Preschool teachers' read-aloud practices in Chile as predictors of children's vocabulary ☆

Ligia E. Gómez[a,b,*,1], Marina Vasilyeva[a], Alana Dulaney[a,c]

[a] Lynch School of Education, Boston College, 140 Commonwealth Av., Campion Hall 239, Chestnut Hill, MA 02467, United States
[b] Department of Psychology, Arizona State University, Tempe, AZ 85281, United States
[c] Department of Psychology, University of Chicago, 5848 S. University Av., Chicago, IL 60637, United States

A B S T R A C T

Book reading is a common practice among teachers in developed countries; yet, little is known about the nature and the role of this activity in the development of children's language skills in Spanish-speaking countries. The present study sought to address this gap by examining teacher ($N = 31$) read-aloud practices in low-income Chilean preschools. We examined whether the use of specific (*High/Low-level*) read-aloud strategies predicted preschoolers' vocabulary growth over a school year. The results showed substantial variability among teachers. The frequency of strategies that focused on discussing meaningful aspects of the stories predicted children's vocabulary scores at the end of the school year, controlling for their scores at the start of the year. The use of these high-level strategies was associated with teachers' prior participation in professional training. The implications of findings for further research on classroom linguistic environment and for teaching practices are discussed.

1. Teachers' read-aloud practices as predictors of children's vocabulary: the case of Chilean preschools

Language skills developed by children during preschool and early school years are key predictors of later literacy and broader academic outcomes (Duncan et al., 2007; La Paro, Pianta, & Cox, 2000; Snow, 2006). Therefore, it is critical to identify factors associated with early language mastery. According to the constructivist framework, the child's linguistic environment plays a significant role in the development of language skills (see Hoff, 2006, for review). A key goal of contemporary research within this framework is to determine how specific characteristics of the environment are related to specific aspects of language growth in children.

For preschoolers, the input provided by teachers in the classroom setting is one of the main components of their language environment. For many children, particularly those from low-income communities, attending school creates an opportunity for increased exposure to different types of language-related activities, compared to those available at home. Thus, researchers have paid increased attention to the characteristics of input provided by preschool teachers during various classroom activities (Dickinson, 2001; Justice, Mashburn, Hamre, & Pianta, 2008; Silverman, Crandell, & Carlis, 2013; Wasik,

Bond, & Hindman, 2006). A common preschool activity that has potential to impact language development is "read-aloud" where the teacher reads and discusses books with a group of students. This activity exposes children to a diverse vocabulary, demonstrates different syntactic structures, and provides contextual cues for understanding the meaning and usage of language. Thus, it is not surprising that a number of investigations have focused specifically on the role of reading activities in the growth of preschoolers' language.

1.1. Investigating the role of read-aloud activities in US preschools

Although reading to preschool-aged children at home is common in the US (particularly, in middle-class families), classroom read-alouds provide additional opportunities. A recent study involving low-income Latino preschoolers showed that book discussions during classroom reading were more extensive than during reading at home (Schick, 2014). Further, teachers engaged children in conversations about the book by providing and requesting information, whereas parents rarely elicited children's input. The observed differences in the characteristics of input were associated with child outcomes – teachers' discourse during book reading mattered more for children's narrative skills than parents' home reading. This highlights the importance of teacher talk

and the need to identify specific teaching strategies that facilitate children's language development.

1.1.1. Identifying teachers' strategies associated with language growth

Studies focusing on read-aloud activities in preschools have identified specific aspects of this practice that are associated with language growth. For example, Girolametto and Weitzman (2002) reported three aspects of teacher input that comprised what they termed "responsive language input" and predicted child outcomes: interaction-promoting (e.g., using questions), child-oriented (following the child's lead) and language-modeling (e.g., expanding child's utterances). Related to the notion of responsive input is a construct of dialogic reading, in which teachers provide comments and ask questions to engage children in book discussions. Wasik et al. (2006) designed a study where teachers were trained in dialogic reading strategies. After the intervention, teachers had increased the use of these strategies, which highlights the malleability of their child-directed speech. Further, children in the intervention condition had greater vocabulary growth than the control group, which shows students' sensitivity to teachers' discourse around book reading.

A comprehensive picture of teachers' strategies during read-aloud sessions emerged from studies conducted by Dickinson and colleagues (e.g., Dickinson, 2001; Dickinson & Smith, 1994). These studies examined shared reading with a focus on teachers' extra-textual talk, a measure of speech that excludes direct reading of the book. Teacher utterances were divided into three categories. One category – cognitively challenging talk – included analysis of characters or events, talk about word meaning, making predictions, and summaries. The second category included teacher utterances with a lower cognitive demand, such as describing physical features of the book. The third category included talk related to managing behavior. The results showed that when teachers used more challenging talk during book reading, their students had higher vocabulary scores in kindergarten. The effects of read-aloud strategies used by preschool teachers were evident even in fourth-grade students' language skills (Dickinson & Porche, 2011).

Further evidence of the longitudinal relation between preschool reading and subsequent growth of language skills has been provided by Zucker and colleagues (Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013). In their study, the frequency of read-aloud activities predicted vocabulary development at preschool age, but it was the inclusion of extra-textual conversations during read-alouds that predicted longitudinal outcomes. This finding adds to a growing body of literature revealing strong effects of extra-textual discourse on preschoolers' language skills (e.g., Barnes, Dickinson, & Grifenhagen, 2017; Roberts, Jurgens, & Burchinal, 2005).

In sum, the extant research indicates that the amount and quality of preschool reading are related to the growth of language, in particular, vocabulary skills. The mechanism underlying this relation appears straightforward as reading exposes children to new vocabulary. Yet, just reading a new word may not be sufficient to acquire its meaning. Comments and questions during reading, referred to as extra-textual talk, play a key role in facilitating vocabulary growth. Note though that not all extra-textual talk can be expected to have the same impact. For example, teachers' talk about discipline is not likely to increase vocabulary because it tends to involve simple commands comprised of familiar words, whereas analytic comments may enhance children's understanding of the text and, in turn, facilitate their learning of new words. Indeed, the evidence across studies indicates that teachers' extra-textual talk that stimulates children's thinking and talking about the meaning of the text is critical to language growth.

1.1.2. Examining the relation between teacher characteristics and instruction

Across the studies reviewed above, researchers have reported a wide variability among preschool teachers in the frequency and nature of read-aloud activities. With some strategies identified as conducive to

children's language growth, a question arises concerning teachers' characteristics that may predict the use of these strategies. Prior studies on preschool teachers' reading strategies did not focus directly on this question, although many of them examined teachers' background, such as education and experience (Dickinson & Porche, 2011; Schick, 2014; Wasik & Hindman, 2014; Zucker et al., 2013). These variables were either examined descriptively or entered in the analysis as controls in predicting child outcomes. Yet, the question about the relation between teachers' background and the use of read-aloud strategies largely remains open.

More broadly, researchers have examined teacher characteristics in relation to the general quality of instruction. One study (Early et al., 2006) used global measures of instructional quality in preschool, reporting that these measures were not systematically related to teachers' background variables, such as level of education, major, or credentials. Another study (Justice et al., 2008) focused specifically on language and literacy instruction in preschools in relation to teachers' background, including factors such as years of experience, level of education, major, and workshop attendance. The results showed that the literacy instruction was unrelated to any of these variables, but the quality of language used during instruction was related to teachers' professional education. Thus, the relation between teacher background characteristics and instructional quality may vary depending on the aspect of instruction examined.

One limitation to the current knowledge on the relations between teacher characteristics, instructional practices, and students' language skills is that most of this research has been done in the US. Yet, investigating these relations across different cultural and linguistic contexts is critical to building the cumulative knowledge of child development and, more specifically, to identifying robust mechanisms of language growth. It remains to be explored how teacher characteristics are related to the use of read-aloud strategies and how these strategies are, in turn, related to language growth in preschool children outside the US.

1.2. Extending the study of read-aloud strategies to novel contexts

In the present study, we extended the existing body of work on reading practices in preschools by exploring teachers' reading strategies in relation to language skill growth in preschoolers from low-SES families in Chile. This provided an opportunity to examine the trends reported in the U.S. studies in a different cultural setting where reading in preschool could be particularly important for young children because book reading might not be as prevalent as other forms of extended discourse in the home.

Ethnographic and psychological research indicates that although oral story telling is a rich tradition in Latin America (Uccelli, 2008), reading with young children is a rare practice at home (McWayne & Melzi, 2014; Melzi & Caspe, 2005; Romero-Contreras, 2007). In this context, preschool becomes a potentially critical source of input that may facilitate children's language and literacy skills. There has been limited research on early reading practices and language development in Latin American schools. One of the few studies available was conducted in Chile, examining language instruction in kindergarten classrooms (Strasser & Lissi, 2009). The authors reported that teachers in this study had spent little time on language or literacy instruction, with most of the class time dedicated to non-instructional activities.

Chilean preschools present a particularly interesting context for studying the relation between teachers' practices and children's language development because of the juxtaposition of traditional cultural views and recent changes in early childhood education. Traditional views concerning the goals of preschool education in Chile have emphasized the development of social competence (Leyva et al., 2015). A typical school day is filled with activities, such as free play, which do not have a particular instructional focus and are conducted in whole-

group settings with 30–40 children per class (Yoshikawa et al., 2015). Partly as a result of class size and partly due to the cultural view of preschools, teachers traditionally focused on socialization and discipline, such as showing respect to adults and getting along with peers. However, in recent decades preschools have been increasingly viewed as an opportunity for the growth of cognitive and language skills that provide basis for later academic achievement (Leyva et al., 2015). Reflecting this trend, the Chilean government has invested in projects aimed at improving the quality of early education. The present study was done in the context of one such project.

1.3. Present study

The current study used a subset of data collected in the *Un Buen Comienzo* project (*A Good Start*; UBC; see Yoshikawa et al., 2015 for a detailed description). UBC was designed as an intervention study, in which schools were randomly assigned to either the UBC intervention or a comparison condition. The intervention involved a variety of professional development activities for preschool teachers, which included, among others, a language and literacy component. In particular, teachers were trained to develop children's language skills in the context of book reading and other activities. The training emphasized the importance of book discussions focused on meaning and encouraged the use of strategies, such as summarizing and analyzing the content of stories. To examine teacher-child interactions after the intervention, the larger project utilized global measures, such as the Classroom Assessment Scoring System (Pianta, La Paro, & Hamre, 2008). The present study focused on a specific activity (shared group reading) and conducted a fine-grained analysis of teacher input during that activity. It has been argued that this type of analysis is essential for obtaining a better understanding of how teachers utilize strategies taught during interventions (Barnes & Dickinson, 2017; Dickinson, Freiberg, & Barnes, 2011).

It should be noted, though, that the focus of our analysis was not on the effects of the intervention, but rather on the relation between reading strategies (to the extent to which they were implemented by teachers) and children's language growth. Given the focus on preschool reading activities, we examined videotapes to identify recordings that included group-reading episodes. It became apparent that teachers in the comparison group engaged students in read-alouds relatively rarely, as they were captured only in a few of these classrooms on a randomly selected day. Further, in those comparison classrooms where read-aloud sessions were recorded, they were shorter in duration than in the intervention group. These findings are consistent with literature indicating that group reading is uncommon in Latin American preschools (Romero-Contreras, 2007; Susperreguy, Strasser, Lissi, & Mendive, 2007). In contrast, intervention teachers engaged students in shared reading at higher rates and for longer time periods. Based on our interest in the relation between students' language growth and the characteristics of teacher input during read-alouds (rather than in the effects of the intervention per se), we decided to focus on the intervention teachers for the purposes of the present study. We reasoned that if the comparison teachers practice read-alouds infrequently, there is no reason to expect that specific features of their input during reading will predict children's language skills. At the same time, since the intervention teachers engaged their students in read-alouds on a more regular basis, their strategies during reading are more likely to reveal a relation to children's language growth.

The key outcome examined in the present study was children's vocabulary. There is a large body of research indicating that early vocabulary skills provide the basis for literacy, social skills, and academic achievement (e.g., Pianta, 1999; Scarborough, 2001; Tabors, Snow, & Dickinson, 2001). The process of building vocabulary – i.e., learning new words – involves more than establishing associations. It requires understanding the underlying concepts, the ways in which new words get combined with others and function pragmatically in speech.

This process is particularly sensitive to language input children receive (Bowers & Vasilyeva, 2011; Hoff, 2003), of which book reading is an important component.

The present study examined three sets of research questions. The first one addressed the variability in the characteristics of teacher talk during reading activities in preschool classrooms. Analyses of classroom activities conducted so far showed a wide variability among the teachers participating in the UBC project in the implementation of instructional strategies introduced during training (for more information on the intervention fidelity of the UBC project, see Mendive, Weiland, Yoshikawa, & Snow, 2015). Similarly, we expected that the teachers would vary in their implementation of suggested reading strategies. We were especially interested in the use of cognitively/linguistically stimulating strategies that had potential to facilitate children's story comprehension and vocabulary acquisition.

The second set of questions concerned the relation between teachers' use of read-aloud strategies and their background characteristics. In particular, we examined the amount of teaching experience and participation in language/literacy training (in addition to the UBC intervention) as potential predictors of teachers' use of different types of strategies. Several studies conducted in the US showed no relation between the amount of preschool teachers' experience and their use of high-quality instruction, and thus we did not have specific predictions with regard to this measure. Yet, based on the findings by Justice et al. (2008) showing a positive relation between teacher's training and the use of high-quality instructional strategies, we hypothesized that Chilean preschool teachers who received training in literacy education (in addition to UBC intervention) may be more likely to use cognitively stimulating strategies.

The third set of questions addressed the relation between teachers' read-aloud strategies and children's language growth. We hypothesized that this relation may vary depending on the type of strategy. In particular, teachers who used cognitively/linguistically stimulating strategies more frequently were expected to have students who showed a greater growth in their vocabulary skills over the school year. Based on prior literature, we included in this category of strategies the teachers' attempts to engage children in talking about word meanings, analyzing the text, making predictions, and summarizing stories. In addition, we took into account prior findings showing that certain aspects of teacher input (e.g., use of sophisticated vocabulary or complex sentence forms) have differential effects on children who vary in the initial level of language (e.g., Bowers & Vasilyeva, 2011). To address this possibility, we examined whether the relation between teachers' use of stimulating strategies and children's vocabulary growth was moderated by children's initial vocabulary skills.

2. Method

2.1. Participants

The study participants were teachers and students from 31 pre-kindergarten classrooms in public schools serving low-income communities in the metropolitan area of Santiago de Chile. These classrooms were distributed across 22 schools; 5 schools (23%) had multiple classrooms that were included in the study; in the majority of participating schools (77%) a single classroom per school took part in the study. The total number of children in the analytic sample was 554. All participating children attended school on a regular public preschool schedule, in which the school day lasts about 4 h (typically, from early morning until lunch time). The average number of children per classroom was 18, with a range of 4 to 34 children per classroom with complete data points for the present study. All children were native Spanish speakers. At the beginning of the school year, the average age of participating children was 53.5 months ($SD = 3.6$) with a minimum age of 41.1 months and a maximum of 64.4 months. The second testing was conducted 7 months after the first testing. There was a slightly

greater percentage of females ($n = 302$ or 54.5%) than males ($n = 252$ or 45.5%).

The 31 participating teachers were all female native Spanish speakers. The majority of teachers (90%) had completed a bachelor's degree in education and one teacher had completed a bachelor's degree in another area; two teachers did not answer this question. All participating teachers fulfilled licensing requirements for preschool instruction. Teachers varied in the amount of professional experience as follows: 16% had been teaching for < 4 years, 23% had between 5 and 14 years of experience and 61% had 15 or more years of teaching experience.

2.2. Measures and procedure

2.2.1. Child outcome measure

The measure of child language used in the present study was the Picture Vocabulary subscale from the Woodcock-Muñoz Language Survey Revised (WMLS-R) Spanish Form (Woodcock, Muñoz-Sandoval, Ruef, & Alvarado, 2005). WMLS-R is considered a valid and reliable measure normed on 3911 native monolingual Spanish-speakers. Although this instrument has not been normed in Chile, it is one of the most widely used tools in testing children from different Latin American countries speaking different varieties of Spanish (Snow & Oh, 2010). The Picture Vocabulary subscale of WMLS-R includes both a receptive and productive vocabulary test. For the first seven items the interviewer requests the child to identify a specific object, whereby the child points to the correct object; the rest of the items require children to name objects, which increase in difficulty as the test moves forward. The maximum possible score is 59. When the child makes six mistakes within a sequence of eight items, the test is discontinued. In the present study, WMLS-R was administered twice — at the beginning and at the end of pre-kindergarten. Scores from Time 2 were treated as the outcome variable, while scores from Time 1 were used as a control variable to account for children's initial level of language skills.

2.2.2. Teacher measures

Each classroom was videotaped at the start and the end of the school year. In the present study, teacher measures were based on the data collected at the end of the year, at which point teachers had an opportunity to acquire strategies introduced during professional training. As part of the UBC project, each classroom received the same set of books that were age-appropriate and deemed stimulating for language development. Thus, over the course of the year, teachers were likely to have read most of the same books from the classroom library. On the day of videotaping, teachers selected one of these books for a read-aloud; their choices varied with an exception of two pairs who selected the same book.

To arrive at the measures of teacher strategies, we examined the video recordings. Each videotaping session lasted approximately 4 h, capturing an entire randomly selected school day. We identified the segments of the video containing a read-aloud activity. 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 directed the students to start a different activity either related to the story (e.g. color a picture of the main character) or unrelated (e.g. meal time). Having identified the relevant segments that contained read-aloud activities, we transcribed and coded teacher-child interactions from these segments.

(1) *Transcription*. Each read-aloud session was transcribed by a native Spanish speaker. The transcripts included all extra-textual utterances produced during the read-aloud. This focus on extra-textual talk, which excluded direct reading of text, reflected our goal to capture differences across teachers in the use of read-aloud strategies. Children's utterances were transcribed without distinguishing among individual children; these utterances were used during coding to clarify the function of teachers' utterances.

Separate utterances were identified using prosodic and semantic cues following established rules (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). In particular, a speech segment was coded as an utterance when there was a clear pause preceding or following the utterance, except when the speaker was in a word-searching pause. An utterance could not span more than one conversational turn. When two clauses were connected by a lexical item within the same conversational turn (e.g., *and*), they were transcribed as one utterance. Examples of utterances include single words (cat), phrases (on the plate), simple sentences (Maria is happy), or a multi-clause sentences (It is time to listen carefully to your classmate).

About 30% of the videos were transcribed by a second Spanish speaker to determine the reliability of the original transcription process. Comparing the transcripts showed that 95% of the utterances were transcribed identically. Next, one of the co-authors (who happens to be a native Spanish speaker) verified all transcripts by reading them while watching the corresponding videos. At this stage, the researcher and transcribers also resolved all cases of disagreement.

(2) *Coding individual utterances*. Teachers' utterances were coded according to their function in the context of the book discussion, as presented in Table 1. Some codes (e.g., *Summary*, *Direct recall*) could be applied to teachers' own comments about the text (e.g., providing a summary of the story or recalling previously read information) or to teachers' requests for children (e.g., asking students for a summary or prompting them to recall information). Our initial coding included a distinction between teachers' comments and prompts. However, based on the analysis that showed similarity in the use of comments and prompts by teachers, we combined these utterances within relevant strategy categories. Further, we should note that most of the utterances received a single strategy code, but a few utterances (< 2% across transcripts) served more than one function (e.g., providing a summary and making a prediction), in which case they received more than one code.

Two raters independently coded 15% of transcripts. The comparison of their results showed that 95% of utterances were coded identically. Discrepancies were resolved by a consultation with a third judge.

(3) *Creating composite categories*. After coding individual strategies, we created composite categories, based on the coding scheme developed by Dickinson and Smith (1994). Specifically, three categories of strategies were formed: *High-level* book related talk, *Low-level* book related talk, and *Managerial* talk not conceptually related to the book.

The *High-level* composite (first four rows of Table 1) included utterances in which the teachers requested or provided a meaningful analysis of the text. This category involved making inferences, predictions, summaries, and connections to personal experience. The *Low-level* composite (next five rows of Table 1) consisted of strategies that were also related to the book being read but appeared to require less analytic thought than the *High-level* category. The strategies included in this composite, such as direct recall of the text or labeling pictures in the book, could potentially facilitate children's comprehension and word learning. Yet, their impact on child language has been found to be less consistent than the effect of the more analytic strategies that comprise the *High-level* composite (e.g., Hindman, Connor, Jewkes, & Morrison, 2008). The *Managerial* composite (last three rows of Table 1) consisted of strategies that served the purpose of managing children's attention and behavior. It has been shown that such utterances typically include simple vocabulary and sentence forms that are not likely to facilitate the development of children's language skills (e.g., Dickinson & Smith, 1994).

In addition to identifying teachers' strategies during read-aloud activities, we examined variables capturing the characteristics of teachers' experience. As part of a larger project, teachers were asked to complete questionnaires with demographic and background information. From these questionnaires, we obtained information about the total amount of teaching experience and whether or not the teachers received literacy training prior to participating in the UBC project. The

Table 1
Read-aloud strategies used by teachers.

Strategy category	Strategy description	Strategy example	English translation	M	r
High-level composite Analysis & prediction	Analyzing story characters or events; making predictions	Porque le sirvió la comida en unos platos donde la cigüeña, que tiene un pico largo, no podía comer.	Because he served the food in dishes where a stork, which has a long beak, could not eat.	15%	0.35
Summary	Summarizing sections of the story or the whole story	Todos cooperaron para obtener la deliciosa zanahoria.	Everyone cooperated to get this delicious carrot.	3%	0.24
Personal experience	Discussing personal experience	¿A qué le tienen miedo ustedes?	What are you afraid of?	5%	0.12
Vocabulary	Defining words; identifying sounds or letters in words	La *cima* es la parte de arriba de un cerro.	The summit is the top of the hill.	4%	0.33
Low-level composite Clarification	Clarifying a child's response	¿Qué dijo mi amor entonces?	Then what did you say sweetheart?	3%	0.13
Repetition and/or rephrasing	Repeating an utterance or rephrasing it	C: Como un árbol. T: Como un árbol, verdad?	C: Like a tree T: Like a tree, right?	12%	0.01
Direct recall	Recall of recently read text	¿Qué hizo la zorra cuando fue la cigüeña a su casa?	What did the fox do when the stork went to her house?	13%	− 0.32
Skill routines	Singing or reciting rhymes to get ready to read, clean, etc.	Y colorín, colorado, este cuento se ha acabado.	"Colorin, colorado, this story is over."	2%	− 0.18
Book features	Treating the book as an object; labeling pictures	Aquí está el título del cuento.	Here is the title of the story.	8%	− 0.02
Managerial Proper behavior	Pointing out rules of proper behavior	Ella levanto su mano y siguió nuestras normas.	She raised her hand and followed our rules.	4%	0.01
Attention & organization	Managing behavior & requesting attention	María anda a sentarte ahí.	Maria, go sit down there.	26%	− 0.20
Reinforcement	Reinforcement of student responses	Muy bien.	Very good.	5%	0.07

first variable was continuous (measured in years) and the second one was dichotomous ("yes" = 1, "no" = 0).

2.3. Analytic approach

2.3.1. Outliers and missing data

Prior to conducting the main analysis, we examined the data for the presence of outliers. We found that, out of 554 children who were tested at two time points, outlier scores were produced by five children at Time 1 and four children at Time 2; two additional children had outlier scores at both testing points. Examining teachers' composite strategy variables, we identified one teacher who was an outlier on the *Low-level* composite variable. Because excluding outliers from the analyses resulted in the same pattern of findings as for the whole sample, the results presented below are based on the total sample.

Next, we addressed the issue of missing data. We found that some responses from teachers' questionnaires were missing, but the items that were skipped showed no systematic pattern – the responses appeared to be missing at random. The percentage of data points that were missing across all teachers and all background variables included in the analysis was 3%. When the amount of missing data is < 5%, variations in strategies for handling it result in substantively similar estimates with negligible differences (Widaman, 2006). In the present study, we applied the mean-replacement strategy.

2.3.2. Main analyses

To address the first research question, we conducted a descriptive analysis examining the extent of variability in read-aloud strategies across teachers. To address the second question, we conducted a regression analysis exploring the relation between teachers' background characteristics and the composite strategy measures (*High-level*, *Low-level*, and *Managerial* composites). Finally, to address the third research question, we used hierarchical linear modeling (Raundenbush & Bryk, 2002) to examine the relation between the frequency of the three composite strategies and the children's vocabulary growth. Given the size of our sample and the number of classrooms, HLM provided a preferred way of taking into account the students' nesting within classrooms (Gámez, 2015).

To examine gains in children's vocabulary, their end-of-year scores were entered in the HLM as the outcome measure, while controlling for their start-of-year scores. We also controlled for several variables that could be related to vocabulary gains, including child-level covariates (age and gender) and classroom-level covariates (class size and teacher characteristics). Further, to distinguish the effects of qualitative aspects of teacher input (i.e., types of reading strategies) from the quantitative aspects (i.e., the amount of teacher talk), we used the total number of teacher utterances during the read-aloud session as a classroom-level covariate. All continuous variables were entered into the models as z-scores, and thus, were centered on the grand mean.

3. Results

3.1. Analysis of individual read-aloud strategies

3.1.1. Variability in the frequency of individual strategies

Table 1 presents descriptive statistics on the use of individual strategies. The frequencies of strategies were determined by calculating the percentage of teacher utterances that were coded into each category

relative to the total number of teacher utterances during the read-aloud. The percentage of individual strategies varied from the maximum of 26% for the utterances aimed at managing behavior to the minimum of 2% for skill routines. Not all teachers used all strategies listed in the table. To examine the diversity of strategy use, we computed the number of different strategies observed during a single read-aloud session in each classroom. This measure varied from 3 to 12 strategies per teacher ($M = 8.2$, $SD = 2.1$).

3.1.2. Relation between individual strategies and children's vocabulary

Next, we examined variability in the relation between teachers' use of each strategy and children's vocabulary. Table 1 presents correlations between the frequency of individual strategies and children's vocabulary scores at the end of school year, partialling out their scores at the start of the year. These data show a substantial range in the strength, as well as in the direction, of correlation across strategies. As expected, the strategies that included the discussion of meaningful aspects of the story were positively correlated with children's vocabulary scores. In contrast, the strategies that were aimed at organizing children's behavior and managing discipline were not strongly positively related to children's vocabulary. One of the concerns in analyzing the relation between individual strategies and children's outcomes is that some of the strategies are infrequent and occur in a small percentage of classrooms. This limits the range of the measure's variability and its ability to show a significant relation to other variables. In order to get a more reliable measure of the teachers' input, we computed composite strategy categories.

3.2. Analysis of composite strategy categories

3.2.1. Variability in the frequency of composite categories

The three composite measures were computed by adding up the raw counts of all the utterances that fell into a particular composite category and dividing the sum by the total number of utterances produced by the teacher. Examining the composites, we found that the strategies from the *Low-level* category were used by teachers in our sample most frequently (43%), followed by *Managerial* strategies (35%) and finally by the *High-level* strategies (22%). It is important to note that there was also substantial variability across teachers within each of the three composite categories. The percent of strategies categorized as *High-level* varied among individual teachers from 2% to 38%. There was even greater variability in the frequency of *Low-level* and *Managerial* strategies (20% to 81% and 13% to 78%, respectively). In the next steps of analyses, we examined how this variability in the use of different types of strategies was related to teachers' prior experience and ultimately to children's vocabulary gains.

3.2.2. Relation between composite strategy categories and teachers' background

We examined to what extent teachers' use of the three composite strategy types (*High-level*, *Low-level* and *Managerial*) was predicted by their background characteristics. The two background variables – total amount of teaching experience and receiving training in literacy instruction prior to participation in the UBC project – were based on teachers' responses to the questionnaire.

To examine the relation between teachers' use of read-aloud strategies and their background characteristics, we ran three regression models. The dependent variables in Models 1, 2, and 3 were the frequency of using *High-level*, *Low-level* and *Managerial* strategies, respectively. The two background variables served as predictors in all three models. The results showed that having received additional training in literacy instruction was positively associated with the use of *High-level* strategies and negatively associated with *Low-level* strategies (see Table 2). At the same time, the amount of teaching experience was not significantly associated with the use of any type of strategy. Finally, the use of *Managerial* strategies was not systematically related to any of the

Table 2
Regression results: teachers' use of three types of strategies as a function of experience.

Model	Unstandardized coefficients		Standardized coefficients		
	B	SE	β	t	p
High-level strategies					
Constant	0.08	0.16		0.51	0.62
Years of teaching experience	− 0.01	0.02	− 0.08	− 0.39	0.70
Received training in literacy/language	0.07	0.03	0.54	2.60	0.02
Low-level strategies					
Constant	1.04	0.23		4.60	0.001
Years of teaching experience	− 0.03	0.03	− 0.15	− 0.97	0.35
Received training in literacy/language	− 0.19	0.04	− 0.71	− 4.36	0.01
Managerial strategies					
Constant	0.03	0.25		0.12	0.90
Years of teaching experience	0.02	0.03	0.14	0.50	0.63
Received training in literacy/language	0.08	0.05	0.44	1.19	0.24

teachers' characteristics examined.

3.3. Analysis of children's vocabulary growth and its relation to teachers' strategy use

In the analyses below that involved children's vocabulary we used raw, rather than standardized, test scores. As pointed out by Yoshikawa et al. (2015), raw scores provide a more sensitive measure in capturing variability among children and detecting change over a school year, which is particularly important when the sample has a relatively restricted age range.

3.3.1. Variability in children's vocabulary scores

We observed variability among children both in terms of starting levels and the growth of their vocabulary skills. At the first testing session, which was conducted at the start of school year, the mean vocabulary score was 18.4 ($SD = 4.6$; range from 2 to 33). At the second testing session, which was conducted at the end of the school year, the mean vocabulary score was 21.6 ($SD = 4.8$; range from 6 to 37). Importantly, there was substantial variability in the growth of vocabulary scores. Most children (85%) showed a positive growth, with a few participants gaining as much as 11 points over the school year. Yet, 15% of children either did not show any change or even showed a lower level of performance at the end of the year, with some losing as many as 6 points. In the next set of analyses, we modeled the variability in children's vocabulary growth as a function of teachers' strategy use.

3.3.2. Modeling children's vocabulary growth

As noted earlier, because children were nested within classrooms, we used HLM to examine the relation between teacher predictor variables and child outcomes. Before modeling children's vocabulary scores, we examined the extent of similarity among these scores within classrooms by computing the intraclass correlation coefficient (ICC) of the unconditional model. A test of the random intercept showed a significant amount of variance between classrooms in vocabulary scores at the end of the year, Wald $Z = 2.51$, $p = 0.012$, and confirmed a need to control for nesting effects, unconditional ICC = 0.10.

To examine gains in children's vocabulary over the school year, we tested a base model in which their end-of-the-year scores were entered as the outcome and their start-of-the-year scores were entered as a child-level predictor (Model 1, Table 3). We examined Model 1 fit using − 2 Log Likelihood as a measure of deviance (with smaller values

Table 3
HLM results: children's end-of-year vocabulary scores as a function of strategy type.

	Model 2a			Model 2b			Model 2c		
	β	t	*p*	β	T	*p*	β	t	*p*
Fixed effects									
Intercept	− 0.01 (0.03)	− 0.40	0.690	− 0.01 (0.04)	− 0.31	0.761	− 0.01 (0.04)	− 0.38	0.710
T1 Vocab	0.76 (0.03)	25.78	< 0.001	0.76 (0.03)	25.63	< 0.001	0.76 (0.03)	25.54	< 0.001
High-level	0.10 (0.03)	2.82	0.012						
Low-level				− 0.04 (0.04)	− 1.26	0.259			
Managerial							− 0.04 (0.04)	− 1.00	0.327

Note. T1 Vocab = start-of-year vocabulary scores. High-level = high level composite. Low-level = low level composite. Managerial = managerial level composite.

indicating better fit). The addition of Time 1 vocabulary scores to the unconditional model improved the model fit, as shown by a decrease in the measure of deviance from 1396.06 to 883.05, $\chi^2(1) = 513.01$, $p < 0.001$.

Next, we modeled the variability in children's vocabulary scores as a function of teachers' use of *High-level*, *Low-level* and *Managerial* strategies by adding each of the composites (separately) to Model 1. In Model 2A, we added the *High-level* composite, which significantly predicted vocabulary scores at the end of the year, $p = 0.012$ (conditional ICC = 0.0875). In Model 2B, we examined the *Low-level* composite and found that it was not associated with children's vocabulary, $p = 0.259$ (conditional ICC = 0.10). Similarly, the *Managerial* composite examined in Model 2C did not predict year-end vocabulary scores, $p = 0.327$ (conditional ICC = 0.10). Comparing the fit of these three models, we found that Model 2A was a better fit than either Model 2B, $\chi^2(1) = 5.61$, $p = 0.018$, or Model 2C, $\chi^2(1) = 5.83$, $p = 0.016$. There was no difference in model fit between Models 2B and 2C, $\chi^2(1) = 0.23$, $p = 0.631$.

The results of Models 2A–C indicate that only the *High-level* composite significantly predicted vocabulary scores at the end of the year, controlling for the scores at the start of the year. To control for a potential effect of other variables on children's vocabulary gains, we ran Model 3, in which a number of covariates were added to Model 2A. The covariates included child-level variables (age and gender), as well as classroom-level variables (two teacher experience variables from the regression analysis, class size, and the number of teacher's utterances during the read-aloud). None of these covariates were significantly related to the outcome and, in fact, the addition of these variables to Model 2A had a negative impact on model fit, $\chi^2(5) = -19.16$, $p < 0.01$. Yet, the frequency of *High-level* strategies remained a significant predictor of children's vocabulary scores at the end of the school year, while controlling for starting scores and all other examined covariates.

Next, we examined a possibility that the relation between the *High-level* composite and children's scores at the end of the year was moderated by their scores at the start of the year. Thus, in Model 4, we added an interaction term to Model 3. The results showed no significant interaction between the *High-level* composite and the initial vocabulary scores, whereas both of these variables remained significant predictors of vocabulary outcomes at the end of the year.

Finally, to determine whether the *High-level* talk remains a significant predictor of children's vocabulary when both text-related composites are considered together, we tested Model 5, in which *High-level* and *Low-level* composites were entered simultaneously. The model included the same covariates as Model 3. The results showed that our findings with regard to these two strategy types were robust – namely, that the *High-level* composite was a significant predictor of children's vocabulary (fixed effect estimate 0.10, standard error 0.04, $p = 0.02$), whereas the *Low-level* composite was not (fixed effect estimate 0.02, standard error 0.04, $p = 0.67$).

4. Discussion

The present study focused on the characteristics of read-aloud activities in relation to children's vocabulary development in Chilean preschools. An accumulating body of research has explored book reading in preschool settings in the US (Dickinson & Porche, 2011; Van Kleeck, 2003; Wasik & Hindman, 2014; Zucker et al., 2013). Yet, virtually nothing is known about this preschool practice in developing countries. The current study allowed us to examine the relation between teachers' strategies and children's vocabulary outcomes in a novel context.

4.1. Use of read-aloud strategies by Chilean preschool teachers

The focus of the present study was on teachers who participated in professional training with a significant focus on improving language and literacy instruction (Yoshikawa et al., 2015). Unlike teachers in the control group who did not receive the training, these teachers conducted reading sessions in their classrooms on a regular basis, allowing us to examine both general trends and variability in their use of read-aloud strategies.

We found that the strategies comprising the *High-level* composite were used, on average, less frequently than *Low-level* strategies. This pattern is similar to that reported by US researchers (e.g., van Kleeck, 2003; Zucker et al., 2013). Yet, observing it in the present study is particularly noteworthy, given that our teachers participated in the UBC professional training, which included a major emphasis on the use of challenging analytic talk during reading activities. The combined findings from the US and Chilean research suggest that *High-level* strategies present a challenge not only for children, but also for teachers. Indeed, they impose significant cognitive demands on teachers, requiring them to engage in inferential reasoning, while simultaneously managing children's behavior and keeping track of the text. The *Low-level* strategies, such as repetition or labeling, appear to require fewer mental resources and thus may be easier for teachers to combine with other demands of the reading activity.

The frequency with which teachers use different types of talk in a preschool classroom may depend not only on the difficulty of implementing a given strategy, but also on the situational demands. In the present study, for example, a third of the teachers' extra-textual utterances were coded as *Managerial*. The relatively high frequency of these strategies may be due in part to the emphasis on discipline and social interaction skills in Chilean preschools. Further, the frequent use of these strategies may result from the structural characteristics of preschool classrooms, which include a large number of students and where activities are done with the whole group, making discipline an important issue. Yet, as discussed below, even within this context, some teachers incorporated a substantial amount of *High-level* talk, whereas others used extra-textual utterances primarily for *Low-level* and *Managerial* talk.

Similar to previous work, we observed substantial variability across individual teachers in the use of read-aloud strategies. This variability

was noticeable in the measures of diversity and frequency of strategies. With respect to diversity, some teachers utilized only three strategies during the read-aloud, whereas others used a full range of strategies observed in the study. With respect to frequency, it varied both when looking at individual strategies and composites. In particular, the use of *High-level* strategies was extremely low in some classrooms (2% of all extra-textual utterances), even though they accounted for more than a third of teacher utterances in other classrooms. This variability highlights the challenges of implementing the skills taught in teacher training programs. Similar challenges have been reported by US researchers (Early et al., 2007; Milburn, Girolametto, Weitzman, & Greenberg, 2014; Wasik & Hindman, 2014).

It should be noted that the effects of training may look different depending on the level of analysis. On the one hand, we can say that the teachers clearly responded to training as they incorporated read-aloud sessions into their regular instructional practice. On the other hand, researchers, such as Dickinson and Porche (2011), emphasized the need for a fine-grained analysis of teacher speech in order to better understand the effects of intervention. Indeed, it was the utterance-level analysis in the present study that revealed the variability in the extent to which the teachers incorporated specific strategies into their practice. Such findings, in turn, raise questions about the factors that may predict the observed variability in strategy use. We have addressed some of these factors by examining the relation between teachers' prior characteristics (such as education and experience) and the nature of their extra-textual talk during book reading.

4.2. Relation between teachers' prior experience and strategy use

Some teacher characteristics examined in the present study showed little variability. For example, all teachers had similar levels of education. Other characteristics – the amount of teaching experience and participation in professional development programs focused on language/literacy instruction prior to UBC – showed substantial variability. We focused on these variables as potential predictors of teachers' strategy use. While the amount of experience was not related to the use of read-aloud strategies, participation in professional development programs predicted a higher use of *High-level* strategies and lower use of *Low-level* strategies.

There are several potential mechanisms that may account for this finding. It is possible, for example, that prior training increased teachers' interest in language development and their motivation to improve language/literacy instruction, which in turn facilitated their UBC training. It is also possible that those who received prior training in literacy instruction were better equipped (in terms of teaching skills) to utilize the *High-level* strategies modeled in the UBC training. In order for teachers to implement these strategies in the classroom, many of them have to adopt what amounts to a new teaching style. It may require more than a single training program to achieve this outcome. Further, teachers may require on-going support and feedback to integrate the new strategies into their instruction.

Our discussion so far has revealed several challenges associated with the implementation of *High-level* strategies during read-aloud activities in preschool classrooms. As noted earlier, these strategies impose substantial cognitive demands on teachers, compared to *Low-level* or *Managerial* strategies. Adopting new strategies often requires changing one's habitual way of teaching, which takes time and may require repeated training. Further, teachers' prior experience may facilitate or impede their readiness to use challenging strategies. Despite these challenges, the findings reported below on the relation between the frequency of *High-level* strategies and child language skills underscore the importance of facilitating teachers' use of such strategies.

4.3. Relation between teachers' strategy use and children's vocabulary skills

Based on prior research, we hypothesized that teachers who used

High-level strategies more frequently would have students with better vocabulary outcomes. This is because such strategies encourage the discussion of meaningful aspects of the text, thereby facilitating children's understanding of novel words, as well as their ability to use familiar words in novel contexts. Our results supported the hypothesis: teachers' use of *High-level* strategies was positively associated with children's vocabulary scores at the end of the year, controlling for the scores at the start of the year. It is worth noting that we were able to obtain this finding using a relatively small sample of classroom interactions. Although the reading activity that we focused on usually takes less than half an hour, a particular type of teacher talk during this activity showed a significant relation to child outcomes.

This finding is consistent with prior research indicating that measures of teacher input that are based on a relatively small sample of speech reliably predict preschoolers' language growth (e.g., Bowers & Vasilyeva, 2011; Dickinson & Porche, 2011; Girolametto & Weitzman, 2002). We suggest that these findings may reflect a relative stability of the teacher's instructional style. That is, teachers who use highly stimulating strategies during read-aloud sessions may be more likely to use similar approaches in the context of other classroom activities. In contrast, teachers who focus more on behavior management during group reading sessions may be more likely to use this approach during other activities. Thus, the examination of teachers' input during read-aloud sessions may provide a glimpse into more general instructional approaches practiced by the teachers in a preschool classroom.

In contrast to our findings regarding the *High-level* strategies, the frequencies of *Low-level* and *Managerial* strategies were not related to children's outcomes. Prior results concerning a potential role of these two types of strategies have been mixed. For example, similar to our study, Dickinson and Smith (1994) found no relation between *Low-level* strategies and vocabulary growth in preschoolers, but Girolametto and Weitzman (2002) showed that a strategy involving labeling pictures promoted language skills in preschool children. A possible explanation for this discrepancy is that the effect of *Low-level* strategies may vary depending on the outcome measure. The child's outcome examined in the study by Girolametto and Weitzman (2002) was language productivity indexed by the number of children's utterances in teacher-child conversations. *Low-level* strategies may be more likely to facilitate such aspects of language, as productivity, than vocabulary skills.

Learning vocabulary requires both exposure to new words and conversational (or contextual) supports for discerning the meaning of these words. Strategies, such as recall and repetition, can certainly increase children's exposure to new words, and strategies, such as picture labeling, help children map new words onto corresponding objects. Yet, these strategies may not be as effective as the discourse that involves a more in-depth textual analysis and focuses the child's attention on the meaning, especially when it concerns learning less frequent, more abstract words.

With respect to *Managerial* strategies, our results showed a lack of relation to vocabulary skills, which is not surprising. Such strategies are not conceptually related to the story and they typically utilize simple lexical items, which are not likely to facilitate the growth of vocabulary beyond a basic level (Dickinson, 2001; Dickinson & Smith, 1994). Yet, they may be useful for some aspects of language learning as they help focus children's attention on the relevant input. Indeed, Dickinson and Porche (2011) found that the frequency of attention-focusing utterances during large group activities was positively related to children's comprehension, although it was not related to their vocabulary scores.

It should be noted that the percentage of such utterances in the Dickinson and Porche (2011) study was much lower than the percentage of *Managerial* utterances in our study. It is possible that within a relatively limited range the strategies directed at behavior regulation have a positive effect on children. However, if the frequency of such utterances becomes much higher, the advantage of focusing attention on relevant stimuli may be outweighed by the disadvantage of disruptions imposed by managerial utterances. In fact, some researchers

emphasize alternative ways of dealing with inattention during group activities. Gianvecchio and French (2002) pointed out that some instances of inattention during reading can be handled by asking children questions about the content, thus focusing their attention back on the story. This approach tends to increase the level of attention in the whole group, whereas non-book-related comments about discipline may break attention of the students who were previously focused on the story. In other words, book-related strategies may regulate children's attention even better than the disciplinary strategies.

4.4. Contribution, limitations, and future directions

There has been a dearth of research on preschool instruction and its relation to child language growth in developing countries. The present study contributes to the small, although growing, body of work addressing this problem. Examining teacher input and child development across countries is important both for a better understanding of local educational settings and for determining the extent of generalizability of the findings that are mostly based on US studies.

Historically, Latin America did not enjoy as much attention from educational researchers as Western countries. We know little about the teacher-student interactions and the role of teacher input in students' learning in countries like Chile. Yet these countries are in need of research data that can facilitate evidence-based educational changes. The present study provided some of the missing information by examining teachers' talk during a classroom reading activity and documenting its relation to child vocabulary growth. Obtaining such a finding with preschools from low-income families in a Latin American country is of a particular significance due to a limited access to books and a relative paucity of reading activities at home.

Extending research outside of the US not only provides missing information about preschools in countries where this information is greatly needed, but also creates an opportunity to test the processes that have been posited based on the study of Western preschools. The present investigation allowed us to determine whether the relation between teachers' use of *High-level* strategies and preschoolers' vocabulary growth held in a new cultural and linguistic context. Indeed, our findings showed the robustness of this relation, thus lending support to the importance of read-aloud activities and teacher's use of specific strategies during these activities.

In addition to replicating existing findings in a novel context, the present study extended the line of research on read-aloud activities. In much of the extant work on preschool reading, teachers' practices are viewed as a starting point of inquiry, without looking beyond that point into possible reasons underlying observed variability among teachers. The present study is the first one, to our knowledge, that started addressing questions about teacher characteristics associated with the use of particular read-aloud strategies. Our finding that teachers' prior professional development predicted their use of *High-level* strategies in the classroom underscores the potential of this approach.

At the same time, we must acknowledge certain limitations of the present study. In particular, when examining teacher characteristics that predicted the use of read-aloud strategies, we were limited by the available data provided by teachers via questionnaires. More systematic work is clearly needed to obtain a comprehensive understanding of factors that lead to different patterns of teacher-child interactions during classroom activities, such as book reading. In the future, it would be useful to collect data from teachers not only on the amount and nature of their prior experience, but also on their beliefs about child development that may influence their interactions with students.

Our analysis focused on the teachers who participated in the intervention condition. This was due to the fact that many teachers in the control condition did not include read-aloud activities in their classroom practice to the extent that would make them comparable to the intervention group, which would have allowed us to examine the nature of input provided during these activities. It should be noted that

in the context of the UBC project, teachers in the control group were provided with additional books for their classrooms but they were not encouraged to do any particular activities. This is understandable from the perspective of evaluating the effects of the intervention using broad measures of manipulated variables (i.e., whether the teacher received training or not). Yet, it would be informative to do a follow-up study in which teachers in both control and intervention conditions are encouraged to have read-aloud sessions, but only intervention teachers receive training in particular strategies. Using the methodology utilized in the present study would enable researchers to examine variability within the intervention and the control groups and to determine whether, despite this variability, training increases the likelihood of using specific strategies.

With respect to questions regarding the role of teachers' input in the development of children's language, an important issue concerns the sustainability of the effects that are observed in early educational settings. While the present study tracked children's language skills over one academic year, it would be informative to determine if teaching strategies observed in preschool classrooms predict the growth of children's language skills not only during preschool, but also beyond it. In considering such effects over longer periods of time, it would be critical to take into account other aspects of children's language environment, including the input that they receive from family and peers.

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