Exploring teachers’ read-aloud practices as predictors of children’s language skills: the case of low-income Chilean preschool classrooms

Author: Ligia E. Gomez Franco

Persistent link: http://hdl.handle.net/2345/3825

This work is posted on eScholarship@BC, Boston College University Libraries.

Boston College Electronic Thesis or Dissertation, 2014

Copyright is held by the author, with all rights reserved, unless otherwise noted.
EXPLORING TEACHERS’ READ-ALOUD PRACTICES AS PREDICTORS OF CHILDREN’S LANGUAGE SKILLS: THE CASE OF LOW-INCOME CHILEAN PRESCHOOL CLASSROOMS

Dissertation

by

LIGIA E. GÓMEZ FRANCO

submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

May 2014
ABSTRACT

Exploring teachers’ read-aloud practices as predictors of children’s language skills:

The case of low-income Chilean preschool classrooms

Ligia E. Gómez Franco

Dissertation Chair: Marina Vasilyeva, Ph.D.

Book-reading is a common practice among teachers in developed countries; yet, little research has been done on the nature and the role of this activity in predicting children’s language outcomes in developing countries with languages other than English. The present study sought to address this gap by examining preschool teachers’ speech characteristics and the read-aloud strategies used in Chilean schools serving Spanish-speaking children from low-income families. The investigation expanded previously used methodology by providing a more in-depth analysis of the teachers’ strategies used during book reading in preschool classrooms. It examined whether the variability in read-aloud strategies and speech characteristics predicted preschoolers’ vocabulary and comprehension growth over a school year. This study was exploratory in nature and it used available Chilean Prekindergarten data from Un Buen Comienzo intervention project. As part of the project, teachers were randomly assigned to either intervention or control group, with teachers in the intervention group participating in workshops designed to improve their instructional methods.
Teachers’ speech characteristics and read-aloud strategies were coded based on videotaped records of reading activities in classrooms. A final list of 24 read-aloud strategy codes emerged; High and Low level composites were created to reflect different degrees of cognitive stimulation. Descriptive analysis demonstrated substantial variability in the use of read-aloud strategies and speech characteristics across teachers. Teachers in the intervention group, on average, used a greater number of diverse read-aloud strategies than teachers in the control group.

Results from Hierarchical Linear Modeling analysis revealed a significant difference in the relation between the use of Read-aloud strategies and the growth of children’s vocabulary as a function of condition (intervention vs. control group). Specifically, for the teachers in the intervention group, *High-level* read-aloud strategies were found to be a statistically significant predictor of children’s vocabulary growth scores. In contrast, for teachers in the control group, this relation was not significant. *Low-level* read-aloud strategies and speech characteristics were not significantly related to children’s language outcomes in either intervention or control group. The implications of the findings for further research on classroom linguistic environment and for teaching practices in preschool classrooms are discussed.
ACKNOWLEDGEMENTS

I would like to acknowledge my dissertation committee—Dr. Marina Vasilyeva, Dr. Mariela Páez, Dr. Patrick Proctor, and Dr. Catherine Snow for their invaluable support during this process. A special thanks to Marina for always being so understanding and extremely supportive during this dissertation process as well as a wonderful mentor throughout my years at Boston College. My sincerest gratitude to Mariela and Patrick for caring guidance, not only during the dissertation but also while working on their research projects. I have learned a great deal about research thanks to those experiences. A huge thanks to Catherine, with whom I feel honored to have met and will always be thankful for the invitation to use the data from Un Buen Comienzo for this dissertation. Additionally, Catherine’s openness, wisdom, and charisma have been invaluable in my last years of grad school and during this process. Millón de Gracias! I could not have asked for a better committee.

In addition, I would like to thank my friends and colleagues at Boston College. They have been a family away from home and the memories I have of my time at BC will never be forgotten.

Finally, this process could not have been completed without the love and tireless encouragement of my husband, Robert Niebuhr, and the caring support of my mother-in-law Kathy—thanks for all the days you kept Sofie entertained so I could complete this milestone. Last but not least, I would like to dedicate this to my parents for their unconditional love and constant encouragement for my academic aspirations.
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>List</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td>CHAPTER 1: INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>CHAPTER 2: LITERATURE REVIEW</td>
<td>5</td>
</tr>
<tr>
<td>CHAPTER 3: METHODS</td>
<td>32</td>
</tr>
<tr>
<td>CHAPTER 4: RESULTS</td>
<td>44</td>
</tr>
<tr>
<td>CHAPTER 5: DISCUSSION</td>
<td>78</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>92</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>105</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Page

Figure 1A. Distribution of read-aloud strategies for the control classrooms............ 53
Figure 1B. Distribution of read-aloud strategies for the intervention classrooms..... 54
Figure 2. Diversity of read-aloud strategies by condition.......................................... 55
Figure 3A. Distribution of Passage Comprehension scores at Time 1 ...................... 70
Figure 3B. Distribution of Passage Comprehension scores at Time 2 ...................... 71
LIST OF TABLES

Table 1. Complete read-aloud strategy coding list .................................................................39
Table 2. Descriptive statistics for teachers speech characteristics ........................................45
Table 3. Correlations for teachers speech characteristics .......................................................46
Table 4. Descriptive statistics for speech characteristics by condition ..................................47
Table 5. ANOVA: Speech characteristics as a function of condition ....................................48
Table 6. Complete list of teacher read-aloud strategies displaying descriptive statistics .......50
Table 7. Descriptive statistics for High-level and Low-level composites by condition ..........59
Table 8. Descriptive statistics for teacher and child variables ................................................61
Table 9. Fixed effects for vocabulary outcomes as a function of speech characteristics ......63
Table 10. Fixed effects for vocabulary outcomes as a function of read-aloud composites ....67
Table 11. Fixed effects for vocabulary outcomes as a function of High-level composite ......68
Table 12. Fixed effects for comprehension outcomes as a function of speech ......................73
Table 13. Fixed effects for comprehension outcomes as a function of teacher read-aloud
strategies ..................................................................................................................................74
CHAPTER I: INTRODUCTION

Language skills developed by children during the preschool and early school years are important predictors of their later academic outcomes (Duncan et al., 2007; La Paro & Pianta, 2000). Thus, it is critical to identify factors that are associated with language mastery in preschool. Much of the research on the role of language environment has focused on home settings and family practices (Senechal & LeFevre, 2002; Hart & Risley, 1995; Weizman & Snow, 2001). Other studies have examined language environment in child care and early educational settings, indicating that the input children receive in these settings has important consequences for later language and literacy development (Dickinson & McCabe, 2001; Dickinson & Porche, 2011; Scarborough, 2001; Storch & Whitehurst, 2002; Snow, Burns, & Griffin, 1998). The notion that children acquire language from input is based on the constructivist framework, where environmental conditions are believed to have a role in language acquisition. In particular, research has shown that the type of adult language children are exposed to is strongly associated with their vocabulary and syntax development (Hoff, 2006; Huttenlocher et al., 2002). Some investigations focusing on the role of school environment and classroom practices suggest that the quantity and quality of linguistic input children receive during reading time influence their language skills (Dickinson & Porche, 2011; Mashburn, et al., 2008).

Reading practices have been predominantly researched in the United States and in several other wealthy, developed countries. Yet, most of the studies have not examined in detail how teachers’ speech characteristics and certain reading strategies are often embedded in more global characteristics of the classroom environment. The present dissertation extends this line of research by conducting an in-depth analysis of two
measures. One set of measures captures the features of teachers’ speech as part of read-aloud exercises using books, while another set of measures captures the specific read-aloud strategies used during these same sessions. Read-aloud practices at this level of analysis have not been researched in Latin American countries. The few research studies done in certain Latin American countries (i.e. Strasser & Lissi, 2009; Rolla San Francisco, Arias & Villers, 2005) show that reading is neither a common practice in schools nor at home (Superreguy, Strasser, Lissi, & Mendive 2007). The high cost of books and limited access to printed material have been cited among the main reasons for this deficiency in Latin America (Strasser & Lissi, 2009). However, some Latin American countries—in particular Chile—are currently undertaking significant efforts to change the educational policies by placing particular attention on literacy practices in preschool. Chile is an especially interesting example because its government has identified education reform as a national priority in recent years (Villalón, Suzuki, Herrera, & Mathiesen, 2002). Nonetheless, empirical research analyzing factors associated with educational achievement in the Chilean context and the outcomes of newly implemented educational programs is still necessary. In the absence of existing data it is critical to conduct studies that could empirically examine whether there is any variability in teacher practices, especially at the preschool level, during academic-oriented activities such as read-aloud sessions, and whether particular teachers’ practices are associated with better student outcomes.

Research in this domain could help us to better understand the kinds of linguistic interactions that guide read-aloud practices in Latin America and more specifically in the Chilean school context. Moreover, this type of research could inform our knowledge
about the relationship between the linguistic input from teachers (i.e., read-aloud strategies and teacher speech characteristics) and children’s language growth. Therefore, the present study aimed to contribute to that body of literature by analyzing Chilean teachers’ speech and the use of read-aloud strategies, concentrating specifically on their relationship with children’s language growth. This study was exploratory in nature and it used available Chilean teacher and student data from the Un Buen Comienzo (UBC) intervention study to explore the linguistic input (reading strategies and speech characteristics) produced by teachers during read-aloud sessions. The study furthermore analyzed whether any relationship existed between teachers’ linguistic input and the children’s language growth and whether there was a difference due to the intervention.

The importance of early reading activities has been widely examined in research conducted with American preschoolers. Recommendations from the National Research Council Committee on the Prevention of Reading Difficulties in Young Children advised teachers to foster pre-literacy skills for children in American preschools (Snow et al., 1998). This dissertation seeks to extend this line of research to the Latin American context by analyzing the teacher’s reading practices in low-SES schools in Chile. This analysis stems from how recommended practices, accepted in a U.S. context, function in the Chilean context, as well as other practices that might be indigenous to Chile. The importance of concentrating in Chile is due to the fact that the selected schools are part of the first large-scale intervention effort in Latin America to improve language and literacy at the preschool level. The project has been called Un Buen Comienzo (A Good Start) and this dissertation used some of the data from this larger project, which included schools randomly assigned to either the intervention or the control group. Analyzing speech and
reading strategies at the micro-level seeks to better capture characteristics that may not be salient when coded as part of other confounding characteristics such as cognitive and environmental variables.

In summary, this study analyzed the extent and nature of variability among preschool teachers and determined whether the intervention has had an effect on the type of interaction and linguistic input teachers provided during read-aloud sessions. Moreover, this study informed an understanding into whether this variability in teacher read-aloud strategies and speech characteristics predicted language growth at the end of preschool.
CHAPTER II: LITERATURE REVIEW

While the main motivation of the proposed study had to do with a practical goal of improving educational practices, the review of factors related to children’s language growth took into consideration two proximal environments where preschool children develop—home and school. Both of these environments are critical elements related to child language growth as established by the literature. Because language skills undergo substantial growth during the early school years, this period of development is important as a predictor of academic success; therefore, factors associated with those language skills have been the focus of numerous investigations (Hart & Risley, 1995; Hoff, 2003, Dickinson & Porche, 2011).

The main reason for reviewing the home input in detail is that there is a limited amount of research on teachers’ speech characteristics; therefore, I used home studies as a reference from which to draw some of the measures for the present study. Additionally, this related to what types of measures should be considered when examining teacher input. Much of the existing work focuses on linguistic input that children receive at home. Even though the proposed study does not concern the child’s home environment, it is still critical to review research studies related to language features and the types of activities that have been found to promote the development of language skills at home. This is especially important for the preschool age, because the findings from home studies can serve as a base to support research findings in the school environment especially at the preschool level. For example, children’s language variability and development has been found to be related to the family’s socioeconomic status (SES). It has been well documented that the kind of input that children from low-income families receive at home is not as diverse as the input higher SES children receive at home (Hart
& Risley, 1995). Thus, the role of language exposure provided at school may be particularly important for children from a low SES background. Different aspects of the linguistic input received at school have been found to affect children’s language and literacy development. This review focused in particular on evidence concerning reading activities that engage young students, such as read-aloud strategies (e.g., Dickinson, 2001) and the type of speech (e.g., Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002) teachers use during those read-aloud sessions.

Much of the existing work, concerning both the home and school environments, has been done with English-speaking children. However, some research has been conducted in the Latin American context and is included in this review, especially to address the specifics of current education research in children, which provides the impetus for the present study.

**Linguistic Input at Home**

A number of important findings can be gleaned from studies done in the home environment. Research focusing on home environments has demonstrated that there is a relationship between parental linguistic input and children’s language development. A large body of research conducted in this area addresses the early development of children’s vocabulary. It has been established that the sheer number of words children hear is related to the size of their own vocabulary (Hart & Risley, 1995). Furthermore, we know that there is substantial variability in lexical input children hear from their parents, not only varying in number but also the diversity of words (Hoff, 2003). This is especially prevalent when taking into consideration family SES. Hart and Risley (1995)
estimated that the number of words heard by children in lower SES groups was half the number of those words uttered by professional parents. The results of this study also showed that the larger the vocabulary children are exposed to at an early age the fewer reading problems children will encounter later on in life (Hart & Risley, 1995). Another seminal study (Huttenlocher, Haight, Bryk, Seltzer & Lyons, 1991) examined children’s vocabulary growth and the variations in the number of words mothers spoke to their children during daily interactions. The authors found that the total number of words children hear from their caregivers and the frequency with which these words are presented are related directly to their vocabulary growth. Results also showed that even as early as 16 months, parents’ speech during daily activities accounted for an important variation in vocabulary growth.

Besides the frequency of words, researchers have also studied the effects of the diversity of vocabulary children were exposed to at home. Weizman and Snow (2001) studied the types of words mothers used in different activities at home. Some of these activities included contexts such as toy play, meal time, or reading both story and informational books. The results showed that mothers used more sophisticated words when reading information or non-fiction books as opposed to story or fiction books; however, mealtime proved to be a time when mothers produced the highest number of sophisticated words. The researchers also found that frequency of usage of sophisticated vocabulary by mothers predicted growth in children’s vocabulary. Similarly, Beals and DeTemple (1993) reported that during mealtime cognitively challenging conversations occurred, fostering the development of emergent literacy skills in kindergarten. Mealtime was also found to be a more flexible time where teachers engage in informal
conversations about events in the children’s lives, fostering the ways in which children elaborate on past or future events and thus practice their language skills (Cote, 2001). Yet an important finding of this study was that the differences among the three meal time groups (stationary teacher, circulating teacher, and non present teacher) was due to the actual organization of those times and not due to the amount of children talk (Cote, 2001). These studies show the importance of taking into consideration certain types of books as well as the specific contexts where child-adult interactions benefit children the most.

Huttenlocher, Waterfall, Vasilyeva, Vevea, and Hedges (2010) found diversity of caregiver speech to be a strong predictor of individual differences in children. Moreover, the order of acquisition of specific syntactic structures was predicted by the frequency of caregiver use of those structures. Also, children learned syntactic structures in the order that they were exposed to them. This study also found a bidirectional relationship between the caregiver and the child, in which the child’s earlier vocabulary development predicted the caregiver’s later use of certain types of words. This study supports the notion that the order of acquisition of words and certain types of syntactic structures is determined by the type of exposure they receive.

The linguistic input mothers provide was also studied longitudinally at the syntactic level (Hoff-Ginsberg, 1986; Vasilyeva, Waterfall, & Huttenlocher, 2008). Hoff-Ginsberg (1986) analyzed the functional and structural properties of maternal speech and its relationship to child’s language growth over a period of six months. This study found that three structural properties of maternal speech (noun phrase utterances, wh- questions, and the frequency of mother’s self repetition) were significant predictors of measures of
syntactic growth in children. In contrast, children grew syntactically at a slower pace when their mothers produced more acknowledgements of declaratives and therefore, had fewer noun-phrases in their speech. There were some correlations between the functional and structural characteristics; for example, the use of real questions by the mother was associated with a higher frequency of wh- questions, which in turn propelled children to use significantly more verbs.

Syntactic structures were also studied developmentally from the emergence of simple sentences to the acquisition of complex sentences in 22 to 42 month-old children (Vasilyeva et al., 2008). The authors found that there was a significant effect of parental education—children whose parents achieved higher levels of education produced higher proportions of complex sentences. This finding supports the notion that children who are not exposed to certain types of structures may not develop specific syntactic structures as rapidly as children who are exposed constantly to such structures. Researchers suggest that SES and parental levels of education influence the exposure to different types of sentences and, in turn, the children’s syntactic development (Hoff, 2006; Huttenlocher et al., 2002; Vasilyeva et al., 2008). Other studies, such as those by Huttenlocher and colleagues (2002), found that “the proportion of complex sentences in parent input was the major predictor of the proportion of such sentences in children” (Hutenlocher et al., 2002, p. 360). The study showed that children’s comprehension and production of these complex sentences was related directly to the production of those sentences by their parents.

Besides providing linguistic input during play time and informal conversations, most parents also read books to their children. It has been established that book reading
at home has great benefits for children’s oral language (Reese, Sparks, & Leyva, 2010; Senechal & LeFevre, 2002; Weizman & Snow, 2001). Senechal and LeFevre (2002) pointed out that children develop larger vocabularies when their parents frequently read to them. Having larger vocabularies is a strong predictor of students’ future story comprehension. Parental reading practices, however, vary according to the socio-economic status and the ethnic background of the parents.

Reading techniques have been found to vary among different ethnic groups; for example, it was reported that when Hispanics and African-American parents read to their preschoolers they ask fewer open-ended questions (Hammer, Nimmo, Cohen, Draheim, & Johnson, 2005; Vernon-Feagans, Hammer, Miccio, & Manlove, 2001). Others have found that Hispanic parents do not find book-reading an enjoyable activity to do with their children (Janes & Kermany, 2001), or that they view it mainly as school-related activity (Goldenberg, Reese & Gallimore, 1992; Boyce, Cook, Roggman, Innocenti, Jump & Akers, 2004), or not very useful when children are too young (Eilers & Oller, 2003). A study conducted at the national level in the United States showed that 48% of Latino parents who did not speak English and had less than 12 years of formal education never read to their preschoolers (Yarosz & Barnett, 2001).

Parents also have different book reading styles. A book-reading practice that has been widely used in empirical research is dialogic reading (Zevenbergen, Whitehurst, & Zevenbergen, 2003). During dialogic reading, adults ask questions after every page that has been read with the purpose of having children use new vocabulary and new sentences in their responses. Research studies that have used this reading technique have found mixed results. A classic work by Whitehurst and colleagues (1994) on dialogic reading
studied low-income households who had children in subsidized day-care in New York. The children were assigned to three conditions. In the first condition, children were read to by their parents and their teachers. In the second condition, children were read to just by their teachers. The third condition was meant for children to play under adult supervision and served as the control condition. Results of this classic study showed that children did better when they had the input from parents and teachers; however, it also proved implementing dialogic in small groups can be a challenge. Mol, Bus, de Jong, and Smeets (2008) trained low-income parents in this technique yet found small effects. Other researchers conducted studies comparing dialogic reading to other techniques. For example, Reese, Leyva, Sparks, and Grodnick (2010) trained parents in dialogic-reading and the elaborative reminiscing technique. During Elaborative Reminiscing, the parents help their children remember what happened in the story and to express feelings about the story. Mothers who were in the elaborative reminiscing group had children who showed significant positive effects in their narrative skills and marginally significant effects on their story comprehension. They found that the elaborative reminiscing technique was more helpful with diverse populations than the dialogic-reading technique, which did not show improvement in narrative or expressive vocabulary.

Studies that focus on parental input in relation to child language development are numerous (see Senechal et al., 2006 for a review of intervention studies); however, they have been challenged with alternative explanations (e.g., Lidz & Gleitman, 2004; Pinker, 2004). One such explanation is the possibility of the results showing a genetic influence more than an environmental one. In order to discard the genetic influence from parents, it is possible to study teachers in the school. According to Bronfenbrenner’s bio-ecological
systems theory schools become the second most important proximal environment for children; this is also likely true for linguistic input; thus, there is great importance in analyzing what occurs at the linguistic level in the school.

**Linguistic Input at School**

In addition to the linguistic environment of the home, another important source of language input for school-age children is provided by interactions with teachers and peers in the school setting, especially considering the number of hours spent and the frequency of such contact. For many children, particularly children coming from low-income communities, attending school creates an opportunity for increased exposure to different types of language and language-related activities compared with those available at home. Even though school factors exert important influence throughout the span of the school years, there has been increased attention recently to the language environment that children are exposed to in school in the early years, especially during preschool (Mashburn, et al., 2008; Zucker, Justice, & Piasta, 2010). Specifically, research has focused on specific settings in the classroom, such as blocks and dramatic play (Dickinson, Darrow, & Tinubu, 2008) or centers and meals (Cote, 2001) where informal conversations between the teacher and preschoolers occur.

Researchers have shown that the quality of early education has significant influence on the development of children’s language skills and later school success (Cunha & Heckman, 2006; Dickinson & McCabe, 2001; Hoff, 2006; Snow, et al., 1998). Several studies have examined a relationship between global indicators such as the quality of child care and the development of child language (Hamre & Pianta, 2007;
Pianta, La Paro, Payne, Cox, Bradley, 2002; Peisner-Feinberg, et al., 2001). For example, research conducted by Mashburn and colleagues (2008) demonstrated that, after controlling for a number of variables such as child and family characteristics, the quality of instructional interactions was positively associated with key measures of academic and language development, including receptive language, expressive language, rhyming, applied problem solving, and letter naming in preschool (Mashburn et al., 2008). A study conducted by Hamre and Pianta (2005) demonstrated the importance of high-quality teacher-student interactions for achievement gains, particularly for children from low-income families. Especially relevant are the interactions related to children’s language development in preschool, as they provide the foundation for later learning (Cunha & Heckman, 2006; Dickinson & McCabe, 2001; Dickinson & Snow, 1987; Snow et al., 1998).

Peisner-Feinberg and colleagues (2001) conducted a longitudinal study that measured the general quality of preschool experiences. The authors found modest long-term effects of general classroom quality on both cognitive and socio-emotional development. They reported a composite measure of preschool quality that included indicators of teacher sensitivity and responsiveness to students. These indicators predicted children’s receptive vocabulary later in kindergarten. Other intervention studies such as the High/Scope Perry Preschool Program (Barnet, 1996), focused on improving the lives of a group of high-risk children (3 and 4 year olds), have shown long-term effects for the participants in the treatment group. The study, however, did not show language-specific effects. Follow-up studies conducted when the participants reached age 40 have shown that the treatment group has overall higher life-time earnings, educational
attainment, and lower criminality records. These benefits not only aided the participants, but also extended to the larger society by cutting down the costs associated with criminal justice and welfare, among others (Nores, Beldfield, Barnett, & Schweinhart, 2005). Studies like the ones mentioned above and others have demonstrated that investing in early education not only has immediate benefits for children’s outcomes but also that these gains remain over time, benefiting the entire society (Yoshikawa et al., 2013).

The general quality of classrooms, as was mentioned above, greatly influences children’s lives. Equally important is the need to analyze the type of linguistic input children receive on a daily basis during their interactions with their teachers. Language input provided by teachers in the classroom context is a key component of children’s language environment (Dickinson & Tabors, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Wasik, Bond, & Hindman, 2006; Girolametto & Weitzman, 2002). Thus, the importance of analyzing the characteristics of the linguistic environment, more specifically the speech and reading strategies provided by the teachers in class, is clear.

**Teachers’ Speech Characteristics**

A line of research that focuses on examining the relationship between the quality of linguistic environment during preschool and children’s acquisition of language skills has shown associations between lexical richness and syntactic complexity of teacher-language that children are exposed to and children’s own language skills such as vocabulary and syntactic comprehension (Bowers & Vasilyeva, 2011; Wasik, Bond, & Hindman, 2006; Huttenlocher et al., 2002).
A seminal study by Huttenlocher and colleagues (2002) examined language input and its role in the acquisition of children’s syntactic skills. As part of this study the investigators examined linguistic input provided by preschool teachers in relation to children’s syntactic development. The study revealed that the characteristics of teacher speech were related to syntactic growth of students in the preschool classrooms. Interestingly, SES was related to children’s syntactic skills at the beginning of the school year, but not related to growth during the school year, which indicates that teacher input can influence the acquisition of syntactic skills, above and beyond SES effects. Moreover, compared to other measures of general quality of teaching, teacher syntax was still a stronger predictor of children’s growth scores, accounting for a contribution four times larger than the general quality of teaching. These results suggest that the syntactic growth in children was due to their teacher’s syntactic input during the school year.

Similar results were found in large-scale studies, such as the NICHD study, which examined language development in relation to linguistic input alongside broad indicators of child care quality (NICHD Early Child Care Research Network, 2000, 2002, 2005). The study was done with monolingual English-speaking children and took into consideration a broad array of cognitive outcomes such as attention, memory, language use, vocabulary, and language comprehension among others. The researchers found the amount of caregiver speech to be predictive of children’s later performance. The researchers reported that teacher-student verbal interactions mediated the effects of broad indicators of care quality on language development. For example, asking questions, responding to vocalizations and other forms of fostering language-related interactions
was associated with better development. Thus, this study demonstrated on a large scale the relevance of teacher input in the language development of children.

Linguistic input by teachers happens at many different times and in different forms throughout the school day. However, examining the characteristics of teachers’ speech specifically during reading time is useful for two reasons. First, it provides a common activity performed by most teachers on a regular basis. In addition, it offers the ability to compare different linguistic input (Girolametto & Weitzman, 2002) and reading strategies used by teachers during this particular activity (Dickinson, 2001a; Dickinson & Smith, 1994; Wasik, Bond, & Hindman, 2006).

**Linguistic input during book reading**

*Reading Strategies used by Teachers.* A common classroom activity considered important for developing language and literacy skills is reading as a group, also called circle-time, or read-aloud, where the teacher reads to a group of students (Hindman, Wasik, Erhart, 2012). The work of Dickinson and colleagues (Dickinson, 2001a; Dickinson & Smith, 1994) has shown that certain reading strategies that include analytic talk by the teacher during, as well as before and after reading, are associated with greater vocabulary growth in preschool children. As part of their project, Dickinson and Smith (1994) coded the teacher talk into three categories. They called the first category cognitively challenging talk, which included analysis of characters or events, prediction, connections between the story and real life, talk about vocabulary, definitions and function of words, summarizing and finally clarifying information about the story. The second category included lower cognitive demand such as instances where physical
characteristics of the book are being described or chorusing of familiar passages. The third category included talk related to managing behavior and attention in class; for instance, managing the seating arrangement or the expected behavior in class. The researchers found that more cognitively challenging talk was present where there was more total talk. Interestingly, during book reading more organization/managerial talk was found. The same study also incorporated a holistic approach to analyzing book reading. This approach included three categories: co-constructive, didactic-interactional, and performance-oriented approaches (Dickinson & Smith, 1994). The performance-oriented approach yielded higher scores on the children’s vocabulary performance. The investigation also included analysis of utterance-level interactions (i.e., total amount of teacher and children talk and associations with children’s PPVT scores). Overall, the authors found that analyzing teachers’ book reading using the utterance-level approach provided a “more stable description of how teachers read and discuss books” (Dickinson & Smith, 1994, p.117).

Using correlational and intervention studies researchers have also found both short-term (Duke, 2000; Whitehurst & Loningan, 2002) and long-term (Dickinson, 2001; Dickinson & Porche, 2011) positive effects of book reading on children’s language development. Dickinson and Porche (2011) measured content and quantity of verbal interaction in preschools. They analyzed three main types of teacher utterances during large group activities and book reading. These categories included attention-related utterances, which included comments made to hold or gain attention and teacher-correcting utterances, which had the goal of correcting incorrect responses by children during large group sessions, and finally, the percentage of analytic utterances during book
reading, which included the discussion about the meanings of words alongside an analysis of events and character-actions in the story. The researchers found that by kindergarten, and later, by fourth grade, the students had higher vocabulary scores when the preschool teachers used more analytic talk when reading books. This dissertation extends such work by concentrating the analysis on book reading at the micro-level. This examination included a unique in-depth analysis of multiple characteristics reflected in two measures: speech diversity and reading strategies during book reading in the context of an intervention study. Oral-language vocabulary and syntactic skills are key components of later reading comprehension. Thus, the larger the vocabulary children have, the fewer problems they will face when learning to read (Snow, 2006). This has been demonstrated in studies where oral language vocabulary predicted reading comprehension beyond preschool years (Cunningham & Stanovich, 1997; Mutter, Hulme, Snowling, & Stevenson, 2004).

For example, a study by Girolametto and Weitzman (2002) explored the linguistic environment provided by teachers when reading with children in a group. They explored the caregiver’s use of responsive language when addressing toddlers and preschoolers in the context of book reading and play-dough activity and its relationship to language productivity. Their results showed that the age of the children did not affect the caregivers’ responsiveness; however, it did affect the use of simple labels. The simple labels were more frequent with toddlers than with preschoolers. The study specifically analyzed three responsive language strategies (child-oriented, interaction-promoting, and language-modeling) used by caregivers. The results showed significant correlations between the use of these three strategies and the preschoolers’ language productivity,
thus showing the importance of caregiver input in the number of utterances, different 
words, and multi-word utterances produced by preschoolers. An interesting finding is that 
the context of the interaction (book reading versus play-dough activity) influenced the 
caregiver’s responsiveness. During the play-dough activity, the caregiver received higher 
scores for responsive language input than during book reading. The authors believed that 
the aim of book reading, viewed as a pre-academic activity, might not have promoted as 
many interactions as the play-dough activity. This final result suggests that context of the 
interaction plays a substantial role; more importantly, teacher training has shown to 
positively affect the way teachers interact with preschoolers during reading.

Research studies have demonstrated that there is a wide variability in the 
strategies teachers use during book-reading sessions, especially when children in a large 
group are being read to (e.g. Connor, Morrison, & Slominski, 2006). Large-group reading 
sessions provide an opportunity to enhance children’s vocabulary skills; however, studies 
have shown that certain type of strategies are more beneficial than others in fostering 
vocabulary knowledge (Dickinson, 2001a; Whitehurst et al., 1994).

Wasik, Bond, and Hindman (2006) trained Head Start teachers in specific book-
reading and conversation techniques designed to develop children’s language and 
vocabulary. They found that significant growth in vocabulary scores could be achieved 
when teachers foster learning environments that promote children’s abilities to express 
themselves through conversations during reading. Another finding suggests that the way 
teachers use strategies, such as questioning during book reading and using “predictive, 
reactive, and recall questions” (Wasik et al., 2006, p. 70) while making connections from 
what was read to other activities, are critical for the preschoolers’ language development.
Research done in Latin America. Most of the available research examining teacher’s input has been done in English-language environments. There is little research done in other languages like Spanish or in other regions such as Latin America. Yet the question of how teacher input predicts children’s language skills has important consequences for educators in both developed and developing countries. The few research studies in Latin America focus on emergent literacy (Bravo-Valdivieso, Villalon, & Orellana, 2006; Piacente, Rodrigo, & Urrutia, 1998) or on the effects of instruction (Rolla San Francisco, Arias, & Villers, 2005; Villalon, Silva, Razmilic, & Swartz, 2005). In particular, the quality of early childhood education has been a subject of discussion in many developed and developing countries including Spanish-speaking populations (UNESCO 2006; Yoshikawa et al., 2007). A study conducted in Costa Rica (Rolla San Francisco, Arias, & Villers, 2005) described the quality of instructional practices in kindergarten. The authors found that children in kindergarten did not show growth in emergent literacy skills throughout the school year. These children finished the school year without adequate preparation for the challenges of first grade, where students are typically expected to read and write by the end of the school year. These expectations are not generally considered unrealistic. Given that Spanish orthography is transparent and easily decodable it can move children into reading for comprehension faster than other languages such as English. During the observations, the teachers provided minimal feedback and virtually “no higher-order concepts were discussed” (Rolla San Francisco, Arias, & Villers, 2005, p. 124) in class. The teachers in the observed classrooms did not focus on cognitive and language development, paying more attention to the social development of the kindergartners, which is a necessary skill for this age-group and a
main focus in Chilean preschools. Yet cognitive and language development start early and deserve equal attention.

Similar results were found in Chile in a study conducted by Strasser and Lissi (2009). The authors found that kindergarten teachers spent little time in language or literacy instruction. Instead, most of the time was consumed by other activities that focused on the children’s behavior management. Some other activities such as reading stories averaged three minutes across observations. Discussion of meaning of words seldom happened during the observed times. In general the authors observed that both at home and school there was scarce access to books and literacy-related activities were infrequent. These results resonate with the ones found in Mexico and Costa Rica by Romero-Contreras (2007), where parents give importance to education, but their home practices are not conducive to preparing children for literacy development. In general, they found that homes have few books and reading is a rare activity.

Context for the Current Study

For children in Latin American countries such as Chile, where reading is an uncommon practice among parents (Romero-Contreras, 2007), teachers’ input provided in the educational context has the potential to become critical to understanding children’s language development. Results from international studies such as PISA (Program for International Student Assessment) have confirmed the need for improvement in the general quality of education. PISA results showed that Chilean students have low levels of reading and writing, comparable to children in other countries in the region (OECD-UNESCO, 2007; Bravo, Villalon, & Orellana, 2005, Vegas & Petrow, 2007).
In recent years the Chilean government has made efforts to improve early childhood education by establishing relevant development policies. Even though the access to education increased from 20.9 percent in 1990 (Umayahara, 2006) to 41.7 percent in 2005 (Contreras, Herrera, & Leyton, 2007), this increment was mainly relevant for children in the elementary grades. Therefore, coverage of 4 year olds reached only about half of those who needed access to preschool (Umayahara, 2006). As a result, part of the government’s plan included opening 20,000 new preschool centers that can offer access to the children who remained outside of the prior system.

Chile, similar to other Latin American countries, is in great need of developing its educational system. This is especially true for the public education systems that serve the lower end of the income distribution. In contrast to other countries in the region, Chile is well positioned in terms of health care and economic progress (World Bank, 2010). Despite the recently improved access to the educational system for under-resourced communities, the quality of educational practices still needs to be improved.

The Larger UBC Study. As part of the efforts to improve preschool education in Chile, an international team of researchers led by Harvard University investigators conducted the first large-scale experimental study of a preschool intervention in Latin America, called Un Buen Comienzo (UBC). Through an intensive professional development intervention, UBC’s main focus was to evaluate the impact of intensive professional development on classroom practices and on children, in order to contribute to the improvement of preschool education quality. As a result, extensive data have been collected including both teacher and child variables in preschool settings.
The preschool settings chosen for the study belong to the bottom 30% of the income distribution. Thus, the project was primarily serving families living in poverty within the metropolitan area of Santiago de Chile, between 2008 and 2011.

**UBC Data Collection Process.** The UBC professional development intervention focused on improving the quality of preschool education in language development, socio-emotional development, health, and family involvement. The UBC study was longitudinal in nature and had a cluster randomized design that included three cohorts (2008, 2009, and 2010), in six low-income municipalities called “comunas” of Santiago de Chile. Each of the cohorts received the same type of training during two consecutive years (Prekindergarten and Kindergarten). This made possible to aggregate the data from the Pre-kindergarten teachers among the three cohorts. Thus, the teachers in the three cohorts had the same level of training at the end of Prekindergarten. In order to be included in the study the municipalities had to have at least eight schools with prekindergarten and kindergarten classrooms and at least 20% of at risk children. At risk children had families who qualified to receive government social and health benefits among other measures such as income and levels of parental education (Yoshikawa et al., submitted).

In 2008, information was collected from the first cohort of 6 schools with 13 preschool classrooms in the *comuna* of Peñalolén. This cohort was followed as preschoolers moved to Kindergarten. In 2009, data were collected from the second cohort, which consisted of 18 schools with 25 classrooms in the *comuna* of Maipú and 11 schools with 16 classrooms in Lo Prado. In 2010, the second cohort was followed as preschoolers moved to Kindergarten and the third cohort of preschoolers was recruited.
and tested. This third cohort consisted of 11 schools with 16 classrooms in Estación Central, 11 schools with 13 classrooms in Pudahuel, and 7 schools with 9 classrooms in San Ramón. In 2011, the last cohort was followed into Kindergarten. Thus, a total of 92 Prekindergarten classrooms were involved in the study.

All children were followed for two years from the beginning of Prekindergarten until the end of Kindergarten. Each child was assessed at 3 different points in time: the first time point at the beginning of Prekindergarten, the second at the end of Prekindergarten, and the third at the end of Kindergarten. For this particular study, the first two data points will be used, that is, the beginning and the end of Prekindergarten. The collection of teacher measures happened at two time points, the first time point being at the beginning of the school year, and the second at the end of the school year.

The data collection in the project involved videotaping a classroom for the entire school day twice during the year. In addition to videotaping, one of the members of the research team collected information about classroom resources including the kinds of books available in the classroom, available materials such as writing supplies, and spatial organization of the classroom, including things such as the location of furniture and reading areas. Teachers were also given a questionnaire requesting demographic information as well as information about their professional training. The child data collected in the UBC project included measures of early math, language and literacy skills, socio-emotional assessments, attendance, and health-related data.

*UBC Intervention Program.* The UBC used a cluster-randomized controlled design with random assignment at the school level, in which schools within a *comuna* were randomly assigned to either the intervention or the control condition. Part of the
intervention required that the teachers be supplied with books in order to facilitate in-class group reading activities. The control classrooms received 10 books (rather than 100 in the intervention group) and were not instructed to do anything specific with them. Teachers in the control condition attended one module on self-care and stress reduction as opposed to the six modules in which the intervention teachers participated during the year (Yoshikawa et al., submitted). Teachers in the intervention condition attended monthly cycles of workshops or modules in which members of the intervention discussed effective strategies for working with their classrooms in the four main areas: language development, socio-emotional development, health, and family involvement. Each cycle included four consecutive sessions that typically occurred during one month. The first session consisted of an introductory workshop where the month’s topic was presented. The second session consisted of classroom observations and teacher coaching. During the third session the participating teachers received feedback on a classroom observation. Finally, during the fourth session the teachers and intervention team reflected on the work done during that past month (Yoshikawa et al., 2008). The area of interest to the present dissertation is related to oral language and early literacy development, where “teachers were trained on book-reading strategies, using extended discourse, and on developing vocabulary and emergent writing skills in children” (Yoshikawa et al., submitted). Topics related to language and literacy were covered throughout several modules. The specifics will be expanded in the next section.

UBC Literacy Program. The main areas focused on during the UBC literacy program were vocabulary development, oral comprehension, and emergent writing. Activities to support these skills were proposed for use during book-reading. The
activities to promote vocabulary development consisted in guidance on choosing a sophisticated word from the book being read, stating it clearly, giving examples of the use of that word in context, and providing an easy definition for the children to remember. After that process was completed, the teacher wrote the word on a piece of cardboard to be pasted on the Word Wall at a level where children could easily see it. The training on oral comprehension consisted of techniques to aid children to monitoring their comprehension of the text being read. These techniques were prediction, summarizing, visualization, and using previous knowledge to make connections. The emergent writing consisted of encouraging children, either individually with the aid of an adult, to draw a picture about the story read aloud, copy a selected word from the board, and write their name.

The Present Study

The rich data collected in this project provided an opportunity for subsequent coding and analysis, thus allowing researchers to address a variety of questions concerning the relationship between teacher characteristics and student outcomes. In the present study, I will use a subset of the collected data in order to address my research questions concerning the relation between teacher input during book reading and the development of children’s language skills.

Since the focus of this dissertation is on the language growth of preschool children, only data collected from preschool (Prekindergarten) classrooms will be analyzed. The outcome variables will capture the growth in children’s language skills from the beginning to the end of the preschool year. The teacher data will be based on
videotaped records of read-aloud procedures in preschool classrooms. As indicated earlier, teachers in participating classrooms were videotaped twice during the school year. The first session was at the beginning of the year and the second was closer to the end of the year. In the present study the teacher measures are based on the data collected during the second observation point because at that point we can expect to see differences between teachers in the intervention and control conditions. It should be also noted that not all the videotaped sessions included read-aloud activities; only those classrooms where these activities were recorded were included in the present study. The analytic sample was drawn from the 2008, 2009, and 2010 preschool cohorts. Even though the cohorts were staggered, the teachers in the three cohorts had the same level of training at the end of Prekindergarten, making it possible to aggregate the data for the analysis. A total of 47 classrooms from the three cohorts with their respective teachers and children were analyzed. These were all the classrooms where read-aloud activities were recorded during the second observation point.

The present study seeks to examine book-reading practices in Chilean preschools that participated in the project Un Buen Comienzo, looking at preschool teachers’ language and the reading strategies used during read-aloud sessions, both in relation to children’s language growth. The two overarching research questions focus first on describing the variability in the characteristics of preschool environments related to reading activities and second, on analyzing the possible associations that may emerge between linguistic characteristics of the classroom environment and child language growth over a school year.
Research Questions

I. Questions focusing on variability in the characteristics of preschool environments related to reading activities. The variability of preschool environments was analyzed using two focused areas: Teachers’ language characteristics and the teachers’ use of read-aloud strategies during reading sessions. This first set of questions regarding the extent of variability in language features and reading strategies were exploratory in nature.

A) Characteristics of teachers’ language during reading

- What is the extent of variability in the characteristics of teachers’ language? The objective of this question was to explore teachers’ language during reading sessions. Three main characteristics were examined: amount of speech, lexical diversity, and structural complexity of utterances. These features of speech have been found to vary significantly among caregivers and also have been found to be related to the growth of children’s language skills in English-speaking contexts. Here we examined these language characteristics among the Spanish-speaking preschool teachers in Chile. In addition to looking at the individual differences in these language characteristics, the relations among them were examined. For example, were teachers with a greater total number of words also presenting more lexical diversity and structural complexity in their utterances?
• Are there systematic differences between the teachers who participated in the intervention versus the control group in the amount of speech, lexical diversity, and structural complexity? It was hypothesized that teachers who participated in the intervention have acquired different skills than the teachers in the control group, but did these skills extend to the nature of their own language? Were there systematic differences in the total number of words, the diversity of the words in their language, and the structural complexity used during reading that can be systematically detected in the intervention group?

B) Read-aloud strategies used by teachers

• What is the extent of variability in read-aloud strategies across teachers? It has been shown in the literature that teachers can use a variety of reading strategies, especially during group reading. The present study examined whether Chilean preschool teachers use read-aloud strategies similar to the ones observed in U.S. schools; it also examined whether read-aloud strategies indigenous to the Chilean context emerge in the course of this study.

• Are there systematic differences in the number and types of read-aloud strategies used in preschool classrooms by the teachers who participated in the intervention versus the control group? It was hypothesized that teachers who participated in the intervention may use a greater variety of different teaching strategies as a result of the professional development intervention. They may also use more high-level strategies aimed at engaging students in a meaningful discussion of the text during reading activities.
II. Questions focusing on associations between teacher input during reading activities and child language outcomes (i.e., the growth of children’s vocabulary and comprehension over the school year). The second broad category had the objective of analyzing possible associations between the linguistic input provided by preschool teachers during read-aloud activities (speech characteristics and reading strategies) and the growth of children’s language skills (vocabulary and comprehension growth scores) over the school year. Two focal questions stemmed from this second broad category:

- What is the nature of the relation between teachers’ language characteristics and children’s language outcomes and does this relation differ for the intervention and control classrooms? Research has demonstrated that adult input has an influence on children’s language development (Wasik, Bond, & Hindman, 2006; Girolametto & Weitzman, 2002). It could be hypothesized that teachers who have more diverse and complex speech (e.g. diversity of vocabulary and structural complexity) will have students who show greater growth in language measures over the school year.

- What is the nature of the relation between teachers’ read-aloud strategies and children’s language outcomes and does this relation differ for the intervention and control classrooms? Literature has shown that specific reading strategies contribute to children’s vocabulary development (e.g., Wasik et al., 2006; Dickinson & Smith, 1994). Therefore, it was hypothesized that teachers with a higher use of cognitively challenging strategies may have students who show a greater growth of language skills over a school year, whereas teachers with a lower use of cognitively challenging strategies may have students showing a
lower growth of language skills. It was further hypothesized that the relation between teachers’ strategy use and children’s language outcomes may differ for the intervention and control groups. If teachers in the intervention condition use reading activities in a more regular and systematic way than teachers in the control group, the relation between their strategies during these activities and children’s language growth may be stronger than in the control group.
CHAPTER 3: METHODS

Participants

The schools in the study are public, which in general serve low-income communities in the metropolitan area of Santiago de Chile. Reports from the larger study showed (Yoshikawa, submitted) that there were no significant differences at the .05 level between experimental and control groups on the variables of interest (e.g. teacher years of experience and degree qualifications; children’s age and gender; and three measures of classroom quality) before the intervention started (Yoshikawa, et al., submitted). A total of 92 Prekindergarten classrooms took part in the larger project. Schools were randomly assigned to either intervention or control condition, resulting in 50 treatment and 42 control classrooms. Teachers in the intervention condition received intensive professional development with ongoing training sessions followed by observations and coaching on the different topics teachers included in the training. Teachers in the control condition participated in a workshop about self-care and stress reduction—topics that were not part of the intervention content.

From 92 classrooms participating in the larger project, 47 classrooms made the analytic sample for the present study \((n = 31\text{ intervention and } n = 16\text{ control})\). These were all of the classrooms that had read-aloud sessions on the day of videotaping at the end of the school year. The 47 classrooms from the present study were distributed across 38 schools; 5 schools (13%) had multiple classrooms (3 schools had 2 classrooms, 1 school had 3 classrooms, and 1 school had 5 classrooms) that were included in the study; in the majority of participating schools (87%), a single preschool classroom per school took
part in the study. The average number of children per classroom was 25, with a range of 5 to 34 children per classroom with complete data points for the present study.

Children. The total number of children in the analytic sample was 913. During the testing at the beginning of the school year (March–May), the average age of participating children was 53.41 months (SD = 3.62) with a minimum age of 41.13 months and a maximum of 64.43 months. The second testing was conducted 7 months after the first testing (October–December). There was a slightly greater percentage of females \((n = 495 \text{ or } 54\%)\) than males \((n = 418 \text{ or } 46\%)\). The children were all native speakers of Spanish living in municipalities principally serving low-income population in the metropolitan area of Santiago de Chile.

Teachers. A total of 47 lead-teachers form the basis of the analytic sample, 31 from intervention and 16 from the control condition. As indicated above, this number included all the teachers who had read-aloud activities in their classroom during the second videotaping session. The discrepancy in the number of the lead-teachers in the intervention and control condition reflected the fact that teachers in the intervention condition were more likely to use read-aloud activities when videotaping happened, specifically 37\% versus 17\% of the total number of teachers in the sample \((N = 92)\).

The lead-teachers were all female native speakers of Spanish from middle to low-middle socio-economic backgrounds. All the lead-teachers had fulfilled their Teaching Degree (license) requirements to be preschool teachers. The average age was 47, ranging
from 30 to 61 years at the end of data collection. Of the 47 lead-teachers, 44 teachers (94%) had completed a bachelor’s degree in Preschool Education, 2 teachers (4%) had completed a bachelor’s degree in another area, one teacher (2%) did not respond. A total of 5 teachers (11%) had a Master’s Degree in Preschool Education. On average, teachers had 6 years of total teaching experience ($SD = 1.46$).

**Measures and Procedure**

*Child Measures.* Measures of child language were based on two subscales from the Woodcock-Muñoz Language Survey Revised (WMLS-R) Spanish Form (2005). WMLS-R is considered a valid and reliable measure normed on 3,911 native monolingual Spanish-speakers from several Latin American countries such as Mexico, as well as Spain and the United States. Hence, this test was considered appropriate for the monolingual Spanish-speaking population of the study. WMLS-R was administered twice during the school year—at the beginning and at the end of prekindergarten. In the analysis, scores from Testing Session 2 were treated as the outcome variable, while scores from Testing Session 1 were used as a control variable to account for children’s initial level of language skills.

Children’s productive vocabulary was measured using the Picture Vocabulary subscale of the WMLS-R (2005). The Picture Vocabulary subscale is a productive vocabulary test. For the first seven items the interviewer requests the child to identify a specific object, the child then pointed to the correct object; the rest of the items require children to name objects that increased in difficulty as the test moved forward. When the
child made six mistakes within a sequence of eight items the test was discontinued. This subtest has a median internal consistency reliability coefficient of .90 for the Spanish version.

Children’s reading comprehension was measured using the Passage Comprehension subscale of the WMLS-R (2005). The Passage Comprehension subscale is designed to measure how well the child can understand written discourse. The test items increase in difficulty. The initial items measure symbolic understanding; specifically, the first six items require children to match a sketch-like drawing of a word with the actual colored picture of the object. In subsequent items, the child silently reads a passage and identifies a missing word that should be placed in the blank space to complete the sentence. This test is discontinued when five consecutive errors have been made.

Identifying the Read-aloud Activities. Each of the classrooms was videotaped for the entire school day (average of 4 hours per video). From these available data, the present study included for the analysis the sections of video containing a read-aloud activity at time 2. The reason for using time 2 was because it better reflected the differences between teachers’ approaches, potentially capturing the effects of the intervention. As indicated earlier, during the school year, the teachers in the intervention group received intensive professional development, whereas teachers in the control group did not. Therefore, what was observed at the end of the school year was more likely to reflect what was happening during the school year. The Time 1 data were collected at the beginning of the school year, before the teachers in the intervention and control groups
received any input; therefore, Time 1 was not indicative of what was happening during the school year. The reading sections were transcribed and coded as described below.

Transcribing the reading sessions. The first task consisted of identifying the teachers who had a read-aloud session at the end of school year. A read-aloud session was considered to start when the teacher signaled (by a song or command) to the students that it was time to read. The end of the read-aloud session was marked when the teacher had the students start a different activity either related to the story (i.e. color a picture of the main character of the story) or an unrelated activity (i.e. meal time). A native Spanish-speaker from Bolivia was responsible for all transcriptions of videotaped classroom interactions.

Segmenting the transcribed sessions into utterances was done under the supervision of an experienced researcher. Every video that was transcribed was then segmented into utterances and coded. The senior researcher and I checked for discrepancies in the segmenting and coding before moving on to the next video. This process was done for about 15% of the videos. Once agreement was reached the remaining videos were checked by the senior researcher every time concerns emerged.

Coding teachers’ speech. After the reading sessions were identified, the samples of speech were transcribed. Transcribing speech required segmenting the auditory flow into individual utterances which were typed into a spreadsheet. Once the transcriptions were completed for all the available classrooms, and were put into CHAT format, several teacher language measures were coded using the CLAN program (MacWhinney, 2000). First, reading strategies used by the teacher during the read-aloud activity were coded as
described above (see Table 1). The total number of types, tokens and the mean length of utterance (MLU) were counted using CLAN. All the CLAN analyses were done at the word level, because the nature of this study did not require smaller units of analysis (see Table 3). These measures reflected the amount of teacher speech during the reading session, diversity of vocabulary and the structural complexity of the speech, which were also included as predictors in the model.

**Teacher Read-Aloud Strategies.** The coding of the reading strategies used during read-aloud sessions in the present study was informed by research done in the field primarily by Dickinson and collaborators. Examples of coding categories introduced by Dickinson (1994) include: (1) Analytical talk, e.g., when the teacher asks the students to explain or make predictions about the story. (2) Vocabulary talk, e.g., when the teacher provides definitions of new words. Even though Dickinson’s framework served as a starting point, the present study has expanded this framework. Thus a contribution of the present study to this line of research is in the development of a detailed coding system that can be used to analyze read-aloud strategies used by teachers (or other caregivers).

**Read-aloud Strategy Coding.** To code read-aloud strategies, teachers’ speech was segmented at the utterance level and then coded into categories according to the type of function that the utterances represented. In addition to categories based on previous work, novel categories also emerged, such as Real Life connection, which indicated the instance when the teacher connected the story with some real-life event that either happened to her or to the children. The first group of codes included about 35 codes that after careful analyses were combined into 24 codes (Table 1). The rationale for merging categories was based on the similarity of functions (for example, Event Analysis and Prediction
were two related categories that were combined into *Analysis or Prediction*). Another example is the *Chiming* and *Repetition*—these two categories represented a time when the teacher asked the students to repeat selected text from the story; these two were combined into *Request for Repetition*. 
Table 1.

*Complete Read-aloud Strategy Coding List*

<table>
<thead>
<tr>
<th>Strategy Code</th>
<th>Complete Strategy Name</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>AnalyPred</td>
<td>Analysis and/or Prediction</td>
<td>Analysis of characters, actions, or events in the story and/or Predictions of what will happen in the story.</td>
<td>Porque le sirvió la comida en unos platos donde la cigüeña, que tiene un pico largo, no podía comer.</td>
</tr>
<tr>
<td>RqAnalyPred</td>
<td>Request for Analysis and/or Prediction</td>
<td>Request for analysis/predictions formulated by the teacher for the students to respond.</td>
<td>Ustedes creen que lo van a encontrar?</td>
</tr>
<tr>
<td>Sum</td>
<td>Summary</td>
<td>Teacher summarizes chunks of text. Or summary extracted directly from text, without other analysis of events.</td>
<td>Todos cooperaron para lograr tener esta rica zanahoria y poder comerla.</td>
</tr>
<tr>
<td>RqSum</td>
<td>Request for summary</td>
<td>Requests to summarize the text formulated by the teacher for the students to respond.</td>
<td>De qué es lo que era el cuento?</td>
</tr>
<tr>
<td>Voc</td>
<td>Vocabulary definition</td>
<td>Vocabulary definitions of new words, functions of words.</td>
<td>La <em>cima</em> es la parte de arriba de un cerro.</td>
</tr>
<tr>
<td>RqVoc</td>
<td>Request or Vocabulary definition</td>
<td>Request to give definitions of words.</td>
<td>Quién sabe qué significa la palabra egoísta?</td>
</tr>
<tr>
<td>WordAnaly</td>
<td>Word Analysis</td>
<td>Analysis of how to write words, letters, and/or sounds that comprise a word. Comparing words according to their sounds.</td>
<td>Empieza con la letra e de elefante.</td>
</tr>
<tr>
<td>RqWordAnaly</td>
<td>Request for word analysis</td>
<td>Teacher request for analysis on how to write a word or decompose the letters and/or sounds that make up a word.</td>
<td>Cuántas sílabas tiene astuto?</td>
</tr>
<tr>
<td>Clar</td>
<td>Clarification and correction</td>
<td>Clarifying in response to a child’s answer.</td>
<td>Child: el de la mochila roja. Teacher: la caperucita roja.</td>
</tr>
<tr>
<td>RqClar</td>
<td>Request for Clarification</td>
<td>Teachers asks students to clarify</td>
<td>Porque usted, qué dijo mi amor entonces?</td>
</tr>
<tr>
<td>StoryStrategy</td>
<td>Story Strategy</td>
<td>Teacher uses or talks about specific reading strategies include: prediction, visualization, summarizing.</td>
<td>La tía nos va a mostrar las imágenes del cuento y ustedes van a tener que ir imaginando lo que pasa en su mente y visualizando lo que cuenta la tía.</td>
</tr>
<tr>
<td>RQStoryStrategy</td>
<td>Request for report on Reading Strategy</td>
<td>Teacher requests children to name or talk about specific reading strategy. Strategies include: prediction, visualization, summarizing.</td>
<td>Qué es lo que era predecir, niños?</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>RepExt</td>
<td>Repetition and extension</td>
<td>Repetition or repetition plus extension and or correction. Whenever the teacher repeats and extends the child’s utterances.</td>
<td>Child: estaba aburrido. Teacher: estaba aburrido de que todos le estén copiando.</td>
</tr>
<tr>
<td>ReaLife</td>
<td>Connection with real life experiences</td>
<td>Including connections between text and real-life experience done by the teacher for the students.</td>
<td>A qué le tienen miedo ustedes?</td>
</tr>
<tr>
<td>RqDrec</td>
<td>Request for Direct recall</td>
<td>Requests for direct recall of recently read text.</td>
<td>Qué hizo la zorra cuando fue la cigüeña a su casa?</td>
</tr>
<tr>
<td>RqRepeat</td>
<td>Request for repetition</td>
<td>Teacher requests children to repeat part of the text, or specific words.</td>
<td>A ver, repitan la palabra ambicioso.</td>
</tr>
<tr>
<td>Skr</td>
<td>Skill routines</td>
<td>Skill routines, including singing or reciting songs to get ready to read, pay attention or clean up.</td>
<td>Y colorín, colorado, este cuento se ha acabado.</td>
</tr>
<tr>
<td>Book</td>
<td>Book</td>
<td>Book-oriented utterances. Talking about the physical features of the book itself, including title and authors.</td>
<td>El cuento se llama Blublu el Pez Espada.</td>
</tr>
<tr>
<td>PictPointing</td>
<td>Picture Pointing</td>
<td>Pointing to pictures or discussing about pictures.</td>
<td>Qué es esto para el caracol?</td>
</tr>
<tr>
<td>ReflReadingBehavior</td>
<td>Reflection on Proper Behavior during reading</td>
<td>Practices associated to expected behavior during reading.</td>
<td>Con qué se escucha cuando uno va a contar un cuento?</td>
</tr>
<tr>
<td>Org</td>
<td>Organization</td>
<td>Organizational and or managerial utterances.</td>
<td>María anda a sentarte ahí y ya Isabel deja tú por favor.</td>
</tr>
<tr>
<td>Att</td>
<td>Attention</td>
<td>Request for attention</td>
<td>Escuchen!</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>Reinforcement</td>
<td>Reinforcement utterances, including evaluations.</td>
<td>Muy bien.</td>
</tr>
<tr>
<td>ExtReadingAct</td>
<td>Extended Reading Activity</td>
<td>Initiating an extension activity related to reading. Making pictures to illustrate the story or reenacting the story.</td>
<td>Ahora, para finalizar vamos a pintar y luego vamos a recortar este elefante.</td>
</tr>
</tbody>
</table>
Analytic Approach

I. Analyses addressing the first set of questions focusing on variability in the characteristics of preschool environments related to reading activities.

A) Characteristics of teacher’s speech during reading

1. Descriptive statistics were used to analyze the central tendencies and extent of variability in characteristics of teachers’ speech (amount of speech, lexical diversity, and structural complexity).

2. Factorial analysis of variance was used to analyze if there were systematic differences between the teachers who participated in the intervention versus the control group in the amount of speech, lexical diversity, and structural complexity.

B) Read-aloud strategies used by teachers

3. Descriptive statistics were used to analyze the extent of variability in reading strategies across teachers at the end of the school year. For each teacher the number of utterances within each strategy category was calculated as well as the percentage of utterances in this category relative to the total number of utterances. Composites were calculated reflecting both the total number of utterances and the percentage of utterances categorized as high versus low cognitive stimulation. Descriptive statistics were obtained for individual strategies as well as composites.
4. Factorial analysis of variance was used to analyze if there were systematic differences in the reading strategies of teachers who participated in the intervention versus the control group.

**II. Analyses addressing research questions focusing on associations between teacher variables (i.e. reading strategies and teachers’ speech characteristics) and child language outcomes (i.e., the growth of children’s language skills over the school year)**

Since the students are nested in classrooms, Hierarchical Linear Modeling (Raudenbush & Bryk, 2002) was used to analyze the associations between teacher characteristics (reading strategies and teachers’ speech) and child language outcomes. A two-level model was used, with Level-1 being the student and Level-2 being the classroom. Outcome variables were children’s scores on the Picture Vocabulary and the Passage Comprehension subscales of the Woodcock-Muñoz Language Survey (2005). Based on these two outcome variables, children’s reading and comprehension scores at T2 were entered in the model while controlling for reading and comprehension scores at T1. This essentially allowed for modeling the change score on each of these two outcome variables as a function of teacher input measures, i.e., composites for strategies and the speech features. In order to see if there was a difference in the relation between teacher input and the growth of children’s language skills by condition (intervention versus control), a moderation model was examined. “Moderation implies that the causal relation between two variables changes as a function of the moderator variable” (Baron & Kenny, 1986, p.1174). At the first level, individual child characteristics and scores were entered.
At the second level, the effects of teacher linguistic characteristics were assessed by adding the teacher-level predictors.

The following Hierarchical Linear Model was used as a base to answer the specific questions about the relation between teacher variables and children’s language outcomes as a function of the intervention or control conditions. To interpret the effect of the moderator, I would look at the coefficients and determine whether being in the intervention condition enhanced the relation between teacher input and child vocabulary (this would be a positive coefficient for the interaction term) or if it diminished the relation (a negative coefficient for the interaction term). Follow up analysis were conducted once significant results were found.

Model 1.

*Teacher variables and children language outcomes as a function of condition*

\[
Y_{ij} = \gamma_{00} + \gamma_{01} \text{TeacherInputT2}_j + \gamma_{02} \text{Condition}_j \\
+ \gamma_{03} \text{Condition} \times \text{TeacherInputT2}_j \\
+ \gamma_{10} \text{ChildScoreT1}_i + u_{1j} \text{ChildScoreT1}_i + u_{0j} + r_{ij}
\]

\(Y_{ij}\) = Child score at T2 of child \(i\) in classroom \(j\)

\(\gamma_{00}\) = average score across all classrooms

\(\gamma_{01}\) = the main effect of Teacher Input* (i.e., read-aloud strategies or speech characteristics)

*Different types of Teacher Input (specific language characteristics or specific strategy composites) were analyzed in separate models

\(\gamma_{02}\) = the main effect of condition

\(\gamma_{03}\) = interaction effect between condition and Teacher input

\(\gamma_{10}\) = the main effect of Child Score at T1, a covariate
CHAPTER 4: RESULTS

The results are organized in two sections. Before presenting the analysis of read-aloud strategies, which were the main focus of analysis, features of teachers’ speech during reading sessions and their relation to children’s language growth were examined. The second section focused specifically on read-aloud strategies used by teachers, first investigating the variability in the strategies across classrooms and then associations between teachers’ use of these strategies and the growth of children’s language skills.

I. Variability in the characteristics of preschool environments related to reading activities:

A) Characteristics of teacher’s speech during read-aloud

1. What is the extent of variability in characteristics of teachers’ speech?

In order to explore the extent of variability in the characteristics of speech during read-aloud activities, three main features of teachers’ speech were examined: Amount of speech, lexical diversity, and structural complexity.
Table 2.

Descriptive Statistics for teachers’ speech characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lexical Diversity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Word Types</td>
<td>222.09</td>
<td>80.83</td>
<td>24</td>
<td>405</td>
</tr>
<tr>
<td><strong>Amount of Speech</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Word Tokens</td>
<td>700.79</td>
<td>366.35</td>
<td>26</td>
<td>1806</td>
</tr>
<tr>
<td>Number of Utterances</td>
<td>100.34</td>
<td>53.72</td>
<td>4</td>
<td>272</td>
</tr>
<tr>
<td><strong>Syntactic Complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Length of Utterance</td>
<td>7.09</td>
<td>0.96</td>
<td>5.05</td>
<td>10.05</td>
</tr>
</tbody>
</table>

Amount of speech was measured using the total number of word-tokens produced by each teacher. A mean of 700 words ($SD = 366.35$) with a range of 1780 was found across all teachers in the sample. The large standard deviation demonstrated that there was a great variation in the sheer number of words teachers produced during the read-aloud sessions. Teachers produced a minimum number of 26 words with a maximum of 1,806 words in a given read-aloud session. Lexical Diversity was analyzed using the Number of Word Types or different words produced by the teacher. The mean Number of Word Types was 222 ($SD = 80.83$). This measure also showed a wide range, 381, with a minimum of 24 and maximum of 405 Word Types. Finally, the ratio of total number of words over the number of utterances (MLU) produced by the teachers was calculated to index the syntactic complexity of the speech. The Mean Length of Utterance in Words (MLUw) across teachers was 7.09 ($SD = 0.96$) or about 7 words per utterance, the range was 5, with a minimum of 5.05 and maximum of 10.05.
To analyze the relationship between different features of teachers’ speech, bivariate correlations were computed; results are presented in Table 3. As shown in the table, the total amount of speech (Number of Teacher Utterances) was highly correlated with the number of Word Tokens and Word Types, which were also highly correlated with each other. In other words, teachers who produced a larger amount of speech during read-aloud sessions were also using a more diverse lexicon during these sessions. In contrast, the measure of syntactic complexity, Mean Length of Utterances (in words) was not correlated either with the overall amount of speech or with the measures of lexical diversity.

Table 3.

Correlations for teacher speech characteristics (n=47)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of Word Token</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of Word Types</td>
<td>0.954**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of Teacher Utterances</td>
<td>0.975**</td>
<td>0.920**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Mean Length of Utterance</td>
<td>-0.011</td>
<td>0.028</td>
<td>-0.200</td>
<td>1</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level.
2. Are there systematic differences between the teachers who participated in the intervention versus the control group in the amount of speech, lexical diversity, and structural complexity?

Descriptive statistics suggested that the intervention group had higher mean scores for the different measures of speech, *Total number of types, total number of tokens*, and *total number of utterances*. (See Table 4).

Table 4.

**Descriptive Statistics for Speech characteristics by condition**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control (n=16)</th>
<th>Intervention (n=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Number of Word Types</td>
<td>189.44</td>
<td>92.70</td>
</tr>
<tr>
<td>Number of Word Token</td>
<td>572.81</td>
<td>416.18</td>
</tr>
<tr>
<td>Number of Utterances</td>
<td>87.38</td>
<td>63.10</td>
</tr>
<tr>
<td>Mean Length of Utterance</td>
<td>6.67</td>
<td>1.19</td>
</tr>
</tbody>
</table>

A Multivariate Analysis of Variance (MANOVA) was used to explore the differences in the speech characteristics between the teachers who participated in the intervention and the control group. A significant effect of condition (*Lambda* (4, 42) = 0.79, *p* < .05) was found between the intervention and control groups. See Table 5.
Table 5.

ANOVA: Speech characteristics as a function of condition

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Word Types</td>
<td>25855.9</td>
<td>1</td>
<td>25855.9</td>
<td>4.24</td>
<td>.045</td>
</tr>
<tr>
<td>Number of Word Tokens</td>
<td>397287.2</td>
<td>1</td>
<td>397287.2</td>
<td>3.10</td>
<td>.085</td>
</tr>
<tr>
<td>Number of Teacher Utterances</td>
<td>4077.8</td>
<td>1</td>
<td>4077.8</td>
<td>1.43</td>
<td>.239</td>
</tr>
<tr>
<td>Mean Length of Utterance</td>
<td>4.2</td>
<td>1</td>
<td>4.2</td>
<td>4.98</td>
<td>.031</td>
</tr>
</tbody>
</table>

As shown in Table 4, the intervention teachers produced more words and more complex speech as indicated by all four measures calculated, the MANOVA reveals that only two of those differences were significant. The total Number of Word Types ($F(1,45) = 4.24, p < .05$) and the Mean Length of Utterance in words ($F(1,45) = 4.98, p < .05$) were significantly higher for the teachers in the intervention than for the teachers in the control group. The effect sizes according to Cohen’s convention (1988) for the two significant measures were between large ($d = -1.15$) for the Number of Word Types and moderate ($d = -0.64$) for the $MLU_w$. Even though the other two measures did not reach significance, the effect size for the Word Token ($d = -0.52$) and the Number of Utterances ($d = -0.35$) are considered medium size.
B) Read-Aloud Strategies Used by Teachers

3. What is the extent of variability in read-aloud strategies across teachers?

Analysis of Individual Strategies

Frequencies of Individual Strategies. The analysis in the present study was based on the final coding list of read-aloud strategies listed in Table 1. For each code, the total number of teacher utterances fitting the code’s description was calculated. The overall frequency of each strategy is presented in Table 6.

The most frequent utterances produced by teachers were coded as organization \((M = 15.47, SD = 13.12)\) accounting for about 15\% \((SD = .09)\) of all the utterances produced by the teachers across classrooms and conditions. Other frequent strategies were Request for Direct Recall \((M =11.64, SD=13.20)\) and Request for Analysis and/or Prediction \((M = 10.9, SD=7.31)\), making up 11\% of all the total number of utterances \((SD = .10)\) and \((SD = .07)\) respectively; Repetition and Extension \((M = 10.72, SD = 10.12)\) making up about 9\% \((SD = .06)\). The large standard deviations in these strategies show the large variability across teachers in the use of such strategies.
Table 6.

*Complete List of Teacher Read-Aloud Strategies displaying Descriptive Statistics*

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Raw Count of Teacher Utterances</th>
<th>Relative Percent to the Total Number of Teacher Utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD) Min Max</td>
<td>Mean (SD) Min Max</td>
</tr>
<tr>
<td>Analysis or Prediction</td>
<td>4.23 (4.80) 0 20</td>
<td>.040 (.04) 0 .22</td>
</tr>
<tr>
<td>Request for Analysis or Prediction</td>
<td>10.91 (7.31) 0 28</td>
<td>.111 (.07) 0 .30</td>
</tr>
<tr>
<td>Summary</td>
<td>2.28 (3.68) 0 7</td>
<td>.023 (.04) 0 .25</td>
</tr>
<tr>
<td>Request for Summary</td>
<td>0.62 (1.17) 0 7</td>
<td>.008 (.02) 0 .13</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>3.04 (3.93) 0 16</td>
<td>.029 (.04) 0 .18</td>
</tr>
<tr>
<td>Word Analysis</td>
<td>0.60 (1.93) 0 12</td>
<td>.006 (.02) 0 .13</td>
</tr>
<tr>
<td>Request for Word Analysis</td>
<td>0.57 (1.28) 0 6</td>
<td>.005 (.01) 0 .06</td>
</tr>
<tr>
<td>Clarification</td>
<td>2.47 (2.84) 0 15</td>
<td>.024 (.02) 0 .10</td>
</tr>
<tr>
<td>Request for Clarification</td>
<td>1.96 (3.58) 0 16</td>
<td>.014 (.02) 0 .10</td>
</tr>
<tr>
<td>Story Strategy</td>
<td>2.11 (3.89) 0 21</td>
<td>.018 (.03) 0 .14</td>
</tr>
<tr>
<td>Request for Story Strategy</td>
<td>0.83 (1.65) 0 6</td>
<td>.007 (.01) 0 .04</td>
</tr>
<tr>
<td>Repetition and Extension</td>
<td>10.72 (10.1) 0 47</td>
<td>.091 (.06) 0 .21</td>
</tr>
<tr>
<td>Real Life Connection</td>
<td>4.36 (5.41) 0 21</td>
<td>.045 (.06) 0 .22</td>
</tr>
<tr>
<td>Request for Direct Recall</td>
<td>11.64 (13.2) 0 60</td>
<td>.109 (.10) 0 .39</td>
</tr>
<tr>
<td>Request to Repeat</td>
<td>0.49 (0.88) 0 3</td>
<td>.005 (.01) 0 .05</td>
</tr>
<tr>
<td>Skill Routine</td>
<td>1.34 (1.36) 0 6</td>
<td>.023 (.07) 0 .50</td>
</tr>
<tr>
<td>Book</td>
<td>2.79 (2.48) 0 10</td>
<td>.029 (.03) 0 .12</td>
</tr>
<tr>
<td>Picture Pointing</td>
<td>5.11 (6.81) 0 29</td>
<td>.046 (.06) 0 .24</td>
</tr>
<tr>
<td>Reflection on Reading Behavior</td>
<td>2.00 (2.70) 0 15</td>
<td>.022 (.03) 0 .12</td>
</tr>
<tr>
<td>Organization</td>
<td>15.47 (13.1) 0 56</td>
<td>.149 (.09) 0 .38</td>
</tr>
<tr>
<td>Attention</td>
<td>7.85 (6.15) 0 23</td>
<td>.080 (.06) 0 .30</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>3.94 (3.91) 0 22</td>
<td>.041 (.04) 0 .21</td>
</tr>
<tr>
<td>Extended Reading Activity</td>
<td>4.04 (7.71) 0 36</td>
<td>.066 (.15) 0 .77</td>
</tr>
</tbody>
</table>
A read-aloud strategy that was found to be indigenous to the Chilean context is *Request to Finish* ($M = 2.32, SD = 2.71$) which was coded every time the teacher prompted a child to finish an incomplete word (*Teacher: de color a__*. *Children: __zul*) or incomplete sentence (e.g. *Teacher: para encontrarse con los__*. *Children: amigos*). These requests were also used at different moments either in preparation to start reading (e.g. *Teacher: para empezar tenemos que estar bien calla__*. *Children: __ditos*; *Teacher: con los brazos bien cruza__*. *Children: __dos*. *Teacher: y los ojos bien a__*. *Children: abiertos*), or to finish the reading activity (Teacher: vamos a lavarnos las ma__*. *Children: __nitos*). These examples showed that there was no systematic pattern in the way the words to be completed were segmented. Overall, the *Request to Finish* strategies averaged about 5% of the total number of utterances produced by the teacher during a reading session.

Not all the teachers used all the strategies. To examine the diversity of strategies used by teachers, the total number of different strategies used during a read-aloud session was computed for each classroom. The number of strategies used in a given classroom varied widely—from 3 to 21 strategies—across teachers ($M = 15.04, SD = 4.14$). Looking at how many different teachers used each of the strategies, a follow up analysis showed that every teacher used each one of the read-aloud strategies at least twice, with the exception of *Request for Story Strategy*—which was not used by any of the teachers in the control classrooms.
Intervention vs. Control Classrooms

The distribution of individual strategies was compared in the intervention vs. control classrooms. Results are presented in Figure 1, A and B. The four most frequent strategies in the control classrooms were: Request for Direct Recall ($M = 10.31, SD = 14.76$, range = 60), Repetition and Extension ($M = 10.44, SD = 11.77$, range = 47), Organization ($M = 11.31, SD = 10.74$, range = 36) and Extended Reading Activity ($M = 4.56, SD = 9.51$, range = 36), whereas the four most frequent strategies in the intervention classrooms were: Organization ($M = 17.61, SD = 13.86$, range = 54), Request for Direct Recall ($M = 12, 32$, $SD = 12, 52$, range = 39), Repetition and Extension ($M = 10.87, SD = 9.37$, range = 35) and Extended Reading Activity ($M = 3.77, SD = 6.76$, range = 32). Thus, both control and intervention classrooms used the same four read-aloud strategies with the greatest frequency.

Most of the identified read-aloud strategies were used by teachers in both the intervention and control conditions, although some of these strategies were used with very different frequencies. Most notably Story Strategy was primarily found in the intervention group. Story Strategy was coded when teachers explicitly talked about specific strategies such as prediction, visualization, and summarizing. The teachers in the control group had a much lower number of Story Strategy utterances than the teachers in the intervention group. In addition, the parallel form of this code, the Request for Story Strategy, in which the teacher requested children to name or talk about a specific reading strategy (e.g. visualization or prediction) was not used at all by the teachers in the control group, but it was used in the intervention group.
Figure 1A.

*Distribution of Read-aloud Strategies for the Control Classrooms*
Next, the diversity of strategies (i.e., the total number of different strategies used by the teacher) in the control vs. intervention classrooms was compared. The control classrooms had on average less diversity in their read-aloud strategy use ($M = 11.75, SD = 4.25$) with a minimum of 3 and a maximum of 18 strategies per classroom. In contrast, the intervention classrooms had on average a higher mean of use of read-aloud strategies ($M = 16.74, SD = 2.9$) with a minimum of 9 and a maximum of 21 strategies being used.
per classroom in a given read-aloud session. The diversity of read-aloud strategies by condition is illustrated in the following Figure 2.

Figure 2.

Distribution of Diversity of Read-aloud strategies by condition

![Distribution of Read-aloud Strategies by Condition](image)

A one-way ANOVA was computed comparing the diversity of read-aloud strategies in the control and intervention classrooms. A significant difference was found between the two conditions ($F(1, 45) = 22.54, p < .05$). As depicted in Figure 2, the teachers in the intervention classrooms had statistically significantly more diverse strategies during read-aloud sessions than the teachers in the control classrooms.
Composite Read-aloud Strategies

Computing High- and Low- Composites. Since some individual strategies were used relatively rarely, composites were formed (using the identified strategies) for the purposes of further analysis. In particular, two composite categories were formed to reflect different degrees of hypothesized cognitive stimulation. The composites were computed by adding the raw counts of all the utterances that fell into the same composite category (High or Low levels) and dividing this sum by the total number of utterances produced by the teacher. A High-level cognitive stimulation composite included utterances where the teacher analyzed, or requested that children analyze, events and characters in the story, asked children to make predictions of what they thought was going to happen in the story, or requested or made a summary of text that was just read. This category also included discussions about definitions of new or unfamiliar vocabulary from the text being read. A second composite was formed using only utterances included in the High-level cognitive stimulations but excluding the requests. This gave a composite that solely included teachers’ analysis or predictions, summaries and vocabulary definitions.

The other composite represented Low-level cognitive stimulation strategies. This composite included utterances that asked children to repeat words or parts of the text being read or as part of behavior-related requests by the teacher to pay attention or to perform a routine to maintain order in the classroom. Other combinations of teacher strategies were also examined as potential variables, but for the purposes of this dissertation, the highest and lowest levels of the spectrum were included in the final analysis.
The High-level cognitive composite \( (M = 0.21, SD = 0.11) \) included utterances that reflected three strategies and their correspondent parallel forms of request. These strategies were Analysis and/or Prediction \( (M = 4.23, SD = 4.80) \) of characters or events in the story (e.g. porque le sirvió la comida en unos platos donde la cigüeña, que tiene un pico largo, no podía comer). These types of utterances accounted for about 4% of the total number of utterances across teachers. The parallel form, Request for Analysis or Prediction \( (M = 10.91, SD = 7.31) \), included utterances in which the teacher requested the students to analyze or make predictions about characters, actions, and events in the story (e.g. ustedes creen que lo van a encontrar?), accounting for about 11% of the total number of utterances across teachers.

*Summary of the story* \( (M =2.28, SD=3.68) \), offered either at the end of the story or short segments of the story while the teacher was reading (e.g. todos cooperaron para poder tener esta rica zanahoria y poder comerla), accounted for about 2% of the total number of utterances; about 0.8% of the total number of utterances, coded as Request for Summary \( (M = 0.62, SD = 1.17) \), elicited summaries either at the end of the story or while the story was being read (e.g. de qué es lo que era el cuento?). It is important to note that this category was different from Direct Recall, because the children were asked for a summary of the story, which can be worded in a multitude of ways. These summaries were usually requested at the end of the story; therefore, children usually picked the part that they liked or remembered the most to make their summary. The last strategy in this composite was Vocabulary \( (M = 3.04, SD = 3.93) \); about 3% of the total number of utterances were discussions about definitions of novel and difficult words that either caused confusion, were specifically targeted by the teacher (e.g. la cima es la parte
de arriba de un cerro) or was formulated as a direct question for the students to respond (e.g. quién sabe qué significa la palabra egoísta?).

The low cognitive level composite ($M = 0.36$, $SD=0.17$) included utterances related to behavior management and organization of the class during the reading session; these managerial-type utterances were some of the most frequently used in class. More specifically, the teacher read-aloud strategies in this category included: Reflection on Reading Behavior ($M = 2.00$, $SD = 2.70$, about 2.2% of utterances), statement of recommendations or norms of expected behavior when reading a story (e.g. con qué se escucha cuando uno va a contar un cuento?) which some teachers actually displayed on the wall; Organization ($M = 15.47$, $SD = 13.12$, about 15%), managerial-type utterances in which the teacher was telling the students what was going to happen next or redirecting the behavior for the children to keep the focus on the story (e.g. María anda a sentarte ahí); Attention ($M = 7.85$, $SD=6.15$, about 8% of teacher utterances), designed to get or regain the attention of the children (e.g. escuchen!); Reinforcement ($M = 3.94$, $SD=3.91$, about 4%), utterances that praised the children or evaluated a response in a general manner by approving or evaluating a certain response or action (e.g. muy bien). Extended Reading Activity ($M = 4.04$, $SD = 7.71$, about 7% of the total number of utterances produced by the teacher), included activities such as coloring or cutting-out shapes that were related to the theme or a particular character in the story (e.g. Ahora para finalizar vamos a pintar y luego vamos a recortar este elefante”). The extended activities usually started right after the reading session was over when the children returned to their own tables.
The *High-level* composite made up about 21% of the total number of utterances produced by the teacher ($M = 0.21$, $SD = 0.11$, range = 0.49) with a minimum of 0.20 and a maximum of 0.52 *High-level* utterances across teachers. The *Low-level* composite made up about 36% of all the utterances produced by the teacher ($M = 0.36$, $SD = 0.17$, range = 0.90) with a minimum of 0 and a maximum of 0.90 *Low-level* utterances across teachers.

**Intervention vs. Control Classrooms**

4. *Are there systematic differences between intervention and control teachers in the use of read-aloud strategies?*

Table 7 presents the descriptive data on the use of high- and low-level strategies in the control and intervention group. As the table suggests, both groups of teachers used more low-level than high-level strategies.

**Table 7.**

*Descriptive Statistics for High-level and Low-level Composites by Condition*

<table>
<thead>
<tr>
<th>Read-Aloud Strategies</th>
<th>Control (n = 16)</th>
<th>Intervention (n=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw Count</td>
<td>Percent Relative</td>
</tr>
<tr>
<td><strong>High-level Composite</strong></td>
<td>Mean (SD)</td>
<td>Ranges</td>
</tr>
<tr>
<td>18.81 (14.99)</td>
<td>.23 (.15)</td>
<td>1 - 47</td>
</tr>
<tr>
<td><strong>Low-level Composite</strong></td>
<td>Mean (SD)</td>
<td>Ranges</td>
</tr>
<tr>
<td>27.50 (16.99)</td>
<td>.36 (.24)</td>
<td>0 - 61</td>
</tr>
<tr>
<td>0 - 61</td>
<td>0 – 90</td>
<td>13 – 73</td>
</tr>
</tbody>
</table>
A factorial analysis of variance with the percentage of strategies as the dependent variable was conducted to determine whether there were differences by condition (control vs. intervention) and type of composite (High-level vs. Low-level). A 2 x 2 ANOVA revealed a statistically significant main effect of composite type \( F(1, 45) = 12.97, p < .05 \). The read-aloud strategies from the Low-level composite were on average used more frequently \( M = .36, SD = .17 \) than the read-aloud strategies from the High-Level composite \( M = .21, SD = .11 \). This pattern was true for both the intervention and control classrooms. The interaction between composite and condition was not significant \( F(1, 45) = .045, p > .05 \), indicating that the difference in the use of Low and High composites was comparable for teachers in the control and intervention classrooms.

II. Questions focusing on relations between linguistic characteristics of the classroom environment (reading strategies and speech) and child language outcomes (i.e., the growth of children’s language skills over the school year)

The descriptive statistics for the variables examined in this section, including teacher input and children’s outcome variables, are presented in Table 8. The teacher input variables included Read-Aloud strategies and Speech characteristics during read-aloud sessions. Children’s vocabulary and comprehension scores at T2 served as the outcome variables, whereas the corresponding scores at T1 served as control variables.
Table 8.

Descriptive Statistics for Teacher and Child Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Variables (n=47)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-level Composite</td>
<td>0.212</td>
<td>0.114</td>
<td>0.02</td>
<td>0.52</td>
</tr>
<tr>
<td>Low-level Composite</td>
<td>0.358</td>
<td>0.171</td>
<td>0.00</td>
<td>0.90</td>
</tr>
<tr>
<td>Number of Word Tokens</td>
<td>700.79</td>
<td>366.35</td>
<td>26</td>
<td>1806</td>
</tr>
<tr>
<td>Number of Different Word Types</td>
<td>222.09</td>
<td>80.83</td>
<td>24</td>
<td>405</td>
</tr>
<tr>
<td>Mean Length of Utterance</td>
<td>7.09</td>
<td>0.959</td>
<td>5.05</td>
<td>10.05</td>
</tr>
<tr>
<td><strong>Child Variables (n=913)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocabulary Scores at Time 1</td>
<td>18.14</td>
<td>4.49</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>Comprehension Scores at Time 1</td>
<td>2.96</td>
<td>1.25</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Outcome Variable (n=913)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocabulary Scores at Time 2</td>
<td>21.45</td>
<td>4.95</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>Comprehension Scores at Time 2</td>
<td>3.31</td>
<td>1.28</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

Since children are nested in classrooms, Hierarchical Linear Modeling was used to analyze the relations between teacher input and children’s language outcomes. When conducting multilevel analysis, the first model tested was the unconditional model

\[ Y_{ij} = \gamma_{00} + u_{0j} + r_{ij} \]

The unconditional model had no predictors, just an estimate of the variability in the dependent variables that existed between classrooms, rather than among students. Following the unconditional model, the model in which specific teacher variables served as predictors of specific language outcomes were examined. Below, the results of these analyses are presented, starting with the analysis of vocabulary outcomes, followed by the analysis of comprehension outcomes.
Vocabulary Outcomes

What is the nature of the relationship between teacher speech characteristics and children’s vocabulary outcomes and does this relationship differ for the intervention and control classrooms?

Children’s vocabulary scores at T2 were analyzed as a function of characteristics of teacher speech (total number of words teachers produced during read-aloud sessions, the diversity of vocabulary, and the structural complexity of speech), controlling for vocabulary scores at T1. It was hypothesized that teachers who have more diverse and complex speech (e.g. diversity of vocabulary and structural complexity) were more likely to have students who showed greater vocabulary growth over the school year. To test this hypothesis, the following model was analyzed:

**Model 2.**

*Vocabulary Outcomes as a function of Speech by Condition*

\[
Y_{ij} = \gamma_{00} + \gamma_{01} Token_j + \gamma_{02} WordType_j + \gamma_{03} TotUtterances_j + \gamma_{04} MLU_j + \gamma_{05} Condition + \gamma_{06} Condition \times Token_j + \gamma_{07} Condition \times WordType_j + \gamma_{08} Condition \times TotUtterances_j + \gamma_{09} Condition \times MLU_j + \gamma_{10} VocabT1 + u_i VocabT1 + u_0_j + r_{ij}
\]

\[Y_{ij} = \text{Vocabulary score at T2 of child } i \text{ in classroom } j \text{ (Vocab T2)}\]

\[\gamma_{00} = \text{average score across all classrooms (intercept) (fixed effects)}\]

\[\gamma_{01} = \text{the main effect of Number of Words produced by teacher (Token)}\]

\[\gamma_{02} = \text{the main effect of Number of Word Types produced by teacher (WordType)}\]

\[\gamma_{03} = \text{the main effect of Number of Utterances produced by teacher (TotUtterances)}\]

\[\gamma_{04} = \text{the main effect of Mean Length Utterance produced by teacher (MLU)}\]

\[\gamma_{05} = \text{the main effect of condition (Condition)}\]
\[ \gamma_{06} = \text{interaction effect between condition and Word Token (Condition*Token)} \]
\[ \gamma_{07} = \text{interaction effect between condition and Word Type (Condition*WordType)} \]
\[ \gamma_{08} = \text{interaction effect between condition and total number of utterances (Condition*TotalUtterances)} \]
\[ \gamma_{09} = \text{interaction effect between condition and Mean Length of utterance (Condition*MLU)} \]
\[ \gamma_{10} = \text{the main effect of child Vocabulary at T1, a covariate (VocabT1)} \]
\[ u_{1j} = \text{random effect of the slope (child characteristics)} \]
\[ u_{0j} = \text{random effect of the intercept (teacher characteristic)} \]
\[ r_{ij} = \text{random error} \]

The results of testing Model 2 are presented in Table 9.

Table 9.

*Fixed Effects for Speech characteristics with Vocabulary change scores*

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>S.E.</th>
<th>df</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ((\gamma_{00}))</td>
<td>6.14</td>
<td>2.61</td>
<td>22.84</td>
<td>2.350</td>
<td>.028</td>
</tr>
<tr>
<td>Word Token ((\gamma_{01}))</td>
<td>-.0019</td>
<td>.0057</td>
<td>22.57</td>
<td>-.338</td>
<td>.738</td>
</tr>
<tr>
<td>Word Type ((\gamma_{02}))</td>
<td>-.0051</td>
<td>.0097</td>
<td>24.67</td>
<td>-.525</td>
<td>.604</td>
</tr>
<tr>
<td>Total Utterances ((\gamma_{03}))</td>
<td>.0170</td>
<td>.0368</td>
<td>22.99</td>
<td>.462</td>
<td>.648</td>
</tr>
<tr>
<td>MLU ((\gamma_{04}))</td>
<td>.1409</td>
<td>.3533</td>
<td>21.09</td>
<td>.399</td>
<td>.694</td>
</tr>
<tr>
<td>Condition ((\gamma_{05}))</td>
<td>.2267</td>
<td>7.350</td>
<td>37.57</td>
<td>.031</td>
<td>.976</td>
</tr>
<tr>
<td>Condition*Token ((\gamma_{06}))</td>
<td>.0054</td>
<td>.0098</td>
<td>30.62</td>
<td>.552</td>
<td>.585</td>
</tr>
<tr>
<td>Condition* Word Type ((\gamma_{07}))</td>
<td>.0046</td>
<td>.0140</td>
<td>27.70</td>
<td>.326</td>
<td>.747</td>
</tr>
</tbody>
</table>
The results of this analysis showed neither main effects of teacher speech characteristics nor a significant interaction between teacher speech characteristics and condition in predicting Vocabulary scores. Since these predictors were not significant there was no need to interpret the variance components associated with them.

6. What is the nature of the relation between teacher read-aloud strategies and children’s vocabulary outcomes and does this relation differ for the intervention and control classrooms?

Two groups of read-aloud strategies were examined as predictors of vocabulary skills: the High-level and Low-level composites. As described earlier the High-level composite comprised of cognitively challenging strategies, directing children’s attention towards the meaningful aspects of the text, and facilitating their thinking and discussion of these aspects. This composite included, for example, utterances containing the analysis of the text, discussion of the meaning of new words, requesting children’s predictions...
about what happens next in the story. The Low-level composite included strategies that were directed towards managing and organizing students’ behavior in the classroom. Most of teachers’ utterances that comprised this composite were short sentences (or sometimes non-clausal phrases, such as “right now”) that used basic vocabulary and were not directly related to children’s understanding of the text.

With respect to the Low-level composite, it was hypothesized that these strategies would not facilitate children’s vocabulary and reading comprehension scores. In contrast, the High-level composite was hypothesized to facilitate the growth of children’s vocabulary and comprehension skills. At the same time, the effect of the High-level composite could be moderated by the condition (intervention vs. control). That is, since teachers in the intervention condition included reading sessions on a regular basis, the types of strategies observed on the day of videotaping are likely to reflect the types of input that children typically received from their teachers in this condition. In the control condition, it was observed that fewer teachers included read-aloud sessions in their classroom practice and even those who were videotaped during these activities may not have done them on a regular basis. Thus, the relation between strategies observed during videotaping in these classrooms and children’s language growth was weaker than those in the intervention classrooms. Thus, the specific hypotheses tested in this study were:

1) The High-level teacher input composite will be related to the main effect on the growth of children’s language skills or there will be an interaction between this teacher input measure and experimental condition (intervention vs. control). Specifically, with respect to the main effect, the higher values of this measure of teacher input will predict higher growth of children’s skills; with respect to the interaction, the strength of the
relation between this measure of teacher input and children’s language growth is expected to be stronger for the intervention, compared to the control group.

2) The Low-level teacher input composite will not show a significant main effect or an interaction effect on children’s language outcomes.

To test these hypotheses, the following model was analyzed:

Model 3.

Vocabulary Outcomes as a function of Read-aloud Composites by Condition

\[ Y_{ij} = \gamma_{00} + \gamma_{01}\text{HighLevel}_j + \gamma_{02}\text{LowLevel}_j + \gamma_{03}\text{Condition}_j \\
+ \gamma_{04}\text{Condition} \times \text{HighLevel}_j \\
+ \gamma_{10}\text{VocabT1}_{ij} + u_{ij}\text{VocabT1}_{ij} + u_{0j} + r_{ij} \]

\( Y_{ij} \) = Vocabulary score at T2 of child \( i \) in classroom \( j \) (Vocab T2)

\( \gamma_{00} \) = average score across all classrooms (intercept) (fixed effects)

\( \gamma_{01} \) = the main effect of Hi-Level teacher input (High-Level)

\( \gamma_{02} \) = the main effect of Low-level teacher input (Low-Level)

\( \gamma_{03} \) = the main effect of condition (Condition)

\( \gamma_{04} \) = interaction effect between condition and High-Level teacher input (Condition*HighLevel)

\( \gamma_{10} \) = the main effect of child Vocabulary at T1, a covariate (VocabT1)

\( u_{ij} \) = random effect of the slope (child characteristics)

\( u_{0j} \) = random effect of the intercept (teacher characteristic)

\( r_{ij} \) = random error
The results of running Model 3 are presented in Table 10.

#### Table 10.

*Fixed Effects for Vocabulary Outcomes as a function of Read-Aloud Composites*

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>S.E.</th>
<th>t-ratio</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept (y_{00})</td>
<td>6.82</td>
<td>0.87</td>
<td>7.80</td>
<td>53.7</td>
<td>0.000</td>
</tr>
<tr>
<td>High-level Composite (y_{01})</td>
<td>-1.55</td>
<td>1.87</td>
<td>-0.83</td>
<td>27.98</td>
<td>0.416</td>
</tr>
<tr>
<td>Low-level Composite (y_{02})</td>
<td>0.07</td>
<td>1.01</td>
<td>0.07</td>
<td>29.78</td>
<td>0.944</td>
</tr>
<tr>
<td>Condition (y_{03})</td>
<td>-1.56</td>
<td>0.66</td>
<td>-2.38</td>
<td>35.67</td>
<td>0.023</td>
</tr>
<tr>
<td>Condition* High-level Compo (y_{04})</td>
<td>7.53</td>
<td>2.70</td>
<td>2.79</td>
<td>35.89</td>
<td>0.008</td>
</tr>
<tr>
<td>Vocabulary at T1 (y_{10})</td>
<td>0.82</td>
<td>0.026</td>
<td>31.69</td>
<td>747.68</td>
<td>0.000</td>
</tr>
</tbody>
</table>

\[
Y_{ij} = 6.82 - 1.55(\text{HighLevel}_j) + 0.07(\text{LowLevel}_j) - 1.58(\text{Condition}_j) \\
+ 7.53(\text{Condition} \times \text{HighLevel}_j) + 0.82(\text{VocabT1}_i)
\]

The key finding of this analysis was the interaction between Condition and High-level teacher input, which indicates that the relation between the High-level strategy composite and children’s vocabulary scores differed significantly depending on the condition. To better understand the nature of this interaction, the relation between the High-level composite and vocabulary scores was examined separately for the intervention versus control group. Similar to Model 1, in the present analysis children’s vocabulary
scores at T2 were modeled as a function of High-level composite, while controlling for vocabulary scores at T1

Model 4.

**Vocabulary scores as a function of High-Level strategies**

\[ Y_{ij} = \gamma_{00} + \gamma_{01} \text{HighLevel}_j + \gamma_{10} \text{VocabT1}_{ij} + u_{ij} \text{VocabT1}_{ij} + u_{0j} + r_{ij} \]

The results of the statistical analysis for the control and intervention condition are presented in Table 11.

Table 11.

**Fixed Effects for Vocabulary outcomes as a function of High-level composite**

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>S.E.</th>
<th>t-ratio</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept ((\gamma_{00}))</td>
<td>6.50</td>
<td>0.92</td>
<td>7.06</td>
<td>115.40</td>
<td>0.000</td>
</tr>
<tr>
<td>High-level Composite ((\gamma_{01}))</td>
<td>-1.65</td>
<td>1.75</td>
<td>-0.95</td>
<td>10.91</td>
<td>0.364</td>
</tr>
<tr>
<td>Vocabulary at T1 ((\gamma_{10}))</td>
<td>0.84</td>
<td>0.04</td>
<td>19.05</td>
<td>326.88</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Experimental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept ((\gamma_{00}))</td>
<td>5.48</td>
<td>0.70</td>
<td>7.80</td>
<td>107.01</td>
<td>0.000</td>
</tr>
<tr>
<td>High-level Composite ((\gamma_{01}))</td>
<td>5.87</td>
<td>1.91</td>
<td>3.071</td>
<td>26.31</td>
<td>0.005</td>
</tr>
<tr>
<td>Vocabulary at T1 ((\gamma_{10}))</td>
<td>0.81</td>
<td>0.031</td>
<td>25.99</td>
<td>380.24</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Looking at the fixed effects of the *High-level* teacher input on vocabulary scores, the results show that for the Control classrooms, the *High-level* composite was not a statistically significant predictor of vocabulary scores at T2, controlling for T1. In contrast, for the Intervention classrooms, *High-level* teacher input was a statistically significant predictor of Vocabulary scores at T2, while controlling for T1. As shown in Table 11, for every one unit increase in the High-level teacher composite, over and above the mean across the classrooms, children’s Vocabulary scores at T2 are predicted to increase by 5.87 units, controlling for T1.

**Comprehension Scores**

As shown in Table 8, the average comprehension score was quite low both at Time 1 and Time 2. To examine the distribution of scores at both time points, a frequency analysis was conducted. Looking at the frequencies (Figure 3, A and B), about 91% of the children correctly responded only on items 1 through 4 at Time 1 and about 87% of the children correctly responded only on items 1 through 4 at Time 2. Based on the procedure for administering this test, the first 7 items on the test require that children match a picture (e.g., a picture of a cat) with a symbolic sketch of that object. This skill is assumed to serve as a pre-requisite for reading comprehension, but clearly the items 1–7 do not directly test reading or even oral language comprehension in children. Based on the pattern of performance of participants in the present study, most of them were not even presented with actual reading comprehension items. Thus, the findings for this outcome measure should be interpreted with caution.
Figure 3A.

*Distribution of Passage Comprehension Scores at Time 1*
Figure 3B.

*Distribution of Passage Comprehension Scores at Time 2*

With this caution in mind, we conducted further analysis examining the growth of children’s comprehension on this test and the relation between the growth and teacher input variable. A paired sample t-test was calculated to compare the comprehension scores at the beginning of the school year (Time 1) and the end of the school year (Time 2). The mean on the T1 scores was 2.97 (SD = 1.24) and the mean on the T2 was 3.30 (SD = 1.29). There was a significant increase from T1 to T2 ($t(784) = -5.69$, $p < .001$).
Given a significant growth in comprehension scores, we conducted HLM analysis to model comprehension scores at Time 2, controlling for Time 1, as a function of teacher input. Model 2 (in which children’s vocabulary scores were replaced with their comprehension scores) was used to examine the relation between the growth of comprehension scores and the characteristics of teacher input. In a similar fashion, Model 3 was used to examine the relation between the growth of comprehension scores and the composite measures of read-aloud strategies.

Both Models 2 and 3 with comprehension scores as outcome variables returned non-significant results for all the predictors, including the features of teacher speech and the frequencies of High-level vs. Low-level strategies (See Tables 12 and 13). As indicated earlier, this may reflect the fact that the low level of performance of the study participants (and a relatively low variability among them) did not allow the measure used in the present study to capture the true variability in their comprehension—an issue that we further address in the discussion.
Table 12.

**Fixed Effects for Comprehension scores predicted by features of Speech**

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>S.E.</th>
<th>df</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ($\gamma_{00}$)</td>
<td>3.070</td>
<td>.705</td>
<td>771</td>
<td>4.352</td>
<td>.000</td>
</tr>
<tr>
<td>Word Token ($\gamma_{01}$)</td>
<td>.0001</td>
<td>.0016</td>
<td>771</td>
<td>.059</td>
<td>.953</td>
</tr>
<tr>
<td>Word Type ($\gamma_{02}$)</td>
<td>-.0025</td>
<td>.003</td>
<td>771</td>
<td>-.818</td>
<td>.414</td>
</tr>
<tr>
<td>Total Utterances ($\gamma_{03}$)</td>
<td>.0049</td>
<td>.010</td>
<td>771</td>
<td>.489</td>
<td>.625</td>
</tr>
<tr>
<td>MLU ($\gamma_{04}$)</td>
<td>-.046</td>
<td>.094</td>
<td>771</td>
<td>-.490</td>
<td>.625</td>
</tr>
<tr>
<td>Condition ($\gamma_{05}$)</td>
<td>-.357</td>
<td>2.23</td>
<td>771</td>
<td>-.160</td>
<td>.873</td>
</tr>
<tr>
<td>Condition*Token ($\gamma_{06}$)</td>
<td>.0001</td>
<td>.0029</td>
<td>771</td>
<td>.031</td>
<td>.975</td>
</tr>
<tr>
<td>Condition*Word Type ($\gamma_{07}$)</td>
<td>.0045</td>
<td>.0042</td>
<td>771</td>
<td>1.081</td>
<td>.280</td>
</tr>
<tr>
<td>Condition*Total Utterances ($\gamma_{08}$)</td>
<td>-.0074</td>
<td>.021</td>
<td>771</td>
<td>-.363</td>
<td>.717</td>
</tr>
<tr>
<td>Condition*MLU ($\gamma_{09}$)</td>
<td>.0117</td>
<td>.3065</td>
<td>771</td>
<td>.038</td>
<td>.970</td>
</tr>
<tr>
<td>Comprehension at T1 ($\gamma_{10}$)</td>
<td>.1706</td>
<td>.0374</td>
<td>771</td>
<td>4.561</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 13.

Fixed Effects Comprehension scores predicted as function of Read-aloud strategies

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>S.E.</th>
<th>t-ratio</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ($\gamma_{00}$)</td>
<td>2.84</td>
<td>0.27</td>
<td>10.44</td>
<td>776</td>
<td>0.000</td>
</tr>
<tr>
<td>Hi-level Composite ($\gamma_{01}$)</td>
<td>-0.24</td>
<td>0.63</td>
<td>-0.39</td>
<td>776</td>
<td>0.698</td>
</tr>
<tr>
<td>Low-level Composite ($\gamma_{02}$)</td>
<td>-0.08</td>
<td>0.33</td>
<td>-0.24</td>
<td>776</td>
<td>0.810</td>
</tr>
<tr>
<td>Condition ($\gamma_{03}$)</td>
<td>0.15</td>
<td>0.22</td>
<td>0.68</td>
<td>776</td>
<td>0.494</td>
</tr>
<tr>
<td>Condition* High-level Comp ($\gamma_{04}$)</td>
<td>-0.42</td>
<td>0.90</td>
<td>-0.47</td>
<td>776</td>
<td>0.639</td>
</tr>
<tr>
<td>Comprehension at T1 ($\gamma_{10}$)</td>
<td>0.17</td>
<td>0.04</td>
<td>4.65</td>
<td>776</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Overview of the Results

The research questions were organized under two umbrella sections. The first section had the purpose of analyzing the variability in the characteristics of preschool linguistic environments (Speech Characteristics and Read-aloud strategies used by teacher). The second section used these characteristics to predict language growth in preschool children.

Examining the characteristics of linguistic environment during read-aloud sessions

Speech Characteristics. The analysis of individual features of speech showed that there was a great variability in the sheer number of words and in the size of vocabularies used by teachers while interacting with children during read-aloud sessions. Out of the
total number of words spoken by the teachers, about 36% consisted in different types of vocabulary words. A significant positive correlation was found between the total number of words (tokens) and the total number of different word (types). Teachers who produced more words were also using more diverse vocabulary during a given read-aloud session. At the same time, the structural complexity of sentences (MLUw) was not related to lexical measures of teacher speech.

The next step of analysis involved comparing features of speech in control and intervention classrooms. A factorial analysis of variance showed that there was a significant effect of condition on both lexical and syntactic measures of teacher speech. The total number of types used by teachers in the intervention classrooms was significantly higher than the teachers in the control classrooms. Finally, the structural complexity measured by the Mean Length of Utterance in words showed a significantly higher mean than the control group. Thus, the teachers in the intervention classrooms produced more speech during read-aloud sessions, and their speech, on average, contained richer vocabulary and longer sentences than the teachers in the control classrooms.

**Read-aloud Strategies.** Just as was the case with the features of teacher speech, there was a significant variability among teachers in the number of read-aloud strategies they used in a given reading session. Some of them were using as few as 3 and others as many as 21 strategies per read-aloud session. When the diversity of read-aloud strategies was analyzed by condition, a significant difference emerged between control and intervention groups. The intervention teachers were using more diverse strategies during read-aloud sessions.
At the same time, there were some similarities between the intervention and control groups in the use of read-aloud strategies. In particular, the most frequent strategies being used were the same (Organization, Request for Direct Recall, Analysis and/or Prediction, and Repetition and Extension) in a slightly different order. There was one strategy salient for the intervention group, the Story Strategy and its parallel form Request for Story Strategy, which illustrates a specific use of strategy covered during the professional development intervention. This particular strategy was almost nonexistent in the control group.

After the individual analysis of strategies, two composites (High-level and Low-level) were formed to reflect different degrees of linguistic and cognitive stimulation. In analyzing the use of these strategy categories in both intervention and control classrooms, a similar pattern emerged: read-aloud strategies in the Low-level category were used more frequently by both the control and intervention teachers than the High-level strategies.

*Examining the relationship between teachers’ speech during read-aloud sessions and children’s language growth*

Teachers’ speech characteristics were not found to be related to children’s growth scores, either for vocabulary or comprehension scores.

However, when looking at the use of read-aloud strategies in relation to children’s language growth, an interesting pattern of finding emerged in the analysis focusing on vocabulary outcomes. For this outcome measure, there was a significant interaction between condition and the use of high-level strategies (Condition*High-level strategies).
This means that the relation between High-level composite and children’s scores varied as a function of the condition. The analysis of the relation between High-level strategies and children’s vocabulary scores in each condition showed that for the intervention classrooms High-level strategies was a significant predictor of vocabulary growth (i.e., scores at T2, controlling for scores at T1), whereas for the control classrooms, High-level use of strategies was not a significant predictor of Vocabulary growth. More specifically, for every one unit increase above the mean, children’s vocabulary was predicted to increase by 5.87 units.

The results related to the comprehension measure revealed that the use of High-level strategies was not a significant predictor of comprehension scores; the same was true for the interaction between condition and High-level strategies. A more in-depth analysis of the Comprehension measure showed that most of the children’s responses on the comprehension test clustered at the low end of the measurement scale. Potential limitations of this measure, as well as more general implications of the findings, are addressed below in the general discussion.
CHAPTER 5: DISCUSSION

The notion that children acquire language from input is based on the constructivist framework, in which environmental conditions are believed to have a role in language acquisition. In particular, research has shown strong associations between the amount and quality of adult language children are exposed to and their related vocabulary and syntax development (Hoff, 2006; Huttenlocher et al., 2002). School is a prime environment where children are exposed to linguistic input by both teachers and peers. Some investigations focusing on the role of school environment and classroom practices suggest that the quantity and quality of linguistic input children receive during reading time influence their language skills (Dickinson & Porche, 2011; Mashburn, et al., 2008).

Research has shown that language skills of children entering preschool vary significantly, in part reflecting differences in their parents’ socioeconomic and educational backgrounds (Hart & Risley, 1995; Hoff, 2003). As a result, schools become an important source of input for the development of language skills in young children, especially those living in poverty. An activity that has been linked to an advancement of language skills among children is book reading (Hindman, Wasik, & Erhart, 2012; Silverman, Crandell, & Carlis, 2013; Wasik & Bond, 2001). It becomes especially important to study read-aloud practices at the preschool level in other contexts such as Latin American countries like Chile, because book reading there is an uncommon practice at home. Moreover, children in much of Latin America—Chile included—have limited access to books, especially those in low-income communities (Strasser & Lissi, 2009).
The data used in this dissertation derived from the first large-scale early childhood intervention project in Latin America. Therefore, part of the interest in analyzing the linguistic environment during book reading was to detect differences between teachers in the control and the intervention classrooms. One of the first differences noticed between the teachers in the two conditions was that many more teachers in the intervention classrooms had read-aloud sessions on the day of the observation, compared to teachers in the control classrooms. This may indicate that reading does not happen frequently in a typical preschool classroom in Chile.

Book-reading or read-aloud is a common practice among teachers in developed countries (Silverman et al., 2013); yet, little research has been done on the nature and the role of this activity in predicting children’s language outcomes in developing countries with languages other than English. Thus this dissertation has as a main objective analyzing the linguistic environment provided by preschool teachers during read-aloud sessions and the associations of these characteristics with children’s vocabulary and comprehension growth scores. Two main aspects of the linguistic environment were analyzed: Speech Characteristics and Read-aloud Strategies used by teachers during reading sessions. This dissertation expanded previously used methodology by doing an in-depth analysis of the speech features and teachers’ strategies with a focus specifically on read-aloud sessions.

Before analyzing the use of read-aloud strategies, which was the main focus of this dissertation, the features of teachers’ speech during reading sessions and their relationship to predicting children’s language growth were examined.
Language Characteristics

Extent of variability in teachers’ language characteristics. Some speech characteristics have been found to be associated with language growth (Bowers & Vasilyeva, 2011; Huttenlocher, et al., 1991, Vasilyeva, et, al, 2008); therefore, it was important to include these features as part of the analysis of the linguistic environment. The teachers in the study showed great variability in their features of speech. For example, the most striking differences were uncovered in the number of words or Word Tokens (Min = 26, Max = 1806) and in the different types of words produced by the teachers Word Types (Min = 24, Max = 405). Essentially, the children in classrooms at the lower end of the range are being exposed to significantly fewer words than children in the upper range.

Among the teachers who produced a greater number of words during read-aloud sessions there was a significant correlation between the Word Tokens and the Word Types. This means that teachers who produced more words were also using more diverse vocabulary while reading. This finding is in line with other studies that have shown similar results (Dickinson & Porche, 2011; Dickinson & Smith, 1994).

Differences in Language characteristics between intervention and control groups. Difference in the features of speech was analyzed as a function of condition and the results showed that teachers in the intervention classrooms produced a larger number of words during read-aloud sessions; moreover, these words were more lexically diverse and the utterances were longer than in the speech of teachers in the control classrooms. It is an interesting finding, given that teachers were randomly assigned to the intervention or
control condition at the beginning of the study. Thus, the difference in the features of their speech during read-aloud sessions is likely to reflect the effects of the intervention, which included professional workshops that focused in part on ways of facilitating children’s language development. Similarly, studies that used UBC data demonstrated that the professional development intervention was effective in affecting the teachers’ practices, especially in allocating more time to early literacy activities and applying specific instructional strategies (UBC Policy Brief).

Even though changing the features of teachers’ speech was not a stated goal of the intervention, it may have resulted from the aspects of professional training that aimed at encouraging teachers to discuss book material during reading sessions and to use specific strategies to engage children in the book-reading process and enhance their understanding of language. For example, encouraging teachers to use certain analytical strategies during book reading and to discuss with children the meaning of sophisticated new words used in the book may lead both to the use of more sophisticated vocabulary and more complex sentences by these teachers.

This finding is the first demonstration of a possibility of changing caregivers’ speech through an intervention. Even though prior studies have shown a relation between certain features of caregivers’ speech—such as teachers or parents—and children’s language development, one of the lingering questions concerned potential implications of these findings, as it was not clear whether one can actually manipulate the relevant features of adults’ speech in their everyday interactions with students. The present findings indicate that the change in the characteristics of speech may result from an
intervention that enhances linguistic awareness in teachers and provides them with specific strategies aimed at facilitating children’s language skills.

It is not clear at present whether the increase in lexical diversity and syntactic complexity of speech observed in the intervention, compared to the control group during read-aloud sessions is a phenomenon specific to read-aloud activities or whether it reflects a more general transformation of teachers’ speech in their interactions with students in preschool classrooms. This issue can be examined in follow-up analyses comparing teachers’ speech across a wider range of classroom activities. If the effect of intervention on teacher speech is relatively narrow (i.e., found only in one or two types of activities) then more work may be needed to develop interventions that have broader effects on teachers’ speech. Such broader effects, in turn, can be expected to result in stronger effects of the intervention on children’s language growth—the issue addressed further in the next section.

**Relation between teachers’ speech characteristics and children’s language growth.** Even though the intervention teachers were using a greater number and variety of words alongside longer sentences, these features of speech were found to be non-significant predictors of language (vocabulary or comprehension) growth in the children over the course of a school year. There are several possible explanations for the lack of a solid relationship between caregiver and child language variables, which had been found to be related in earlier works (see Bowers & Vasilyeva, 2013 for some mixed findings). One possibility is a dosage effect. The two testing points at which children’s language skills were assessed at seven months apart. The teachers from the intervention group started receiving professional training at the beginning of this period. It may have taken
some time before any noticeable differences in speech characteristics between the two
groups of teachers emerged and the size of the difference even at the end of the school
year, while significant, may be insufficient to exert comparably different effects in
students. Furthermore, it may require more time for preschool students to be exposed to a
larger and richer language input in order to show a difference in their own language
skills.

Another possibility is that the sample of teachers’ speech, on which the measures
of speech characteristics have been based, was too limited. The nature of this study
limited the speech sample to one activity—namely, the read-aloud session, which lasted
on average about twelve minutes. Thus, the speech sample was not as large as other
studies have reported using for their analyses. Furthermore, since the speech sample was
obtained from a single activity (read-aloud), it may not have been representative of the
overall speech characteristics. Collecting samples of teachers’ speech from across a range
of activities (e.g. meal time, free-play, academic instruction) may have provided a more
representative sample as speech characteristics tend to vary across activities (Cote, 2001).
Thus, as pointed out earlier, examining samples of teacher speech across a variety of
activities may be informative both for a better understanding of variability in teachers’
speech and also for a better understanding of the relationship between features of teacher
speech and children’s language growth.

Use of Read-Aloud strategies

One of the main goals of the larger UBC study was directly related to improving
the instructional quality of teaching. The intervention program included six instructional
modules for the Prekindergarten teachers, which occurred on monthly bases during the school year; there were several modules related to improving language and literacy instructional practices. The teachers in the control group did not receive training in these specific topics. (Yoshikawa et al., submitted).

Read-aloud sessions provide an opportunity to enhance children’s vocabulary skills; however, studies have shown that certain types of strategies are more beneficial than others in fostering vocabulary knowledge (Dickinson, 2001a; Whitehurst et al., 1994). Given that the present study was exploratory in nature, the most appropriate approach was to let the different coding emerge directly from the teachers’ discourse. Thus, the reading strategies in this dissertation were developed after careful analysis of the transcriptions from the video-taped read-aloud sessions. One of the contributions of the dissertation is the detailed list of codes that expanded previously used methodology. It was suggested in the literature (Dickinson & Porche, 2011) that there is a need for more detailed description of what happens during read-aloud sessions.

As hypothesized, there was great variability in the use of strategies among teachers. The number of different strategies used during a single read-aloud session ranged from 3 to 21 strategies in a given read-aloud session. Similarly, the literature has pointed out that there is a wide variability in the strategies teachers use during book-reading sessions, especially when instructors are reading to children in a large group (e.g. Connor, Morrison, & Slominski, 2006). Comparison of teachers’ strategies in the control and intervention conditions showed that the teachers in the intervention classrooms used, on average, a larger number of different strategies than their counterparts in the control group. Thus, one of the outcomes of the intervention was that the teachers who
participated in professional development workshop used a wider variety of strategies in discussing books with children. Some of these strategies were taught during workshops, whereas others may have emerged as teachers attempted to engage children in a deeper discussion of various aspects of the text.

The analysis of the individual strategies showed that overall the most frequent strategies were *Organization, Request for Direct Recall, Request for Analysis and Prediction, and Repetition and Extension*. These strategies happened to be the most frequent in both the intervention and control classrooms. Thus, although intervention teachers did show a greater diversity of strategies, they did not differ substantially from the control group in the kinds of strategies that dominated their discourse with students during read-aloud sessions.

Many of the individual strategies observed in the present study have been reported in prior work conducted with English-speaking preschool students and teachers in the US (Dickinson & Smith, 1994; Dickinson & Porche, 2011). In addition, some strategies emerged that have not been discussed in prior literature. Among these strategies was the *Teacher Request to Finish*. In the request to finish strategy teachers asked children to either complete an unfinished word or familiar sentence. These requests did not present a specific instructional pattern. Some of the teachers used the requests as a way to capture attention from the students (Teacher: “ahora vamos a escu-” . Child: “_char”). Additionally, teachers employed this technique in order to complete a familiar skill routine like finishing common phrases (Teacher “y colorin Colorado, este cuento se ha ___” Child: “_ acabado”). Teachers also used this technique to segment a word into syllables. Another interesting finding was the *Story Strategy*, which was found only in the
intervention condition. This strategy was one of the specific instructional strategies reviewed during the professional intervention. The emergence of this strategy could be indicative that the intervention teachers were applying to some degree the content learned during the modules. Yet, even though there was a significant difference in the use of this strategy between the intervention and control teachers, frequency of use of the Story Strategy was not a significant predictor of children’s language growth. As was suggested in the findings of the larger study, the teachers may not be applying these techniques with the necessary frequency or specificity to be reflected in statistically significant results (Yoshikawa et al., submitted).

Since most of the individual strategies were not used as frequently, High-level and Low-level composites were created to reflect different degrees of linguistic and cognitive stimulation. Interestingly, the teachers in both the intervention and control classrooms were on average using more of the Low-level strategies during read-aloud than the High-level counterparts. It was hypothesized that the Low-level composite that denoted less cognitively challenging strategies would not predict language growth in children, whereas the High-level composite would serve as a predictor of language growth.

Indeed, the findings showed that the use of Low-level strategies was unrelated to the growth of language skills in preschoolers. However, the use of High-level strategies showed an interesting pattern of relation to the growth of vocabulary skills in children. One of the main findings of the dissertation is that for the teachers in the intervention classrooms, the use of High-level strategies was found to be a significant predictor of children’s vocabulary scores at the end of the school year, controlling for their vocabulary scores at the beginning of the year. In other words, teachers who frequently
used strategies that encouraged the discussion of the meaningful aspects of the text, including the definition of new words and analyzing events described in the text, had students who showed a greater growth in their vocabulary skills. It should be noted that the training that all the teachers in the intervention condition have undergone made great emphasis on the use of instructional techniques through book reading. Yet, there was clearly a substantial variability in the implementation of these techniques by the intervention teachers. What is critical is that this variability in the extent to which intervention teachers used High-level strategies in their classrooms during read-aloud sessions predicted variability among children in the growth of vocabulary skills. The results of this dissertation suggest that it seems to be possible to include the use of specific strategies (i.e., High-level strategies) in professional development modules to predict children’s vocabulary growth at the end of the school year.

In contrast to the intervention group, in the control group there was no significant relation between teachers’ use of High-level strategies and children’s vocabulary growth. As pointed out, teachers in the control condition were less likely to have a reading session during the whole day when the data collection was conducted, compared to the teachers in the intervention condition. It is possible that even for those teachers in the control group who have been observed to have a reading session read-aloud activities occur less regularly than in the intervention classroom. In this case, input provided by teachers during these activities may be insufficiently systematic to create an environment facilitating children’s language growth.
Limitations and Future Directions

Unlike children’s vocabulary scores, their comprehension scores were not found to be related to any of the teacher input variables. This could be due in part to the nature of the comprehension measure itself. As noted earlier, its initial items measure children’s ability to interpret graphic symbolic representations rather than linguistic stimuli. Even though this measure showed growth over the preschool year, most participants in the present study did not go beyond those initial items at either first or second testing point. Thus their scores did not properly capture individual differences in language comprehension. It should be noted that the larger study was continued past pre-kindergarten age and the selected measure may have worked much better with older children.

A second methodological limitation of the study is related to the measurement of teachers’ speech characteristics. The main goal of the present study was to analyze teachers’ language input during read-aloud sessions; therefore, the speech sample used in the study was smaller than in some previous studies (Vasilyeva, et al., 2008; Huttenlocher et., al, 1991, 2002) and it was limited to one particular context. As indicated earlier, other studies supplement the speech sample collected during reading by including other activities in their analysis, such as meal time or play time. For example, Girolametto and Weitzman (2002) explored the linguistic environment provided by teachers when reading with children in a group. They explored the caregiver’s use of responsive language when addressing toddlers and preschoolers in the context of book reading and a play dough
activity and its relationship to language productivity. In a similar way, Dickinson and Porche (2011) measured content and quantity of verbal interaction in preschools by analyzing three main types of teacher utterances during large group activities and book reading. Sampling multiple activities may provide more representative measures of lexical and syntactic characteristics of teachers’ language. At the same time, it should be noted that the measures of read-aloud strategies used in the present study were sufficiently sensitive to not only capture variability among teachers, but also the relation between teacher input and children’s vocabulary growth. Thus, the use of broader units of analysis, including composite measures of strategies, appears to provide a useful tool for investigating teacher input in relation to children’s language. The present study focused on potential effects of teachers in Prekindergarten, while future studies could look at more distant effects to see if the same effects remain or other effects emerge at the end of kindergarten.

In the larger study teachers were randomly assigned to either intervention or control groups. Yet, due to the nature of the study in which the focus was on read-aloud activities, the sample for the study was limited to the teachers who had a video-taped reading session. Since not every teacher had a reading session, the teachers who were captured reflect a selected group of teachers in the intervention as well as in the control group. An important question that stems from this limitation is related to having more general information about the frequency of read-aloud activities in the intervention and control groups before the implementation of the larger study. Having a baseline would be useful to more accurately assess the effects of the intervention in this particular activity.
Implications

Read-aloud practices at the preschool level are still in great demand for further research, especially in Latin American countries. This dissertation explored in detail the linguistic environment that low-income Chilean children are exposed to and focused specifically on the use of read-aloud strategies and speech features of teachers. The present dissertation contributed to this established line of research by extending previously used methodology through an in-depth analysis of reading strategies and speech characteristics of the linguistic environment during read-aloud sessions. Moreover, the variability found in teachers was used to predict children’s vocabulary outcomes.

Even though the larger UBC study did not find statistical instructional differences among their teachers, detailed analyses such as the ones presented in this study have sought to contribute to the understanding of practices among teachers who were part of an intensive intervention study. The contribution to the larger study lays in the fact that using the identified High-level read-aloud strategies, it was possible to predict in the intervention classrooms the children’s vocabulary growth scores at the end of Pre-kindergarten.

Implementation of read-aloud strategies seems to be a challenge even for well-designed empirical studies. Not all of the teachers in the intervention classrooms had read-aloud sessions every day; this could be an indication that either this activity remains uncommon, especially if considered on a daily basis, or that other activities are
considered more important at the preschool level and take the place of reading sessions. Furthermore, even when the intervention teachers had a read-aloud session, some of them used a relatively low range of strategies and the most frequent strategies were organizational ones that do not contribute greatly to children’s language development. Thus, more applied research is needed to determine the conditions (including the nature and duration of professional training) that would be most conducive to teachers’ acquisition of effective instructional strategies.
REFERENCES

HighScope Perry Preschool Program (Monographs of the HighScope Educational

Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in
social psychological research: Conceptual, strategic, and statistical considerations.

literacy development. Yearbook of the National Reading Conference, 42, 207–
215.


rendimiento en la lectura: Una investigación de seguimiento entre primer y tercer


children's emergent literacy growth. Journal of Educational Psychology, 98(4),
665–689.


(Eds.), *Beginning literacy with language: Young children learning at home and school* (pp. 223–255). Baltimore, MD: Brookes.


readiness, early earning and the transition to kindergarten. (pp. 49–84). Baltimore: Brookes.


NICHD Early Child Care Research Network. (2000). The relation of child care to


NICHD Early Child Care Research Network. (2005). Pathways to reading: The role of
oral language in the transition to reading. *Developmental Psychology, 41*, 428–
442.

economic impacts of the High/Scope Perry Preschool Program. *Educational


Peisner Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C.,
children’s cognitive and social developmental trajectories through second grade.
*Child Development, 72*, 1534–1553.

sobre la adquisición del lenguaje temprano. Relaciones con el desarrollo del
lenguaje de los niños. *Revista Iberoamericana de Diagnóstico y Evaluación
Psicológica, 4*, 102–116.


Un Buen Comienzo (Policy Brief). Mejoras en la instrucción de lenguaje y alfabetización inicial en NT1 y NT2: Resultados del programa Un Buen Comienzo


Yoshikawa, H., Leyva, D, Snow, C.E., Ernesto Treviño, E., Arbour, M. C., Barata, M. C.,


### Apendix A. *Additional Codes*

<table>
<thead>
<tr>
<th>Code Name</th>
<th>Coding</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Question</td>
<td>Coded as “1”</td>
<td>Coded every time the teacher poses a question.</td>
</tr>
<tr>
<td>Teacher Response</td>
<td>Coded as “1”</td>
<td>Coded every time the teacher answers a question posed by the student.</td>
</tr>
<tr>
<td>Teacher request to finish word or sentence</td>
<td>Coded as “1”</td>
<td>Coded every time the teacher prompts child to finish a word to complete a sentence or a response.</td>
</tr>
<tr>
<td>Teacher's utterances before reading</td>
<td>Coded as “b”</td>
<td>Coded every time the teacher from the time the teacher gives a cue that they will start reading a story or when the teacher informs that now it is story time.</td>
</tr>
<tr>
<td>Teacher's utterances during reading</td>
<td>Coded as “d”</td>
<td>Coded from the time the teacher reads the title of the book.</td>
</tr>
<tr>
<td>Teacher's utterances after reading</td>
<td>Coded as “a”</td>
<td>Coded when the story finishes and the teacher says: Colorín, colorado, este cuento se ha acabado.</td>
</tr>
</tbody>
</table>
### Appendix B. *Speech characteristics during read-aloud*

<table>
<thead>
<tr>
<th>Code Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of different words (Types)</td>
<td>Includes the total amount of different word types produced by the teacher not including the text. This shows the diversity of vocabulary.</td>
</tr>
<tr>
<td>Total number of word token</td>
<td>Total number of words.</td>
</tr>
<tr>
<td>Type/Token Ratio</td>
<td>Ratio of type of words over the number of words</td>
</tr>
<tr>
<td>Ratio of words over utterances</td>
<td>Mean length of the utterance at the word level.</td>
</tr>
</tbody>
</table>
Appendix C. Descriptive Statistics (Mean and Standard Deviation) for specific Read-Aloud strategies in the two composites by Condition

<table>
<thead>
<tr>
<th>Composite</th>
<th>Read-Aloud Strategies</th>
<th>Control (n=16)</th>
<th>Intervention (n=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Raw Count</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>High Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis or Prediction</td>
<td>4.06 (5.40)</td>
<td>.046 (.058)</td>
<td>4.32 (4.55)</td>
</tr>
<tr>
<td>Request for Analysis or Prediction</td>
<td>9.94 (7.92)</td>
<td>.116 (.077)</td>
<td>11.42 (7.05)</td>
</tr>
<tr>
<td>Summary</td>
<td>1.13 (2.45)</td>
<td>.025 (.062)</td>
<td>2.87 (4.08)</td>
</tr>
<tr>
<td>Request for Summary</td>
<td>0.88 (1.78)</td>
<td>.014 (.035)</td>
<td>0.48 (0.68)</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>2.81 (4.67)</td>
<td>.026 (.044)</td>
<td>3.16 (3.57)</td>
</tr>
<tr>
<td>Total High-Level</td>
<td>18.81 (14.99)</td>
<td>.23 (.15)</td>
<td>22.26 (12.68)</td>
</tr>
<tr>
<td>Low Level</td>
<td>Reflections on Reading</td>
<td>1.00 (1.32)</td>
<td>.01 (.017)</td>
</tr>
<tr>
<td>Organization</td>
<td>11.31 (10.74)</td>
<td>.13 (.103)</td>
<td>17.61 (13.86)</td>
</tr>
<tr>
<td>Attention</td>
<td>8.44 (7.10)</td>
<td>.10 (.079)</td>
<td>7.55 (5.68)</td>
</tr>
<tr>
<td>Reinforcement</td>
<td>2.19 (2.37)</td>
<td>.03 (0.50)</td>
<td>4.84 (4.27)</td>
</tr>
<tr>
<td>Extended Reading</td>
<td>4.56 (9.51)</td>
<td>.09 (.206)</td>
<td>3.77 (6.76)</td>
</tr>
<tr>
<td>Total Low-Level</td>
<td>27.50 (16.99)</td>
<td>.36 (.24)</td>
<td>36.29 (17.84)</td>
</tr>
</tbody>
</table>