

QUESTIONING AROUND TEACHER-CHILD BOOK READING: THE EFFECT
OF QUESTIONS THAT GO BEYOND THE SCRIPTED CURRICULUM ON
CHILDREN'S VOCABULARY GROWTH

A Dissertation

by

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Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT

By reviewing existing data of preschool teacher small group shared reading video observations, the present investigator seeks to investigate the relationships between teacher questioning and child expressive and receptive vocabulary outcomes among a sample of dual language learners. Specifically, the aim is to understand whether questions at the lower end of cognitive complexity or whether higher order questions would influence vocabulary development. Teacher observations were coded and evaluated for question frequency and complexity and were analyzed using an observational system routinely used in experimental studies. The present study seeks to expand the knowledge concerning teacher language as it relates to the vocabulary of dual language learners.

The present study used hierarchical linear models, which accounted for the nested nature of the data, to analyze the relationships between teacher questioning and various other predictor variables on language and literacy outcomes. Analyses did not reveal significant relations between teachers' questioning behavior on either standardized or researcher-developed measures. However, being in an intervention group appeared to significantly influence outcomes on researcher-developed measures. Additionally, preexisting levels of vocabulary moderated outcomes, which speaks to the importance of the home literacy environment and its relation to language. Finally, treatment teachers asked significantly more questions than comparison teachers, indicating they generalized their question type behavior from scripted intervention questions. Despite some non-significant findings concerning teacher questioning

behaviors, understanding factors that moderate language delays and encourage vocabulary development of dual language learners should be a research priority.

ACKNOWLEDGEMENTS

Somewhere along this tremendous journey that is graduate school, I read a motivational poster with the following quote, “If you haven’t felt like quitting, your dreams aren’t big enough.” Well, throughout this process, I have realized how giant my dreams truly are. Writing this dissertation has been one of the most humbling, mind-boggling, and challenging things I have ever done, and I have many individuals to thank for helping me persevere and continue trekking. First of all, I would like to thank my committee, Dr. Gonzalez, Dr. Riccio, Dr. McCormick, Dr. Clemens, and Dr. Eslami for their valued support and dedication throughout this process. I am eternally grateful for their encouragement and responsiveness and have greatly appreciated their significant guidance. Additionally, I would like to express sincere gratitude to Shuqiong Lin, statistician, whose expertise was invaluable as statistics are like a foreign language to me!

I would also like to thank my extraordinary parents, Manuel and Pita Gámez who have shown me the value of unconditional love and endless support and who have always been my biggest fans. I am blessed to be a part of family that treasures faith, love, and laughter, and I hope that I can instill these values in my own family someday. Above all, I would like to thank my sweet husband Marc Patience for taking this beautiful, rollercoaster of a ride with me. Having a loving partner who understands the madness of graduate school and the monumental importance of a dissertation has made my life easier and has made the journey not only bearable, but worth every minute. Almost exactly two years ago, I made a vow to encourage him, inspire him, and to never

forget that we share a once in a lifetime love, and every day, he makes it easy to keep and hold these vows near to my heart. More than anything, I am looking forward to continuing our journey hand in hand and to discovering what life and love have yet to offer.

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CHAPTER I

INTRODUCTION

The verbal interactions between children and their teachers are crucial. It has been found that often, especially for young children from impoverished homes, the language heard in classrooms is their first exposure to complex forms of dialogue. Further, these discourses are especially significant because, in many cases, the classroom serves as the only source for experience with important language and literacy interactions (Wasik, Bond & Hindman, 2006). Importantly, most children attain preliteracy skills through classroom communication that encourages and supports the development of code-related and oral language skills, which subsequently serve as a strong foundation for later reading with comprehension. As such, research has found that children who arrive in first grade with a basis in preliteracy skills are more equipped to engage in the intricate task of acquiring reading skills when compared to children who are less well prepared (Smith & Dickinson, 1994; West, Denton, & Germino-Hausken, 2000). Despite the myriad of opportunities for language and literacy development in the classroom, many children, especially the economically disadvantaged or diverse, start schooling already language delayed. Understanding the teacher-level factors that mitigate or recoup early language delays is thus a research priority.

In preschool, teachers encounter children with wide variability in oral language and literacy experiences. Unfortunately, many children begin school with delayed levels of skills and abilities, which subsequently puts them at high risk of downstream reading challenges (Curby, Rimm-Kaufman & Cameron Ponitz, 2009). Many of these young

children enter school unprepared to benefit from classroom instruction, which effectively compounds their delays. Although some are able to recognize letters and simple sight words, others are lacking, which can later hinder vocabulary development and reading comprehension (Dickinson, Darrow, & Tinabu, 2008; Wasik, Bond, & Hindman, 2006). For example, children from economically disadvantaged homes often alarmingly enter preschool programs with oral language difficulties that are one to two standard deviations below national norms. These vocabulary discrepancies relate to later reading-comprehension difficulties, which remain unchanging without adequate interventions (Biemiller, 2003; Dickinson, Darrow, & Tinubu, 2008; Hart & Risley, 1995). From among the children vulnerable to early language and literacy delays, English Language Learners (ELLs)—often from high poverty homes with poor home literacy environments—are especially disadvantaged in the classrooms (Curby, Rimm-Kaufman, & Cameron-Ponitz, 2009).

According to the National Clearinghouse for English Language Acquisition (Ballantyne, Sanderman, & Levy, 2008), the term *English Language Learners* (ELLs) refers to students not yet proficient in English who need instructional support to access scholastic content in their classes. Demographics indicate within the last ten years, there has been a rapid increase in the English language learner population, and these students are the fastest-growing segment of the student population in the United States. Research also indicates that ELLs are a “high-risk” group and are more likely to be economically disadvantaged and to come from less educated families than their same-aged peers.

Seemingly, the risks faced by young and oftentimes poor ELLs make them uniquely vulnerable to language and literacy delays at school entry.

Statement of the Problem

Disparities in language and literacy emerge early in life and are most frequently associated with lack of exposure or second language acquisition issues in the home (Foorman, Anthony, Seals & Mouzaki, 2002). Disparities are frequently experienced by English language learners, who make up a significant proportion of children who fail to achieve proficient reading skills (Perie, Grigg, & Donahue, 2005). When comparing language minority children from a low socioeconomic status to other students, wide discrepancies can be observed as early as age 3 (Farkas & Beron, 2004), and these discrepancies increase exponentially, so much so that children from advantaged homes may enter first grade with twice the vocabulary as children from less advantaged homes (Snow, Burns & Griffin, 1998). Unfortunately, children who fall behind early in their schooling have an increasingly difficult time catching up to their peers as they get older (McClelland, Acock, & Morrison, 2006). As evidence, well-conducted studies show that over time, language minority children present with lower academic achievement, poorer literacy outcomes, and higher grade repetition and high school dropout rates than their peers. Regrettably, these trends continue to extend throughout performances on high school exit examinations and graduation rates (August & Hakuta, 1997; NCES, 2004).

An early environmental source associated with wide variation in children's language and literacy is the home. Research shows that limited or no exposure to books and literacy activities in the home contributes to a mismatch between expectations of the

school and entry-level child language and literacy skills (Neuman & Celano, 2001). Home literacy environments may be lacking in shared reading activities and in communicative exchanges crucial to development of language skills expected in young children entering school (Storch & Whitehurst, 2002). Well documented evidence shows that limited exposure to and experiences with oral language enriched environments in the homes often set the ceiling on language and verbal abilities prior to formal schooling (Dickinson, Darrow, & Tinubu, 2008; Wasik, Bond, & Hindman, 2006). In fact, research shows that vocabulary is “a skill whose determinants have clear roots in social class and race differences in speech, vocabulary, and child-raising patterns, habits, and knowledge” (Farkas & Beron, 2004, p.468). Vocabulary has been documented as a reliable determinant of reading success (Biemiller, 2003), and unfortunately, it has long been determined that disadvantaged children have declining reading comprehension resulting from a lack of adequate vocabulary knowledge (Chall, Jacobs, & Baldwin, 1990).

Due to limited opportunities for exposure to language and literacy activities, the school often becomes the sole source of language and literacy stimulation and development for many. Because vocabulary knowledge is one of the strongest predictors of reading comprehension, and because this is a critical skill that many children fail to attain, it is crucial to evaluate the features of classrooms and teachers that predict achievement and student success. As a result of inadequate language and literacy exposure in low-income homes, the importance of teaching practices in preschool classrooms has been emphasized (Hofferth & Sandberg, 2001). Teacher language in the

classroom, specifically, has been shown to be a powerful moderator of variability in language and literacy development for young students deemed as being “high-risk” (Hart & Risley, 1995; NICHD, 2000). This effectively highlights the important role that teachers play in children’s early language development and literacy abilities.

Specifically, in preschool classrooms, teacher-child interactions that are high quality and that provide instructional vocabulary opportunities across multiple contexts have been shown to have an important impact on cognitive abilities and reading achievement of at-risk children (Barnett, 2001). The need for instructional practices which integrate oral language proficiency, reading, and writing have been emphasized in research. Through these practices, teachers can foster early language and literacy with conversations that use rich and complex vocabulary (Wasik & Hindman, 2011). For example, the amount of exposure to different words, extended talk on a single topic, and talk that communicates information have been shown to enhance language development (Dickinson, Darrow & Tinubu, 2008). As such, superior programs and effective interventions should provide opportunities for student to speak and develop language skills through high-quality teacher-child interactions.

A widely used teacher practice, which encourages language enrichment in classrooms, is shared book reading (SBR), which provides a rich, focused, and interactive environment between adults and developing preschoolers (Ard & Beverly, 2004). Notably, through SBR, children learn targeted and incidental vocabulary that they may not encounter in their everyday conversations. Furthermore, it has been found that the *quality* of shared book reading influences children’s emergent literacy. Interactions

that extend beyond the text and encourage dialogue among adults and children through use of extended talk and open-ended questions help children gain more from conversations and provide them the opportunity to be engaged in cognitively challenging dialogue (Wasik, Bond, & Hindman, 2006). Further, having adults ask questions and make comments about books in an interactive and expressive manner has been shown to achieve large effect sizes in children's language growth (Bus, van Ijzendoorn & Pellegrini, 1995; van Kleeck, 2008).

Specifically, *questions* represent a commonly used communicative tool during SBR, and existing research has examined the relationship between cognitive complexity of question forms (open- or closed- questions, yes/no questions) and childhood vocabulary outcomes (Rivera et al., 2005). Several findings document preschoolers benefitting from adult use of more cognitively complex questions and comments that require inferencing, predicting, reasoning, and explaining (van Kleeck, 2003; Zucker et al., 2010), and these are positively associated with child vocabulary outcomes and reading comprehension (van Kleeck, Vander Woude, & Hammett, 2006). Regrettably, to this author's knowledge, relatively little is known about the association of teacher question type strategies concerning English language learners and their verbal and literacy outcomes.

Unique Contribution

While research shows positive language and literacy outcomes for children who are exposed to expressive and intricate conversations with their teachers during shared book reading, little is known about outcomes among English language learners in dual

language programs, consequently referred to as dual language learners (DLLs). Often, these children have limited exposure to complex dialogue in their homes, thereby making the classroom their primary source of oral language acquisition. Teacher language and cognitive complexity of questioning have been identified as significant predictors of language development (Wasik, Bond & Hindman, 2006; NICHD, 2000). Although it has been determined that questions made by teachers affect student learning, little research has specifically measured the variety and discourse complexity of teacher question type. Furthermore, research regarding teacher question types and its relationship to the vocabulary of DLLs is particularly limited. In an effort to fill this void in the literature, this study seeks to examine teacher language cognitive complexity in the context of teacher questions during shared book reading and the association of these patterns with receptive and expressive language outcomes in dual language learners.

Purpose

The purpose of this study is to use an extant data set of teacher small group shared reading video observations obtained from a federally funded intervention efficacy project to code and evaluate teacher questioning frequency and question complexity (e.g. literal/low demand versus inferential/high demand). More importantly, this study will investigate the relationships between teacher question type and child expressive and receptive vocabulary outcomes among a sample of dual language learners participating in the 2011-2012 grant year. Specifically, the aim is to understand whether questions at the lower end of cognitive complexity or higher order questions would influence vocabulary development. Teacher shared reading observations will be analyzed using the

XT Observer Noldus system, an observational system routinely used in experimental studies. Coded in these video clips will be information such as teacher question frequency and non-scripted vocabulary word use. Because we were interested in questioning outside of the scripted material, only non-scripted questions were coded for cognitive complexity. It is hypothesized that during shared book reading activities, students of teachers who use richer language, extended descriptions, and high demand inferential questions will elicit stronger outcomes in measures of receptive and expressive vocabulary than students of teachers who use low demand questions. Children are expected to adapt their level of language to match the level of cognitive demand shown by their teachers.

Research Questions

How does the complexity of teacher question type during Shared Book Reading (SBR) relate to preschoolers' language and literacy measures on *standardized* assessments of *receptive* and *expressive* vocabulary? How do alternative student and teacher variables relate to preschoolers' language and literacy measures on *standardized* assessments of *receptive* and *expressive* vocabulary?

How does the complexity of teacher question type during SBR relate to preschoolers' language and literacy measures on *researcher-developed* assessments of *receptive* and *expressive* vocabulary? How do alternative student and teacher variables relate to preschoolers' language and literacy measures on *researcher-developed* assessments of *receptive* and *expressive* vocabulary?

CHAPTER II

REVIEW OF LITERATURE

This study focuses on the verbal interactions between preschool children and their teachers. Specifically, it evaluates teacher questioning frequency and question complexity in the context of teacher talk during shared book reading. The aim is to understand whether teacher questions influence vocabulary outcome measures of English language learners in a Dual Language Program, subsequently referred to as dual language learners (DLLs). The following review of literature addresses various areas related to the purposes of the study including (a) disparities in language and literacy, (b) early literacy exposure in the classroom, (c) the privileged status of vocabulary, (d) shared book reading, and (e) teacher questioning practices.

Disparities in Language and Literacy

Children come to school having experienced widely disparate differences in exposure to language and literacy. Gaps in oral vocabulary are demonstrated early in life and are often associated with a lack of vocabulary exposure and/or second language acquisition in the home (Foorman, Anthony, Seals & Mouzaki, 2002). Additionally, children living in poverty who belong to minority groups tend to significantly lag behind their same age language-majority peers, with wide discrepancies being observed at an early age and increasing throughout their schooling (Early Childhood Longitudinal Study, Kindergarten Class, Farkas & Beron, 2004).

Unfortunately, early lack of exposure to and experiences with oral language often results in disadvantages that manifest in the classroom along socioeconomic lines. For

example, well documented evidence demonstrates a link between social class and ethnic differences in parent language skills and routines and in the speech and academic performance of children. Studies have demonstrated that in contrast to working class or minority children, middle class and White parents typically speak “Standard English” and use a varied vocabulary when interacting with their children. Additionally, they often ask questions and engage children in discussions (Hart & Risley, 1995), which may effectively prepare them for the demands and expectations they will face in the classroom. Similarly, a comprehensive age trajectory of language and literacy variances by class and race was described by Farkas and Beron (2004). Through their analyses of various data sets (e.g., ECLS-K), they found that where ethnic groups are concerned, a majority-minority vocabulary gap is observed as early as 36 months of age. At this time, linguistic interactions with caregivers produce substantial vocabulary differences across social lines, which further widen during preschool. Additional analyses by these authors indicate that oral vocabulary has strong roots in social class and ethnic differences. They also describe that the gaining of vocabulary awareness begins early and is strongly reliant on the skills and knowledge of parents, siblings, and peers.

These results were consistent with other findings, such as those of Guo (1998) who found that childhood is where poverty exerts its maximum effect in reducing vocabulary development. For low social class minority children in particular, a weak language and home literacy-learning environment has the potential to put a ceiling on school readiness. Research has found that this lack of opportunity and access tends to

translate into poorly developed oral language skills, which are fundamental to later literacy and academic achievement (Catts, Hogan, & Fey, 2003; Hart & Risley, 1995).

In their landmark study, Hart and Risley (1995) also examined disparities in language and literacy. These authors observed and recorded thousands of oral language interactions of welfare, working class, and upper class families from minority and majority populations; significant differences were discovered across the three groups in regard to the quantity of verbal interactions and number of words used in those dialogues. Notably, upper class parents had significantly more conversations with their children and used a broader vocabulary than the other two groups. Consequently, these children had a substantial vocabulary advantage and added words to their language at a much higher frequency than young children from working class and welfare families. Both family income and the percentage of years the family lived in poverty had significantly negative effects on all outcomes.

The implication is clear—children from minority populations and from impoverished homes are likely to come from relatively diminished home learning environments, which may set the ceiling on language and verbal abilities prior to formal schooling. As previously described, from among children who are vulnerable to deficits in language and literacy, *English language learners* (ELLs) may be especially disadvantaged in the classroom. Presently, there are over five million ELLs enrolled in American schools, who represent approximately 11 percent of the K-12 public school enrollment. Roughly 80 percent of them speak Spanish as their native language, with the majority of them being second-generation immigrant children (Calderón, Slavin, &

Sánchez, 2011; NCELA, 2007). Notably, it has been found that ELLs are more likely to come from less educated families than their English proficient peers and are more likely to come from low-income households. These students who live in underprivileged areas have several risk factors for school failure, including lack of early academic socialization and of academically motivating home environments (Denton et al., 2003). Additionally, the education level of their parents is often significantly low; for parents of English language learners, almost half do not complete high school and a quarter of them have less than a ninth grade education (NCELA, 2007). Reflecting the effect of a poor home literacy environment, a large percentage of these children lag behind their same-aged peers and routinely fail to achieve English proficiency (Perie, Grigg, & Donahue, 2005). Further, children often fall behind in vocabulary, early reading, letter recognition, and early math in kindergarten, and continue to lag behind in these areas more than their same-aged peers in first grade (Denton, West, & Walston, 2003; Rouse, Brooks-Gunn, & McLanahan, 2005).

In summary, children enter school with a variability of experiences with language and literacy, and those from impoverished home learning environments are likely to demonstrate early deficiencies in oral language. This often results in disadvantages for language minority children within the classroom, which translates into poorly developed vocabulary skills foundational to literacy and academic achievement (Farkas & Beron, 2004; Hart & Risley, 1995). Because of the growing numbers of students who may be vulnerable to deficits in language and literacy, it is imperative to

evaluate the classroom instructional environment and the role that their teachers play in guiding them as they begin to develop these essential skills.

Early Literacy Exposure in the Classroom

Research has found that multiple factors including home, parenting, parent education levels, preschool, and community resources can affect children's literacy development. Considering the growing numbers of ethnic and language-minority students in American schools, addressing the early literacy development disparities for this population has practical, educational, research and policy implications. Significantly, one setting that attempts to balance differences in children's entry level language and literacy skills is the classroom instructional environment, and more specifically, the role of the teacher. Apart from parents or guardians, teachers are a primary source of knowledge for young children and because of this, more emphasis has been placed on the crucial role that they have in guiding children to develop essential language and literacy skills (O'Conner et al., 2005; Mathes et al., 2005). As previously mentioned, many children begin schooling having grown up in language and literacy impoverished environments in which there is little or no exposure to complex and evocative language exchanges between adults and children (Dickinson & Tabors, 2001). Furthermore, home literacy environments are often lacking in shared reading activities and print materials, crucial to early development of language skills (Storch & Whitehurst, 2002). Therefore, language and literacy interactions between teachers and young children are of clear importance in the classroom.

The significance of early exposure rests on research showing that “quality preschool programming” can have a meaningful and positive impact on the academic skills of at-risk students (Restrepo & Towle-Harmon, 2008). To date, research documents that effective preschool interventions have a positive impact on general intellectual abilities and reading outcomes (Barnett, 2001). Specifically, at the teacher-level, instructional aspects around teacher-child interactions that are high quality, explicit, and provide instructional opportunities across multiple contexts enhance children’s understanding of vocabulary (Smith & Dickinson, 1994).

Diminishing the vocabulary gap in preschool involves focused and strategic instructional and educational opportunities, especially for low-income minority children (Frede & Barnett, 2006). In identifying fundamentals of effective instruction, Calderón, Slavin, and Sánchez (2011) hold that the quality of education is of great relevance in educating dual language learners and in addressing their widely varying needs. They further assert that in order to become proficient readers and to be able to simultaneously recognize words and comprehend text, students require practice at decoding and fluency. They found that in the classroom, teachers must give equal attention to both word recognition and comprehension. For students who are English proficient, word recognition simply means “being able to read a word out loud,” but for DLLs, comprehension is much more difficult. Thus, in order to be effective, instruction must be divided among various areas including word meaning, decoding, grammatical structures, background knowledge, and comprehension skills (Stahl & Fairbanks, 1986).

Altogether, research emphasizes the need for instructional practices that integrate oral language proficiency, reading, and writing. Essentially, research has found that the quality of teacher-child interaction is *the* most important predictor of enhanced language and cognitive development (Dickinson, Darrow, & Tinabu, 2008; Tabors, Snow, & Dickinson, 2001) and that teachers can foster early language and literacy through conversations, which use rich and complex vocabulary (Wasik & Hindman, 2011). Other successful strategies that have been shown to enhance language development include the amount of exposure to different words, extended talk on a single topic, and talk that communicates information without controlling a child's behavior (Dickinson, Darrow & Tinubu, 2008). Importantly, providing students with the opportunities to speak and develop language skills is an imperative feature of high-quality programs and effective interventions (Wasik, Bond, & Hindman, 2006).

The Privileged Status of Vocabulary

From among the early language and literacy skills essential for later reading with fluency and comprehension, vocabulary knowledge has been identified as a crucial skill. The size of a child's vocabulary knowledge is strongly related to how well children will understand what they read (Stahl & Nagy, 2006); further, studies have evaluated the connection between early vocabulary/oral language and reading comprehension connection over extended periods of time and have proved that vocabulary discrepancies emerge early, are associated with later difficulties in reading and comprehension, and are unchanging without appropriate intervention (Biemiller, 2003; Hart & Risley, 1995). Because vocabulary knowledge is one of the strongest predictors of reading

comprehension, and because it is a critical skill that many children fail to attain, it is imperative to understand the aspects of classrooms and teachers that predict achievement and student success.

According to a report by the National Reading Panel (2000), oral vocabulary is described as “the key to learning to make the transition from oral to written forms, whereas reading vocabulary is crucial to the comprehension processes of a skilled reader” (p. 15). Those that lack these essential skills also lack the foundation crucial for reading with fluency and comprehension (National Early Literacy Panel, 2004).

Resterpo and Towle-Harmon (2008) discuss the challenges presented to preschool DLLs; they hold that these young students must develop skills in a language they do not speak while simultaneously gaining oral language and developing literacy skills in their native tongue. With downstream reading difficulties being associated with early weak vocabulary skills, strategic interventions that focus on building high priority vocabulary around meaningful instructional activities are needed. In fact, in order to catch up with their peers, DLLs would need to acquire several hundred words in addition to what they are already learning. Accordingly, instruction targeted towards these students must not only improve, but also accelerate vocabulary development (Biemiller, 2006). To mitigate the effects of poverty and/or language minority status to close early vocabulary gaps, targeted and strategic instruction must begin early in preschool when the highest rate of vocabulary growth occurs (Farkas & Beron, 2004).

Research has established that in the classroom, the amount of exposure to different words by teachers predicts vocabulary development, especially when the words

are relatively sophisticated in relation to a child's age and are used in ways that help the child understand its meaning (Hart & Risley, 1995; Hoff, 2006; Weizman & Snow, 2001). In a meta-analysis about young children's learning of words, Marulis and Neuman (2010) examined the effects of vocabulary intervention on Pre-K and kindergarten children's oral language development. Based on their analyses of 67 studies, they found that vocabulary training by teachers produced a large and educationally significant effect on word learning. Overall, results indicated that children's language development greatly benefited from strategic and targeted vocabulary interventions. Remarkably, gains with a gain of nearly one standard deviation on measured vocabulary outcomes were made. Additionally, when examining interventions targeted at at-risk language minorities, middle and upper income DLLs were much more likely to benefit from vocabulary instruction than those living in poverty. These results indicate that although vocabulary interventions improve oral skills, they may not do so equally well, especially for high-risk preschoolers.

Though the gap between language majority and language minority children in the classroom may not entirely disappear, the classroom setting still represents a primary source and opportunity for language enrichment. Many classrooms provide opportunities for children to participate in discussions, to be exposed to print in many forms, and to engage in higher cognitive language interactions. Research has shown that participation during teacher "read-alouds" contributes to vocabulary growth (August & Shanahan, 2008) and that extended talk on a single topic has also shown to assist children in acquiring language skills. Further, research has shown when children are encouraged to

continue to speak, they displayed stronger language growth (Peterson, Jesso & McCabe, 1999) and gained more from conversations when teachers use more open-ended questions (McKeown & Beck, 2003; Wasik, Hindman, & Bond, 2006), richer vocabulary (Tabors, Beals, & Weizman, 2001), and when engaged in cognitively challenging conversations (Dickinson, 2001; Foorman, Anthony, Seals & Mouzaki, 2002).

In summary, vocabulary knowledge has been identified as a crucial skill essential for later reading fluency and comprehension. The classroom setting represents a source for significant enrichment for vocabulary, especially among children who may not live in environments rich in exposure to oral language (Biemiller, 2006). Research has shown that strategic interventions, which increase the amount of exposure to different words, predict vocabulary growth. Specifically, vocabulary training by teachers has been shown to have a significant effect on word learning (Hart & Risley, 1995; Hoff, 2006).

Shared Book Reading

Language enrichment does not occur in a vacuum; several classroom practices, shared-reading in particular, provide rich opportunities for teachers and children to engage in evocative conversations that accelerate children's language acquisition. Shared Book Reading (SBR), a notable and widely used method of promoting young children's vocabulary development, involves listening to and discussing books. This teaching tool promotes higher cognitive language interactions and helps students gain inferential language skills from extended talk and open-ended questions (Wasik, Hindman, & Bond, 2006; Dickinson, 2001; van Kleeck, 2008; U.S. Department of

Education, 2015). Shared book reading refers to the interactions that occur when an adult and a child share a book together, and a considerable body of literature indicates a reciprocal and substantial relationship between child and adult communication during this focused activity (Hargrave & Senechal, 2000; Hindman et al., 2008; Reese & Cox, 1999). In recent years, several meta-analyses that support the importance of shared book reading and the interactions around shared reading have been published. Most notably are a series of studies by Bus and colleagues (Bus et al; 1995; 2004; Mol et al., 2008; 2011). These studies have consistently shown that shared book reading supports language, reading, and spelling achievement in children throughout their development. In particular, children more readily acquire vocabulary during this time than they would during other language interactions with language, such as dialogues during mealtimes or playtimes. Furthermore, story comprehension and language development increase when teachers ask questions about pictures, difficult words, and story events, and when they give informative responses concerning children's answers (e.g., Collins, 2010; De Temple & Snow, 2003; Mol, Bus, & de Jong, 2009; Mol et al., 2008). Accumulating research supports shared reading conversations as a means of developing oral language, especially vocabulary acquisition.

Shared book reading is composed of numerous and overlapping interactions that facilitate child language and literacy acquisition. The National Reading Panel (2000) cited the proven effectiveness of a number of instructional techniques used during shared-reading including repeated exposure, rich context, and direct instruction. Research suggests that shared-reading exchanges offer an “optimal setting” for engaging

preschoolers in numerous discussions (Gest et al., 2006; Massey et. al, 2008). Not only does SBR provide a rich, focused, and interactive environment, but interactions during this time often go “beyond the text” of stories and invite additional discourse between an adult and a child. Children are also provided with multiple opportunities to engage in conversations while adults ask questions, add information, and promote use of descriptive language (Wasik, Bond, & Hindman, 2006). As presented, research shows that cognitively enriched discussions in group settings during SBR are positively related to children’s vocabulary outcome measures (Hart & Risley, 1995; Wasik, Bond, & Hindman, 2006), but of added importance, it had been shown that the efficacy of shared reading is influenced by the *manner* in which a teacher reads and by interactions that occur beyond the text (Reese, Cox, Harte & McAnally, 2003). Therefore, not only are these high quality interactions likely to make reading more enjoyable but they also simultaneously increase the likelihood for learning new language and expanding a child’s comprehension skills.

As described in Dickinson and Smith’s observational studies (1994), these “child-involved analytical discussions” incorporate repetitions of low-frequency vocabulary words, classification of word meanings through definitions, picture clues, sentence context, and story meanings, and deep processing of meaning, which are fundamental to increasing the size of preschool vocabulary. Evidence suggests that repeatedly reading books out loud while explaining word meanings afford multiple exposures to the same new words which encourages word learning (Biemiller, 2001). Notably, according to De Temple and Snow (2003), extra-textual conversation may be the “key to unlocking” the

entire benefits of SBR. Further, research has found that the frequency with which information is expressed beyond the text is more strongly associated with children's receptive vocabulary by age 5 than with how often children are read to (Roberts, Jurgens, & Burchinal, 2005). Particular effects have also been found for analytic talk and questions concerning the meaning of words and discussion of plots, with studies suggesting reading styles lead to more rapid vocabulary growth in preschoolers (Dickinson & Tabors, 2001; Dickinson & Smith, 1994).

As evidenced, books are a source of rich language input strongly related to vocabulary growth in young children (Blewitt, Rump, Shealy, & Cook, 2009; Weizman & Snow, 2001). To summarize, the classroom practice of shared book reading provides rich opportunities for teachers and their students to engage in complex dialogue, which has been strongly related to language acquisition. During this focused activity, various interactions centered on the book take place before, during, and after reading, which increase vocabulary and story comprehension (De Temple & Snow, 2003; Mol, Bus, & de Jong, 2009). These overlapping rich and focused interactions provide an optimal setting for preschoolers and also lead to an increase in reading frequency (Hart & Risley, 1995; Wasik, Bond, & Hindman, 2006). In particular, extra textual conversations such as teacher questions have been related to significant gains in receptive and expressive vocabulary outcomes (Justice, 2002; Bus, van Ijzendoorn, & Pellegrini, 1995).

Teacher Questioning

Teacher cognitive complexity of questioning during shared book reading, in particular, has been shown to relate to significant gains in preschool children's receptive

and expressive skills (Justice, 2002; Bus, van Ijzendoorn, & Pellegrini, 1995; Senechal, 1997). These interactions of high demand require some decontextualization and encourage inferences about the cause of events, the feelings of characters, meanings of words, predictions, and relating elements to personal experiences (De Temple & Snow, 2003). Among the most studied of interactions around shared-book reading are those pertaining to teacher questioning. Questions are a powerful tool and represent a leading form of dialogue in preschool classrooms (Zucker et al., 2010). Questions and comments often simultaneously occur during shared book reading and have resulted in vocabulary gains, expressive language, receptive word learning, and emergent literacy (Ard & Beverly, 2004; Justice, 2002; van Kleeck, 2008; Walsh & Blewitt, 2006; Wasik & Bond, 2001). Further, children who are highly engaged and who have a high amount of inferential discussion with their teachers during shared book reading have been shown to have better reading comprehension outcomes (Sonnenschein, Baker, & Serpell, 2005). Thus, initiating dialogue about the material that is being read and asking open-ended questions provides opportunities for children to actively participate and to improve their understanding of language and vocabulary.

Through questioning, adults play a large role in scaffolding, or moving conversations to inferential levels, which assist children in gaining oral vocabulary knowledge (Walsh & Blewitt, 2006; Wasik & Bond, 2001). In a preschool study, Ard and Beverly (2004) found significant progress in receptive word learning for those who heard adult questions or combined questions and comments during SBR. Additionally, Blewitt and colleagues (2009) studied the effects of questions during shared book

reading and came to two important conclusions. First, both high and low demand questions benefit the initial process of word learning, regardless of a child's vocabulary. Secondly, when adults scaffold to higher demand questions, deeper understanding of words is better supported. Previous research has found that adult questions benefit a child's expressive vocabulary because they provide practice and increase attention to target words (Hockenberger et al., 1999; Senechal, 1997). Additionally, when a teacher asks cognitively demanding open-ended questions during SBR, children have a heightened level of consciousness and effort, which increases their memory. Therefore, through these cues, the attention of preschoolers is enhanced; this eases retrieval of related information and leads to children having a better understanding of presented text (Matute, Lipp, Vadillo, & Humphreys, 2011).

Additionally, the effectiveness of questioning on learning may vary as a function of the *type* of questions used during SBR interactions. Literal queries address concrete text features and illustrations (e.g., What color is his shirt? What did his mother have in her hand?), while higher level inferential inquiries require student to make judgments, predictions, or explanations about concepts described throughout stories (e.g., What do believe will happen next? Why did the bird chase after the cat?). Importantly, as the cognitive complexity in the type of questions asked increases, preschool language development also increases (Justice, 2002).

In their examination of the relationship between teachers' use of inferential and literal questioning, Zucker and colleagues (2010) found that the level of abstraction in questions was related to elaborated levels of children's responses at inferential levels.

Inferential questioning encouraged students to engage in conversations at more complex levels, with children adapting their own language to match that of cognitive demand shown by their teachers. Similarly, van Kleeck and colleagues (2006) randomly assigned at-risk children into no-treatment control conditions or a shared reading condition in which adults posed literal and inferential questions during reading sessions. Children exposed to inferential utterances showed a significant growth in vocabulary. Research has thoroughly demonstrated that going “beyond the text” leads to complex and extra-textual conversations (Dickinson & Smith, 1994; van Kleeck et al., 2006). Combined, these studies demonstrate that higher volumes of inferential utterances during reading are positively associated with children’s vocabulary outcomes.

In summary, these findings indicate that extended talk, cognitive complexity, and type of teacher questions promote child language and literacy. When children are engaged through an increased use of teacher strategies during shared book reading, vocabulary outcomes are further developed. Importantly, these strategies have been shown to help prevent poor literacy skills and reduce discrepancies among children, especially for those who may be at-risk (Zucker et al., 2010). Unfortunately, very little is known about teacher use of cognitively demanding questioning around shared book reading among language minority children. Given that dual language learners are increasingly represented in classrooms and often face the challenge of learning another language and instructional content, identifying instructional strategies that optimize opportunities to engage in language rich conversations that accelerate vocabulary acquisition would have practical, educational, and policy implications. The purpose of

this study is to examine verbal interactions between dual language learner preschool children and their teachers engaged in shared-book reading. Specifically, this study will evaluate teacher question frequency and question complexity in the context of teacher talk during shared book reading. The aim is to understand whether teacher question type is associated with vocabulary outcome measures of dual language learners.

CHAPTER III

METHOD

Procedures

This study will use an existing dataset of preschool teacher small group shared-reading video clips from an Institute of Education Sciences (IES) federally funded grant project titled Project Words of Oral Reading and Language Development (U.S. Department of Education, 2011). The goal of Project WORLD was to evaluate the effects of an 18-week shared-reading intervention on the language and literacy outcomes of English language learner preschool children in South Texas. The intervention targeted a range of cognitively complex activities with teacher talking points around content-related words using open-ended questions with feedback before, during, and after reading. Teacher-directed evocative conversations provided children with opportunities to deeply process new content-related concepts. In addition, the intervention offered intensive and intentional opportunities to integrate new information and vocabulary with existing knowledge so that new information would be understood at a deeper level. Data used in the present study included teacher and child data as well as videotaped teacher observations collected over the course of a randomized clinical trial (RCT) conducted in 2011-2012.

Earlier published studies of Project WORLD demonstrated that preschool children, largely from low-income households, who received 20-minute daily sessions of content-focused shared book reading and vocabulary instruction in five-day instructional cycles over 18 weeks far outperformed their practice-as-usual peers on receptive and

expressive vocabulary outcome measures. Significant effects were found on the standardized measure of receptive vocabulary as well as researcher-developed measures of receptive and expressive social and science vocabulary. Effects of the intervention ranged from $\delta_T = 0.93$ for general receptive vocabulary to $\delta_T = 1.41$ for intervention-specific receptive vocabulary (Gonzalez, Pollard-Durodola, Simmons, et al., 2011).

In an effort to fill this void in the literature on the complexity of teacher questions, the present study will examine patterns of teacher question type around shared book reading and the association of these patterns with child language and literacy outcomes. The aim of this study is to evaluate the relationship between question complexity, as it occurs during shared book reading, and children's vocabulary outcomes. Because of the cognitively demanding nature of questioning that emphasizes inferential knowledge and preschool children's limited basic comprehension skills, it was hypothesized that there would be a relationship regarding complexity of questioning between Project WORLD teachers and business as usual (BAU) teachers, which would positively benefit Project WORLD children in a statistically significant manner on vocabulary.

Participants

The setting for the study was two school districts in the Lower Rio Grande Valley of South Texas. The school district serves approximately 27,935 students who are overwhelmingly Hispanic (95.7%), economically disadvantaged (95.9%) and at-risk (20.9%). Of these students approximately 46.3% are limited English proficient (LEP) (Texas Tribune, 2012; <http://www.texastribune.org/public-ed/explore/la-joya-isd/>).

Participants in the present study were 42 preschool teachers from 23 preschools who consented to participate in small group Project WORLD instruction over the course of the 2011-2012 academic school year. In September of 2011, using stratified random sampling, all eligible teachers were randomized into either a treatment or business-as-usual (BAU) condition. In all, 23 teachers were randomly assigned to the Project WORLD condition and 19 teachers were randomly assigned to a business-as-usual condition. The BAU teachers engaged in regularly practiced shared book reading activities around four day cycles. For each condition, participating students were nested within teachers, and standardized and researcher-developed tests were administered before and after the intervention to measure their receptive and expressive vocabulary development.

After obtaining consent, forty-two prekindergarten and Head Start teachers participated in the study. Teachers were randomly assigned to participate in the intervention ($n=23$) or comparison ($n=19$) condition. Of the 42 participating preschool teachers, 95% held bachelor's degrees, and 5% held master's degrees. In addition, 83% held Bilingual/English as a Second Language (ESL) certifications, 7% held early childhood certifications, and 10% held degrees in other areas such as psychology, interdisciplinary studies, and social work. The average number of years total years teaching did not differ significantly between WORLD teachers ($M=8.09$, $SD=6.74$) and comparison teachers ($M=8.95$, $SD=8.13$), $t(40)= 0.38$, $p=0.71$. The average number of years teaching preschool also did not differ for WORLD teachers ($M=3.78$, $SD=3.59$) and comparison teachers ($M=3.89$, $SD=3.00$), $t(40)= 0.11$, $p=0.91$. Because the aim of

this present study is to examine distinctions in cognitive complexity of teacher question type during shared reading and its association with child language outcomes, both treatment and BAU teachers will be included in this study. Descriptive characteristics for teachers included in the final sample are listed in Table 1.

Table 1 Descriptive statistics for teacher-level variables by treatment conditions

Teacher-level variables	Intervention ^a	Comparison ^b
Gender		
Female	22	18
Male	1	1
Primary language		
English	14	12
Spanish	9	7
School district		
A	20	17
B	3	2
Total years of teaching	8.09 (6.74)	8.95 (8.13)
Years of teaching Pre- Kindergarten	3.78 (3.59)	3.89 (3.00)
Highest degree completed		
Bachelors	22	18
Masters	1	1
University reading credits	4.36 (1.15)	4.42 (1.23)
Professional development hours	93.09 (47.95)	102.32 (52.77)
Certifications		
Bilingual (general/ESL/Reading)	4	2
Interdis studies/Psych/Sci/Social	2	2
work		
Early childhood	0	3
Bil/ESL/Read	17	12

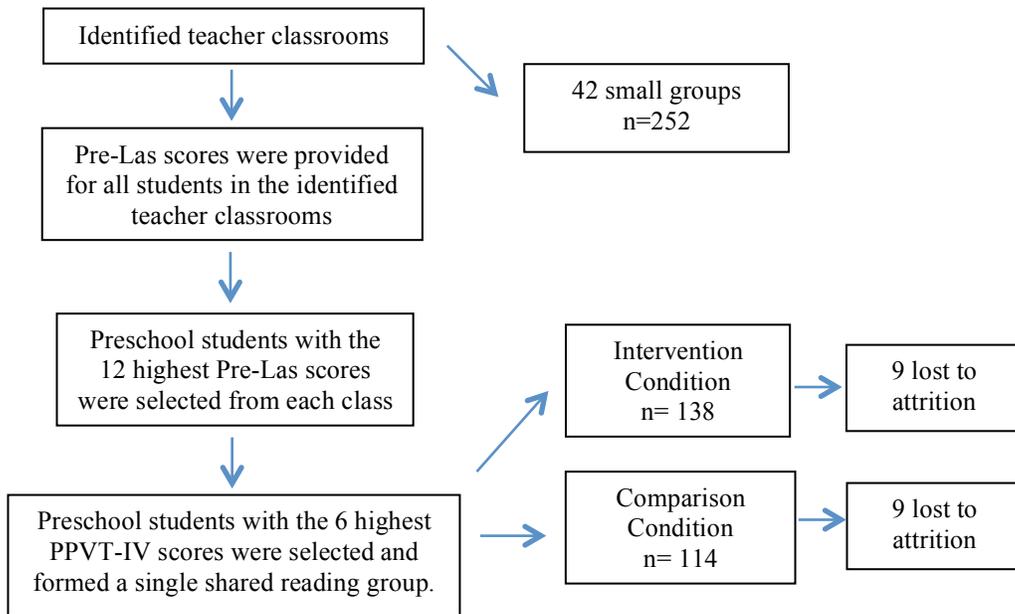
Note. All teachers are Hispanic. Teachers' years of teaching, university reading credits, and professional development hours are reported by the mean and standard deviation.

N = 42.

^a*N* = 23. ^b*N* = 19.

A three-step process was used to identify 252 preschoolers who qualified to participate in the study. From these classes, in step one, school district personnel provided Spanish and English proficiency Preschool Language Assessment Scales (Duncan & De Avila, 2000) scores for all students in the identified teacher classrooms. In step two, to select 12 preschoolers who were eligible for testing, trained students in a Master's level education program rank-ordered English and Spanish scores in order from highest to lowest. Twelve preschool students were selected from among the highest English speakers and, if there were few or no English speakers, 12 highest Spanish speakers. From 12 students, in step three, six students who scored highest on the Peabody Picture Vocabulary Test-III (PPVT-III) were selected. Students who were selected formed a single shared reading group within the treatment and BAU. There were a total of 42 small groups of six children (3 females and 3 males), unless children dropped out or were absent. The students were nested under teacher treatment or comparison conditions, with 138 treatment students and 114 comparison students. Of the 252 students (138 intervention and 114 comparison) originally in the study, 18 (7%) did not complete outcome measures. Of those students lost to attrition, 9 were from the intervention condition and 9 were from the comparison condition. Figure 1 indicates identification process, assignment, and attrition of participants. Chi-square analyses indicated that the difference between the number of participants in each group was insignificant (chi-square= 0.01, p= 0.94). Pretest scores and demographic variables from participants in each condition will be presented in the following chapter.

Figure 1 Identification Process, Assignment and Attrition



Children within these districts were predominately Hispanic, economically disadvantaged, and were on average 3.62 years old. Of these students, 95% were classified as Bilingual, with an overwhelming majority (94%) speaking Spanish as a first language. Most of these students were economically disadvantaged, with 92% of them being eligible for a free or reduced-cost lunch. Descriptive characteristics for students included in the final sample are listed in Table 2.

Table 2 Descriptive statistics for student-level variables by treatment conditions.

Student-level variables	Intervention ^a	Comparison ^b
Gender		
Female	69	57
Male	69	57
Ethnicity		
Hispanic	127	108
Native-American	2	2
School district		
A	120	102
B	18	12
English Learner status		
Bilingual	133	107
Non-bilingual	5	7
Age in months (at pretest)	56.88 (3.67)	56.11 (3.57)
Attendance	7.28 (6.43)	6.54 (0.99)
Lunch status		
Non-economically disadvantaged	11	9
Economically disadvantaged	127	105
Special education		
Yes = 1	4	2
No = 0	134	112

Note. Students' ages and attendance are reported by the mean and standard deviation.

N = 252.

^a*N* = 138. ^b*N* = 114.

Measures

In order to assess receptive and expressive vocabulary development of students at pretest and posttest, a battery of standardized, norm-referenced measures and researcher-developed measures were administered. Trained graduate assistants and project personnel administered these assessments two weeks prior to intervention and two weeks post intervention. Individuals who collected data completed training, which included practice time. Data collectors were trained and assessed until they reached complete reliability on all measures prior to administration. Standard scores were used for

standardized assessments and raw scores were used for researcher-developed assessments, which will be subsequently described.

Receptive Vocabulary. The PPVT-4 (Dunn & Dunn, 2007) is an individually administered norm-referenced assessment used to measure receptive vocabulary. Specifically, it is used as a screening tool for English language ability and language development in educational and clinical settings. For its administration, examiners present a series of four pictures on a panel to each child; the child is then asked to point to a picture of an object or action named by the examiner. Reported alpha and split-half reliability coefficients are in the range of 0.93 to 0.95 for Forms A and B, respectively.

Receptive vocabulary was also evaluated with a custom Researcher-Developed Receptive Picture Vocabulary Test (RDRPVT). This assessment was created for the federally funded grant Project WORLD (Gonzalez et al., 2011) and was generated to be comparable in procedure, materials, and response requirements to the PPVT-4 and was created to measure target words taught during the WORLD intervention. In the same way, the examiner stated a target word from the intervention and the child was requested to point to one of four pictures on a plate that represented that word. Researchers used a stratified sampling procedure and selected 18 target words used throughout the intervention to construct this measure. Alpha coefficients based on their sample were .66 and .77, and split-half estimates were .68 and .80 (odd-even test items compared) for pre- and posttests, respectively.

Expressive Vocabulary. The Expressive Vocabulary Test, 2nd edition (EVT-2; Williams, 2007) is an individually administered, norm-referenced assessment of how

well individuals can name objects, actions, or concepts in English. Color pictures are presented to examinees, who are asked to name what is shown. This vocabulary test has prompts and cues in order to ensure examinees will attend to relevant aspects of each illustration. Age-related starting points and ceilings ensure that only a subtest of items is administered. Split-half coefficients presented in the manual were .93 to .94.

Expressive vocabulary was also assessed with an Researcher-Developed Expressive Picture Vocabulary Test (RDEPVT), also created for Project World (Gonzalez et al., 2001) was produced to be similar in procedure, materials, format, and response requirement to the EVT-2 and was specifically designed to measure vocabulary knowledge taught in the WORLD intervention. Children were asked to name the target word illustrated on the test plate, which consisted of a single vocabulary word. The researchers scored responses on a scale ranging from 0-2; 0 indicating a vague or incorrect response; 1 indicating an attribute of the target word (“water” from the target word “raindrop”); and 2 indicating a student provided the target word or a synonym. The target vocabulary words assessed were the same 18 vocabulary words as on the RDRPVT. On administrations, the expressive test was administered prior to the receptive measure. Alpha coefficients for the test were .52 and .77, and split-half estimates were .49 and .78 (odd-even test items compared) for pre- and posttest, respectively.

Instructional Materials and Procedures. Project WORLD (Gonzalez et al., 2011) used an 18-week intervention organized by four different themes with daily 15-20 minutes lessons designed for each. Intervention teachers were presented with

instructional materials and received manuals that included overviews and lesson plans for shared book reading and vocabulary instruction. All books came with a picture card for each theme and picture cards for each target vocabulary word.

Within the first theme, *Places Where We Live and Go*, four weekly lesson units were organized around the topics of cities, homes, school, and stores. Each unit, which consisted of specific books and concepts, had a number of key vocabulary related to the themes presented within the books. The second theme was *Nature*, which included weekly units about water, snow, storms, seasons, and light. *Earth- Land and Water* was the third theme with weekly units that included units on land, water, and the ocean. Finally, the last six units centered on the theme of *Living Things* and included information on plants, trees, ocean animals, birds, and animals.

The criteria used to select the 36 books (18 informational and 18 storybooks) were as follows: (a) age appropriate content and language, (b) an adequate number of key vocabulary related to various themes, (c) target words depicted within illustrations, (d) content could be read and discussed within the allotted session, and (e) the structure of the books permitted children to draw inferences by predicting and identifying main ideas (Gonzalez, Pollard-Durodola, Simmons, et al., 2011). Daily lessons were developed around the themes, books, and vocabulary using a 5-day instructional cycle; on days 1 and 3, new words and concepts were introduced, on days 2 and 4, previously taught concepts were reviewed and the teachers reread the book, and on day 5, new words were integrated and presented concepts were cumulatively reviewed.

Vocabulary Words and Instruction. The vocabulary words within the WORLD intervention were selected to assist students in developing associative sets of words (e.g. snow, melt, cloud, snowflake), meant to help them better understand and recall word relationships. In order to help guide the vocabulary selection process, Gonzalez et al. (2011) examined a range of word lists and curriculum materials and used the following criteria: (a) relevance to presented themes, (b) unlikely to be known or learned through ordinary conversation by preschool students, and (c) importance for later learning and understanding of word. Early lessons introduced two vocabulary words per book, and in order to scaffold difficulty through the units, subsequent books introduced three words from each text with a total of six words taught per week. Frequent encounters with the target words were integrated across themes and topics through reviews, repeated readings, and challenge questions. Children were introduced to words through ‘before reading’ exercises and continued to be presented with those same vocabulary words while their teacher was reading the book. Not only was an explicit definition presented, but children were also given in-context word meanings and concepts. Additionally, the ‘after reading’ review included picture cards and guided discussions with book related questions for each word.

Comparison Condition. In the WORLD project, teachers within the comparison group selected their own texts and reading strategies. Some were determined by the district’s curriculum and others were selected by the teachers themselves. Classroom sessions for both the intervention and comparison groups were videotaped to document the length of the book reading sessions, materials, and general procedures.

Video Observations. Over the course of the 18 weeks, Project WORLD and business as usual teachers were videotaped during one of their daily-shared reading lessons. Video observations occurred at the beginning (December 5-9, 2011), middle (January 30-February 3, 2012) and end (March 26-30, 2012) of the intervention and BAU conditions. Trained graduate assistants notified teachers a week prior to the observation of the date and time for the videotaped observation. Observations were stratified so that roughly an equal distribution of instructional days (i.e., Day 1, Day 2, Day 3, Day 4, Day 5) of the curriculum or practice as usual was observed. Videotaping was conducted using 4 gigabyte HD DV pocket camcorders to record high quality videos at high definition 1080p video clips. Video clips were subsequently downloaded into a Samsung flash memory card. Once video clips were secure in flashcards, they were subsequently uploaded to a secure server site located within the college of education.

Observational System for Coding Teacher Questioning

The NOLDUS Observer XT (Noldus) software system was used for coding and analysis of teacher video clips data. The Observer XT system provides software to collect; analyze, and present observational data. The system allows for customizable coding scheme building (e.g., question cognitive frequency and complexity), data entry, data management, statistical analysis and inter-rater reliability analysis. The Observer XT system is equipped with fully integrated video recording and playback functions. The system provides for continuous coding and tracking of events both visually and statistically. Specific to this study, the Observer XT system permitted coding and describing of teacher question complexity and type as being either high-demand (high

cognitive complex questions that focus on inferences and predictions), and low demand questions (low cognitive complex questions that require recall of story elements or description of picture). The advantage of using The Observer XT software is that it was used to code the shared book reading instructional activities with precision and allows one to look more closely at teacher question type and child outcome data and its relationship to language and literacy outcomes.

Each video clip was coded using The Observer XT system while viewing the video recording. A total of 126 treatment teacher observations (42 teachers \times 3 observations per teacher) were coded according to two foci: (a) question frequency and (b) question cognitive complexity. For this study, the aim was to understand how non-scripted questioning opportunities were distributed according to cognitive complexity. The hypothesis of this study was that higher-order questions would lead to better vocabulary outcomes. Specifically, questions where students were asked to associate new vocabulary with previously taught words and/or contrasting examples (i.e., tasks at the higher end of cognitive complexity) would influence vocabulary development more than questions where students were requested to label or define a vocabulary word (i.e., tasks at the lower end of cognitive complexity).

Coding of Teacher Questions

For this study, a coding system was developed in order to assess non-scripted teacher questions during shared book reading. The coding protocol is listed in Appendix A. Codes differentiating literal language (Levels 1 and 2) and inferential language (Levels 3 and 4) were largely adapted from the four levels of linguistic abstractions used

by Blank et al. (1978), van Kleeck et al. (1997, 2006), and Zucker et al. (2010). Specific codes and definitions are listed in Appendix B.

Various codes were employed to differentiate between scripted questions, cognitive complexity of non-scripted questions, and the occurrence of non-scripted “Magic Words” or vocabulary terms. Specifically, non-scripted questions were coded through various levels of linguistic abstraction (see Table 2 in the appendix); including literal questions, at lower levels of complexity (Levels 1 and 2), and inferential questions that were considered higher-order questions (Levels 3 and 4). Literal questions within Level 1 expose children to identifying, locating, and noticing perceptually present concrete entities (objects or characters pictured in the book). Examples include: “Where is the mountain?”; “Is this a shadow?” and “Can you say the word, mountain?” Questions within Level 2 are also literal questions; however, they focus on describing characteristics, scenes, and recalling information presented earlier in the book being read. For example, “What do you see?”; “What does the frog look like?”; “Do you remember where the shadow was?”

Inferential questions within Level 3 are questions that draw inferences, integrate ideas, and summarize information, such as: “How do you think Franklin felt?”; “Why is one cloud dark and one cloud white?” and “What was the big thing that happened in the story?” Finally, inferential questions at Level 4 are related to making hypothetical predictions, problem solving, defining words, and making text-to-life connections. Examples within this level include: “What do you think happened next?”; “What is an

appliance?"; and "What could the girl have done instead?"

Interrater Agreement

Two observers were used to calculate interrater agreement. The first author completed all coding and a second doctoral student who was trained in coding procedures coded multiple videos; observers' agreement was calculated separately from the coding procedures. Through the coding process, any disagreements were noted for the three events of interest including frequency of vocabulary words, frequency of non-scripted questions, and cognitive complexity of non-scripted questions. 23% percent of the videos (n= 27) were randomly selected and independently coded by an additional trained graduate student. Specifically, 21% of treatment videos (n=14) and 24% of control videos (n=13) were observed and analyzed by both coders. Any discrepancies were addressed through consensus. Observers' agreements for non-scripted vocabulary words resulted in a Cohen's kappa value of $k=0.92$ (96% agreement) and agreement for frequency of non-scripted questions resulted in a mean kappa value of $k=0.84$ (93%). Finally, cognitive complexity of questions throughout the selected videos resulted in a mean kappa value of $k=0.77$ (82%). These kappa values indicated satisfactory agreement.

Data Analytic Strategy

The research questions used student scores on standardized and researcher developed measures of receptive and expressive vocabulary as outcomes and teachers' Observer XT data as predictors. Because of the use of non-independent observations due to the nesting structure in our data (251 students nested within 42 classrooms),

multilevel modeling (Hox, 2002) was used to analyze the data, as it takes non-independency into account. Multilevel modeling is preferred over traditional fixed-effects models for nested data. Because non-independence of students within classrooms was likely to be a result of sharing the same teacher, in all multilevel models, the teacher was used to define clusters of students rather than the classroom. Additionally, this modeling was employed to analyze the extent to which teachers' inferential questioning behaviors might relate to children's receptive and expressive vocabulary growth within the preschool year. All multilevel models were estimated using SAS 9.2 (SAS Institute, 2007).

A hierarchical two-level linear random intercept model was the statistical model used; there are two levels used in this model, students nested within teacher. The following equations describe the models.

Level 1 (Student-Level) Model

$$\begin{aligned} \text{Posttest}_{ij} = & \beta_{0j} + \beta_{1j}\text{Pretest}_{ij} + \beta_{2j}\text{Age}_{ij} + \beta_{3j}\text{Home Language}_{ij} \\ & + \beta_{4j}\text{Maternal Education}_{ij} + \beta_{5j}\text{Paternal Education}_{ij} \\ & + \beta_{6j}\text{Access to Books}_{ij} + e_{ij} \end{aligned}$$

In this model, i = each student and j = each group. The model was estimated separately for each of the four posttest measures (i.e., PPVT-4, EVT-2, RDRPVT, RDEPVT) as the outcome variable. For each model, the pretest measure of the same variable was entered as a covariate. As shown in the previous equation, other covariates included in the models were age, home language, maternal education, paternal education, and access to books.

Level-2 (Group-Level) Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \text{ Intervention}_j + \gamma_{02} \text{ Freq. of Literal Qs}_j + \gamma_{03} \text{ Freq. of Inferential Qs}_j \\ + \gamma_{04} \text{ Non-script Vocabulary}_j + \gamma_{05} \text{ Years Teaching}_j + U_{0j}$$

$$\beta_{1j} = \gamma_{10} \text{ (the fixed effect of the corresponding pretest measure on the posttest)}$$

$$\beta_{2j} = \gamma_{20} \text{ (the fixed effect of age on the posttest measure)}$$

$$\beta_{3j} = \gamma_{30} \text{ (the fixed effect of home language on the posttest measure)}$$

$$\beta_{4j} = \gamma_{40} \text{ (the fixed effect of Maternal Education on the posttest measure)}$$

$$\beta_{5j} = \gamma_{50} \text{ (the fixed effect of Paternal Education on the posttest measure)}$$

$$\beta_{6j} = \gamma_{60} \text{ (the fixed effect of Access to Books on the posttest measure)}$$

In the Level-2 model, we included the intervention effect (i.e. Intervention), the frequency of literal questions, inferential questions, non-scripted vocabulary words, and teachers' years of experience in the model. The target effect, γ_{01} , captured the difference between the control group and the intervention group on the posttest measures after controlling for all other variables in both student- and group-level models.

In order to determine whether questioning frequency and question type were related to vocabulary outcomes, full information maximum likelihood, a method of estimating the parameters of a statistical model, was used for this analysis. An assumption of this model was that independent variables (i.e. frequency of questions) and dependent variables (i.e. outcome scores) were normally distributed among classrooms and students; therefore, this method gave a unified approach to estimation and maximized the agreement of the selected model with the observed data. Other assumptions included a normal distribution of error, homogeneity of variance, and

independence where observations were independent of each other. Because the purpose of this model was to determine whether certain variables were related to outcomes and not to improve or establish the perfect model, an unconditional model was not run. Consequently, intra-class correlations were not calculated.

Typically, researchers may use known information to predict missing data; however, in order to refrain from speculating about outcome measures based on demographics and other independent variables, missing data were deleted. Specifically, pairwise deletion was used, and only specific missing values and not entire cases were removed. Additionally, the data was screened for outliers; however, outliers were not deleted. Students with outlier scores, especially those who may be within the below average range, can be important to focus on when analyses use new instruments or attempt to understand relations between outlier scores and independent variables. Finally, centering was not used. Though there is slight collinearity among predictors, centering makes interpretation of analyses more difficult.

In addition to significance tests for the coefficients in the models, we also report effect sizes. These are analogous to R^2 values for regression (Raudenbush & Bryk, 2002). They are calculated as the proportion that the level 1 (student level) residual variance is reduced by the addition of a level 1 predictor to the model. Because they are calculated for single predictors, the values we report are more closely analogous to semipartial r^2 values than to overall R^2 values. Because these are only analogs to proportions of variance accounted for, their calculated values are sometimes slightly

negative; in which case we report a value of zero because the true variance accounted for cannot in reality be negative.

CHAPTER IV

RESULTS

The purpose of this study was to evaluate teacher question type and questioning complexity during shared book reading in order to investigate the relationship between questions and vocabulary outcomes in a sample of dual language learners. The presentation of results includes (a) a summary of descriptive information for control and treatment group outcomes (b) a summary of descriptive findings on teacher question frequency and complexity and (c) results on the relationship between question type and researcher-developed and standardized measures of receptive and expressive vocabulary.

Analysis of Pretreatment Assessments

Demographic variables were provided for all 252 children. To examine any potential differences on these variables (i.e. age, gender, ethnicity, English learner status, intervention group assignment) a series of t-tests and chi-square analyses were conducted. No statistically significant differences between the two groups on any of these variables were found. Thus, at pretest, the groups were equivalent on demographic variables. Table 3 presents analyses of those descriptive statistics.

Table 3 Analyses of Descriptive statistics between groups for student-level variables

Student-level variables	Chi square or t	p-value
Gender	0.00	1
Ethnicity	0.04	0.85
School district	1.17	0.27
English Learner status	0.87	0.35
Age in months (at pretest)	1.67	0.09
Attendance	1.22	0.22
Lunch status	0.78	0.98
Special education	0.35	0.55

Descriptive Information on Vocabulary Outcomes

The potential for differences between the intervention group and comparison group were further examined on pretest and posttest measures of vocabulary. T-tests were used to compare whether differences between means varied over test conditions and are presented in Table 4. As detailed, no statistically significant differences were found between groups when comparing pretest scores. Thus both groups were equivalent at pre-test for researcher-developed and standardized measures of vocabulary. On posttest scores, some statistically significant differences were found. Specifically, vocabulary post-test scores were larger in treatment groups on researcher-developed vocabulary measures than in comparison groups. No significant differences on posttest scores were found between groups on standardized measures.

Table 4 Pretest and posttest measures for intervention and comparison groups.

Measure	Pretest			t
	Total	Intervention	Comparison	
PPVT-4				
<i>N</i>	249	136	113	0.05, <i>p</i> = .957
<i>M</i>	63.81	63.86	63.76	
<i>SD</i>	15.42	14.76	16.24	
EVT-2				
<i>N</i>	238	132	106	0.17, <i>p</i> = .864
<i>M</i>	55.63	55.87	55.33	
<i>SD</i>	24.01	23.59	24.64	
RDRPVT				
<i>N</i>	252	138	114	0.69, <i>p</i> = .499
<i>M</i>	6.28	6.14	6.46	
<i>SD</i>	3.67	3.45	3.92	
RDEPVT				
<i>N</i>	252	138	114	0.28, <i>p</i> = .781
<i>M</i>	6.24	6.34	6.11	
<i>SD</i>	6.45	6.56	6.35	
Measure	Posttest			t
	Total	Intervention	Comparison	
PPVT-4				
<i>N</i>	234	129	105	0.53, <i>p</i> = .599
<i>M</i>	72.70	73.16	72.13	
<i>SD</i>	14.63	14.12	15.29	
EVT-2				
<i>N</i>	232	127	105	0.30, <i>p</i> = .762
<i>M</i>	64.08	63.65	64.60	
<i>SD</i>	24.01	25.09	22.75	
RDRPVT				
<i>N</i>	234	129	105	10.20, <i>p</i> < .001
<i>M</i>	11.83	14.43	8.64	
<i>SD</i>	5.18	4.25	4.38	
RDEPVT				
<i>N</i>	234	129	105	6.76, <i>p</i> < .001
<i>M</i>	14.98	18.32	10.88	
<i>SD</i>	9.37	9.59	7.25	

Note. Peabody Picture Vocabulary Test (4th edition); EVT-2= Expressive Vocabulary Test (2nd edition); RDRPVT= Researcher-Developed Receptive Picture Vocabulary Test; RDEPVT=Researcher-Developed Expressive Picture Vocabulary Test.

Descriptive Findings on Teacher Question Type

Table 5 presents frequency of literal questions, frequency of inferential questions, and total frequency of questions for both control and treatment groups. Independent t-tests were used to compare teachers' questioning frequency in control groups with teachers' questioning frequency in treatment groups.

Table 5 Teacher question frequency

Questioning	Total	Intervention	Comparison	t	Effect size <i>d</i>
Total Frequency					
<i>N</i>	42	23	19	5.76, <i>p</i> < .001	1.73
<i>M</i>	258	348	189		
<i>SD</i>	116	93	80		
Literal Qs					
<i>N</i>	42	23	19	5.36, <i>p</i> < .001	1.38
<i>M</i>	172	235	123		
<i>SD</i>	85	77	54		
Inferential Qs					
<i>N</i>	42	23	19	4.27, <i>p</i> < .001	1.86
<i>M</i>	86	113	65		
<i>SD</i>	41	30	38		

It is important to note that only questions that went above and beyond the treatment scripted questions were counted; this indicates that treatment teachers asked more questions than were required of the condition. There was a statistical difference between the intervention and comparison condition on frequency of questions asked by the preschool teachers. Results indicate that teachers in the treatment conditions asked questions at a higher frequency than teachers in the control conditions overall, $t(36) = 5.76, p < .001$. This was true for both literal questioning, $t(36) = 5.36, p < .001$, and

inferential questioning, $t(36)=4.27, p<.001$ and was statistically significant across all domains. Effect sizes were large across all domains ($d=1.73, d=1.38, d=1.86$) indicating differences in questioning among treatment and comparison groups were larger than one standard deviation.

Information related to questioning frequency at various levels of abstraction was also collected and is presented in Table 6. Overall, intervention teachers asked significantly more questions from Levels 1 (i.e., “Is this a cloud?”), 2 (i.e., “What does the cloud look like?”), and 3 (i.e., “Why do you think the cloud is dark?”) than comparison teachers. Intervention and Comparison teachers did not differ in the number of Level 4 (i.e., “What do you think will happen when it starts to rain?”) questions asked, which are the most cognitively complex type of questions. Finally, the frequency of non-scripted vocabulary words mentioned throughout intervention sessions is presented. The frequency of non-scripted vocabulary or “magic words” that are part of the WORLD curriculum were also coded in order to provide descriptive information.

Table 6 Summary of Vocabulary Descriptive Information Concerning Non-Scripted Questioning

	Total	Intervention	Comparison	t
<i>Levels of Abstraction</i>				
<i>Literal- Level 1</i>				
N	42	23	19	4.85, p < .01
M	89.52	128.45	50.59	
SD	47.10	57.88	36.31	
Range	9-244	22-244	9-144	
<i>Literal- Level 2</i>				
N	42	23	19	3.38, p < .01
M	73.59	89.41	57.76	
SD	27.08	34.40	19.78	
Range	27-136	36-136	27-97	
<i>Inferential- Level 3</i>				
N	42	23	19	7.60, p < .01
M	123.56	87.91	35.65	
SD	20.20	24.50	15.92	
Range	10-138	49-138	10-67	
<i>Inferential- Level 4</i>				
N	42	23	19	1.74, p=.09
M	39.10	23.27	15.82	
SD	11.50	11.30	11.70	
Range	0-46	7-46	0-42	
<i>Non-Scripted Vocabulary Words</i>				
N		23		
M		314		
SD		78.45		
Range		215-460		

Relation Between Questioning and Vocabulary Outcomes

To address our research questions, the data was analyzed using multilevel modeling. This accounted for the nested nature of the data (children within classrooms) and accounted for teacher variance. Four models were estimated, one for each of the four measures of interest (PPVT-4, EVT-2, RDRPVT, RDEPVT). The model for each outcome measure used the pretest value of the same measure as one of the covariates. Aside from the inclusion of the corresponding score of the pretest assessment, the four

models were identical. Each model consisted of two levels: the student level (Level 1) and the classroom level (Level 2). As a predictor of the slope, pretest vocabulary scores were entered at Level 1. Other child factors including age and those related to Home Literacy (Home Language, Access to Books, Maternal Education, Paternal Education) were entered as well. Small groups were treated at the classroom level; these variables included in this study (i.e. frequency of non-scripted literal and inferential questioning, vocabulary word frequency) were tested, as well as teachers' years of experience, and the intervention group. An additional classroom variable, frequency of total questions, was entered but was removed because it was never significant in models for any of the measures. Because the aim of the study was to determine whether non-scripted questions were related to child outcomes, the results of the control and intervention groups are reported together. HLM results for standardized measures of expressive and receptive vocabulary are presented in table 7.

Table 7 Hierarchical Linear Models of Standardized and Researcher Developed Measures

Parameter Estimates for Multilevel Models Predictors	Dependent Variable			
	PPVT-4	EVT-2	RDRPVT	RDEPVT
<i>Fixed Effects</i>				
Intercept	30.42	27.06	3.40	-4.34
(SE)	(13.33)	(20.14)	(5.15)	(9.01)
Level 1 Pretest (γ_{10})	0.76*	0.82*	0.49*	0.89*
(SE)	(0.05)	(0.05)	(0.07)	(0.08)
Level 1 Age (γ_{20})	-0.15	-0.09	0.12	0.15
(SE)	(0.19)	(0.30)	(0.08)	(0.13)
Level 1 Home Language (γ_{30})	-1.48	0.19	0.42	0.02
(SE)	(1.44)	(2.25)	(0.56)	(0.99)
Level 1 Maternal Education (γ_{40})	2.14*	0.97	0.30	0.19
(SE)	(0.62)	(0.99)	(0.25)	(0.44)
Level 1 Paternal Education (γ_{50})	-0.001	-0.001	0.001	-0.001
(SE)	(.0003)	(0.004)	(0.01)	(0.001)
Level 1 Access to Books (γ_{60})	-0.001	-0.001	-0.002	-0.001
(SE)	(0.001)	(0.001)	(0.01)	(0.001)
Level 2 Intervention (γ_{01})	3.62	7.41*	5.82*	7.83*
(SE)	(0.16)	(3.25)	(1.27)	(2.13)
Level 2 Freq. of Literal Qs (γ_{02})	-0.02	-0.05	-0.004	0.003
(SE)	(0.01)	(0.02)	(0.007)	(0.012)
Level 2 Freq. of Inferential Qs (γ_{03})	-0.02	-0.06	-0.002	-0.03
(SE)	(0.03)	(0.04)	(0.02)	(0.03)
Level 2 Non-Script Vocabulary (γ_{04})	-0.08	-0.08	-0.08	-0.11
(SE)	(0.05)	(0.07)	(0.03)	(0.06)
Level 2 Years Teaching (γ_{05})	0.20	0.21	0.08	0.01
(SE)	(0.12)	(0.18)	(0.06)	(0.10)
<i>Random Effects</i>				
Level 1 Residual Variance (σ^2)	63.38	166.05	9.64	29.32
Level 2 Residual Variance (τ_{00})	12.10	4.17	4.62	12.72

Four multilevel models were tested in order to determine whether there was a relationship between conditions, student, and teacher and vocabulary outcomes. Posttest score comparisons in vocabulary outcomes varied with student and teacher characteristics and question types. Random effects were included in order to measure all variation at each level and measure any potential progress. Further, throughout the

models, the first level error variance was the variance of the residuals, and the second level error variance-covariance structure was the variance of intercept random effects. Full information maximum likelihood was used to estimate the parameters of a statistical model. Assumptions of the model included a normal distribution of independent and dependent variables, a normal distribution of error, homogeneity of variance and independence of observation among individual participants. An unconditional model was not run because the purpose of this study was not to improve on or create the perfect model; consequently, the intra-class correlation coefficient was not calculated. Typically, comparative fit index or the root mean square errors of approximation are used to measure model fit. Output analysis reported by statistical analysis software reported no such fit indices. This likely occurred because the p-value reported for each predictor was sufficient in showing how well statistical models fit the set of observations. No significant discrepancies were found between observed values and the values expected under the models in question.

For these analyses, missing data were deleted, and only specific missing values and not entire cases were removed. Additionally, outliers were not deleted, as data, especially those that may have been within the low average range, may have been an important focus when attempting to understand relationships among independent and dependent variables.

Standardized Vocabulary Outcomes

The first research question examined the relationship of questioning type on outcomes of the PPVT-4 and EVT-2, standardized measures of receptive and expressive

vocabulary, respectively. The results of the analysis indicated no statistically significant relationships between frequency of lower cognitive complexity questions ($\gamma_{02} = -0.02$, $p = .17$) and vocabulary outcomes or between frequency of higher cognitive complexity questions ($\gamma_{03} = -0.02$, $p = .43$) and outcomes measured by standardized assessments. In other words, frequency of lower and higher cognitive complexity questions was unrelated to standardized vocabulary outcomes. The second research question concerned student-level and teacher-level variables and their relationship to outcomes on standardized measures of vocabulary, pre-test scores, maternal education, and intervention group accounted for post-test score comparisons. Not surprisingly, pretest scores on the PPVT-4 ($\gamma_{10} = 0.76$, $p < .001$) and the EVT-2 ($\gamma_{10} = 0.82$, $p < .001$) were related to post-test scores on the same tests. On the PPVT-4, maternal education was related to receptive vocabulary. Specifically, for every one year of education mothers had, there was a 2.14 standard score gain on receptive posttest scores. Significant results were also found for the EVT-2. Being in the treatment group resulted in a 7.41 standard score posttest gain over the comparison group on expressive vocabulary.

Predicting Vocabulary on Researcher-Developed Outcomes

The third research question examined the relationship between question type and the researcher-developed measures of receptive and expressive vocabulary on the RDRPVT and RDEPVT, respectively. The results of the analysis indicated no statistically significant relationships between questions of lower cognitive complexity ($\gamma_{02} = -0.004$, $p = .59$) and vocabulary outcomes or between questions of higher cognitive complexity ($\gamma_{03} = -0.002$, $p = .89$). As in the standardized measures, pretest scores on the

RDRPVT ($\gamma_{10} = 0.49, p < .001$) and the RDEPVT ($\gamma_{10} = 0.89, p < .001$) were related to posttest scores. Being in the intervention group was related to post-test score comparisons on the researcher-developed receptive ($\gamma_{01} = 5.82, p < .001$) and expressive ($\gamma_{01} = 7.83, p < .001$) measures of vocabulary outcomes as well.

CHAPTER V

SUMMARY

The purpose of this study was to evaluate the relationship teacher question type in the context of shared book reading and to investigate its relationship with standardized and researcher-developed receptive and expressive vocabulary in dual language learners. Research has found that shared reading conversations characterized by complex content-related vocabulary have been found to promote children's vocabulary acquisition (Gonzalez et al., 2011; Pollard-Durodola et al., 2011). Further, questioning in particular has been found to significantly promote word learning during SBR activities, with both high and low demand level questions benefitting the word process of learning (Ard & Beverly, 2004; Blewitt et. al., 2009; Wasik & Bond, 2001). Because teacher language in the classroom has been shown to be a powerful moderator of variability in literacy development for "high-risk" students (Hart & Risley, 1995; NICHD, 2000), the hope was to fill the void in the literature regarding this population and to highlight the important role that teachers play in preschool classrooms.

Descriptive Findings Concerning Questioning and Vocabulary Outcomes

Results indicate no significant differences between intervention and comparison groups on pretest measures. However, after implementation of the WORLD intervention, statistically significant vocabulary gains were found on some measures. Specifically, treatment group outcomes were statistically higher than comparison group outcomes on researcher developed measures. These findings are expected as these modified versions of the standardized tests specifically targeted content-related vocabulary words, which

were central to the intervention. There were no differences between groups on receptive and expressive vocabulary development as measured by standardized tests; however, both groups made significant pretest to posttest gains. These outcomes are similar to other studies related to shared book reading activities where researcher developed measures were more sensitive to vocabulary growth than standardized assessments (Hargrave & Senechal, 2000; Pollard-Durodola et al, 2011; Senechal et al., 1997).

Research has previously found that higher order questions have been shown to differentially relate to vocabulary outcomes (Ard & Beverly, 2004; van Kleeck, 2008). In order to systematically assess questions and their relation to vocabulary outcomes, descriptive findings related to question cognitive complexity were evaluated. Analyses determined that treatment teachers asked significantly more questions during shared book reading than did comparison teachers. Further, intervention teachers not only asked more questions in general, but they had significantly more queries at Levels 1, 2, and 3 of abstraction than did comparison teachers. This likely occurred because treatment teachers were given specific scripts to follow with various levels of questioning, which may have led to assorted follow-up questions at varying cognitively complex levels during shared book reading activities. This finding is important considering only unscripted questions were coded; therefore, the implication is that teachers generalized questions at varying complexities from the WORLD curriculum to their shared book reading activities by including more spontaneous questioning in their teaching strategies. Intervention and comparison teachers did not differ in the number of questions asked

from Level 4, the most cognitively complex type of questions suggesting no difference in the proportion of inferential questions asked by both groups of teachers.

Differential Effects of Questioning on Vocabulary Outcomes

The present study used hierarchical linear modeling (HLM), which accounted for the nested nature of the data, to analyze the relationships between teacher question type and various other variables on vocabulary outcomes. Findings indicated no significant main relationship between question type and vocabulary outcomes. Specifically, when examining literal questioning and inferential questions, the frequency of these differing levels of abstraction did not relate to receptive or expressive vocabulary as measured by either standardized or researcher-developed outcomes. These findings were not consistent with some of the existing shared reading research that has found significant relationships between question type and vocabulary outcomes. Specifically, questions have been shown to result in significant gains in preschool children's receptive and expressive skills (Ard & Beverly, 2004; Justice & Ezell, 2002; van Kleeck, 2008) during shared book reading activities, which subsequently influence emergent literacy, and better reading comprehension outcomes (Walsh & Blewitt, 2006; Wasik & Bond, 2001). It is altogether possible that the coding system created was not sensitive enough to detect finer grade questioning categories and thus could not capture any significant relationships. Other teacher verbal behavior not measured in the current study may have been related to outcomes. For example, some literature has determined that comments, elaborations on word meanings, *and* questions during SBR *best* support vocabulary development (Justice, 2002; Penno, Wilkenson, & Moore, 2002); therefore, future

research focusing on all teacher utterances instead of exclusively focusing on questioning may yield more fitting results.

Differential Effects of Assorted Variables on Standardized Vocabulary Outcomes

Though not the initial focus of the study, important socio-demographic variables were significantly related to vocabulary outcomes within the constructed models. On standardized measures of expressive and receptive vocabulary, pretest scores had a slight but statistically significant interaction with vocabulary outcomes for both measures. This outcome suggests that preexisting levels of vocabulary were positively related to effects of shared book reading such that children that started out with higher vocabulary performed better. In education, this is known as the “Matthew effect” a term used to describe the how early readers acquire reading skills. This term, described by Stanovich (1986), indicates that early attainment of reading skills typically leads to subsequent reading successes as a student learns and grows. Conversely, those who fail to learn to read in the early years of schooling may fall behind their same-aged peers and continue to fall further behind as their reading difficulties increase. In other words, a student with a greater existing knowledge and vocabulary base is expected to effectively progress while slow starters typically decline and continue having persistent problems, which leads to scholastic gaps in language and literacy early in life (Foorman, Anthony, Seals & Mouzaki, 2002; Early Childhood Longitudinal Study, Kindergarten Class, Farkas & Beron, 2004).

On the measure of standardized receptive vocabulary, mothers’ level of education was a significant predictor of vocabulary gains. This finding is consistent with

research that describes the importance of the home literacy environment and how it has the potential to affect literacy and academic achievement (Catts, Hogan, & Fey, 2003). It specifically aligns well with research that demonstrates a link between parent language and education and significant gains in vocabulary (Hart & Risley, 1995, Farkas & Beron, 2004, Denton et al., 2003); however, this relationship was only found within standardized receptive outcomes. Clearly, the greater the maternal education, the better child outcomes were. This may have occurred because better educated mothers engaged in more conversations with their children. Research has shown that these conversations may provide children with more opportunities to use words, thereby increasing their vocabulary (Storch & Whitehurst, 2002; Dickinson, Darrow, & Tinubu, 2008; Wasik, Bond, & Hindman, 2006). As previously reviewed, this finding is similar to earlier published studies of WORLD where significant relationships were found on standardized measures of receptive vocabulary as well (Gonzalez, Pollard-Durodola, Simmons, et al., 2011). This is meaningful because dual language learners require the development of a substantial receptive vocabulary, foundational for oral language and reading skills (STAHL, 2005; NICHD, 2011; Dickenson & Spraugue, 2001).

On measures of standardized expressive vocabulary, the WORLD condition was found to be strongly and positively related to vocabulary outcomes, which may speak to the impact of shared book reading practices and the WORLD intervention on generalized vocabulary. The repeated use of vocabulary in this intervention and embedded definitions throughout the shared book reading curriculum likely had an impact on learning. Further, teacher scaffolding around questions could have encouraged

children to speak more and practice vocabulary, therefore increasing their language and literacy skills. As indicated by evidence, young children from at-risk settings benefit from book reading interventions (Wasik & Bond, 2001; Wasik et al., 2006), and it is possible that these measures were sensitive enough to children's curriculum vocabulary growth. This differs from previous research concerning the WORLD shared book intervention, which did not find intervention groups to be significant moderators for standardized vocabulary outcomes (Pollard-Durodola, Gonzalez, Simmons, 2014; Pollard-Durodola et al., 2011).

Differential Effects of Variables on Researcher-Developed Vocabulary Outcomes

On researcher-developed measures of expressive and receptive vocabulary, pretest scores had a slight but statistically significant interaction with vocabulary outcomes for both measures, which further suggests, as with standardized measures, that preexisting levels of vocabulary were related to posttest levels. As indicated by the "Matthew effect" (Stanovich, 1986), those who start well will likely continue to do so, while those who start at a level behind their same-age peers may be unlikely to catch up. As previously described, a widening gap between these groups continues to grow and students who do not make initial progress in learning may have increasing difficulties. As found in previous studies, this suggests that students with lower entry level skills may need more intensive vocabulary instruction extending beyond small group session (Penno, Wilkinson, & Moore, 2002; Gonzalez et al., 2011). Additionally, condition was also found to be related to vocabulary outcomes on researcher-developed measures. This further speaks to the impact of shared book reading practices and the WORLD

intervention on content related vocabulary. Seemingly, being introduced to vocabulary words and related concepts through the WORLD condition leads children to have higher receptive and expressive vocabulary outcomes in a test created to measure target words. Overall, when measuring their vocabulary, these students demonstrated the ability to understand and express terms learned through the intervention condition. These findings are consistent with previous published studies of the WORLD intervention (Pollard-Durodola et al., 2011; Gonzalez et al., 2011).

Although there were no posttest differences between groups on standardized tests, which measure non-target vocabulary words, existing research indicates increased outcomes on targeted vocabulary may provide the foundation for additional vocabulary networking, though effects may not be apparent until some time in the future (Gonzalez et al, 2011; Hirsch, 2006). Longitudinal studies are needed to determine this growth; however, it is clear that knowledge-related vocabulary growth impacts later comprehension. Evidence suggests that frequent exposures to target vocabulary is beneficial and positively impacts expressive and receptive vocabulary outcomes, especially for children with low vocabulary knowledge from at-risk settings (Wasik & Bond, 2001; Wasik et al., 2006; Pollard-Durodola, Gonzalez & Simmons, 2014).

Limitations

Various limitations of this research should be considered. Importantly, the present study concerns a highly unique population of dual language learners in low-income, Hispanic families. Further, the sample was drawn from a fairly small geographic area. Therefore, results may only be generalized to a small group of individuals. Though

comparable groups of students and teachers may have similar results, it is also important to note that these observations were made for a very controlled study; therefore, teachers may have modified their usual teaching practices. It is important to consider whether similar findings could be replicated in larger, more diverse samples.

Another important limitation is that when evaluating relationships between numerous variables and outcomes, there was no control for Spanish or English language proficiency or any consideration of initial Spanish receptive or expressive levels of vocabulary. Additionally, the extent to which English and Spanish were taught in the selected dual language programs was not measured; therefore, the impact of preexisting language skills and the influence of language instruction could not be accounted for. Further, there are various other unmeasured variables not accounted for that may have affected the impact of shared reading activities. For example, at the student level, executive functioning, temperament, and self-regulation could have impacted attention, responsiveness to teacher question type, and subsequent learning. Additionally, at the teacher level, factors such as engagement, patience, and other teaching factors are unaccounted for and may have served as confounding variables. Evidence has shown that the quality of children's participation and language learning is increased by the use of *responsive strategies*, or multi-turn conversations where they are encouraged to participate (Cabell et al., 2011). If teachers were asked to invite children to initiate conversations and take turns, and if they had built on children's talk, significant vocabulary gains as related to teacher question type may have been made. This important aspect of following-up to children's responses was not addressed and may

have determined the importance of teachers elaborating and scaffolding children's initial responses with further questions. Similarly, due to the small-group nature of these experiences, individual children's utterances could not be linked specifically to vocabulary outcomes. Therefore, no links between question type and children's engagement and utterances during these activities could be examined. These variables have been shown to influence the efficacy of instruction children encounter in the classroom (Nelson, Benner & Gonzalez, 2003; Connor, Morrison & Petrella, 2004) and focusing on them may have yielded more information that could have been influential upon examining interactions with question type behaviors.

Implications for Future Research and Practice

The present study investigated the relationship between teacher question type and other variables on vocabulary outcomes. Some of the limitations are related to the sample of DLLs unique to this study, the nature of the controlled study, and unaccounted variables such as the extent of language-specific instruction, levels of Spanish vocabulary skills, and engagement and classroom climate. Using a larger sample of students in future studies could lead to more diverse information and different outcomes. Additionally, future studies should consider other aspects that may affect teacher question type such as, elements of the plots presented, student's interest in text topics, and additional unexplored variables such as attention and responsiveness during shared book reading activities.

Further, future research should focus on classroom engagement and question type behaviors. Numerous variables could have impacted the interaction between question

type and vocabulary outcomes. As such, other domains that should be considered in the future could include emotional support, such as classroom climate and regard for student perspectives; classroom organization, such as behavior management; and instructional support, such as quality of feedback and language modeling. Research has shown that all children benefit from effective teacher-child interactions, regardless of language status, race/ethnicity, or special needs (August & Shanahan, 2008; Bowman, Donovan, & Burns, 2001). Therefore, a tool used to assess classroom quality across this diverse population of dual language learners may have yielded more significant results.

As this study used extant data from an intervention study, teachers were not prompted to ask more questions. It would be beneficial for teachers to reflect on how and when to ask literal and inferential questions that go beyond the text. This may help teacher-child conversations move to inferential levels and may even assist teachers in their professional development. Research should continue to investigate the relationship between teachers' use of questions and vocabulary outcomes. For example, assigning two different conditions, including a no-treatment condition and a shared reading condition in which adults were *prompted* to pose literal and inferential questions would likely give us more information regarding extra-textual questions. Additionally, future research should take greater consideration of teacher behavior and the effects of the intervention. Relatedly, it would be important to analyze teacher perceptions of the intervention and determine if and how perceptions and behaviors impact outcomes.

Finally, future research should study long-term effects of outcomes in order to determine if in fact the increases observed might result in better vocabulary development

over time. Overall, it is particularly important to expand our knowledge of dual language learners and variables associated with successful language outcomes. Studies regarding the discourse complexity of teacher question type and its impact on DLLs and literacy outcomes are particularly limited; therefore, ongoing research in this area should continue.

Conclusion

Large disparities in exposure to language and literacy are demonstrated early in life and have been shown to be associated with a lack of vocabulary exposure and second language acquisition in the home (Foorman, Anthony, Seals & Mouzaki, 2002). Teachers face various challenges in the classroom as they are asked to support the learning of these and other students with varied abilities. When comparing dual language learners to others, significant discrepancies are observed at an early age (Farkas & Baron, 2004), and over time, these trends have been shown to continue throughout their scholastic education (NCES, 2004). Research has shown teachers can foster early language and literacy in the classroom through various practices (Wasik & Hindman, 2011); one of these practices is shared book reading, which provides a focused and interactive environment between adults and preschoolers (Ard & Beverly, 2004). The current study sought to better understand the interactions, which occur through shared book reading and how they would relate to vocabulary outcomes of dual language learners.

Teacher cognitive complexity of question type during SBR activities has been shown to relate to significant gains in vocabulary skills (Justice & Ezell, 2002; Bus, van

Ijzendoorn, & Pellegrini, 1995; Senechal, 1997). Further, questioning of differing complexity have been shown to benefit the initial process of word learning and have shown deeper understanding of words when teachers scaffold to questions of higher demand (Blewitt et. al., 2009). Because of significant empirical evidence, we expected to find significant progress in word learning as it relates to teacher question types.

Unfortunately, when examining teacher question type, relationships between questions and receptive and expressive vocabulary, as measured by standardized or researcher-developed measures, were not found. However, the WORLD curriculum was a powerful intervention and appeared to significantly influence outcomes on researcher-developed measures. Additionally, preexisting levels of vocabulary moderated outcomes. This speaks to the importance of the home literacy environment and its relationship on language.

Despite non-significant findings concerning teacher question type behaviors, understanding factors that moderate language delays and encourage vocabulary development of dual language learners should be a research priority. As previously discussed, school can often become the sole source of language and literacy development for this population, it is crucial to evaluate features that predict vocabulary, achievement, and overall success. Because research has found that teachers can foster early language with conversations that use rich and complex vocabulary (Wasik & Hindman, 2011), we should continue to evaluate and subsequently foster programs and effective interventions that provide opportunities for students to develop language through high quality teacher-child interactions. Importantly, the importance of going

“beyond the text” should encourage more work to be done in the area of stimulating rich extra-textual queries and dialogues in order to ensure that shared reading improves vocabulary and overall child outcomes.

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APPENDIX A

Coding Manual

This coding manual is designed to orient one to the purpose of the coding system, the distinctions of teacher questioning to be identified, and support substantial practice in coding each behavior group. This will ultimately lead to the ability to meet reliability standards and code actual data for this project.

Phase 1: Coding Protocol

Phase 2: Guided Practice- Coders should randomly selected videos together and practice coding

Phase 3: Independent Practice- Coders should watch randomly selected videos and independently practice coding; coders should come to consensus on coding disagreements

Phase 4: Reliability Testing: code randomly selected videos independently and test for interrater reliability

Coding protocol

Description of Unscripted Questions

An unscripted question is a question that has three or more words different from a scripted in the WORLD curriculum.

A question is:

- Any utterance related to shared book reading activities in an interrogative form *“What is the boy doing?”*
 - Utterance that appears in a declarative form but has rising intonation *“He ate bugs?”*
 - Text-related questions included interrogative forms, forced-choice questions, and wh-questions *“Tell me what you think will happen next.”*
 - Questions statements that have the words what, who, where, when, why *“Why is he sad?”*
-

When to code a *question*:

- A question must be coded right after the coder has time to hear the question and to identify its cognitive complexity
- If the teacher repeats a question nobody answers, these count as different questions.
- If the teacher repeats a question to ask different students, these count as different questions.

When to code a *Magic Word*:

- Vocabulary words should be coded when they are unscripted, or used in addition to the script

Overview of Levels

Cognitive Complexity Levels		
Literal Questions, Level 1	Label/Identify Repeat Information	To ask about the name of an object or person; label To ask the child to repeat information/vocabulary
Literal Questions, Level 2	Describe scenes/ actions	Describe/discuss what is going on in the picture
	Qualities/ characteristics Recall Information	Describe qualities/characteristics of objects or characters Require children to recall information previously mentioned in the text; test the child's knowledge of previously discussed details
Inferential Questions, Level 3	Draw Inferences	Draw inferences from something not explicitly stated in the text; Infer/judge character's point of view, cognitions, and/or feelings Compare similarities/differences of objects, characters, or text
	Similarities/ Differences Summarize/ synthesize	Summarize/synthesize parts of the story across more than one page
Inferential Questions, Level 4	Predict/ Cause & Effect	Require students to make predictions/hypothesize about subsequent events or conditions; Identify causes of occurrences or events; identify direct/indirect effects
	Definitions	A statement or explanation that communicates the critical attributes or meaning of the target word; communicates understanding of the term
	Associate/connect	Draw text-to-life connections and comparisons; relate a concept in the book to the child's experiences, including past, present, and future experiences; formulate solutions to problems

Note. Coding categories adapted from Blank et al (1978), van Kleeck et al., (1997, 2003) and Zucker et al. (2010).

APPENDIX B

Specific Codes and Definitions

The distinction between literal and inferential language involves considering the level of cognitive demand that a linguistic interaction places on a child (Chapman, 2000). The following framework concerning cognitive complexity of questions is derived from Blank, Rose, & Berlin's (1978) four levels of linguistic abstraction that differentiate literal language (Level 1 & 2) from inferential language (Levels 3 & 4).

Note. Categories and descriptions adapted from Blank et al. (1978a), Gonzalez (2011), van Kleeck et al. (1997), van Kleeck (2003), Zucker et al. (2010).

Literal language- requires children to discuss, describe, and/or respond to information they can readily perceive^e; involves using language for purposes of labeling, describing characters, objects, and actions in the book.^a

Level 1 (Matching perception): includes adult language about the book that is very concrete and hence, the least abstract. Level 1 questions expose the child to identifying, locating, and noticing perceptually present concrete entities (objects or characters pictured in the book); examples include, "What is this?" and "Find the ball."^d

Description	Examples
Level 1	Teacher Question
1. To ask about the name of an object or person	<i>Where is the <u>mountain</u>? What is this called?" (S) Lightning Is this a <u>shadow</u>? What is this, everyone? (S): Rain What is all over the ground where Peter is walking? (S): Snow</i>
2. To ask the child to repeat information/vocabulary	<i>Can you say the word, <u>mountain</u>? Can you repeat the sound that <u>thunder</u> makes? This is an <u>otter</u>. Can you say, <u>otter</u>? Our word for the day is, <u>kangaroo</u>. Everyone, what is our word of the day? Can you say <u>enormous</u> with me?</i>

Level 2 (Selective Analysis/Integration of Perception): expose the child to a slightly higher level of abstraction. Questions at this level focus on describing characteristics, scenes, recalling information presented earlier in the book being read, and urging the child to complete a sentence of the book's text by using the typical intonation pattern that signals this expectation. Examples include, "What color is this?," or "What is he doing in this picture?"^d

Description	Examples
Level 2	Teacher Question
1. Describe scenes/actions	<i>What do you see? What else?</i> <i>What is the <u>kangaroo</u> doing?</i> <i>What is the baby bear holding?</i> <i>What is the bird building his <u>nest</u> with?</i> <i>What are the dog and the little girl doing in the <u>shade</u>?</i>
2. Qualities/characteristics	<i>How does the bear's shadow look?</i> <i>What does the frog look like?</i> <i>How many edges does this snowflake have?</i> <i>What colors do you see in this <u>rainbow</u>?</i> <i>Is this <u>cloud</u> dark or white?</i>
3. Recall Information	<i>How does the bear's shadow look?</i> <i>What does the frog look like?</i> <i>How many edges does this snowflake have?</i> <i>What colors do you see in this <u>rainbow</u>?</i> <i>Is this <u>cloud</u> dark or white?</i>

Inferential language - requires children to use their language skills to infer or abstract information by inferencing or analyzing, as occurs when a teacher asks a child to predict what a book might be about; involves using language for purposes of hypothesizing, reflecting on, and integrating ideas and information

Level 3 (Reorder/Infer about Perception): questions move somewhat beyond concrete discussion of what is immediately (or has just recently been) perceptually present. Utterances about the text at this level summarize information presented in the text or in pictures, provide a point of view for a character, compare similarities and differences, provide judgments about information presented in the book, and unify a sequence of pictures in the book. Examples include, "How do you think the little girl feels about her friend moving?," and "Bear is stronger than Little Bird, isn't he?"^d

Description	Examples
Level 3	Teacher Question
1. Draw inferences	<i>Why do they use <u>twigs</u> to build their <u>nests</u>?</i> <i>Do you think the bear is happy now?</i> <i>Do you think the boy is scared of the <u>storm</u>?</i> <i>How do you think Franklin felt?</i> <i>Do you think that was difficult for the <u>otter</u>?</i>
2. Similarities/differences	<i>Why is one <u>cloud</u> dark and one <u>cloud</u> white?</i> <i>What is the difference between standing in the <u>shade</u> and standing in the sun?"</i> <i>What is the difference between a <u>raindrop</u> and a <u>snowflake</u>?</i> <i>What is the same in these pictures of <u>plants</u>?</i> <i>How are a <u>twig</u> and a <u>trunk</u> similar?</i>
3. Summarize/synthesize	<i>What was the big thing that happened in the story?</i> <i>Can you tell me what happened during the <u>storm</u>?</i> <i>What happened first in the story?</i> <i>What was the big thing that made the baby <u>owls</u> worried?</i> <i>And then what happened in the end?</i>

Level 4 (Reasoning About Perception): pose the highest level of abstraction or representational demand. Questions at this level expose the child to dealing with information presented in books by reasoning in a variety of ways: making hypothetical predictions, problem solving, defining words, and making text-to-life connections. Examples include utterances such as, "What do you think made that happen?," and "What is a storm?"^d

Description	Examples
Level 4	Teacher Question
1. Predict/Cause & effect	<i>What do you think happened next?</i> <i>What do you think will <u>hatch</u> on this page?</i> <i>Why?</i> <i>What do you think the bird will build?</i> <i>Do you think the sun has something to do with the <u>shadows</u>?</i> <i>What will happen if the boy goes outside during the <u>storm</u>?</i>
2. Definitions	<i>Do you understand what a <u>shadow</u> is?</i> <i>What does the word '<u>puddle</u>' mean?</i> <i>Who can tell me what <u>enormous</u> means?</i> <i>What is an <u>appliance</u>?</i> <i>What's another word for 'too little'?</i>
3. Associate/Connect	<i>What could he have done instead?</i> <i>Where have you seen <u>lightning</u>? What was it like?</i> <i>Do you have an <u>appliance</u> at home?</i> <i>Can you tell me about a time when you felt like Franklin?</i> <i>Have you ever seen a <u>nest</u>? What did it look like?</i>