four of the five different types of content per book reading session. In spite of a greater variety of content, the majority of comments were coded as text-driven

meaning. Indeed, some categories such as academic subject and personal connection comments only accounted for small percentages of overall content (7% each). Despite small amounts of these codes, a significant correlation emerged (r =.32, p < .05) between them. The correlation between academic subject and personal connection talk might indicate that teachers who used personal connection talk were also likely to use academic subject comments. Both of these content types were associated with vocabulary growth for either low or typical language children, indicating that some teachers might be providing differentiation of content that met the needs of a variety of students. This finding is similar to other studies that have also detected differences in language growth based on small differences in environmental factors (Connor et al., 2006; Dickinson & Porche, 2011; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Small amounts of language rich experiences may have the power to enhance children's language growth.

Facilitating Story Comprehension

Low language children appeared to have benefited from hearing medium-level text-driven comments as reflected by growth on the PPVT (b =0.12, p =0.031). Trends in the data indicate that this type of talk may also facilitate general language growth for this group of children as the relationship approaches significance (b=0.06, p=0.06). A trend for typical language children also emerged, as a relationship approaching significance was found for PPVT growth (b=0.09, p=0.078). Therefore, it appears that both low and typical language children may benefit from hearing medium-level text-driven meaning (Medium-TDM) comments.

These trends may indicate that teachers who defined vocabulary, explained concepts, or gave additional information that elaborated on the meaning of the story positively may have fostered vocabulary growth. However, this growth was relatively small as low language children gained 0.65 points for each occurrence of medium-level text-driven comments on their standardized scores on the PPVT.

Medium-level text-driven comments are similar to analytic talk described by Dickinson and colleagues (1994; 2011), as they involve the discussion of word meanings and the text, thus enhancing story comprehension. Both of the Dickinson studies (1994; 2011) found that analytic talk was a predictor of vocabulary growth for children from low-income homes. Similarly, Gerde and Powell (2009) found that teachers' book-focused utterances, which included both questions and comments, positively impacted the receptive vocabulary growth for children with low initial receptive vocabulary scores. The findings from the present study add to that body of research as they reveal positive effects for general language growth as measured by the PLS and receptive vocabulary as measured by the PPVT for children with low language.

Medium-level text-driven strategies may fall into low language children's zone of proximal development as they provide support through the immediacy of the text and the accompanying illustrations, while also supplementing children's understanding through adult's extratextual comments that define, explain, or give additional information. The medium level strategies may model skills that this group of children would be unable to accomplish without support. This modeling may serve to push students' thinking, which may in turn foster vocabulary growth.

The child is permitted to focus on the here and now of the book reading experience, but is not required to use higher-level thinking skills that may require larger funds of vocabulary knowledge.

While typical language children may not need the same degree of support as their low language peers, they still benefit from explicit connections that enhance their conceptual knowledge and understanding of the text. The teachers' comments may serve to clarify or extend their understanding of the story, which in turn may deepen their understanding of the vocabulary terms. Deeper understanding of the story may facilitate deeper understanding of vocabulary.

Many studies have demonstrated the benefits of explicit instruction of vocabulary terms (Beck & McKeown, 2002; Justice, Meier, & Walpole, 2005; Coyne et al., 2004), with children receiving the greatest benefit from talk that explicitly defined words as well as enhanced story comprehension. These studies show that children experience greater vocabulary growth when provided with direct, explicit instruction of vocabulary terms, however, different effects were experienced based on assessments of initial vocabulary ability. My study found that both groups benefitted from explicit definitions and elaborated explanations, but that the association was stronger for children with smaller funds of vocabulary as indicated by the significant relationship detected at the $p < .05$ level. This may indicate that the support provided in medium-level comments is appropriate for both groups of children, but falls more squarely into low language children's zones of proximal development.

Effects for Children with Typical Language

Children with typical language ability not only benefitted from explicit instruction, but also from high-level, high-quality talk. Content that helps children make connections with existing knowledge, and that expands conceptual knowledge was related to receptive vocabulary growth for this group of children.

Quality, not quantity. Children with typical language ability experienced significant receptive vocabulary growth when in classrooms where teachers used more instructional comments. Instructional comments pertain to the text, academic subjects, or personal connections. Significant relationships were not found for total comments at the $p < .05$ level, which is the summation of all comments made by the teacher. This indicates that the quality of the comment is of greater importance than the total amount of comments. Teachers who make more comments overall are not necessarily producing more vocabulary growth.

My results differ from the findings of parent-child studies, which showed that the total amount of commenting was related to children's language growth (Hockenberger, Goldstein, & Haas, 1999; Kertoy, 1994). These studies focused on interactions between parents and children where books were read in a one-on-one fashion. Increases in parents' use of commenting were positively related to children's language growth. These individualized shared book reading sessions may be quite different from whole class sessions conducted in preschool classrooms, particularly in regards to issues of comments pertaining to behavior management. It would be expected that preschool teachers would utilize comments to address children's behaviors or issues of classroom management, while parents may have

less need to do so. Behavior-related comments have not been related to children's

vocabulary growth (Dickinson & Smith, 1994), and some studies have found that

greater amounts of behavior management talk have a negative relationship with

children's language growth (Gianvecchio & French, 2002).

The finding from my study may indicate that it is not the overall quantity of

commenting that matters, but rather the content of the commenting that matters.

Similar findings have been unearthed through studies investigating the quantity and

quality of vocabulary used during shared book reading. An early study found that

the overall quantity of words spoken to children between the ages of 14 and 26

months were related to vocabulary growth (Huttenlocher et al., 1991) however,

later studies found that adults' use of sophisticated or academic vocabulary, which

are low-frequency words, are better predictors of preschool-aged children's

receptive vocabulary growth (Dickinson & Porche, 2011; Weizman & Snow, 2001).

While quantity may play an important role for initial vocabulary acquisition in

young children, quality may be of greater importance as children age. Young

children need to hear many, different words, while older children need to hear more

sophisticated vocabulary that conveys deeper breadth and depth of knowledge.

This may also be true for commenting, as older children may derive greater benefit

from comments that expand or develop conceptual knowledge, rather than being

presented with a large amount of comments.

Connecting to prior knowledge. Children with typical language ability in

classrooms where teachers used more medium-level personal connection comments

had higher end-of-the-year receptive vocabulary scores than their peers in

classrooms where fewer personal connection comments were made. Children

gained, on average, 1.55 points on their standardized scores on the PPVT for each

occurrence of personal connection talk. As teachers rarely made these types of

comments, growth on the PPVT was relatively limited. Personal connection

comments make direct associations to children's previous experiences, both inside

and outside of the classroom, and are similar to text-to-self connections used for

reading comprehension. The teacher explicitly connects the information from the

text to the child's life through giving, recalling, or explaining. The child is not

required to reflect upon the experience as would be required with high-level

strategies, therefore reducing the level of cognitive demand.   Personal connection

comments may strengthen children's neural networks, allowing them to recall new

vocabulary terms with greater ease as they are inserted into an existing framework

of knowledge. The child is required to access long-term memory, however, the

teacher is guiding and supporting her with this more challenging task.

My results are similar to those found by Hockenberger and colleagues (1999)

who taught seven mothers from low-SES homes to comment while reading narrative

storybooks to their at-risk or developmentally delayed preschool-aged children. All

mothers increased their use of commenting behaviors during the intervention, and

as mothers' comments increased, the number of children's verbalizations also

increased. More cognitively challenging comments that related the book's content

to the children's personal experiences evoked the most responses and produced

longer conversations than when mothers made general or literal comments.

General comments did not provide the same level of support as personal connection

comments, as they did not make connections to children's existing funds of knowledge. It may be that linking new vocabulary terms to children's personal experiences facilitates acquisition.

Cognitive stretching. Simple talk related to identifying or labeling pictures may not be sufficient for long-term vocabulary growth due to the highly contextualized nature of the activity. Indeed, children with typical language ability did not receive significant benefits from low-level strategies, but there are indications that increasing the use of high-level strategies did benefit typical language children's vocabulary growth in the present study as indicated by a relationship at the $p < .1$ level. Teachers used relatively small amounts of this type of comment, which may have limited my ability to detect effects of such talk on children's vocabulary growth. High-level strategies, which are related to decontextualized talk, encourage children to go beyond the pages of the book allowing them to draw connections to their lives, which may serve to facilitate long-term retention of vocabulary terms. The use of high-level strategies may place the novel terminology into multiple contexts that go beyond the realm of the storybook, and expand the child's frame of reference. Exposures in multiple contexts may assist children with developing deeper understanding of the term, thus promoting retention.

The use of high-level strategies may prime children for future word learning experiences, as it helps children to understand the relationships between words and concepts, thus building depth and breadth of vocabulary (Senechal et al., 1995). In addition, it serves to expose children to the sophisticated vocabulary needed to

express states of mind (ponder, meditate) or used in inference making (predict, infer). Helping children to tune into language may facilitate word learning, thus including high-level comments in shared book reading sessions with typical language children may produce vocabulary growth.

Children may need to have solid vocabulary skills before benefitting from the use of high-level strategies. Children with low language ability did not profit from these comments, perhaps due to insufficient vocabulary knowledge. Typical language children may be better prepared to access this type of instruction due to their more developed vocabularies. While typical language children did benefit from exposure to high-level strategies, the relationship was modest. Children may require more exposure to high-level strategies in order for robust growth to be detected, and the teachers in this study did not use high-level strategies frequently. A threshold for high-level strategies may exist, such that a certain number of exposures are required before children experience significant vocabulary growth. It is possible that the teachers in this study did not provide a sufficient number of high-level strategies during the 12 minute shared book reading sessions for strong relationships to emerge with typical language children's vocabulary growth.

Effects for Children with Low Language

Fewer relationships were found between book reading experiences and language growth for children with low levels of vocabulary knowledge. Results suggest that these children appear to profit from the building of conceptual knowledge through text-to-world connections found in academic subject comments.

Building conceptual knowledge. Trends in the data indicate that children with low language benefitted from teachers' medium-level comments pertaining to academic subjects, as demonstrated by growth on the PPVT. These findings only approached the p < .05 level of significance, possible because teachers did not employ these comments with great frequency. There are indications that teachers who gave, explained, or defined vocabulary about science, social studies, or math helped to build conceptual knowledge for children with low language, but only to a small degree ($b = 0.36$, $p = 0.09$). The amount of impact was small as indicated by the fact that a change in .5 points on the PPVT for each occurrence of academic subject comments. As these comments only comprised about 7% of all teacher comments, the amount of growth was small.

My findings are similar to those from previous studies examining shared book reading interventions that contain science-related instruction (Neuman, 2011; Pollard-Durodola et al., 2011). Low-language children in Head Start classrooms who experienced instruction in the *WOW* curriculum produced growth that exceeded that of their typical language peers (Neuman et al., 2011). This intervention taught vocabulary terms in taxonomical categories, which may have been related to low-language children's strong growth on a researcher-made measure of conceptual knowledge.

Word meanings exist within a framework, not in isolation, hence connecting definitions of vocabulary terms from the text to the world at large may facilitate deeper understanding (Anderson & Freebody, 1981; Nagy, 2005). Word knowledge may assist with reading comprehension, which is strongly related to vocabulary

knowledge. Children who are able to comprehend what is read to them, may be better able to learn new vocabulary as they understand the framework into which it should be inserted.

Vocabulary is frequently used as a proxy for conceptual knowledge; therefore children with smaller funds of vocabulary knowledge may also have smaller funds of conceptual knowledge. Teachers who use the explicit instruction found in medium-level strategies to help children learn new information may be assisting them with developing new frameworks of conceptual knowledge for vocabulary terms. The development of these frameworks may assist with future vocabulary learning as children will have existing structures into which novel vocabulary terms may be inserted.

Differential Effects Based on Vocabulary Ability

Results from the present study are consistent with findings that children with *different* levels of vocabulary ability profit *differently* from *different* types of instruction (Connor, Morrison, Slominski, 2006; Gerde & Powell, 2009). The present study found only one type of instructional strategy and content that was beneficial for both groups of children, however, the strength of the associations differed. This indicates that children in the same classrooms who are experiencing the same instruction are benefitting differently.

Similar results were documented by Connor and colleagues (2006) who found more significant relationships between teacher behaviors and typical language children's vocabulary growth than with low language children. Children

with typical language ability demonstrated vocabulary growth from experiencing teacher-child managed meaning and code focused instruction, while children with lower language ability profited only from meaning focused instruction. This finding indicates that children with larger funds of vocabulary knowledge may benefit differently from vocabulary enriching opportunities than children with smaller funds. A larger number of instructional strategies that are associated with better learning may provide typical language children with more opportunities for vocabulary acquisition.   Connor and colleagues' (2006) study demonstrated that while all children received the same instruction, the instruction was better targeted at producing vocabulary growth in typical language children than low language children.

The literature is converging towards consensus on the importance of taking into account prior vocabulary knowledge when considering the extent of vocabulary growth accounted for by shared book reading sessions. This study contributes to that body of literature. Other studies investigating teachers' book reading styles have also found that children with different funds of vocabulary knowledge profit differently from different reading styles (Ewers & Brownson, 1999; Penno et al., 2002), however, these studies have used broad measures that classify an entire book reading session. Utterance level measures, such as those used in the present study, have the potential to pinpoint the type of instruction that is most valuable to each child, and may allow teachers to vary the level of support during a single book reading session. These findings indicate that one commenting style during book reading may not be of similar benefit to all children.

Instructional differences may become particularly important when considering the instructional strategies and content used by teachers, as certain strategies appear to be beneficial for one group of children while having no effects on others, as was the case in the present study. The use of varied instruction can provide multiple levels of support that may allow all children to profit from the same shared book reading experience. Teachers who only use a limited number of strategies may provide rich instruction for children with typical language but not for children with low language.

Implications

Implications for Practice

Given that preschool classrooms contain a variety of children with unique instructional needs, a teacher's ability to differentiate instruction is of great importance. The results of this study indicate that children with varying levels of vocabulary ability profit differently from instructional strategies and content, hence necessitating the need for differentiation. Providing a range of strategies and content during large group settings such as book reading may increase the chance that a child will be provided with a strategy or content that is within her zone of proximal development.

Differentiation should include a variety of instructional strategies and content, so that the needs of all children are met (Tomlinson et al., 2003). Scaffolding children's learning may require diversity of strategies and content so

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that all children may benefit from the provided instruction. Indeed, the Emergentist Coaltion Model posits that children draw on different cuing systems based on their present level of vocabulary knowledge, hence children with smaller funds may require multiple layers of support in order for acquisition to occur.

My study adds to the growing body of research indicating that differentiation should include the use of multiple strategies and a variety of content so that all children may benefit during a large group book reading session. A more nuanced view of book reading may be necessary in order to accommodate the needs of all children within a classroom. Teachers must consider both the instructional strategy and the content of the comment in order to differentiate instruction. Matching the strategy level to a child's background knowledge of the content may be of great importance, particularly when instruction is targeted at children with smaller funds of vocabulary knowledge. Higher-level strategies may be more appropriate for content that is familiar to a child, while low or medium-level strategies may be more appropriate for new or novel content. Having a teacher label an illustration (low-level), give additional information about the term (medium-level), and then classify the word (high-level) would draw on each instructional strategy level, thus addressing the needs of all children within the classroom. Teachers who use small amounts of low or high level strategies may not be providing instruction in the zone of proximal development for children with large or small funds of vocabulary knowledge.

Implications for Research

Prior studies have found greater effects for expressive rather than receptive vocabulary from shared book reading experiences, but this study found more significant and larger effects on receptive than expressive vocabulary. Teachers' comments exposed children to new vocabulary, which was related to receptive vocabulary growth in this study, with only modest and minimal effects on general language and expressive vocabulary. In contrast, interactive book reading sessions that emphasize questioning may focus on eliciting vocabulary from children, which may be related to expressive vocabulary growth. Receptive tends to be a precursor to expressive vocabulary, hence the use of comments may set children on the path towards vocabulary learning. A recent meta-analysis indicates that interactive SBR typically has larger effects on expressive ($d = 0.59$) than receptive ($d = 0.42$) vocabulary (Mol, Bus, & de Jong, 2009). Similarly, analyses of dialogic reading, an intervention characterized by the interactive conversations between an adult and child, also reports larger effects on expressive rather than receptive vocabulary (Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1994). These shared book reading interventions emphasize interaction, and encourage adults to question children so as to promote conversation. In contrast, this study has evaluated teachers' comments, which do not necessitate a response from the child, but rather provide supplemental information that teaches content. Different types of teacher utterances may facilitate different types of vocabulary growth in preschool-aged children.

This study added a new level of strategy to the existing research base, using three levels whereas earlier studies used a dichotomized system of low and high level strategies. High-level strategies were broadly defined in previous studies, containing instructional strategies such as predicting, giving new information, discussing the text, or analyzing the story. Some strategies, such as defining, were categorized as both low or high in different studies. Given this overlap, the third level, medium, was developed. Strategies considered to be high-level in previous work, such as giving new information or discussing the text, were considered to be medium-level strategies. The introduction of this third level may account for the divergence between my findings and those from previous studies that found high-level, decontextualized instructional strategies were strongly related to vocabulary growth for children with typical language ability (Ewers & Brownson, 1999; Smith & Dickinson, 1994). The reduced effects of high-level strategies, and stronger effects of medium-level strategies may indicate that the results found in previous research were driven by large amounts of medium-level strategies that were folded into the high-level category. The creation of a medium level demonstrated the importance of expanded explanations and explicit definitions, and their benefits for both low and typical language children.

Limitations and Future Directions

While this study adds to the body of literature by identifying a feature of teachers' talk that positively influence children's vocabulary growth, some limitations exist. Additional studies that replicate the coding scheme and extend on

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these results are warranted. Two limitations relate to methodological issues, while the third addresses potential factors that may mediate the effectiveness of teachers' commenting practices.

First, no strong causal inferences may be made from the data. While the study was a randomized control study, naturally occurring variation in teacher practice was used for predictive purposes, hence other unmeasured variables may be responsible for the detected effects. Only naturally occurring teacher talk was analyzed, hence the variation may not have been sufficient for relationships to have been detected. Indeed, several relationships approached significance for types of comments that were used less frequently by teachers. Had greater amounts of these comments appeared, significant relationships may have resulted. Similarly, while the relative homogeneity of the sample in terms of race and SES allowed for a reduction in potential mediators, it also may have limited the study's ability to detect interactions due to a restriction in range. These limitations could be addressed in future studies of teacher's commenting practices.

Second, the single observation sessions averaging 12 minutes used in my study may not have accurately portrayed teachers' typical shared book reading sessions. It is possible that teachers vary their styles of reading over the course of the school year, in accordance with the book that they are reading, or the climate of the classroom on a particular day. A recent study from Gerde and Powell (2013) indicates that teachers do indeed shift their practices at the utterance level across the year, and that these shifts are related to children's vocabulary growth. While fidelity measures aligned with the current study did not indicate significant change

in teachers' book reading practices between fall and spring, it is possible that teachers did make small adjustments to their comments that may have impacted children's vocabulary growth.

Finally, additional, unmeasured variables may play key roles in children's vocabulary acquisition as the words taught during shared book reading may moderate the effectiveness of the instruction. The amount of vocabulary instructed during shared book reading may be related to the amount of growth that children experience. Biemiller and Boote (2006) estimate that children may learn 41% of the words taught, and that children learn more words when more words are taught. However, the optimal amount of instructed vocabulary may vary based on children's initial vocabulary knowledge. In addition, the amount of exposure to targeted vocabulary terms may also account for differences in children's learning. It is unknown how many times a child must encounter a word before it is learned. While children are able to learn some words quickly through a process called fast mapping (Carey, 1978), it is not known if this learning will be reflected adequately in standardized outcome measures. The number of exposures to a word may be related to the child's developmental level, present vocabulary ability, or prior knowledge. Most likely, the amount of exposure required to learn a new vocabulary term will vary from child to child. Similarly, the degree of difficulty of the vocabulary terms may factor into children's acquisition. Some studies have found relationships between adults' use of sophisticated vocabulary and children's growth (Dickinson & Porche, 2011; Weizman & Snow, 2001), such that increased uses of more sophisticated vocabulary were related to increases in children's vocabulary

growth. Other studies have found that more basic lists of words are of greater utility for children with limited funds of vocabulary knowledge (Kaiser, 1993; Roskos et al., 2008). A degree of match between the child's present level of vocabulary ability and the instructed vocabulary must occur so that "just-right" words are instructed. These are words within a child's instructional level that are neither too hard nor too easy.

Future studies may wish to include these variables to determine how they affect teachers' strategy and content instruction and children's vocabulary learning. For example, the type of strategy used to define sophisticated vocabulary may differ from those used to teach more common terms. Low-level strategies, such as labeling or describing an illustration, may not be sufficient to convey the more complex meaning of a sophisticated vocabulary term. Similarly, the amount of exposure to a vocabulary term needed for acquisition may vary based on the strategy used for instruction. Vocabulary terms that are illustrated and labeled may be acquired more rapidly due to the contextualized presentation, hence less repetition may be required. Considering strategy instruction by vocabulary term interactions may provide further insight into the mechanisms that drive learning during shared book reading.

Conclusion

Shared book reading between teachers and children in preschool classrooms can be a language-promoting interaction. While many studies have shown the relative benefits of shared book reading, less is known about how children profit

from the experience. Examining the comments made by teachers during SBR may provide insight into the mechanisms that drive language growth, particularly for children with varying funds of vocabulary knowledge.

Important issues about instructional strategies and the content of comments were raised by this study. A detailed portrait of how teachers comment during SBR was painted, revealing the variety of implemented instructional strategies and content. Despite great variability among teachers, little variety of strategy and content use was found within a given teacher, indicating that limited amounts of differentiated instruction were occurring. This lack of differentiation may leave some children lacking in the type of instruction that will benefit them the most. Fortunately, results demonstrated that teachers' commenting practices are malleable. Teachers in the semi-scripted, language-focused intervention showed the most variety in strategy and content use, indicating that curriculum may be shaping some features of teacher's commenting practices.

Many aspects of teachers' commenting practices were positively related to children's vocabulary gains, however, many differences were found based on children's initial vocabulary ability. A larger number of positive relationships were found for children with typical language ability, indicating that these children had a greater number of word learning opportunities during SBR. Fewer significant relationships were found for children with low language. These findings support the literature base and theoretical stance that prior vocabulary knowledge plays an important role in children's vocabulary growth, and that different forms of input may affect children differentially based on their present ability.

This study added to the literature base by examining an under-appreciated feature of teacher language, comments, and strengthening the argument that teacher's extratextual talk during shared book reading may positively impact children's vocabulary growth. This study highlighted the importance of matching the level of instructional strategy and content to children's present levels of vocabulary ability, and re-enforced the importance of differentiated instruction. Children experiencing the same shared book reading sessions may not all be profiting equally, however, with further research, the types of instruction that are most effective for a variety of learners may be unearthed and implemented.

Appendix A

Books Read Aloud

Title	Author
Dandelion	Don Freeman
Rabbits and Raindrops	Jim Arnosky
Hooray a Pinata	Elisa Kleven
The Doorbell Rang	Pat Hutchins
The Lion and the Little Red Bird	Elisa Kleven
A Hat for Minerva Louise	Janet Morgan Stoeke
Max's Dragon Shirt	Rosemary Wells
Dog's Colorful Day	Emma Dodd
One Dark Night	Hazel Hutchins
Gilberto and the Wind	Marie Hall Ets
The Carrot Seed	Ruth Krauss
The Farm Concert	Joy Cowley
Goodnight Moon	Margaret Wise Brown
Mike Mulligan and his Steam Shovel	Virginia Lee Burton
New Puppy	Mary Rogers
The Very Hungry Caterpillar	Eric Carle
Zoo Looking	Mem Fox
Matthew and Tilly	Rebecca C. Jones

The Snowy Day	Ezra Jack Keats
Brown Bear, Brown Bear, What do you See?	Eric Carle
The Long, Long Tail	Joy Cowley
Meanies	Joy Cowley
The Terrible Tiger	Joy Cowley

Appendix B

TELL Coding Manual

ASKA	***Ask for an action***: Question or command which requests that child or children do or say something, gives instructions or directions. Includes asking children to look at or listen to a specific referent, such as "look at this picture" or "listen to Ms. Smith." Also a general group request, such as "let's find out…" Includes classroom procedural actions to prepare for an activity ("everyone sit criss-cross applesauce" or "put your hands in your lap" before starting a new activity).
ATTN	***Attention-getting***: Question or statement which calls/directs attention to the speaker, *or* gives/acknowledge attention to another speaker. Includes names, teacher calling on children, asking to look at or listen. Includes manners routines, such as please, thank you, you're welcome; fillers that serve to continue the activity such as "ok" or "let's see"
CHOR	***Choral response***: group (2+ children) response in unison, recitation of known text, poem, song, or saying. Must be clear that it is known text, etc., such as fill in the blank on a second reading or predictable/rhyming text; not just that several kids give the same answer at the same time.
CLAR	***Clarification request***: Comment or question that reveals a failure to understand or hear, and a request for the speaker to repeat or rephrase what was just said. May be close to a repeat with questioning intonation. If word-for-word repeat, should be REPT.
CONT	***Controlling***: Question, statement or response, which seeks to control contingent actions, behaviors, or responses. Focus is on controlling or correcting behavior, not giving activity-related directions or instructions. All behavior-related commands. Includes reminders of classroom procedural actions during an activity ("everyone sit criss-cross applesauce" or "put your hands in your lap" after starting the activity). Always followed by an "RR" content code.
CORR	***Correcting***: Question, statement, or response contingent on previous utterance, which corrects it in terms of factual information (not grammar/syntax—that would be EXPD). Must provide correcting information, not just evaluate right or wrong. May include a self-correction.
EVAL	***Evaluating***: Question, statement, or response, which encourages or provides evaluation. "Good job", "yes," "no," and "right" are typical examples. Content code for these evaluations focuses on whatever type of response is being evaluated. Evaluation can consist of negative as well as positive feedback.
EXPD	***Expanding***: Rephrase with slight correction or expansion. Child's meaning retained but cast into more comprehensible, conventional, or precise format. Correction of form, not content. Cannot be a follow-up question asking for more information, only a teacher utterance that expands a child's utterance. Takes precedence over EVAL if it serves as an evaluation but also expands (such as CHI: rectangle; TCH: this IS a rectangle.)
EXPL	***Explaining***: Questions, statement, or response, which solicits, elicits, or provides an explanation— such as a motivation, cause, or process. Must have cause & effect in same utterances or 2 adjacent utterances by the same speaker. Typically includes a linking word, such as 'because,' 'so,' or 'if…then.' If separated into 2 utterances, the second utterance will be EXPL, the first will typically be GIVE or RESP.

GIVE	**Give information**: Statement that describes a situation, communicates an idea, experience, or opinion. Voluntary information, without being asked.
INAU	**Inaudible**: Either entire utterance is unintelligible, or part is unintelligible and therefore function is unclear. Includes laughs, coughs, cries, etc.
QUKN	**Known-answer question:** Question or request for information where the speaker knows the answer, is looking for a specific response. May include fill in the blank. May also include questions posed like a true question but where the speaker clearly has an expected answer (such as "Do you know what color this is?").
QURH	**Rhetorical question:** Question used with the intent of making a point indirectly. No response encouraged, expected.
QUTR	**True question:** Question or request for information where the speaker does not know the answer, no one 'correct' answer. May be completely open-ended, or several appropriate answers may be possible (such as "How would you solve this problem?" "What is an animal you would see on a farm?"—i.e. there might be "right" and "wrong" answers, but not a specific, known answer to the question). May include a fill in the blank.
REPT	**Repeating**: Direct echo or repetition of part or all of previous utterance without adding new information. Prioritize repeat over other possible functions. Can include repeating part of a text. If speech overlaps, it cannot be repeat. May be a self-repeat, or repeating another speaker.
RESP	**Responding:** Statement that responds to a question, inquiry, or fill-in-the-blank. Gives information as a direct response. Speakers can respond to a text if the text presents a question or fill-in-the-blank. Speaker can also answer/respond to their own question. Only the statement immediately following the question may be considered responding (or overlapping immediate responses); following statements should be considered GIVE, REPT, etc.

Appendix C

Samples of Coded Transcripts

Coding Key

Abbreviation	Code
TDM	Text-driven meaning
TDP	Text-driven print
ASC	Academic subject
PEC	Personal connection
OAC	On-going activity
DL	Describe/label
DE	Demonstrate
SE	Sequence
EN	Enumerate
RC	Recall
GE	Give/Explain/Define
IP	Infer/Predict
RF	Reflect
CC	Categorize/Classify/Generalize
STR	Strategy
CON	Content

Transcript 1

@Begin

@Languages: en

@Participants: CHI Child, TCH Teacher, TXT Text

@ID: en|change_me_later|CHI|||||Child||

@ID: en|change_me_later|TCH|||||Teacher||

@ID: en|change_me_later|TXT|||||Text||

@Date: 03-DEC-2007

@Time Duration: 00:00-13:39

@Activities: reading Gilberto_and_the_Wind

@Time Start: 00:00

*TCH: %spa: $STR:GE $CON:TDM Gilberto_and_the_Wind.

*TCH: %spa: $NON:QU Gilberto_and_the +...

*CHI: wind.

*TCH: %spa: $NON:OT mhm.

*TCH: %spa: $STR:DL $CON:TDM it look like he holdin(g) on to somethin(g) right here.

*TXT: +" i am gilberto, and this is the story of me and the wind.

*TCH: %spa: $STR:GE $CON:TDM of me and the wind.

*TXT: +" i hear wind whispering at the door.

*TXT: +" yooouu he whispers.

*TXT: +" yooouuu.

*TXT: +" so i get my ballon Atamarius, and i run out to play.

*TXT:	+" at first, wind is gentle.

*TCH:	%spa: $STR:GE $CON:TDM that mean it's blowin(g) softly.

*TXT:	+" and just floats my balloon around in the air.

%tim:	1:02

*TCH:	%spa: $STR:GE $CON:TDM just floats.

*TXT:	+" and then, with a jerk, he grabs it away and carry it up to the top.

*TCH:	%spa: $STR:GE $CON:TDM that mean the wind got strong, and when the

wind got strong it &=howls moves his balloon fast.

*TCH:	%spa: $STR:DL $CON:TDM moved it up to the top of the tree.

*TXT:	+" wind, oh wind!

*TXT:	i say +".

*TXT:	+" blow it back to me.

*TXT:	+" please!

*TXT:	+" but he won't.

*TCH:	%spa: $NON:OT Duane.

*TXT:	he just laugh and whispers +".

*TXT:	+" yooouu.

*TCH:	%spa: $STR:GE $CON:TDM you make a sound.

*TCH:	%spa: $STR:DE $CON:TDM yoooouuu &=laughs huh.

*TXT:	+" wind loves to play with the wash on the line.

*TCH:	%spa: $NON:OT oh.

*CHI:	+< he just got the top of our xx +/.

*TXT: +" he blows the pillow slips into the balloons, and shake the sheets and twist the apron strings.

%tim: 2:05

*TXT: +" and he pulls out all the clothespins.

*TCH: %spa: $NON:QU <and when he pulled out> [//] when the wind pulled out all the clothespins that he could then he tries &t &u and then what happened?

*TCH: %spa: $NON:QU to the clothes?

*TCH: %spa: $NON:OT i mean, he's +/.

*CHI: they blew.

*CHI: +< they blow away.

*TCH: %spa: $STR:GE $CON:TDM they had to come off the line, i guess, if he blew (th)em out.

*TXT: +" then he tries the clothes <and throw> [//] though he knows they're too small.

*TCH: %spa: $STR:GE $CON:TDM the wind tried on the clothes.

*TCH: %spa: $NON:QU can you believe that?

*TCH: %spa: $STR:GE $CON:TDM he tried on the clothes.

*TCH: %spa: $STR:IP $CON:TDM i wonder how he did that.

*CHI: they was too little.

*TCH: %spa: $NON:QU they were too small, wasn't they?

*CHI: yeah.

*TXT: +" and the wind love umbrellas.

*TXT: +" once when i took one out in the rain, my umbrella, he tried to take it away

from me.

%tim: 3:02

*TCH: %spa: $STR:DL $CON:TDM the wind started blowin(g) and it was rainin(g).

*TCH: %spa: $STR:DE $CON:TDM and the wind tried to take my umbrella and it

&=gestures flipped it and [/] and made it just turn the other way.

*TCH: %spa: $STR:DE $CON:TDM and when he couldn't take it, he broke it.

*TCH: %spa: $STR:GE $CON:TDM (be)cause i wasn't lettin(g) go and he was

tryin(g).

*TCH: %spa: $STR:GE $CON:TDM and both of us were tuggin(g) at it, and when we

pull at things like that it break.

*TXT: +" if the gate in the pasture is latched or left unlatched, wind plays with that

too.

*TXT: +" he opens it and bangs it shut, &=gestures and makin(g) it squeak and it

&=squeaks &=bangs &=squeaks &=bangs &=squeaks squeak and cry some.

*TXT: +" wind, oh wind!

*TXT: i say +".

*TXT: +" <and i go on climb> [//] and i go and climb on.

%tim: 4:00

*TXT: +" give me a ride!

*TXT: +" but, with me on its gate it's too heavy.

*TXT: +" (be)cause when i sit on the gate, the wind will not move that gate.

*CHI: (be)cause it's too strong.

*TCH: %spa: $STR:GE $CON:TDM (be)cause i must be too heavy.

*TCH: %spa: $STR:GE $CON:TDM <but when the &w> [//] when it just movin(g) it's &=blows no one's sittin(g) on that it can move back and forth, back and forth.

*TCH: %spa: $STR:GE $CON:TDM but if i go and sit on top of it, xx it won't move.

*TXT: +" wind can't move it at all.

*TXT: +" when the grass is tall in the meadow, wind and i we like to race.

*TXT: +" wind runs ahead, then comes back and start all over.

*TCH: %spa: $STR:DE $CON:TDM &=blows .

*TXT: +" but he always win, because he just runs over the top of the grass and i have to run through it and touch the ground with my feet.

%tim: 5:00

*TCH: %spa: $STR:DE $CON:TDM but wind just go &=blows straight across.

*TCH: %spa: $STR:DE $CON:TDM but i hafta [: have to] go &=stomps runnin(g) through there pullin(g) my legs through that hard grass.

*CHI: mhm.

*TXT: +" and when the big boys on the hill have kites to fly in the wind, <that> [//] the wind'll help (th)em out.

*TCH: %spa: $NON:QU i wonder can we go outside today and fly a kite?

*CHI: xx.

*TCH: %spa: $STR:GE $CON:TDM the wind kinda [: kind of] have to be heavy.

*TXT: +" wind carries their kites up to the sky and all around.

*TXT: +" but when i have a kite, that wind won't blow for nothin(g).

*TXT: +" wind won't fly, it won't fly at all.

*TXT: +" i try to get my kite up and it just drop down to the ground.

*TXT: +" wind, oh wind.

*TXT: i say +".

*TXT: +" i don't like you today.

%tim: 6:01

*TCH: %spa: $STR:GE $CON:TDM he don't like him (be)cause his kite won't stay up in the air.

*TXT: +" when the apples are ripe in the fall, i run with the wind to the pasture and wait under the tree.

*TXT: +" and wind always blows an apple down for me.

*TCH: %spa: $STR:GE $CON:TDM always blow one down.

*TCH: %spa: $STR:GE $CON:TDM now, wind good, blow that apple down so i have me somethin(g) to eat.

*TXT: +" and when i have a boat with my paper sail on it, wind comes and sails it for me.

*TCH: %spa: $STR:RF $CON:PEC we ain't [: are not] have no wind to blow our boats, we use somethin(g) else.

*CHI: straws.

*CHI: +< water.

*CHI: +< we use water.

*TCH: %spa: $STR:RF $CON:PEC +< we use a straw.

*TCH: %spa: $STR:RF $CON:PEC we did, we used a straw.

*TCH: %spa: $NON:QU and we made our own wind, didn't we?

*CHI:	yeah.

*TXT:	+" just as he sails big sailboats <for> [/] for the sailors on the sea.

*TCH:	%spa: $STR:RF $CON:PEC <we> [/] we didn't have these kinda [: kind of]

boats, though, we just had regular boats.

%tim:	7:01

*TCH:	%spa: $STR:DL $CON:TDM they had this &s sailboat.

*TCH:	%spa: $STR:DL $CON:TDM and the sail is that tall part on there.

*TCH:	%spa: $STR:GE $CON:ASC and it's made outta [: out of] cloth, like cloth, and

<it's> [//] <it'll> [//] the wind'll &=blows blow it in and the wind makes the sail

move.

*TCH:	%spa: $NON:QU so the wind makes the boat sails, okay?

*CHI:	okay.

*TXT:	+" and when i have a pinwheel.

*TCH:	%spa: $STR:RF $CON:PEC and we saw what that pinwheel did for that wind.

*TCH:	%spa: $NON:QU <did the pinwheel make the> [//] do the wind make the

pinwheel go around?

*CHI:	yes.

*CHI:	+< no.

*TCH:	%spa: $NON:QU did it?

*CHI:	yeah.

*TCH:	%spa: $STR:RF $CON:PEC it did!

*TCH:	%spa: $NON:QU <that's when we put the fan> [/] when we put the fan in

front of the pinwheel did it move?

*CHI: no.

*CHI: yes ma'm.

*TCH: %spa: $STR:RF $CON:PEC some of us was really watchin(g) and we saw it move, we did.

*CHI: it was in a xx.

*TCH: %spa: $STR:GE $CON:OAC but did &d with the &e okay then.

*TCH: %spa: $STR:GE $CON:TDM he calls it air.

%tim: 8:02

*TCH: %spa: $NON:QU can we call air and wind the same thing?

*CHI: yeah.

*TCH: %spa: $NON:OT <let> [/] let's just +/.

*CHI: xx and the fan.

*TCH: %spa: $NON:QU and the fan was makin(g) wind, okay?

*TCH: %spa: $NON:OT let's see if you can get some.

@Comment: teacher fans herself to create wind

*TCH: %spa: $NON:QU do you feel anything?

*CHI: i do.

*TCH: %spa: $NON:QU what you feel?

*CHI: wind.

*CHI: +< air.

*TCH: %spa: $NON:QU do you feel air, or do you feel wind?

*CHI: wind.

*CHI: +< i can't feel xx.

*TCH: %spa: $NON:QU i think we kinda [: kind of] breathe air, don't you think?

*CHI: yeah.

*CHI: yeah.

*CHI: i feel air.

*TCH: %spa: $NON:QU don't you think we +//.

*TCH: %spa: $STR:GE $CON:ASC i think we breathe air.

*TCH: %spa: $STR:GE $CON:OAC i might be wrong, we gonna [: going to] have to find that one out.

*TCH: %spa: $STR:GE $CON:ASC but i think we can feel +...

*TCH: %spa: $NON:QU can't you feel this wind?

*TCH: %spa: $NON:QU you feel that wind?

*TCH: %spa: $NON:OT &=laughs .

*TCH: %spa: $STR:GE $CON:OAC he said uh+uh.

*TCH: %spa: $NON:QU do you feel that wind?

*TCH: %spa: $NON:QU you feel somethin(g)?

*CHI: i do.

*CHI: i don't.

*TCH: %spa: $NON:OT okay, well.

*TXT: +" <when i have> [/] when i +//.

*TCH: %spa: $NON:OT Duane.

%tim: 9:00

*TXT: +" when i have my pinwheel out, wind comes and play too.

*TXT: +" first i blow it myself to show <how it> [/] <how it> [//] how i want it to go.

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*TXT: +" then, i hold it out.

*TXT: +" and when i hold it up and the wind blows it just right for me.

*TCH: %spa: $STR:GE $CON:TDM and makes my pinwheel goes around and around.

*TCH: %spa: $NON:QU do pinwheels go straight?

*CHI: no.

*TCH: %spa: $NON:QU they go what?

*CHI: (a)round.

*TCH: %spa: $NON:OT (a)round.

*TXT: +" and when he blows it, he turns it so fast that <it whistle> [//] oh it

whistles and sings, and all i can see is a blur.

*TCH: %spa: $STR:DL $CON:TDM (be)cause see it be goin(g) so fast and it can't see

&n +//.

*TCH: %spa: $STR:GE $CON:ASC when things go really really really fast, you can't

see nothin(g) but a blur, (be)cause it be kinda [: kind of] blurry.

*TCH: %spa: $NON:QU do you ever seen somethin(g) blurry?

*CHI: no.

*TCH: %spa: $STR:GE $CON:TDM i don't know how to tell you blurry is.

*CHI: xx.

*TCH: %spa: $NON:OT lemme [: let me] see, do you eyes like this.

@Comment: teacher squints eyes

*TCH: %spa: $NON:OT kinda [: kind of] squinch (th)em together.

%tim: 10:01

*TCH: %spa: $NON:QU do things look a little blurry?

*TCH: %spa: $STR:GE $CON:TDM that might be a little +//.

*TCH: %spa: $STR:GE $CON:TDM i don't know how to tell you what blurry looks.

*TCH: %spa: $STR:GE $CON:PEC sometime(s) your t_v might mess up and it might look funny.

*TCH: %spa: $STR:GE $CON:PEC and you can't hardly see the pictures on it.

*TCH: %spa: $STR:GE $CON:TDM that's kinda [: kind of] blurry.

*TCH: %spa: $STR:GE $CON:TDM somethin(g) you just can't see it clear enough.

*TCH: %spa: $STR:GE $CON:TDM it's not clear, well.

*TXT: +" wind likes my soap bubbles best of all.

*TXT: +" he can't make the bubbles, i have to do that all by myself.

*TXT: +" but he'll carry them away.

*TCH: %spa: $STR:GE $CON:TDM so when i'm outside.

*TCH: %spa: $NON:OT Khalil.

*TCH: %spa: $STR:GE $CON:TDM and i'm outside blowin(g) bubbles, the wind will take my bubbles and blow (th)em everywhere.

*TCH: %spa: $STR:DE $CON:TDM they'll just blow, blow, blow, blow, blow.

*CHI: away.

*TCH: %spa: $NON:OT yeah.

*TXT: +" and then he blows some back and makes me laugh (be)cause when they burst in my eye or they burst on the back of my head, i have to laugh.

%tim: 11:03

*TXT: +" when the leaves have fallen off the trees, i like to sweep them into a pile.

*TCH: %spa: $NON:QU Duane, how you make a pile?

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*CHI: uh scrape it.

*CHI: +< i don't know how to make a pile.

*TCH: %spa: $STR:DE $CON:TDM you put it all in one big +//.

@Comment: teacher demonstrates with her hands

*TCH: %spa: $NON:QU this is a pile, when you put it all in one what?

*CHI: place.

*TCH: %spa: $STR:DE $CON:TDM <one in> [//] all in one place.

*TCH: %spa: $NON:OT and +...

*TXT: +" but when the wind comes along and i put all my leaves in one place.

*TCH: %spa: $NON:QU guess what the wind'll do?

*CHI: blow (th)em away!

*TXT: +" and they'll just show and they'll sweep without a broom and here the wind'll scatter them.

*TXT: +" and the wind scatters all over and the leaves go everywhere.

*TXT: +" and he blows the dirt in my eyes.

*TXT: +" sometime when wind is strong he start breakin(g) the trees.

*TXT: +" and knockin(g) down fences.

*TXT: +" then i get afraid.

%tim: 12:01

*TXT: +" i run in the house and i lock the door.

*TXT: +" and when wind comes howlin(g) at me and tries to squeeze in through the keyhole.

*TXT: i tell him +"/.

*TXT: +" no.

*TXT: +" <but then he comes one day when wind is all one> [//] then when it comes one day when wind is all tired out.

*TXT: +" wind!

*TXT: i whisper +".

*TXT: +" oh wind, where are you?

*TXT: +" &sh .

*TXT: +" &sh .

*TXT: answers wind +".

*TXT: +" and he stirs one dry leaf to show me where he is.

*TXT: +" so i lie down beside him and we both go to sleep under the willow tree.

@Comment: teacher finishes reading book 12:46

*TCH: %spa: $STR:GE $CON:OAC the end.

*CHI: +< end.

*CHI: yay!

@Comment: children applaud

*TCH: <that hat> [/] that hat right there, <what> [//] uh Duane they call that a uh &s what you call it soberto.

%tim: 13:03

*CHI: xx.

*CHI: hood.

*CHI: +< hat.

*TCH: %spa: $NON:OT hm?

*CHI: hood.

*CHI: +< a hat.

*TCH: %spa: $STR:GE $CON:TDM uhuh it's a hat.

*TCH: %spa: $STR:GE $CON:TDM it's not on his shirt.

*TCH: %spa: $STR:GE $CON:TDM it's not a hood.

*CHI: it's a hat.

*TCH: %spa: $STR:GE $CON:TDM it's a somberto.

*TCH: %spa: $STR:GE $CON:TDM it's mean it's got a big [/] big brim on it.

*TCH: %spa: $STR:GE $CON:TDM they wear those kinds in Mexico.

*TCH: %spa: $STR:GE $CON:TDM Mexicans like to wear those.

*CHI: who that?

*TCH: %spa: $STR:GE $CON:TDM sombertos.

*TCH: %spa: $STR:GE $CON:TDM no we're talkin(g) about his nice big hat.

*TCH: %spa: $STR:GE $CON:OAC now it's time for us to get ready to go outside.

*CHI: yay!

@End

Transcript 2

@Begin

@Languages: en

@Participants: CHI Child, TCH Teacher, TXT Text

@ID: en|change_me_later|CHI|||||Child||

@ID: en|change_me_later|TCH|||||Teacher||

@ID: en|change_me_later|TXT|||||Text||

@Date: 16-NOV-2007

@Time Duration: 00:00-15:30

@Activities: looking at black bear informational poster, reading

Brown_Bear_Brown_Bear_What_Do_You_See?

@Time Start: 00:00

*TCH: %spa: $STR:GE $CON:OAC sitting down.

*TCH: %spa: $NON:OT i like the way that Raven's sitting down [=! singing].

*TCH: %spa: $NON:OT right now we're getting ready to have our shared reading [=!
singing].

*TCH: %spa: $NON:OT we're still talkin(g) about bears [=! singing].

*TCH: %spa: $NON:OT Teachername have a bear game she's gonna [: going to] play
today [=! singing].

*TCH: %spa: $STR:GE $CON:OAC i know you're gonna [: going to] have a lotta [: lot
of] fun anyway.

*TCH: %spa: $NON:OT so put on your listening ears [=! singing].

@Comment: teacher and students do accompanying gestures

*TCH: %spa: $NON:OT and put on your glasses [=! singing].

*TCH: %spa: $NON:OT and put your hands in your lap [=! singing].

*TCH: %spa: $NON:OT so we can learn like that [=! singing].

*TCH: %spa: $STR:GE $CON:BVM bear facts.

*TCH: %spa: $NON:OT bear facts.

*TCH: %spa: $STR:GE $CON:BVM our shared reading book is Bear_Facts.

*TCH: %spa: $STR:GE $CON:BVM and i found some more facts about bears.

%tim: 1:00

*TCH: %spa: $NON:OT and if +...

*TCH: %spa: $NON:OT whoa!

@Comment: teacher unfolds black bear fact poster

*TCH: %spa: $STR:GE $CON:BVM i found some more facts about bears.

*CHI: +< bears.

*TCH: %spa: $NON:QU and you know what this says?

*TCH: %spa: $STR:GE $CON:BVP it says +"/.

*TCH: %spa: $STR:GE $CON:BVP +" black bear.

*TCH: %spa: $NON:QU Jamequa do you mind holdin(g) this up for Teachername?

*TCH: %spa: $STR:GE $CON:BVP this says +"/.

*TCH: %spa: $STR:GE $CON:BVP +" black bear.

*TXT: +" black bear.

*TCH: %spa: $STR:GE $CON:OAC <let's> [//] lemme [: let me] read to you what it

says.

*TXT: +" hungry hungry black bear climbin(g) in the trees.

*TXT: +" eatin(g) nuts and berries, all that she sees.

*TXT: +" hibernating black bear sleeping in the lair.

*TXT: +" keepin(g) warm and cozy from the cold winter air.

*TXT: +" wake up little black bear!

*TXT: +" sleeping time is done.

*TXT: +" it's time to run and play in the warm spring sun.

*TCH: %spa: $STR:RC $CON:ASC now we've been talkin(g) <about> [//] in our shared reading book about bears and what bears like, and baby+bears are called cubs.

*TCH: %spa: $STR:RC $CON:ASC and what bears like to eat.

%tim: 2:01

*TCH: %spa: $STR:RC $CON:ASC bears like to eat berries and nuts, and bears +//.

*TCH: %spa: $NON:QU what do they do in the wintertime?

*CHI: get up.

*TCH: %spa: $NON:QU no what do they do in the wintertime?

*CHI: go to sleep.

*CHI: +< xx.

*TCH: %spa: $NON:QU what do they do Isaiah?

*CHI: stay asleep.

*TCH: %spa: $NON:QU they &s sleep and when do they wake up?

*CHI: in springtime.

*TCH: %spa: $NON:OT in the springtime.

*TCH: %spa: $STR:DL $CON:ASC so these are some bear facts, right here.

*TCH: %spa: $STR:GE $CON:BVM and i also got a book that i wanna [: want to] share with you today about bears and the name of this book is +//.

*TCH: %spa: $NON:OT y'all [: you all] can come in a little closer.

*TCH: %spa: $STR:GE $CON:BVM about bears.

*TCH: %spa: $NON:QU what is this on the outside of this book?

*CHI: color xx.

*CHI: +< colors.

*TCH: %spa: $NON:OT colors.

*TCH: %spa: $NON:QU do you think this is the front of the book?

*CHI: no.

*TCH: %spa: $NON:QU what's wrong with this book, Isaiah?

*CHI: it's xx.

*TCH: %spa: $NON:QU who can tell me what is wrong with this book.

*TCH: %spa: $NON:QU Jaquarius, what's wrong with it?

*CHI: it got colors on it.

%tim: 3:00

*TCH: %spa: $NON:OT no it has colors in it but somethin(g) is different about this book.

*TCH: %spa: $STR:GE $CON:OAC and i know &i if you look real hard you might could tell me what it is, Justin.

*CHI: broke.

*TCH: %spa: $STR:GE $CON:OAC it's torn up.

*TCH: %spa: $NON:OT very good, this book is torn up.

*TCH: %spa: $STR:GE $CON:PEC Teachername found this book <and and and &w>

[//] in Amber and Mike's room but i wanted to bring it.

*TCH: %spa: $STR:GE $CON:PEC and i wanted to share this book with you, and

Amber and Mike had this book at home.

*TCH: %spa: $STR:RF $CON:PEC and they've torn it up.

*TCH: %spa: $STR:RF $CON:PEC and i couldn't find the covers at home but i said <i

&st> [//] i'm still gonna [: going to] bring it anyway.

*TCH: %spa: $NON:QU but is this the way we should take care of books?

*CHI: no.

*TCH: %spa: $STR:GE $CON:PEC +< no, it's not.

*TCH: %spa: $STR:GE $CON:PEC and Amber and Mike knows better.

*TCH: %spa: $STR:GE $CON:PEC but i guess i gotta [: got to] buy (th)em another

one for Christmas, okay?

*TCH: %spa: $STR:GE $CON:BVM but the name of this book is

Brown_Bear_Brown_Bear_What_Do_You_See?

*TCH: %spa: $STR:GE $CON:BVP and that's what that says.

*TXT: +" brown bear brown bear, what do you see?

*TCH: %spa: $NON:QU i brought this book from home, okay?

*TCH: %spa: $STR:GE $CON:OAC so it's a little old.

*TCH: %spa: $NON:OT but bear with me.

*TXT: +" brown bear brown bear, what do you see?

%tim: 4:02

*TXT: +" i see a red bird looking at me.

*TXT: +" red bird red bird, what do you see?

*TXT: +" i see a yellow duck looking at me.

*TXT: +" yellow duck yellow duck, what do you see?

*TXT: +" i see a blue horse looking at me.

*TXT: +" blue horse blue horse, what do you see?

*TXT: +" i see a green frog looking at me.

*CHI: +< green frog looking at me.

@Comment: students start to catch on to the predictable text and try to read along

*TXT: +" green frog green frog, what do you see?

*CHI: +< green green frog see?

*TXT: +" i see a purple cat looking at me.

*CHI: +< cat looking at me.

*TXT: +" purple cat purple cat, what do you see?

*CHI: +< purple cat purple cat, what do you see?

*TXT: +" i see a white dog looking at me.

*CHI: +< looking at me.

*TXT: +" white dog white dog, what do you see?

*CHI: +< what do you see?

*TXT: +" i see a black sheep looking at me.

*CHI: +< i see a sheep looking at me.

%tim: 5:01

*TXT: +" black sheep black sheep, what do you see?

*CHI: +< black sheep black sheep, what do you see?

*TXT: +" i see a gold fish looking at me.

*CHI: +< i see a fish looking at me.

*TXT: +" gold fish gold fish what do you see?

*CHI: +< gold fish gold fish, what do you see?

*TXT: +" i see a teacher looking at me.

*CHI: +< i see a teacher looking at me.

*TXT: +" teacher teacher, what do you see?

*CHI: +< teacher, what do you see?

*TXT: +" i see children looking at me.

*CHI: +< children lookin(g) at me.

*TXT: +" children children, what do you see?

*CHI: +< children, what do you see?

*TXT: +" i see a brown bear, a red bird, a yellow duck, a blue horse, a green frog, a

purple cat, a white dog, a black sheep, a gold fish looking at me.

*CHI: +< looking at me.

*TCH: %spa: $STR:GE $CON:BVM the end.

*CHI: no more words!

*TCH: %spa: $STR:GE $CON:BVM no more words.

*TCH: %spa: $STR:GE $CON:BVM this is the end of this story.

*TCH: %spa: $NON:OT i want you to raise your quiet hand and tell me the &a +//.

*TCH: %spa: $STR:RF $CON:ASC now &l this week we're talkin(g) (a)bout

woodland animals.

%tim: 6:02

*TCH: %spa: $STR:RF $CON:ASC last week before that we talked about farm animals and there were all kinds of animals in this book.

*TCH: %spa: $NON:OT raise your quiet hand if you remember any of the animals from that

book <right> [//] that we just read, Brown_Bear_Brown_Bear.

*TCH: %spa: $STR:GE $CON:OAC i'm lookin(g) for quiet hands.

*TCH: %spa: $NON:QU Raven, can you name me a animal <that you &s> [//] that you remember from that book Brown_Bear_Brown_Bear?

*CHI: a goldfish.

*TCH: %spa: $NON:OT a goldfish!

*TCH: %spa: $NON:QU how (a)bout you, Justin?

*CHI: duck.

*TCH: %spa: $NON:OT a duck.

*TCH: %spa: $NON:QU where does the duck live?

*CHI: on the farm.

*TCH: %spa: $NON:OT on the farm, very good.

*TCH: %spa: $NON:QU how (a)bout you, Willie?

*CHI: a horse.

*TCH: %spa: $NON:OT a horse!

*CHI: me!

*TCH: %spa: $NON:QU where does a horse live?

*CHI: in the barn.

*TCH: &e in the barn, yeah the horse lives in the barn.

*TCH: %spa: $NON:QU Mya, what animal do you remember from the story?

*CHI: a cat.

*TCH: %spa: $NON:OT a cat.

*TCH: %spa: $NON:QU what about you?

*CHI: &b bird.

*TCH: %spa: $NON:OT a bird.

*TCH: %spa: $NON:QU and you, Ashlyn?

%tim: 7:01

*CHI: a bear.

*TCH: %spa: $NON:OT a bear.

*TCH: %spa: $NON:QU and what about you, Jaquarius?

*CHI: a frog.

*TCH: %spa: $NON:OT a frog.

*TCH: %spa: $NON:QU Isaiah.

*CHI: a dog.

*TCH: %spa: $NON:OT a dog.

*TCH: %spa: $NON:OT very good.

*TCH: %spa: $STR:GE $CON:BVM now y'all [: you all] named just about all the animals in that story.

*TCH: %spa: $NON:OT and look what Teachername has.

*CHI: ooh!

*CHI: +< wow!

*TCH: %spa: $NON:OT oh!

*CHI:	you got xx cow?

*TCH:	%spa: $STR:GE $CON:ASC i have all those animals that you just named right
here.

*TCH:	%spa: $NON:OT i want everybody to sit back in a circle.

*TCH:	%spa: $STR:GE $CON:OAC a circle is big and round with nothin(g) in the
middle.

*TCH:	%spa: $NON:OT fold your legs.

@Comment:	teacher passes out animal cut-outs to students

*TCH:	%spa: $STR:GE $CON:OAC oh yes Teachername might not do it the stame [:
same] &u &s order as the story, but there you go.

*CHI:	+< bird.

*CHI:	bird.

*CHI:	bird.

*CHI:	ooh i'm gonna [: going to] get a cow.

*TCH:	%spa: $NON:OT i need for everybody +//.

*TCH:	%spa: $NON:OT <i'ma [: i am going to] give> [/] i'ma [: i am going to] &g +/.

*CHI:	i'm gonna [: going to] get the dog.

*TCH:	%spa: $NON:OT wait a minute.

%tim:	8:00

*TCH:	%spa: $STR:GE $CON:OAC Teachername is just pickin(g) on top goin(g)
around.

*TCH:	%spa: $NON:OT okay?

*CHI:	okay.

*TCH: %spa: $STR:GE $CON:OAC so there you go, that was on top.

*TCH: %spa: $STR:GE $CON:OAC and this one was on top.

*TCH: %spa: $STR:GE $CON:OAC that one and that one.

*TCH: %spa: $STR:GE $CON:OAC and that one.

*TCH: %spa: $STR:GE $CON:OAC and this one.

*TCH: %spa: $STR:GE $CON:OAC and that one.

*TCH: %spa: $STR:GE $CON:OAC and that one.

*TCH: %spa: $NON:OT okay.

*TCH: %spa: $STR:GE $CON:OAC this is what i want you guys to do.

*TCH: %spa: $STR:GE $CON:OAC i give you these two here.

*TCH: %spa: $STR:GE $CON:OAC you're children and you're the teacher.

*TCH: %spa: $NON:OT okay.

*TCH: %spa: $STR:GE $CON:OAC what Teachername is gonna [: going to] do +//.

*TCH: %spa: $STR:GE $CON:OAC Ashlyn what i want you to do is +//.

*TCH: %spa: $NON:OT we're gonna [: going to] +//.

*TCH: %spa: $NON:OT Ashlyn, stand up.

*TCH: %spa: $NON:OT come on here um Daysia.

%tim: 9:00

*TCH: %spa: $NON:QU can y'all [: you all] scoot down a little bit um Janequa if you

don't mind?

*TCH: %spa: $NON:OT come on, let's see if we can try to get everybody up here.

@Comment: teacher is lining class up at the front of the room

*TCH: %spa: $NON:OT Cameron, come on up here.

*TCH: %spa: $NON:OT okay, one more.

*TCH: %spa: $STR:GE $CON:OAC and then <we'll do> [/] we'll do the second group

later.

*TCH: %spa: $NON:QU how (a)bout that?

*TCH: %spa: $STR:GE $CON:OAC there you go.

*TCH: %spa: $NON:OT turn your animal around so your friends can see them.

*TCH: %spa: $NON:OT very good.

*TCH: %spa: $STR:GE $CON:BVM these are the animals that was in the story

Brown_Bear_Brown_Bear_What_Do_You_See.

*TCH: %spa: $STR:GE $CON:OAC so <Ashlyn is> [/] uh <Ashlyn is gonna [: going to]

say> [//] um we're gonna [: going to] say brown bear +//.

*TCH: %spa: $STR:GE $CON:OAC we're gonna [: going to] ask Ashlyn.

*TCH: %spa: $STR:GE $CON:BVM +" brown bear brown bear what

        do you see?

*TCH: %spa: $NON:QU and she's gonna [: going to] look over there at Daysia and

tell us what she see okay?

*TCH: %spa: $STR:GE $CON:OAC and then we're gonna [: going to] say +"/.

*TCH: %spa: $STR:GE $CON:BVM +" red bird red bird what

        do you see?

*TCH: %spa: $STR:GE $CON:OAC and she's gonna [: going to] turn over there to

Cameron and say what she see.

*TCH: %spa: $NON:QU what do you see right there?

*CHI: purple.

*TCH: %spa: $STR:GE $CON:BVM a purple cat.

%tim: 10:01

*TCH: %spa: $NON:OT okay.

*TCH: %spa: $STR:GE $CON:BVM you're the brown bear, you're the red bird, the

purple cat, the blue horse, and the white dog.

*TCH: %spa: $NON:QU okay we're gonna [: going to] ask Ashlyn what does she see

and you gonna [: going to] look over at Daysia, the person next to you, right?

*TCH: %spa: $NON:OT let's try it.

*TCH: %spa: $NON:QU brown bear brown bear, what do you see?

*CHI: +< what do you see?

*TCH: %spa: $NON:QU what you gonna [: going to] +/.

*CHI: <i> [/] i see a bird.

*TCH: %spa: $NON:OT &sh <she said> [//] say i see a red bird.

*CHI: bird.

*CHI: a red bird.

*TCH: %spa: $STR:GE $CON:BVM lookin(g) at me.

*TCH: %spa: $NON:QU red bird red bird, what do you see?

*TCH: %spa: $NON:QU what you see, red bird?

*CHI: a cat.

*TCH: %spa: $STR:GE $CON:BVM a purple cat.

*TCH: %spa: $NON:OT say lookin(g) at me.

*TCH: %spa: $NON:QU purple cat purple cat, what do you see?

*TCH: %spa: $NON:QU what do you see?

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*CHI: a horse.

*TCH: %spa: $STR:GE $CON:BVM i see a blue horse lookin(g) at me.

*TCH: %spa: $NON:QU blue horse blue horse, what do you see?

*CHI: a white dog.

*TCH: %spa: $STR:GE $CON:BVM i see a white dog lookin(g) at me.

*TCH: %spa: $NON:OT let's give them a clap.

*TCH: %spa: $NON:OT &=claps .

*CHI: +< &=claps .

*TCH: %spa: $NON:OT now i want my second group to come up.

%tim: 11:01

*TCH: %spa: $NON:OT <you can come up> [//] you stay up here Justin.

*TCH: %spa: $NON:OT &y thank you Ashlyn, you can sit down.

*TCH: %spa: $NON:OT come on uh my next group.

*TCH: %spa: $NON:OT go sit down Daysia.

*TCH: %spa: $NON:OT you fine.

*TCH: %spa: $NON:OT just sit down.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT come on my next group.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT y'all [: you all] can sit over there for me Daysia if you don't

mind.

*TCH: %spa: $NON:OT Teachername you will get those sticks from them.

*TCH: %spa: $NON:OT come on.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT come on up.

*TCH: %spa: $NON:OT let's see what other animals we have.

*TCH: %spa: $NON:OT (o)kay.

*TCH: %spa: $NON:QU now we gonna [: going to] ask white dog white dog, <what

does he> [//] what do he see?

*TCH: %spa: $NON:OT <and &y> [/] and you got to answer.

*TCH: %spa: $NON:OT you got to say what you see.

*TCH: %spa: $NON:QU all ready?

*TCH: %spa: $STR:EN $CON:ASC one two three.

*TCH: %spa: $NON:QU white dog white dog, what do you see?

*TCH: %spa: $NON:QU what do you +//?

*TCH: %spa: $NON:OT say it loud.

*CHI: i see a duck.

*TCH: %spa: $STR:GE $CON:BVM i see a yellow duck lookin(g) at me.

%tim: 12:01

*TCH: %spa: $NON:QU yellow duck yellow duck, what do you see?

*TCH: %spa: $NON:QU what do you see?

*CHI: a black sheep.

*TCH: %spa: $STR:GE $CON:BVM i see a black sheep lookin(g) at me.

*TCH: %spa: $NON:QU black sheep black sheep, what do you see?

*CHI: i see a gold fish.

*TCH: %spa: $STR:GE $CON:BVM i see a gold fish lookin(g) at me.

*TCH: %spa: $NON:QU gold fish gold fish, what do you see?

*CHI: i see a green frog.

*TCH: %spa: $STR:GE $CON:BVM lookin(g) at me.

*TCH: %spa: $NON:QU green frog green frog, what do you see?

*TCH: %spa: $NON:OT say you see children.

*CHI: i see children.

*TCH: %spa: $STR:GE $CON:BVM i see children lookin(g) at me.

*TCH: %spa: $NON:OT very good, give yourself a big clap.

*CHI: &=claps .

*TCH: %spa: $NON:QU +< very good, Ayesha you didn't wanna [: want to] come up?

*TCH: %spa: $STR:GE $CON:OAC all righty, <you three &ch> [//] you three didn't

get a chance to do anything, but that's okay.

*TCH: %spa: $NON:OT sit on your bottoms.

*TCH: %spa: $NON:OT here you go Teachername.

%tim: 13:00

*TCH: %spa: $STR:RC $CON:ASC so <we talked about> [/] we talked about bears.

*TCH: %spa: $NON:OT Teachername you'll kind of close that in for me if you don't

mind, the board, so they can come on up.

*TCH: %spa: $STR:RF $CON:BVP we have been talkin(g) about rhyming words in the classroom.

*TCH: %spa: $STR:GE $CON:OAC and Teachername's gonna [: going to] write the word +...

*TCH: %spa: $NON:OT (ex)cuse me Justin can you &s get over there so you can see.

*TCH: %spa: $STR:GE $CON:OAC Teachername's gonna [: going to] write the word +...

*TCH: %spa: $STR:GE $CON:BVP bear.

*TCH: %spa: $NON:QU what does bear begin with?

*CHI: b@l!

*TCH: %spa: $NON:QU and what sound does b@l make?

*CHI: &b .

*CHI: +< &b .

*CHI: &b .

*TCH: %spa: $NON:OT okay.

*TCH: %spa: $NON:QU can you think of anything that begins with the letter b@l besides bear?

*TCH: %spa: $NON:OT raise your quiet hand.

*TCH: %spa: $NON:QU what begins with the letter b@l, uh Jaquarius?

*CHI: branch.

*TCH: %spa: $NON:QU branch, and what else Cordell?

*CHI: a bear.

*TCH: %spa: $NON:QU a bear, and what else uh Kendrick?

%tim:	14:01

*CHI:	bird.

*TCH:	%spa: $NON:QU a bird, and what else?

*TCH:	%spa: $NON:QU <&w> [//] what begins with the letter b@l?

*CHI:	bear.

*TCH:	%spa: $NON:QU a bear, what else?

*CHI:	balloon.

*TCH:	%spa: $NON:OT a balloon.

*TCH:	%spa: $NON:QU what else, Raven?

*CHI:	bike.

*TCH:	%spa: $NON:OT a bike.

*TCH:	%spa: $NON:QU what else Janequa?

*CHI:	um a xx.

*TCH:	%spa: $NON:QU <what &l> [//] <what> [/] what um begins with the letter b@l?

*CHI:	&b &b b@l, &b &b b@l [=! whispers].

*TCH:	%spa: $NON:QU a boat?

*CHI:	a boat.

*TCH:	%spa: $NON:QU a boat and what about you, Mya?

*CHI:	a sheep.

*TCH:	%spa: $NON:OT a sheep.

*TCH:	%spa: $NON:QU can you think of anything else that +//.

*TCH:	%spa: $NON:QU what about a banana?

*CHI: mat.

*CHI: mat.

*TCH: %spa: $STR:GE $CON:BVP a banana, and a sheep says baa and baa begins

with the letter b@l.

*TCH: %spa: $STR:GE $CON:BVP i'm kinda [: kind of] writing the uh uppercase b@l

and now i'm gonna [: going to] write +//.

*TCH: %spa: $NON:QU what letter's this?

*CHI: e@l.

*CHI: e@l.

*CHI: lowercase e@l.

*TCH: %spa: $NON:OT lowercase e@l.

*CHI: a@l.

*CHI: +< a@l.

%tim: 15:00

*TCH: %spa: $NON:QU what is that?

*CHI: a@l.

*TCH: %spa: $STR:DL $CON:BVP lowercase a@l, okay.

*TCH: %spa: $NON:QU and what is this?

*CHI: r@l.

*TCH: %spa: $NON:OT a r@l.

*TCH: %spa: $NON:QU and that's a +//.

*TCH: %spa: $NON:QU is that a capital r@l or a lowercase r@l?

*CHI: a lowercase r@l.

*TCH: %spa: $NON:OT a lowercase r@l.

*TCH: %spa: $NON:OT okay.

*TCH: %spa: $STR:GE $CON:BVP ball Teachername said begins with the letter b@l

as well.

*TCH: %spa: $NON:OT all right i want you to fold your legs.

*TCH: %spa: $NON:QU now what words sound like bear?

*TCH: %spa: $NON:QU bear and +//.

*TCH: %spa: $NON:QU can you think +//?

*TCH: %spa: $NON:OT raise your quiet.

@End

Equations for Outcome Measures

Guide to Abbreviations

ABBREVIATION	DEFINITION
PPR	Peabody Picture Vocabulary Test
EVT	Expressive Vocabulary Test
PLS	Preschool Language Scale
NDW	Number of different words in a 50 word sample
Condit	Curriculum Condition
PreK experience	Teachers' experience in pre-K classrooms
Non-verbal IQ	Leiter International Performance Scale
Low/Medium/High Comments	Comment Strategy Level
Low/Medium/High TDM	Low/Medium/High Text-driven Meaning Comments
MediumTDP	Medium Text-driven Print Comments
MediumASC	Medium Academic Subject Comments
MediumPEC	Medium Personal Connection Comments

Hypothesis I: *The amount of instructional comments, rather than total comments, used by teachers will be related to children's vocabulary growth across one year of preschool.*

Instructional Comments

Receptive Vocabulary (PPVT)

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010} Instructional\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

Expressive Vocabulary (EVT)

$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010} Instructional\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

General Language (PLS)

$$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010} \, Instructional \; Comments_{jk} + \gamma_{100} \, Non\text{-}verbal \; IQ_{ijk} + \gamma_{200} \, PreK$$

$$experience_{ijk} + \gamma_{300} \, PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Expressive Vocabulary Sample (NDW50)

$$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010} \, Instructional \; Comments_{jk} + \gamma_{100} \, Non\text{-}verbal \; IQ_{ijk} + \gamma_{200} \, PreK$$

$$experience_{ijk} + \gamma_{300} \, NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Total Comments

Receptive Vocabulary

$$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010} \, Total \; Comments_{jk} + \gamma_{100} \, Non\text{-}verbal \; IQ_{ijk} + \gamma_{200} \, PreK$$

$$experience_{ijk} + \gamma_{300} \, PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Expressive Vocabulary (EVT)

$$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010} \, Total \; Comments_{jk} + \gamma_{100} \, Non\text{-}verbal \; IQ_{ijk} + \gamma_{200} \, PreK$$

$$experience_{ijk} + \gamma_{300} \, EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

General Language (PLS)

$$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010} \, Total \; Comments_{jk} + \gamma_{100} \, Non\text{-}verbal \; IQ_{ijk} + \gamma_{200} \, PreK$$

$$experience_{ijk} + \gamma_{300} \, PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Expressive Vocabulary Sample (NDW50)

$$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010} \, Total \; Comments_{jk} + \gamma_{100} \, Non\text{-}verbal \; IQ_{ijk} + \gamma_{200} \, PreK$$

$$experience_{ijk} + \gamma_{300} \, NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Hypothesis II: *Children with differing levels of vocabulary knowledge will profit differently from instructional strategies that contain different levels of cognitive demand. Strategies within the child's zone of proximal development will have the greatest effects, such that children with low language will profit from low and medium-level strategies, while children with typical language will benefit from medium and high-level strategies.*

Receptive Vocabulary (PPVT)

$$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Low\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Medium\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010}\,High\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Expressive Vocabulary (EVT)

$$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Low\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Medium\ Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\ IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010}\,High\ Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\ IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

General Language (PLS)

$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Low\ Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\ IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Medium\ Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\ IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010}\,High\ Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\ IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

Expressive Vocabulary Sample (NDW50)

$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Low\ Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\ IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010}\,Medium\,Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\,IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010}\,High\,Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\,IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

Hypothesis III: *Differing levels of cognitive demand contained within teachers' instructional strategies for comments that are text-driven meaning in nature will differentially affect children's end-of-year vocabulary scores. Comments that are within the child's zone of proximal development will produce the greatest growth. Children with low language ability may profit the most from medium levels of text-driven meaning content, while children with typical language ability may profit the most from high levels of text-driven meaning content.*

Receptive Vocabulary (PPVT)

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010}\,LowTDM\,Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\,IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010}\,MediumTDM\,Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\,IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010}\,HighTDM\,Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\,IQ_{ijk} + \gamma_{200}\,PreK$

$experience_{ijk} + \gamma_{300}\,PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

Expressive Vocabulary (EVT)

$$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010}\,LowTDM\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010}\,MediumTDM\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$$EVT\_post_{ijk} = \gamma_{000} + \gamma_{010}\,HighTDM\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,EVT\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

General Language (PLS)

$$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010}\,LowTDM\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010}\,MediumTDM\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

$$PLS\_post_{ijk} = \gamma_{000} + \gamma_{010}\,HighTDM\;Comments_{jk} + \gamma_{100}\,Non\text{-}verbal\;IQ_{ijk} + \gamma_{200}\,PreK$$
$$experience_{ijk} + \gamma_{300}\,PLS\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$$

Expressive Vocabulary Sample (NDW50)

$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010} LowTDM\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010} MediumTDM\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$NDW\_post_{ijk} = \gamma_{000} + \gamma_{010} HighTDM\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} NDW\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

Exploratory Analysis

Receptive Vocabulary (PPVT)

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010} MediumTDM\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010} MediumASC\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010} MediumPEC\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

$PPR\_post_{ijk} = \gamma_{000} + \gamma_{010} MediumTDP\ Comments_{jk} + \gamma_{100} Non\text{-}verbal\ IQ_{ijk} + \gamma_{200} PreK$

$experience_{ijk} + \gamma_{300} PPR\_pre_{ijk} + Condit_{jk} + r_{0jk} + u_{00k} + e_{ijk}$

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