Read Writ (2014) 27:287–313
DOI 10.1007/s11145-013-9445-4

Exploring the variety of parental talk during shared book reading and its contributions to preschool language and literacy: evidence from the Early Childhood Longitudinal Study-Birth Cohort

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Published online: 17 April 2013

Abstract Although many studies have explored shared book reading between preschoolers and their families, very few have examined this practice within a large, nationally representative sample. Using the ECLS-B dataset, this study investigated shared reading among nearly 700 families of diverse ethnic, linguistic, and socio-economic backgrounds. Coding of families' book-related discussion focused on the variety of types of talk that parents used during reading. Results showed that parents focused primarily on the meaning of the story, with little attention to the code of the text. The range of talk techniques that parents used was largely independent of background factors such as child gender, ethnicity, or age, as well as family home language. A wider variety of meaning-related remarks by parents was linked to more advanced language skills among preschoolers. Findings provide a portrait of the nature of shared book reading discussion among American families, a profile of the background factors that are linked to this talk, and a precise account of the unique contributions of this talk to key emergent language and literacy competencies.

Keywords Book reading · Early Childhood Longitudinal Study-Birth Cohort · Language · Literacy · Preschool

Introduction

Shared book reading between parents and young children is one of the most celebrated and frequently studied techniques for building early academic skills

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(Bus, Leseman, & Keultjes, 2000; Bus, van IJzendoorn, & Pelligrini, 1995; Scarborough & Dobrich, 1994). Book reading can foster children's vocabulary skills, particularly when parents use books as an opportunity to talk with children about new words and ideas (e.g., Sénéchal, 2006). In addition, parents can use book reading to draw children's attention to the letters and sounds that comprise print (e.g., Davis, Evans, & Reynolds, 2010; Ezell & Justice, 2000). However, because of the intensive effort required to explore parent–child talk during book reading, the bulk of the extant literature on this topic has involved small samples of participants (i.e., fewer than 100 parent–child pairs) of fairly homogenous backgrounds (i.e., recruited from just one or two towns or regions). Consequently, many questions remain regarding precisely how American families talk about the meaning and/or the code of texts when reading with their young children. These include understanding which child and family background factors might foster or hinder this talk and how this book-related talk uniquely predicts early language and literacy outcomes when accounting for these background factors. Answering these questions is essential for targeting future research studies on productive topics and, ultimately, for refining guidance to parents about how to most effectively read with their children and, thus, to optimize children's early learning.

The current study employs the large-scale, nationally representative Early Childhood Longitudinal Study-Birth Cohort dataset to advance our understanding of the nature of shared book reading with preschool children and its role in early reading-related development. Using this dataset, we provide a rich and detailed snapshot of book-related talk in American homes.

Shared book reading

Broadly defined, shared book reading refers to experiences in which pre-literate children, generally in preschool or kindergarten, listen as a more expert reader (e.g., parent, teacher, sibling) reads a book to them (What Works Clearinghouse, 2006). While reading, adults may engage the child in discussion of the book, drawing attention to the pictures, words, and meaning of the story (Bus, 2001; van Kleeck, Gillam, Hamilton, & McGrath, 1997). These interactions with books provide children with access to new words and ideas beyond their daily lives and serve as springboards for conversations about the world that are relatively rare in common parlance with young children (Elley, 1989; Ganea, Pickard, & DeLoache, 2008; Girolametto, Weitzman, van Leishout, & Duff, 2000) and, surprisingly, among adults. For example, one study (Hayes & Ahrens, 1988) found that the language used by young children and adults while reading was more complex than that documented in conversations between college students. Furthermore, books model how the printed word communicates meaning, and they can help with letter recognition and sound awareness (Justice, Skibbe, & Ezell, 2006). In all, shared reading can be a uniquely valuable and motivating window into the literate world for young children.

In light of this potential, considerable policy efforts by groups such as the Commission on Reading (Anderson, Hiebert, Scott, & Wilkinson, 1985) and the Committee on the Prevention of Reading Difficulties in Young Children (Burns,

Griffin and Snow 1999) have provided parents with the message that reading books with their child(ren) is among the most important ways of promoting language and literacy development. Accordingly, research suggests that most parents report reading with their young child(ren) at least several times a week (Bus et al., 2000; Child Trends, 2010; Wood, 2002), regardless of socioeconomic status or ethnicity (Hindman, Miller, Froyen, & Skibbe, 2012; Raikes et al., 2006). Thus, book reading dominates the landscape of family language and literacy activities.

Types of parental talk during shared book reading

Vygotsky's sociocultural theory of learning and development (1978) suggests that children acquire much of their knowledge about the world as experts around them (e.g., parents, teachers) mediate their experiences with new information. Put another way, adults interpret the world and share this information with children, complementing what children already know while strategically extending their emerging expertise. Empirical research supports this hypothesis. For example, when parents and children read books together, the nature of their talk about those books has a critical impact on what children learn from that reading (Evans, Shaw, & Bell, 2000; Lonigan, Anthony, Bloomfield, Dyer, & Samwell, 1999; Sénéchal, LeFevre, Thomas, & Daley, 1998). Interestingly, though, while parents are frequently advised to read with their children, this advice is often quite broad in nature, focusing on recommending a particular frequency of reading (e.g., daily readings) and the value of a variety of diverse practices such as discussing the parts of the book, the plot, and the images [e.g., United States Department of Education (US DOE), 2003, 2005]. Parents are rarely provided with clear guidance about what to talk about when they read, and indeed, many questions remain in the research literature regarding what kinds of talk would be most beneficial. Below, we describe what is known about parental talk during reading and its relations with children's language and literacy development.

Meaning-based talk

When reading books together, parents and children might discuss the words and concepts in the book, helping children to make meaning of the story (Dickinson & Tabors, 2001; Hindman, Connor, Jewkes, & Morrison, 2008; Sénéchal, Pagan, Lever, & Ouellette, 2008; Yaden, Smolkin, & MacGillivray, 1993). One type of talk, termed descriptive (as well as immediate, concrete, or contextualized) talk, involves labeling and discussing the illustrations (Dickinson & Tabors, 2001; Hindman et al., 2008). This talk focuses on content that is immediately apparent on the pages of the book, including describing the characters and/or actions depicted in the storybook. Transcending this immediately apparent content, parents and children might also employ inferential talk (also termed non-immediate, abstract, or decontextualized talk). This talk can include making predictions about how the story might unfold or relating the story to one's own experiences. Parents might also further children's understanding by defining words or introducing other novel

information that helps children understand the story (e.g., "Franklin the turtle has a special shell on his body that he can use for protection"). Finally, parents might provide or request a summary of what has happened so far, or recall a previous event in the book.

The extant literature, despite the relatively small sample sizes of most studies, provides some insight into the relative frequency of these various kinds of meaning-focused talk. Parents (most often mothers) and children primarily label and describe the pictures in the book when reading and do not engage in much inferential talk (Dickinson & Tabors, 2001; Evans, Reynolds, Shaw, & Pursoo, 2011; Hindman et al., 2008; Sénéchal, 2006). When using inferential talk, parents most often evaluate the book or story and predict (or ask children to predict) what is likely to happen next; in contrast, defining words and recalling/summarizing the story are relatively uncommon occurrences (Dickinson & Tabors, 2001; Evans et al., 2011; Hindman et al., 2008; Hindman, Wasik, & Erhart, 2012).

All of these types of meaning-related talk during shared book reading, whether more concrete or more abstract, can support children's language and vocabulary development. Studies have differed in whether they conceptualize the active ingredient in reading as the frequency of reading, the frequency of particular types of talk during reading, or the overall variety of types of talk that families use during reading. Nevertheless, the trend in results remains the same. For example, in a study involving mostly middle- and upper-income families, Sénéchal et al. (1998) found that the frequency of storybook exposure was predictive of children's oral language skills but not their written-language skills such as alphabet knowledge, spelling, and decoding. While a relatively small body of work (see Castro, Espinosa, & Páez, 2011; Goodson, Layzer, Smith, & Rimzdius, 2004; Sandstrom, Moodie, & Halle, 2011) has conceptualized the active ingredients of reading only as the diversity of types of talk to which children are exposed, many studies have combined codes (e.g., summing the frequency of prediction talk and the frequency of defining talk) into meaning-related variables reflecting both the diversity and frequency of talk (e.g., Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Dickinson & Tabors, 2001; Hindman et al., 2008; Hindman et al., 2012a, b; Hood, Conlon, & Andrews, 2008; Wasik & Bond, 2001). Critically, in these latter studies, similar associations between the frequency of meaning-related talk and oral language outcomes have emerged.

Code-focused talk

Parents and children can also discuss the text (or code) of the book (Justice, Bowles, & Skibbe, 2006). Specifically, parents might point out (or ask children to identify) specific letters, highlight sounds in the text (e.g., rhymes, alliteration), or note the sounds that particular letters make within words. Parents might also invite children to practice their code-related skills by prompting them to read some or all of the text (which, for pre-literate children, might involve interpretation of images more than actual decoding). As with meaning-focused talk, most work conceptualizes code-related talk as the total amount of talk, summing or averaging across various different types of remarks, related to code (see Goodson et al., 2004 for an approach focusing particularly on the diversity of types of talk).

Interestingly, evidence suggests that families rarely focus on this aspect of the text during shared book reading with young children (Hindman et al., 2008; Yaden et al., 1993), at least in the absence of a high-quality intervention encouraging them to do so (Justice & Ezell, 2002). For example, Price, van Kleeck, & Huberty (2009) found that only 6 % of parents' talk during book reading was focused on print, and very similar proportions have emerged from other studies of parent–child and even teacher–child readings (e.g., Hindman et al., 2008; Yaden et al., 1993). Parental support in this area is particularly important, as without this guidance, young, pre-literate children devote little focus to print (Evans & Saint-Aubin, 2005; Justice, Pullen, & Pence, 2008; Justice, Skibbe, Canning, & Lankford, 2005), at least until they develop more code-related expertise (Davis et al., 2010; Evans, Saint-Aubin, & Landry, 2009).

Even if this code-related talk is relatively rare during reading, it may provide a critical springboard for continued literacy development (National Early Literacy Panel [NELP], 2009; Piasta, Justice, McGinty, & Kadaverek, 2012). Indeed, when parents explicitly reference print during book reading, children make greater gains in print concepts than peers who were not exposed to this talk (Justice & Ezell 2002; Justice, Skibbe, McGinty, Piasta, & Petrill 2011). These gains have long-term benefits for later reading skills (Catts, Fey, Tomblin, & Zhang, 2002; Hammill, 2004; NELP, 2009).

What factors predict parents' talk during shared book reading?

Prior research has identified a number of factors that are linked to the talk between young children and their parents during shared book reading. However, given the small-scale nature of much of this work, it is important to more fully explore these key issues together in a large and diverse sample. First, while the influences of socioeconomic status on book reading experiences have been widely examined, many studies confound parent education, family ethnicity, and family home language; recent work suggests that education may warrant primary focus (Hammer, Farkas, & Maczuga, 2010; Hill & Craft, 2003; Hill et al., 2004; Hindman et al., 2012a, b). Currently, evidence is conflicting: parents with less education may read less often with children (Adams, 1990), although recent work finds that low-income families may read with children nearly every day, perhaps partly as a result of outreach campaigns (Raikes et al., 2006).

However, beyond the frequency of reading, families with less education tend to have lower incomes, which results in less access to high-quality books in their school and home environments (Crosnoe et al., 2010), especially in rural environments where libraries are scattered (Burchinal, Vernon-Feagans, & Cox, 2008). Further, less educated parents may talk less than high-income parents while reading with children and may use less advanced vocabulary (Hart & Risley, 1995; Hoff, 2003). Although code- and meaning-focused talk have not been examined specifically, one study comparing shared book reading practices between more and less educated mothers in Israel found that less educated mothers provided less conversation during book reading and used fewer varied labels for items in the books (Ninio, 1980). More recently, the Harvard Home–School Study (Dickinson &

Tabors, 2001) identified similar results in the United States, although there was significant variability across families.

Children's disability status might also affect the nature and contributions of shared book reading. Parents of children with disabilities often place less emphasis on literacy development (Marvin & Mirenda, 1993), sometimes reporting less positive beliefs about literacy, engaging in fewer literacy activities at home, and providing lower quality emotional supports during these activities than mothers of children exhibiting typical development (Pellegrini, McGillicuddy-DeLisi, Sigel, & Brody, 1986; Skibbe, Justice, Zucker, & McGinty, 2008; Skibbe, Moody, Justice, & McGinty, 2010). Thus, it is possible that book readings between parents and children with disabilities might feature less frequent and/or less varied code- or meaning-focused talk.

Finally, it is plausible that factors such as child age, gender, and experience with books may matter for parents' talk during shared reading. Specifically, children who are older may, on average, be more engaged in complex discussion during reading, perhaps because of greater background knowledge or attentional skills (Hammer et al., 2010; Hindman et al., 2008; Hindman et al., 2012a, b). The same may be true of girls (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991), perhaps because of stronger self-regulation (Ready, LoGerfo, Burkam, & Lee, 2005). In addition, parents who read with children more often might have more effective routines that facilitate richer conversations, and children might better manage their own attention during the reading (Dolezal-Sams, Nordquist, & Twardosz, 2009).

In the current study, we take advantage of the large-scale ECLS-B sample to simultaneously explore how all of these factors are predictive of parents' meaning- and code-related talk during reading.

How does children's prior knowledge moderate the effects of book-related talk?

In the past five years, evidence has accrued to suggest that what children take away from language and literacy instruction, including shared book reading with their families, may depend in part on the knowledge that they bring to the experience (Connor, Morrison, & Slominski, 2006; Hindman et al., 2008; Hindman et al., 2012a, b). However, there is little consensus as to the direction of these effects (likely because most of this research has been smaller scale, and much of it has examined specific interventions, making cross-study comparison difficult). On one hand, some research indicates that children with more initial knowledge (including vocabulary, letters, sounds, or most broadly, general cognition or problem solving) are better able to take advantage of new information provided during reading and, thus, learn from reading at a faster rate than less skilled peers (Hindman et al., 2012a, b; Reese & Cox, 1999). On the other hand, some data show that children who know the least about content derive the greatest benefit from book readings, essentially "soaking up" the new information in these experiences and beginning to close the gap with their more skilled peers (Dale et al., 1996; Hindman et al., 2008). However, many of these latter experiences have come in the context of interventions tailored to make vocabulary especially salient. It may be the case that in typical situations—in other words, absent of intervention or another system for reaching out

to children with lower skills—children who enter a book reading with the strongest cognitive (e.g., vocabulary, problem solving) skills will most effectively engage with the parents' talk and with the story and will demonstrate the greatest gains as a result. The current study explores this issue in the diverse and large-scale ECLS-B sample.

Research aims

Given the importance of shared book reading with young children and the pressing unanswered questions described above, four research aims guided this study. We first examined the variety and frequency of parents' talk with preschool children around shared book reading in a nationally representative sample. We expected that most parents would use both kinds of talk, but that meaning-related talk would be more frequent than code-related talk. We then explored how key background factors predicted this book-related talk. Based on prior research, we expected that more educated parents might use more code- and meaning-related talk. Accounting for education, we expected very small differences across ethnicity and home language. We also predicted that parents of children with special needs might employ less of both types of talk.

In addition, we investigated how this talk was related to children's skill development, controlling for a variety of child and family background factors. We expected that meaning-related talk would be linked to vocabulary skills, whereas code-related talk would be associated with literacy competence. In our final aim, we endeavored to move beyond a "one-size-fits-all" model by examining how patterns of association between parents' talk and children's outcomes might depend on children's prior cognitive skills. We anticipated that the contributions of parents' talk to preschoolers' outcomes would be strongest for children with the highest early cognitive skills.

Method

Procedures

The Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) is a nationally representative study following children born in 2001 from infancy through kindergarten. Approximately 14,000 children were recruited from all ethnic and socioeconomic backgrounds, and from all regions of the nation. During home visits when children were nine months of age, as well as near their second and fourth birthdays, children's cognitive, social, and physical skills were assessed directly, and parents (typically mothers) were interviewed. In addition, the mother and child were videotaped reading a book together. The reading was part of the Two Bags Task, a modification of the Three Bags Task used in the NICHD-ECCRN study and the Early Head Start study. Each mother–child dyad was given two bags, with Bag 1 including the book *Corduroy* (Freeman, 1968), available in English or in Spanish,

and Bag 2 including Play-Doh, a rolling pin, and cookie cutters. The experimenter asked families to play with both of the bags, beginning with the book and ending with the Play-Doh, for 10 total minutes. Book-reading-related discussion was later coded from the videotapes for a random sub-sample of 800 families.

Participants

It is important to note that, because of the need to protect the confidentiality of ECLS-B participants, studies using these data are required to round all unweighted sample sizes to the nearest increment of 50. Thus, the data in the text and tables below employ these rounding rules.

Sample size

Of these 800 randomly selected dyads (one preschool child and his/her mother) in the RAPT sub-study, approximately 100 families had uncodable tapes, mostly (72 %) because the family's reading was too short to reliably code (book reading <2 min) or (13 %) because the tape had technical problems (e.g., insufficient light during the reading, dyad out of frame). A small portion (approximately 10 %) read in a language other than English (83 %) or Spanish (7 %) for which coding protocols were not developed. Thus, the total sample of dyadic book readings remaining for analysis was approximately 700, or 87 % of the total randomly recruited RAPT subsample.

Weighting

To ensure that parameter estimates are representative of the larger population, despite attrition from the sample over time, data were weighted using the WR30 weight. However, the weight was adjusted, as per the suggestion of the ECLS-B research team (see Najarian, Snow, Lennon, & Kinsey, 2010), using a ratio (8,900/800) to account for the inverse of the probability of selection for the RAPT subsample. The weight was normalized ($M = 1$).

Composition

Sample composition is described in Table 1. In total, 52 % of children were female. Families were ethnically diverse, as 58 % of children were white, 14 % were Black, 8 % were Hispanic/Latino, 3 % were Asian, and 1 % of children were of other ethnicities (e.g., Pacific Islander, Native American). In addition, 16 % of children were of multiple ethnic backgrounds, predominantly white and Hispanic (10 %) and white and Black (2 %). Seven percent of children received special education services in school.

Twelve percent of families spoke a language other than English at home (either in addition to, or instead of, English). Fourteen percent of mothers had not graduated from high school, while 27 % reported high school or equivalent degrees

Table 1 Participant information

Variable	Mean or percent	SD	Range
Child age in months	51.89	3.65	44.00–62.00
Child cognition, 2 years	121.15	10.04	92.61–157.99
Literacy score	13.24	6.85	5.47–34.68
Language score	8.68	1.93	4.65–13.63
Gender (female)	52		
Ethnicity			
White	58		
Black	14		
Hispanic/Latino	8		
Asian	3		
Other	1		
Multiple ethnicities	16		
Special education services	7		
Home language (non-English)	12		
Education			
No high school degree	14		
High school degree	27		
Some college	26		
Bachelor's degree	17		
Graduate work	5		
Graduate degree	8		
Doctoral/professional	3		
Location (urban)	85		
Region			
Northeast	18		
Midwest	24		
South	37		
West	21		
Home book reading			
No reading	2		
Once–twice/week	25		
3–6 times/week	35		
Daily	38		

Approximate $N = 800$

as their highest level of education, 26 % had attended some college, 17 % held bachelor's degrees, 5 % had pursued graduate work, 8 % held master's degrees, and 3 % held doctoral or professional degrees. While most (85 %) households were located in urban settings, they were geographically diverse, with 18 % in the northeast, 24 % in the midwest, 37 % in the south, and 21 % in the west.

Measures

Predictors

The ECLS-B research team collected data on a wide range of predictors.

Reading aloud profile: together coding system This coding scheme was developed for the CLIO study (Goodson et al., 2004; Judkins et al., 2008). It can be used throughout a book reading to note the presence or absence of key reading-related behaviors among parents and children. Reading-related talk occurring before, during, and after the reading was coded to ensure that the entire experience was captured. Readings conducted partly or entirely in Spanish (7 % of the sample, as above) were coded by coders fluent in Spanish.

Mothers' code-focused talk included three specific practices: talking about letters, talking about sounds, and inviting the child to read. Meaning-focused practices included behaviors related to highlighting new vocabulary, recalling or summarizing book content, relating the book to the child's own experiences or to other familiar books, acting out the story, directing the child to examine the pictures, and expanding on the story. For each code, families received a score of yes (i.e., a value of 1) if they employed the type of talk at least once; however, the specific number of times that each family used that technique was not tracked. Thus, families with higher scores on the code- and/or meaning-related items used more types of talk during their reading experience. See Table 2 for the list of specific codes, identified as they appear in the dataset.

RAPT coding training The protocols employed by the ELCS-B research team to recruit coders, ensure initial reliability, and guard against drift over time are extensively described in a technical report (Najarian et al., 2010). In brief, coders were trained by CLIO experts to 90 % reliability on all codes and then monitored through weekly reliability checks as RAPT coding proceeded. In addition, the daily load of coding was carefully regulated (with no more than about 4 h of coding per day) to guard against fatigue. Differences between coders or points of uncertainty in how to code particularly unusual videos were reviewed by the coding team at weekly group meetings to ensure accurate coding.

RAPT data reduction As is common in book reading research, an index was created for the meaning-related talk, with a separate index for the code-related talk. Each family's score on an index equaled the sum of their 0 or 1 codes for each relevant type of talk. However, given the large sample size in the current study, we conducted follow-up analyses in which we decomposed these indices into their specific items to explore which particular types of talk, if any, were uniquely predictive of child learning.

Reading duration The coding team calculated the length of the book reading in seconds, beginning with mothers' initial removal of the book from the first bag and concluding with mothers' and children's putting the book aside and moving to the activity in the second bag. On average, book readings were 352.89 s long (SD = 105.11 s, range = 120–600 s), equivalent to 5.88 min.

Table 2 Descriptive statistics, book-related talk

Type of talk	Specific variables from dataset comprising this construct	% of mothers using practice at least once	Mean	SD	Range
Total code-related talk	(See 3 variables below)	–	.12	.38	0–3
Point out sounds or letters	Z3BPPHON, Z3DPLTR	1	.02	.16	0–2
Invite child to read	Z3DPCRD	11	.11	.31	0–1
Total meaning-related talk	(See 13 variables below)	–	2.83	1.62	0–9
Vocabulary	Z3DPVOC, Z3APVOC	14	.14	.34	0–1
Recall/summarize	Z3DPREC, Z3APREC, Z3APSMWO, Z3APSMWH	16	.19	.46	0–3
Relate to child's life	Z3BPRLAT, Z3DPRLT, Z3APREL, Z3BPREMD	46	.59	.73	0–4
Act out story	Z3DPACT	43	.43	.50	0–1
Direct child to pictures	Z3DPPIC	85	.85	.36	0–1
Expands on story	Z3DPSTY	64	.64	.48	0–1

The (Z3…) terms indicate exactly which variables from the dataset were used to create the constructs under examination

Approximate $N = 800$

Frequency of home reading Mothers reported on the frequency with which they generally read to their children via individual interview with a trained assessor. Assessors provided a series of categories of reading frequency, and parents chose the category that best reflected their own practices. In total, 2 % of families reported no reading, 25 % read with children once or twice per week, 35 % of families read 3–6 times per week, and 38 % of families read every day.

Child and family demographic factors As above, mothers reported on a variety of child and household background factors including child gender and ethnicity, maternal education, family home language, and the region of the country in which they lived.

Cognitive skills at 2 years Children's cognitive skills at 2 years of age, and particularly their language and problem solving, were gauged using the Bayley Mental Scales, Short Form (Andreassen & Fletcher, 2007; Andreassen, Fletcher, & West, 2005). The Short Form was designed by the ECLS research team using a subset of items, identified through IRT modeling, which discriminated meaningfully between children in a parsimonious way and approximated children's scores on the full Bayley Scales of Infant Development–II (Bayley, 1993).

Dependent variables

A series of child outcome variables were examined.

Language skills Children's vocabulary skills were assessed using a measure developed specifically for the ECLS-B. A total of 15 items tapped children's

receptive language skills, drawn primary from the Peabody Picture Vocabulary Test–Third Edition (PPVT-III; Dunn & Dunn, 1998). Items were rigorously pilot tested with preschool-aged children before formal data collection began. The ECLS-B research team then created an ability score (theta) for these language-related items that accounted for item difficulty to more precisely gauge relative levels of performance. Analyses of children's scores revealed no floor or ceiling effects on these language items. Administered in conjunction with code-related items (see below), these meaning- related items had an alpha reliability of .83.

Literacy skills Literacy skills were measured using 35 items (8 phonological awareness, 13 letter and letter sound knowledge, 9 print concepts, and 5 word reading) compiled and pilot-tested by the ECLS-B research team. Items were drawn primarily from the Preschool Comprehensive Test of Phonological and Print Processing (Pre-CTOPPP; Lonigan, Wagner, Torgeson, & Rashotte, 2002), while some items were taken from the ECLS-K or were developed for the ECLS-B. As with meaning-related items, code-related items were pilot tested among preschool-aged children to ensure no floor or ceiling effects, and an ability score (theta) was created to account for item difficulty. These code-related items had an alpha reliability of .81.

Missing data

Regarding background variables, missing data were apparent for the cognitive assessment at 2 years (8 % of children missing data) and the preschool language or literacy measure (5 % of children missing data). In addition, a very few (less than 1 %) of families were missing data on one or more types of book-related talk, such as discussing vocabulary or recalling/summarizing. Analyses using *t* tests suggested that data were missing at random, or related to variables available in the dataset (including gender, ethnicity, 2- and 4-year-old assessment scores, and frequency of family book reading). Consequently, listwise deletion could result in a biased sample. To avoid bias and preserve sample size, a single EM imputation was used, creating a system of regression equations leveraging known information to fill in missing data while still preserving the underlying relations between variables in the original dataset. One complete dataset was computed using the missing values add-on for SPSS/PASW 19.

Results

Aim 1: nature and extent of parents' talk throughout book reading

Key results are reported below, while results for each type of talk are provided in Table 2.

Code-related talk

Mothers used an average of .12 code-related practices, although there was slight variation among families (SD = .38, range = 0–3). The most commonly used

technique, employed by 10 % of mothers, was offering children the opportunity to read one or more words in the text. Very few mothers (less than 1 %) mentioned letters and/or sounds. The code-related index variable combing all code-related items was skewed to the right.

Correlations among types of code-related talk As in Table 3, the few mothers who discussed letters or sounds were more likely to invite children to read ($r = .27$, $p < .001$).

Meaning-related talk

Mothers used an average of 2.83 types of meaning-related talk (SD = 1.62), but values ranged from 0 to 9. Of these, the most common were directing children to the pictures, which 85 % of mothers did at least once. In addition, on at least one occasion, 63 % of mothers expanded on the story, 46 % of mothers related the book to children's own lives or to already-familiar books, 43 % of mothers acted out the story, 16 % discussed remembering, recalling, or summarized the book, and 14 % discussed vocabulary (see Table 2).

Correlations among meaning-related practices In general, mothers who engaged in one of these meaning-related techniques also used others (see Table 3), although correlations were typically small ($r < .30$, $p < .001$). Meaning-related input was normally distributed.

Correlations between code- and meaning-related practices

As a final point, Table 3 suggests that families who engaged in discussion of letters and sounds were more likely to discuss vocabulary and to recall/summarize the story ($r \approx .1$, $p < .05$ for both). Families who invited children to read were more likely to discuss links between the book and children's own lives ($r = .17$, $p < .001$). Overall, however, as the correlations were small, these types of talk were used independently of one another.

Aims 2 & 3: predictors of reading-related talk and relations to child outcomes

Our second research aim examined how sociodemographic factors predicted mothers' code- and meaning-related input during book reading, while our third aim focused on how these factors and both code- and meaning-related talk were linked to child language and literacy skills. We therefore created one path model in Mplus 5.21 that incorporated both aims 2 and 3 at the same time (see Fig. 1 for depiction of the model to be tested).

Analytic strategy

As in Fig. 1, predictors of mothers' code- and meaning-related talk during book reading included factors related to the child (age, gender, ethnicity) and family

Table 3 Correlations among types of book-related talk

Types of book-related talk	1	2	3	4	5	6	7	8
1. Letters/sounds	1							
2. Invite child to read	.22***	1						
3. Vocabulary	.10**	.03	1					
4. Recall/summarize	.08*	.00	.13***	1				
5. Relate to child's life	.04	.17***	.18***	.17***	1			
6. Act out story	−.04	.02	.13**	.09*	.23***	1		
7. Direct child to picture	.05	.02	.11**	.13***	.20***	.12**	1	
8. Expand on story	.05	−.05	.19***	.13**	.19***	.10**	.37***	1

Approximate $N = 800$

* $p < .05$; ** $p < .01$; *** $p < .001$

(home language, maternal education, frequency of home book reading), as well as length of the book reading. Mothers' meaning-related talk was treated as a continuous variable, whereas mothers' code-related talk was treated as dichotomous (no talk vs. at least one instance of talk) in light of the limited variability (i.e., in total, only 11 % of families used any of this talk, and fewer than 2 % of families used more than one type of code-related talk). In the same model, mothers' code-related talk was modeled as a predictor of child literacy, while meaning-related talk was linked to child language. The background factors above, as well as child cognitive skills at two years of age and neighborhood of residence, were modeled as predictors of variance in child outcomes. To accommodate the normalized weight, we used an MLR estimation method. It should be noted that disability status was removed from the model because it was unrelated to all other variables in the model, likely because children's data were collected near their birthdays at various points during the school year, resulting in an unequal probability that children would have received a diagnosis of disability.

Findings

Results of the model (see Fig. 2 and Table 4) suggested that, in this nationally representative sample, mothers were more likely to use code-related talk at least once when they reported reading books more often ($\beta = .16$, $p = .001$). Regarding child outcomes, the presence of at least some code-related talk was not reliably linked to stronger literacy skills ($\beta = .07$, $p = .094$).

In contrast, mothers used more types of meaning-related talk when they had higher levels of education ($\beta = .14$, $p = .004$), as well as when their overall book reading was longer ($\beta = .40$, $p < .001$). More types of meaning-related talk during book reading predicted higher child vocabulary skills ($\beta = .09$, $p = .032$).

Model fit was excellent, with a high CFI (1.00) and TLI (.96), and a low RMSEA (.03). The Chi square value for the model ($df < 10$, $n \approx 700$) was 5.91 and was not significant ($p = .21$).

Table 4 Complete results, path model

Path	Unstandardized coefficient	Standardized coefficient	*p* value
Paths of primary interest			
Meaning talk → Language skills	.05	.09	.032
Code talk → Literacy skills	.20	.07	.097
Covariates → Code talk			
Duration → Code talk	.00	.19	.684
Female → Code talk	.06	.19	.063
Book reading → Code talk	.06	.16	.001
Child age → Code talk	.00	.05	.288
Home English → Code talk	.05	.05	.073
Maternal education → Code talk	.01	.08	.193
White → Code talk	−.03	−.09	.460
Covariates → Meaning talk			
Duration → Meaning talk	.01	.40	<.001
Female → Meaning talk	−.10	−.06	.525
Book reading → Meaning talk	−.02	−.01	.844
Child age → Meaning talk	.02	.05	.246
Home English → Meaning talk	.30	.19	.169
Maternal education → Meaning talk	.12	.14	.003
White → Meaning talk	.30	.18	.132
Covariates → Language Skills			
Duration → Language skills	.00	−.10	.030
Female → Language skills	−.01	−.01	.861
Cognition at 2 years → Language skills	.03	.33	<.001
Book reading → Language skills	.18	.16	<.001
Child age → Language skills	.05	.22	<.001
Home English → Language skills	.53	.60	<.001
Maternal education → Language skills	.05	.12	.003
Urban → Language skills	.12	.13	.189
White → Language skills	.15	.17	.050
Covariates → Literacy skills			
Duration → Literacy skills	.00	.06	.154
Female → Literacy skills	.14	.08	.072
Cognition at 2 years → Literacy skills	.02	.27	<.001
Book reading → Literacy skills	.25	.23	<.001
Child age → Literacy skills	.06	.25	<.001
Home English → Literacy skills	.06	.07	.676
Maternal education → Literacy skills	.08	.17	.001
Urban → Literacy skills	.07	.08	.479
White → Literacy skills	−.14	−.15	.118

Table 4 continued

Path	Unstandardized coefficient	Standardized coefficient	*p* value
Covariances			
Language ↔ Literacy	.17	.33	<.001
Code talk ↔ Meaning talk	.02	.04	.369

χ^2 (df = 6, n ≈ 700) = 7.13, p = .309; CFI = 1.00; TLI = 0.98; RMSEA = .02

Approximate N = 800

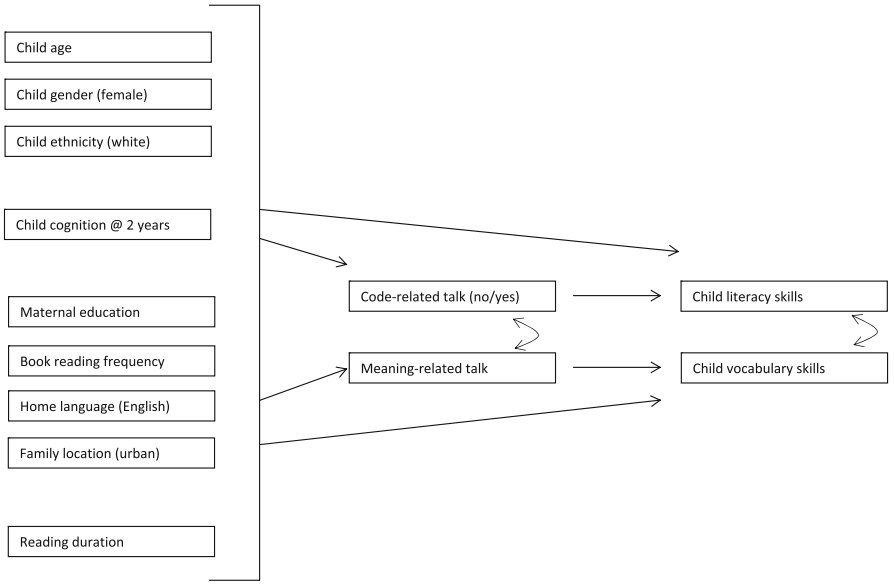

Fig. 1 Hypothesized model, meaning-related talk and child language skills

Exploratory item-level analysis

In one additional analysis, we took advantage of our large sample size to decompose the code- and meaning-related indices into their components to determine which specific practices might be particularly predictive of children's skills. Our analytic strategy remained similar to the previous model, simply replacing the indices with their components (i.e., talk about letters/sounds and invitations for children to read, as well as talk focused on vocabulary, recalling/summarizing, relating to children's lives, pointing out pictures, acting out the story, and expanding on the story). We thus modeled the links between each background factor and each of these types of talk, as well as the relations between each of these practices and children's vocabulary or literacy skills, controlling for the same collection of covariates as

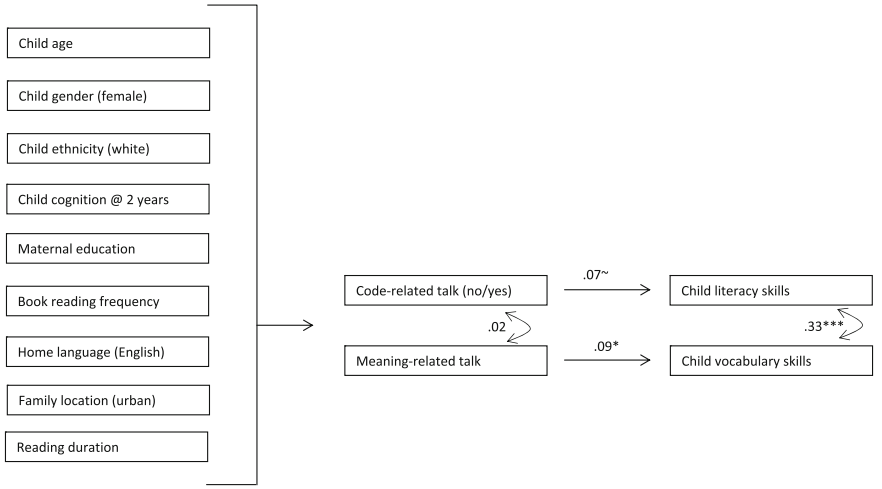

Fig. 2 Final model, primary relations between code- and meaning-related talk and child language. $***p < .001$, $**p < .01$, $*p < .05$, $\sim p < .10$

before (e.g., child age, gender, ethnicity, etc.). We also allowed correlations between the various types of talk.

Results of interest indicated that not all components of the meaning-related index were equally predictive of children's vocabulary skills. In particular, vocabulary skills at four years of age were higher for children whose mothers focused upon relating the story to children's familiar experiences ($\beta = .15, p < .001$). Vocabulary skills were weaker for those whose mothers emphasized recalling/summarizing the story ($\beta = -.09,\ p = .014$). For code-related talk, neither emphasizing letters/sound nor inviting children to read aloud was uniquely predictive of literacy skills; instead, these variables were more predictive when combined.

Aim 4: moderating role of children's initial cognitive skills

To examine whether the contribution of parent talk during book reading to children's language and literacy skills depended in part upon children's early cognitive skills, we added on to the model described above. Specifically, we included a pair of two-way interaction effects between cognition at two years and our two significant predictors of children's skills: recalling/summarizing and relating the story to children's own lives. In creating the cognition-by-recalling/summarizing and cognition-by-relating-to-life variables, the component variables were centered at their mean, and then the product of those variables was computed. Interaction variables were normally distributed. In light of potential multicollinearity, these variables were entered together as well as one at a time to ensure that results were robust.

In all cases, results showed that the role of these two types of meaning-related talk in children's vocabulary at four years of age did not depend upon children's cognitive skills at two years of age ($\beta < .10$, $p > .30$ for both interactions).

Discussion

This study took advantage of the recent, large-scale, nationally representative ECLS-B dataset to create a more comprehensive and specific model of the nature, predictors, and contributions of talk during book reading to early language and literacy development. Results indicated that parents—primarily mothers—engaged in a variety of different kinds of meaning-related talk while reading a simple narrative with their preschoolers. Code-related talk was rare. These two types of talk were differentially predicted by factors in children's environments and, in turn, differentially related to early skills. Code-related talk, the most common example of which was inviting children to read the text, was more apparent among families who reported more frequent home book readings. In contrast, meaning-related talk was more varied among more educated families and those who spent more time reading the book. Few demographic factors such as home language and ethnicity were predictive of the variety of book-related talk that families used. Beyond the effects of these covariates, code-related talk was not significantly related to children's literacy skills in at four years of age, while meaning-related talk played a small, significant role in early receptive language development. These predictive relations did not depend on children's cognitive skills at age 2, but instead were consistent across children. Overall, results of this study provide a nationally representative portrait of the factors that play into mothers' talk during book reading, as well as how that talk is related to children's reading-related skill development during the school transition period.

Book reading talk includes a variety of techniques, but some are infrequently used

Perhaps one of the most interesting and important findings from the current study is the profile of techniques that mothers use when talking about books during shared reading experiences. As stated above, prior research on parent–child exchanges during reading has generally involved small samples (i.e., fewer than 100 dyads) and has often selected families in one geographic area and/or socioeconomic stratum because coding these exchanges is extremely resource-intensive (e.g., Dickinson & Tabors, 2001; Hindman et al., 2008; Sénéchal et al., 1998).

The current study provides an unprecedented large-scale, nationally representative perspective on this topic. These data suggest that relatively little code-related talk occurs during reading; indeed, almost none of these mothers talked about letters or sounds while reading, and only 10 % invited children to read the text. Thus, although it is possible that parents provide code-related support in other contexts, data from this study suggest that shared book reading is not the primary vehicle for these experiences in the home. Moreover, this dearth of code-focused talk was observed across families, regardless of background factors. While it could be argued that the available book, a narrative that did not focus on the alphabet, might bias families' talk, other research suggests that even when letters and sounds (e.g., rhymes, alliteration) are salient in the story, parents still focus largely on meaning (Hindman et al., 2008; Yaden et al., 1993).

Although young, pre-literate children do not generally focus their attention on the text of a book independently and instead look at the pictures during reading (Evans & Saint-Aubin, 2005; Justice et al., 2005), families can draw their attention to this element of the text (Justice & Ezell, 2002; Justice et al., 2011; Piasta et al., 2012). However, a wealth of activities beyond book reading could potentially foster code-related skills, meaning that book reading is not necessarily a critical forum for this type of instruction. For families interested in focusing on the code of books, some guidance for incorporating this talk into readings would be helpful; conversely, for families with a strong preference for focusing on meaning-related content during reading, equipping them with other techniques to be used beyond book reading that support code-related learning could be valuable.

While meaning-focused talk was relatively more prevalent, mothers preferred some techniques to others. Nearly all mothers referred children to illustrations, making use of one of the unique affordances of books for vocabulary development, and approximately half expanded on or acted out parts of the story or related it to children's own lives. These techniques are consistent with best practices in mediating the child's experience as a reader and bridging the gap between the child and the text (Crain-Thoreson & Dale, 1999; Lonigan & Whitehurst, 1998; Mol, Bus, de Jong, & Smeets, 2008). In contrast, fewer than 20 % of parents summarized the book or discussed vocabulary, which represent more classic examples of abstract or decontextualized talk. This finding is consistent with smaller-scale prior research, which typically finds that labeling and describing pictures is more prominent than abstract discussion, both between parents and children and between teachers and children (Dickinson & Tabors, 2001; Hindman et al., 2008). It is the case that the books read as part of this study were not especially complex and thus may not have required this support; moreover, perhaps the nature of the reading (e.g., observed and videotaped) discouraged mothers from engaging in more detailed discussion that might place greater demand on children's attention and behavior. However, it could also be the case that, on average, there is room for richer discussion during parent–child book reading, and that some (or even many) families would benefit from specific guidance in these techniques.

However, in interpreting these findings, it is important to note that this book reading experience was likely the families' first reading of this book, or for those already familiar with the story, perhaps their first reading in some time. There is evidence that the nature of adult and/or child talk and understanding may change through re-reading a story (Goodsitt, Raitan, & Perlmutter, 1988). Consequently, talk during later readings might have differed in complexity (perhaps becoming more sophisticated) or variety (with perhaps more focus on code as the meaning became more familiar).

Selective predictors of book-related talk

Code-related talk—primarily inviting children to read—was more apparent in households reporting higher rates of book reading, likely because these families might have more comfortable and familiar routines for reading that better allow children to experiment with this complex and open-ended task. Regarding meaning-

related talk, the duration of the book reading session demonstrated the strongest link to the number of different types of talk that mothers employed when reading with children. This finding suggests that mothers who opt to engage children for longer periods of time (within the time constraints in this study) do not simply use the same types of talk multiple times (e.g., asking children to label images), but also employ a wide range of techniques. The question of whether mothers' (or perhaps even children's) desires to discuss a number of aspects of the story drive this longer time span or, alternatively, whether families who are more engaged in a book spend more time and use more varieties of talk about the book warrants future research.

Apart from a small association with maternal education, demographic factors such as ethnicity, home language, and even children's early cognitive skills were not reliably linked to the variety of talk techniques that mothers employed. Our findings help to untangle the often confounded variables of parent education, ethnicity, and home language by showing that education might be the key driver of how SES relates to book-related talk (e.g., Dickinson & Tabors, 2001; Hart & Risley, 1995, 1999). Other typically identified risk factors (e.g., minority ethnicity, non-English home language) may not independently affect the range of distinct language-related experiences with which children are presented during book reading. This is an encouraging finding, which suggests that most parents, regardless of many background factors, can and do engage in a variety of supportive meaning-related talk techniques while reading books with their children.

Code-related talk was not significantly predictive of literacy skills

In this study, mothers' references to the code of print were not reliably related to children's literacy skills. This finding contrasts somewhat with ample evidence (e.g., Justice & Kadaverek, 2002; Piasta et al., 2012) that code-related talk can make a significant contribution to children's literacy skills. Given the large sample size, it is unlikely that insufficient statistical power obscured this relation. Instead, it is probable that the relative lack of code-related talk undermined the predictive power of this variable. It is interesting to note that much of the prior research demonstrating links between code-related talk and literacy skills has been conducted in the context of interventions in which the production of code-related talk was explicitly targeted. Thus, different results might be observed were parents to engage in more code-related talk, and were the coding scheme more sensitive to the absolute amount of this talk rather than to the variety of types of talk employed.

Meaning-related talk linked to vocabulary skills

Meaning-related talk during book reading was predictive of language skills, over and above the variety of covariates in the models. This finding dovetails with prior work using smaller sample sizes, providing helpful validation (Hindman et al., 2008; Sénéchal et al., 2008). However, of the varied items comprising the index of meaning-related talk, two specific items appeared to drive this association. Children's vocabulary skills were higher when parents made more efforts to relate the story to children's own lives and experiences. This finding is resonant with

Piagetian ideas of schema construction (Piaget, 1973), which hypothesize that we learn new information by grafting unfamiliar ideas on to concepts that we already know. Parents' talk about prior experiences at school, in books, and through real-world experiences may help forge these connections and, by extension, increase children's conceptual and vocabulary knowledge.

It is interesting to note that other types of talk included in the coding system that are arguably more abstract and higher-order (e.g., defining words or expanding on the story; see Bus et al., 2000) were not significantly related to vocabulary development. It is possible that limited variability in these items lowered predictive power. That said, this finding serves as a reminder that while book reading has the potential to foster child skills, the realization of this potential depends heavily upon the discourse that families weave around books.

An inverse relation also emerged between vocabulary skills and more efforts to recall and summarize what had transpired in the story. In light of other evidence that recalling and summarizing can be useful for children (e.g., Hindman et al., 2008), it is plausible that parents who used these strategies in the current study did so in an effort to highlight basic points that children may have missed or to call children's attention back to the book so as to complete the task. This explanation could have particular relevance in the current study, because the RAPT coding team noted that children's attention to the book sometimes flagged, especially when children noticed that Bag 2 of the task contained Play Doh and expressed eagerness to progress to this latter part of the experience (Najarian et al., 2010). Thus, this technique, particularly in the present context, might be one that parents sometimes use to compensate for poor understanding or focus, not always garnering positive results. It is also possible that children with lower word knowledge are less able to understand the story, and that parents use recall and summary remarks in an effort to bolster understanding, although this technique is not always successful.

Moderating role of cognition at two years of age not observed

Despite some evidence in other studies, there was no suggestion in these data that children with stronger cognitive skills at two years of age derived greater benefit from more exposure to book-related talk. This finding could suggest that, when a large and diverse sample is employed, and when a sizeable body of covariates are controlled, the role of book-related talk is essentially the same for all children, regardless of their general background knowledge. Alternatively, it could be the case that a coding system that provided a more detailed frequency count of how often children were exposed to particular types of talk would reveal stronger relations. A third possibility is that prior knowledge specifically related to literacy and vocabulary skills at least partly moderates the role of book-related talk, whereas general cognition does not. Nevertheless, it is in many ways encouraging that, in the current study, no particular sub-groups of children appeared to struggle to take advantage of the potential benefits of book-related talk.

Educational implications

A wide variety of websites and other resources devoted to book reading are aimed at parents, and the Federal government provides many helpful resources to encourage reading (e.g., US DOE, 2003, 2005). In many ways, these initiatives appear to be successful, as our findings suggest that parents from a multitude of backgrounds can use books to engage in meaning-based talk. In turn, this talk was related to early skill development. Although this study is entirely descriptive and cannot be interpreted as providing causal conclusions about child learning, it does highlight several specific potential implications that merit further review. In particular, this study found that, when parents highlighted connections between books and children's own lives, children had stronger vocabulary skills regardless of their earlier cognitive competence. Future research might strategically manipulate this connection-making to untangle the nature of the association between these factors and, if a causal relation emerges, determine how best to capitalize on this resource to foster children's learning. Another key implication of this work is that parents who are interested in using book reading to advance code-related skills may need explicit guidance to help children attend to letters and sounds.

Limitations

Several limitations in this study reveal areas for future research. Although the current study allowed us to observe parental talk during book reading within a large, nationally representative sample of families, the coding system was not exhaustive. In particular, it was not possible to examine the exact frequency with which families engaged in each type of talk, which would require line-by-line coding for each book reading session and thus was not feasible for the research team to undertake with a sample of this size. In addition, to protect participants' identities, these videos are not available to other researchers who could conduct this coding. Currently, there is no clear evidence to determine whether using (a) many different types of talk, (b) more of just a few types of talk, or (c) some combination of these approaches better builds children's literacy and/or vocabulary skills. Additional work is needed to determine whether the frequency with which parents used each technique, in addition to the variety of techniques they used, predicts children's skill development. Further, subsequent work could explore whether the positioning of talk before, during, or after the reading makes a difference for its relations to child outcomes. Finally, future studies could track whether and how parents' talk changed as the story was read multiple times, rather than just once (Biemiller, 2004; DeTemple & Snow, 2003; Korat & Blau, 2010; Sénéchal, 1997).

Second, each child's general cognition was assessed roughly two years before the observed book reading session. Although scores on measures of cognition from two to four years of age are often quite stable (Sajaniemi, Hakamies-Blomquist, Katainen, & von Wendt, 2001), it is possible that results may have varied somewhat if cognition had been assessed at the same time as the other measures included in the study. Future research should investigate this issue and test other factors that might relate to individual differences in the ways that children learn from parental talk

during book reading. As a third point, the current study includes only two measures of child outcomes. Future work might extend outcomes to include other skills such as expressive language, motivation around reading, and socio-emotional competence (Baker, Scher, & Mackler, 1997; Bus et al., 1995).

Finally, as with all observational work, the relations between families' practices and children's skills cannot be construed as causal and may in fact be correlational or bi-directional in nature (e.g., children may elicit different types of talk from parents which then affects their own responses).

Conclusions

In this large-scale, nationally representative study, mothers' discussions during shared book readings with their preschool children focused primarily on the meaning of the story, with little attention to the code of the text. The range of talk techniques that mothers used was largely independent of background factors such as child gender and ethnicity or family home language. A wider variety of meaning-related talk by mothers was linked to stronger language skills among preschoolers, particularly mothers' efforts to relate the narrative to children's own lives and prior experiences. Findings provide a portrait of the nature of shared book reading discussion among American families and the unique contributions of this talk to key emergent language and literacy competencies.

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