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Abstract

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Keywords

children, effects, their, reading, mothers, states, united, start, head, early, participating, outcomes, language, fathers

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It is well known that reading aloud affects children's language and literacy development. Little is known though, about fathers reading to their children. This study examined paternal and maternal bookreading frequency among 430 low-income families and investigated whether paternal bookreading and maternal bookreading predicted children's early language and cognitive development and emergent literacy skills. Results demonstrated that mothers read more frequently to their toddlers than fathers but approximately 55% of fathers reported reading at least weekly to their children. Paternal bookreading at 24 and 36 months significantly predicted children's language and cognitive skills at age 36 months as well as their book knowledge at preK. Maternal bookreading was only a significant predictor of child cognitive skills at 36 months.

Keywords: fathers, bookreading, child development, low-income

Over the last 35 years there has been considerable research on the development of father-child relationships (Lamb & Tamis-LeMonda, 2004). Societal changes in Western countries such as the increase in women's participation in the labor force, changes in the

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demographic profile of the family as a result of divorce and remarriage and the development of father studies as its own research field have all contributed to this development (Amato & Sobolewski, 2004; Lamb & Tamis-LeMonda, 2004). Until recently fathers were regarded as breadwinners or head of the family. However, these days more fathers are involved in the care of children and participate in more child-related activities (Tamis-LeMonda & Cabrera, 2002). This has resulted in father research moving away from unidimensional characterization of fathers being either absent or present to a more comprehensive view on the different roles fathers can play in children's lives (Lamb & Tamis-LeMonda, 2004; Pancsofar et al., 2010). There is agreement among researchers that positive father involvement can benefit children's cognitive competence, school performance, self-esteem, empathy, life skills and social competence (Marsiglio, Day, & Lamb, 2000; Palkovitz, 2002; Pleck & Masciadrelli, 2004). However, we know little about fathers' engagement in language and literacy activities such as bookreading and the impact on children's development.

Reading aloud is considered an important activity in Western culture to promote children's language, literacy and cognitive development (Bus, van IJzendoorn, & Pellegrini, 1995; Lyytinen, Laakso, Poikkeus, 1998; Mol & Bus, 2011). Parents are advised to start reading frequently to their children at an early age. Most research on bookreading, though, has primarily examined maternal bookreading and the impact on children's development. The changing role of fathers requires an examination of the effects of shared bookreading on children's development. Recent research in the U.S. has demonstrated that paternal bookreading, in particular father's vocabulary use during a bookreading session, can contribute significantly to children's language development (e.g., Duursma, Pan, & Raikes, 2008; Pancsofar et al., 2010). Whereas attachment theory has provided a solid framework to examine maternal impact on children, no such framework has been developed for research on fathers (Cabrera, Fitzgerald, Bradley, & Roggman, 2007). The heuristic model of father development (Cabrera et al., 2007) is a dynamic model focusing on variables that predict father involvement and outcomes. This directional model was designed to test direct effects of father-child involvement but also assumes that mediated and moderated effects 'will dominate any explanatory framework that emerges' (Cabrera et al., 2007). Whether or not fathers, in particular low-income fathers participating in early interventions such as Early Head Start (EHS), reading to their children is associated with father characteristics such as level of education or language spoken at home (Duursma et al., 2008) and to child characteristics such as gender and child language development has not been fully explored (Duursma et al., 2008). In addition, maternal bookreading might moderate or mediate paternal bookreading (Duursma & Pan, 2011), as father-child interactions are embedded in a larger ecology which includes father-mother relationships as well as financial and family resources (Lamb, 2004; Cabrera, Shannon, Tamis-LeMonda, 2007).

This study aims to provide a more complete picture of reading aloud in low-income families in the U.S. and to put the spotlight on fathers within bookreading research. Previous studies with low-income families have suggested that maternal and paternal bookreading, considered separately, can impact children's language development (Duursma et al., 2008; Raikes et al., 2006). This study seeks to examine the effect of paternal and maternal bookreading together on children's early language development.

**RELATIONSHIP BETWEEN READING ALOUD AND CHILD'S LANGUAGE,
LITERACY AND COGNITIVE DEVELOPMENT**

One of the most important effects of reading aloud is vocabulary growth; children can learn the meaning of new words during shared bookreading interactions with adults (e.g., Bus, van IJzendoorn, & Pellegrini, 1995; Payne, Whitehurst, Angell, 1994). Shared bookreading provides children with opportunities to learn vocabulary from books, as well as the use of decontextualized language (Dickinson, & Snow, 1987). Decontextualized language refers to language used to communicate new information to those who have little experience with the context of the information (Wasik & Bond, 2001). Bookreading not only exposes children to new vocabulary, but also to the more complex language adults use when interacting with children around a book (Fletcher & Reese, 2005; Snow, Nathan, & Perlmann, 1985). The language used in children's books is often more complex than the language adults use when interacting with children in play situations (Sénéchal, LeFevre, & Hudson, 1996). For example, children's books contain 50% more difficult words than prime-time television or college students' conversations (Hayes, & Ahrens, 1988).

There is little research available on the impact of reading aloud on children's cognitive skills. Lyytinen et al. (1998) reported a positive relationship between bookreading and children's cognitive development at age two as measured by the Bayley MDI (Lyytinen et al., 1998). In another study, daily reading to children by low-income mothers was positively related to children's cognitive development at ages two and three (Raikes et al., 2006).

The positive effects of being read to from an early age continued to be observable in the elementary school years (Snow, Burns, & Griffin, 1998). The age at which parents begin reading to their children was correlated with children's language development; children who are read to from an early age tend to have higher scores on language measures (DeBaryshe, 1993; Pancsofar, Vernon-Feagans, & the Family Life Project Investigators, 2010). The age at which mothers started reading to their children was one of the best predictors of language and variance in frequency of bookreading (DeBaryshe, 1993; Raikes et al., 2006). These results support the possibility that early bookreading can have significant and long-lasting effects on children's language and cognitive development.

Long before children receive any formal literacy instruction, they develop emergent literacy skills. The development of these skills is important to children's later success in reading (NICHD Early Child Care Research Network, 2005; Sénéchal & LeFevre, 2002). Emergent literacy has been defined as the skills or knowledge that children develop before more conventional forms of reading and writing (Lonigan, 2004; Whitehurst & Lonigan, 1998). During bookreading, children learn skills related to literacy such as recognizing letters, understanding that print represents the spoken word, how to hold a book, how to turn the page and to start at the beginning (Bus, van IJzendoorn, & Pellegrini, 1995). To summarize, shared bookreading can benefit children's language, literacy and cognitive development. Starting early and continuing to read appears to have the most impact on children's early language, literacy and cognitive development.

Factors Associated with Frequency of Parent-Child Bookreading

Parental demographics such as level of education, family income, and language(s) spoken at home can impact frequency of bookreading. Mothers with higher levels of education were more likely to read frequently to their children than mothers with lower levels of ed-

ucation (Lyytinen et al., 1998; West, Denton, & Germino-Hausken, 2002). Given the dearth of research on fathers' reading to their children, not much is known about the relationship between paternal education and bookreading frequency. However, considering the strong relationship between maternal education and bookreading frequency, it is expected that fathers with higher education read more frequently to their children than fathers with lower levels of education. Duursma et al. (2008) reported paternal education as a significant predictor of bookreading frequency; fathers in the U.S. participating in the evaluation of EHS read more frequently to their young children when they were more highly educated. Fathers with higher education may provide a more stable financial and social environment for their children (e.g., Pleck, 2007). They are also more likely to have flexible workhours, and this can influence the quantity and quality of time spent with their children (Yeung, Sandberg, Davis-Kean, & Hofferth, 2001). Father education could make a significant contribution to children's development.

There is little consensus on the relationship between family income and bookreading. However, poor families frequently have unequal access to books, materials and other language and literacy sources such as libraries (Neuman, 1996). This potentially affects the frequency of exposure to cognitively stimulating and challenging conversations around bookreading. In the long term, this could have significant effects on children's early language and literacy development and later reading achievement (Payne, Whitehurst, & Angell, 1994).

The language spoken at home could influence frequency of bookreading, as families from different cultural backgrounds may have less access to reading materials in their own language. In a National Center for Education Statistics (NCES) study of home literacy activities and signs of children's emergent literacy, 48% of mothers who did not speak English read three or more times a week to their 3- to 5-year-olds compared to 84% of mothers who did speak English (Nord, Lennon, Liu, & Chandler, 2000). Yarosz and Barnett (2001) found that non-English speaking parents were far less likely to read daily to their preschoolers than English-speaking parents. Even when mothers had at least a bachelor's degree, only 28% of non-English speaking Hispanics reported reading daily to their preschoolers compared to 66% of English speaking Hispanics and 69% of White/non-Hispanics (Yarosz & Barnett, 2001).

Child characteristics such as gender could also play a role in bookreading frequency. Duursma et al. (2008) found that low-income fathers who participated in the EHS study read more frequently to their daughters than to sons. Children's early language skills might also contribute to whether or not parents read frequently to them. Lyytinen et al. (1998) found that children with larger vocabularies at 14 months engaged longer in shared bookreading and made more requests for bookreading than linguistically less advanced children. Parents, though, have the primary responsibility for making books available to children and reading and talking to them (Lonigan, 2004). In this study both parent and child characteristics are included.

The following research questions are addressed:

1. How often do low-income fathers and mothers participating in EHS read to their children at ages 14, 24, 36, months and at 5 years?
2. Does paternal bookreading, in addition to maternal bookreading, predict children's language and cognitive development at 36 months and their emergent literacy skills at age 5?

METHODS

Participants

Participants in this study were drawn from a sample of 3,001 families participating in the longitudinal evaluation of the effectiveness of Early Head Start (EHS) (ACF, 2003). Early Head Start is a federally funded, community-based program that aims to improve child and family development for low-income families with children under the age of three (ACF, 2001; 2002a; 2002b). Early Head Start programs in 17 sites participating in the national evaluation of EHS recruited 3,001 children and families at or below poverty level from 1996 to 1999. The families were randomly assigned to a program or control group. Families in the program group received a variety of child development and education services (ACF, 2001; 2003). Families were enrolled during the mother's pregnancy or any time up to the child's first birthday. Demographic information from the families was gathered at the time of enrollment and updated at each assessment, which took place at child ages 14, 24, and 36 months and again before kindergarten entry at age five.

The fathers who participated in this study were drawn from 14 of the 17 research sites.¹ The father studies were added to the EHS evaluation research design in response to the federal Fatherhood Initiative and efforts within Early Head Start to involve fathers in program activities. Mothers of children participating in the Early Head Start Research and Evaluation sample were asked to identify the child's father or father figure at child ages 24 and 36 months and in the spring before the child entered Kindergarten. These fathers were contacted and invited to participate in the study. Seventy-six percent of completed mother interviews at child age 24 months led to potential father interviews. Similar numbers were found at child age 36 months (Boller et al., 2006). At child age 24 months, a total of 803 fathers participated in the EHS study. At child age 36 months, 698 fathers participated, and at age five years, 805 fathers participated in the EHS study. Fifty-three percent of the fathers who participated at age five were the same men who were interviewed at 36 months, and 10% were the same men interviewed at child age 24 months. Around 36% of fathers identified and interviewed at age five had not been previously interviewed. Fathers who participated in the study were, on average, older, higher educated, married, living with the child's mother and employed at child age 24 months compared to fathers who did not participate. Mothers' and fathers' race/ethnicity, mothers' age and education, fathers' employment at child age 36 months, and child outcomes at ages 24 and 36 months were not related to fathers' participation in the study (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004).

For the current study, fathers, mothers and their children were included in the sample if they had interview data available at child ages 14 (mothers only), 24, or 36 months. The interview data included demographic information on parental reported bookreading. For some of the analyses, father, mother and/or child data were missing, resulting in variations in sample size.

Procedures

Family Characteristics. Mothers were first interviewed when they entered the study and again at child ages 14, 24, 36 months, and in the spring before children were eligible to enter kindergarten at age five ($M_{\text{age}} = 63$ months). Interviews were conducted in person by

trained local data collectors in the mother's home. Data was gathered on mothers' education, age, race/ethnicity, and language(s) spoken at home. Data collectors were trained by the national Early Head Start team. Training sessions were approximately 3-5 days (depending on which assessments were involved). Data collectors were asked to review a training manual prior to training and prepare to participate in group lectures and discussions, hands-on-practice, and taping of practice administrations. After training, data collectors were required to conduct practice interviews and assessments and submit audiotapes or videotapes to the national center for certification.² Fathers were interviewed in their homes by trained local data collectors at child ages 24 and 36 months and at age five. Demographic information on the fathers included: age, residential status, education, race/ethnicity, and language(s) spoken at home. At each child age, more than half of fathers in the study were residential biological fathers, with the remaining fathers evenly divided between biological fathers who did not live with the child and social fathers (father figures) who did (see Table 1). Fathers varied greatly in age, but on average, fathers were 28 years old when they first entered the study. The average years of education for fathers was 12 years. Fifty-one percent of families were in the program group at baseline. Sixty-three percent of children were the mother's firstborn child, and 51% of children were male.

Mother's participation in the study remained more stable than fathers. Some fathers participated at all child ages, while others only participated at one data point. This led to changes in the composition of the sample of fathers. At each child age, approximately half of the fathers in the sample were White; 20-30% were African-American. At child age 24 months, 26% of fathers were Hispanic. At child age 36 months, 13% of fathers were Hispanic, and at age five this number increased to 29% (see also Table 1).

More than 75% of fathers in this study spoke English at home, and approximately 15% spoke Spanish. Since the mother or mother figure was less likely to change than the father figure over the course of the study, demographic information on mothers gathered at baseline was used for all analyses here. Table 2 shows that at study entry, mothers were on average 23 years old and had about 9 years of education. Forty-eight percent of mothers were White, 23% were Black, and 25% were Hispanic. The majority of the mothers reported speaking English at home (78%), whereas 19% spoke Spanish (see Table 2).

Bookreading frequency. At child ages 14, 24, and 36 months and again at age five, mothers were asked how often they read to their child. Mothers were also asked about fathers' frequency of bookreading at the first two ages. Fathers were asked how often they read to their children at child ages 24 and 36 months and at age five. The response categories for both fathers and mothers at child ages 14, 24 and 36 months were: 1) more than once a day, 2) once a day, 3) a few times a week, 4) a few times a month, 5) rarely, or 6) never. Following Raikes et al. (2006), the categories "more than once a day" and "once a day" were combined into the category *daily*; "rarely" and "never" were combined into the category *rarely*. During data collection at child age five, mothers were asked how many times *they or someone in their family* read to their child in the past week. The response categories were: (1) zero, 2) one or two times, and (3) three or more times.

Child cognitive skills. Children's cognitive development was measured at 24 and 36 months using the Bayley Scales of Infant Development-2nd edition (Bayley, 1993), yielding a Mental Development Index (MDI) standard score. The Bayley consists of 178 items that

Table 1

Father Demographics at Child Age 24 Months (n = 803), 36 Months (n = 749), 60 Months (n = 801)

Father Demographics, Child Age	24 months	36 months	60 months
<i>Father Status</i>			
Biological-residential	65%	62%	57%
Biological Non-residential	16%	15%	13%
Non-biological Residential	15%	18%	24%
Non-biological Non-residential	4%	5%	6%
<i>Father Age</i>			
Mean	28	31	
SD	7	9	
Range	16-53	17-79	
<i>Father Education (in years)</i>			
Mean	12	12	12
SD	3	3	3
Range	0-20	0-20	2-20
<i>Race/Ethnicity</i>			
White	47%	53%	50%
African-American	23%	21%	20%
Hispanic	26%	13%	29%
<i>Language Spoken at Home</i>			
English	83%	85%	88%
Spanish	16%	14%	11%

Table 2

Mothers' Age, Education, Ethnicity/Race, and Language Spoken at Home at Baseline (n = 747)

Maternal Background	Characteristics
<i>Age (in years)</i>	
Mean	23
SD	6
Range	15-44
<i>Education (in years)</i>	
Mean	9
SD	3
Range	5-16
<i>Ethnicity/Race</i>	
White	48%
African-American	23%
Hispanic	25%
<i>Language Spoken at Home</i>	
English	78%
Spanish	19%

assess, among other things, problem solving, classification, memory, habituation and early number concepts (Bayley, 1993). In the norming sample, MDI internal reliability was .88, and test-retest reliability ranged from .71 to .91 (Bayley, 1993). In this study, the average Bayley score was 90 ($SD = 14$, range 49-134) at child ages 24 and 36 months.

Child language skills. Children's vocabulary production at 24 months was assessed using the *MacArthur Bates Communicative Development Inventory Toddler-Short form* (Fenson et al., 1994; Fenson et al., 2000). This checklist asks parents to identify the words their child can produce. In the standardization sample, the mean for boys' vocabulary production was 52 (range = 14-87) and 68 for girls (range = 30-96) (Fenson et al., 1994). Spanish-speaking children were assessed using the Spanish version of the CDI.

Language development of English-speaking children was measured at 36 months using the Peabody Picture Vocabulary Test-III (PPVT) (Dunn & Dunn, 1997). This measure assesses children's receptive vocabulary and provides a quick estimate of verbal ability (Dunn & Dunn, 1997). In the standardization sample, the internal reliability for the PPVT ranged from .92 to .98, and Cronbach's alpha was .97 (Dunn & Dunn, 1997) ($M = 100$, $SD = 15$). Children whose mothers said Spanish was the child's stronger language were assessed using the *Test de Vocabulario en Imágenes Peabody* (TVIP) (Dunn, Padilla, Lugo, & Dunn, 1986), a Spanish adaptation of the PPVT. Approximately 10% of the children were assessed in Spanish.

Emergent literacy. Children's emergent literacy skills were assessed using the Story and Print Concept Tasks (ACF, 2003). These tasks were designed to assess basic story concepts such as comprehension of story content, and print concepts such as where the name of the book is written. Cronbach alpha's for book knowledge was .55 and for print knowledge, .71 (ACF, 2002a). Table 3 shows the descriptives for the child measures.

Table 3
Descriptives Child Measures

	Mean	SD	Range
<i>Cognitive Development</i>			
Bayley MDI 24 months	90.49	14.60	49-134
Bayley MDI 36 months	91.84	13	49-134
<i>Language Development</i>			
MacArthur Bates CDI 24 months	55.75	22.44	1-100
PPVT	85.48	16.20	40-123
<i>Literacy Development</i>			
Book Knowledge	3.17	1.34	0-5
Print Knowledge	4.24	1.59	0-6

RESULTS

Bookreading Frequency at 14 months

Mothers were asked about paternal bookreading frequency at child age 14 months. One third of mothers reported *daily* reading by fathers, and 21% reported *weekly* paternal reading. Approximately half of mothers reported fathers read infrequently to their children (*monthly or never*). Maternal bookreading frequency at 14 months looked different: almost half of mothers in the study reported reading *daily* to their children, and 29% reported reading *weekly* at 14 months. Only 23% read infrequently to their child (*monthly or rarely*). No comparison could be made between paternal and maternal bookreading frequency at child age 14 months because no data were available from fathers themselves (see also Table 4).

Bookreading Frequency at Child age 24 months

The percentage of mothers reporting they read frequently (daily or weekly) to their children increased with children's age; 77% of mothers reported reading frequently at child age 14 months and 87% reported doing so at 24 months. The percentage of mothers who reported reading infrequently to their child (*monthly or never*) dropped from 23% to 13%.

Residential fathers reported reading more frequently to their children at age 24 months than non-residential fathers; 28% of residential fathers reported reading *daily* to their children compared to 16% for non-residential fathers. Only 17% of residential fathers reported reading *monthly* to their children compared to 32% of residential fathers (see also Table 5). Since data were available on paternal bookreading frequency reported by both mothers and fathers, we were able to compare the two: mothers tended to overestimate paternal bookreading frequency at the *daily* level with 13% and 9% at *weekly* level.

Bookreading Frequency at 36 months

Similar numbers of bookreading frequency by mothers and fathers were reported at 36

Table 4

Maternal and Paternal Bookreading Frequency at Child Ages, 14, 24, 36, and 60 Months

	Daily	Weekly	Monthly	Rarely
Mothers at 14 months (<i>n</i> = 2170)	48%	29%	11%	12%
Mothers' report on fathers (<i>n</i> = 1079)	32%	21%	17%	30%
Mothers at 24 months (<i>n</i> = 766)	59%	28%	9%	4%
Fathers at 24 months (<i>n</i> = 792)	26%	32%	20%	22%
Mothers' report on fathers at 24 months (<i>n</i> = 474)	39%	23%	19%	19%
Mothers at 36 months (<i>n</i> = 699)	57%	30%	7%	6%
Fathers at 36 months (<i>n</i> = 722)	26%	32%	19%	23%
Fathers at 60 months (<i>n</i> = 757)	24%	36%	23%	17%

Table 5

Bookreading Frequency of Residential and Non-Residential Fathers at Child Ages 24, 36 and 60 Months

	24 months		36 months		60 months	
	Non-Residential Fathers (<i>n</i> = 639)	Residential Fathers (<i>n</i> = 158)	Non-Residential Fathers (<i>n</i> = 594)	Residential Fathers (<i>n</i> = 134)	Non-Residential Fathers (<i>n</i> = 520)	Residential Fathers (<i>n</i> = 259)
Daily	28%	16%	28%	18%	25%	22%
Weekly	33%	27%	34%	25%	36%	36%
Monthly	17%	32%	17%	28%	23%	24%
Rarely	22%	25%	21%	29%	16%	19%

months. Mothers read more frequently than fathers; 57% of mothers reported reading daily compared to 26% of fathers. Residential fathers read more frequently to their children than non-residential fathers; more than half of residential fathers reported reading daily or weekly compared to 43% of non-residential fathers (see also Table 5).

Bookreading Frequency at 5 years

Mothers were asked at child age five how often they or someone else in their family had read to the child in the last week. Almost 95% of mothers reported that the child had been read to at least once or twice in the last week. More than 60% of children were read to multiple times a week, while only 5% were not read to by an adult in the past week.

Fathers were also asked when the child was five years old how often they read to their children. The response categories at five years for fathers were the same as those used for fathers at 24 and 36 months. More than half of the fathers reported reading frequently (*daily* or *weekly*), while less than half of the fathers reported reading infrequently (*monthly* or *rarely*). These numbers are comparable to those reported at 24 and 36 months (see also Table 4). The difference in bookreading frequency among residential and non-residential fathers at child age five years was very small; 25% of residential fathers reported reading to their children compared to 22% of non-residential fathers. The percentage of non-residential fathers reporting to read daily increased with child's age; 16% at 24 months, 18% at 36 months, and 22% at five years. The percentages did not change for residential fathers; 28% at child ages 24 and 36 months and 25% at five years (see also Table 5).

The results demonstrate that, contrary to earlier findings on bookreading frequency in low-income families, many fathers—including non-residential fathers—and mothers read to their young children. There were no differences in bookreading frequency among EHS program and control families at child ages 14, 24, 36, and five years (although this was not the focus on the current study). However, EHS is not an intervention program that specifically targets bookreading, although programs such as EHS do frequently recommend parents to read to their young children.

Regression Analyses Predicting Child Development Outcomes

We used hierarchical multiple linear regression to address the research question of whether paternal bookreading frequency, in addition to maternal bookreading, predicts children's book knowledge and story comprehension skills at five years and language and cognitive development at child age 36 months. First, we examined whether paternal and maternal bookreading at child age 24 months predicted child outcomes. Next, we examined the effects of bookreading at child age 36 months on child outcomes. We hypothesized that earlier bookreading (at 24 months) would be a better predictor of child outcomes than later bookreading (36 months) since research suggests that having a history of early and frequent reading is related to child outcomes, and parents are more likely to continue a pattern of frequent bookreading when they start early in the child's life (DeBaryshe, 1993; Raikes et al., 2006). In all of the regression models, maternal bookreading was entered first followed by paternal bookreading. This was done to examine the 'additional' effect of paternal bookreading. It is possible that only maternal bookreading affects child outcomes and not paternal bookreading. Next, we included parental demographics and child characteristics including: 1) maternal education, 2) paternal education, 3) maternal home language, 4) paternal home language, 5) child's gender, and 6) child language development at age 24 months (measured by the MacArthur-Bates CDI) or children's cognitive development (measured by the Bayley MDI at 24 months), depending on the child outcome. Outcomes were chosen based on the research literature signifying their importance as discussed in the introduction. Initially, we included maternal and paternal ethnicity as controls as well. However, these variables were not significant in previous analyses, and due to the decrease in sample size when using variables from different data waves, we opted not to include father and mother ethnicity. The total sample size was 429 for all regression analyses due to the fact that not all families had complete data at different data waves.

Story Comprehension

Story comprehension at five years was best predicted by paternal education, maternal language, child gender, and child language development (24-months MacArthur-Bates CDI). Parental bookreading at child age 24 months was not a significant predictor of story comprehension at five years. We did find a significant interaction between paternal education and paternal bookreading. Initial tests for multicollinearity indicated high levels of multicollinearity between paternal bookreading and paternal education when the interaction term paternal bookreading and paternal education was introduced into the model ($VIF = 17.18$ for paternal bookreading and $VIF = 17.24$ for interaction term bookreading and education). Introducing an interaction term into a regression model by definition creates multicollinearity (Afshartous & Preston, 2011). We addressed this by centering both variables³ as well as the interaction terms. After centering, VIF scores were low ($VIF = 1.2$ for parental bookreading; $VIF = 1.2$ for interaction term bookreading and education). This model was able to explain 19% of the variance (see Table 6).

Book Knowledge

Paternal bookreading at child age 24 months was a significant predictor of children's book knowledge (measured with the Story and Print Concept Task) at five years. Maternal

Table 6

Hierarchical Regression Models Predicting Story Comprehension at Prek With Parental Bookreading at 24 and 36 Months as Predictors (n = 429)

	Bookreading at child age 24 months			Bookreading at child age 36 months		
	B	SE	β	B	SE	β
Maternal bookreading	.05	.05	.05	-.01	.05	-.01
Paternal bookreading	.47	.22	.41	.00	.06	.00
Maternal education	.02	.02	.06	.02	.02	.06
Paternal education	.13	.04	.23***	.10	.03	.19***
Maternal language	-.01	.00	-.10*	-.01	.00	-.09
Paternal language	-.00	.32	-.00	.00	.01	.03
Child gender	.49	.15	.16***	.50	.15	.16***
Language development (CDI 24 months)	.02	.00	.31***	.02	.00	.29***
Interaction paternal education and paternal bookreading	-.04	.02	-.37*			
R^2	.20			.19		
F for change in R^2	19.59***			24.17***		

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

bookreading did not predict children's book knowledge. The only other significant predictor was child's language skills at 24 months. There was a significant interaction between father education and father bookreading. This model explained 10% of the variance (see also Table 7).

Children's Language Development

Paternal bookreading at 24 months predicted children's language skills, as measured by PPVT scores at child age 36 months. Maternal bookreading was again not significant, but maternal and paternal education, paternal home language, child gender and language production at age 24 months (as measured by MacArthur-Bates CDI) were all significant predictors in this model. Approximately 10% of children in this sample were assessed in Spanish, indicating that this was the child's first language. We did ask fathers about their home language. However, where maternal language is often the same language spoken in the home and by the child, this is more complicated in the case of fathers. Not all fathers in this study lived with their children, and therefore it is not possible to assume that the language spoken by fathers at home was the same language spoken by children. Paternal language did impact child outcomes though, favoring English-speaking fathers.

We also found an interaction between paternal education and paternal bookreading. This model explained 22% of the variance in children's language development at 36 months (see also Table 8).

Table 7

Hierarchical Regression Models Predicting Book Knowledge at Prek With Parental Bookreading at 24 and 36 Months as Predictors (n = 429)

	Bookreading at child age 24 months			Bookreading at child age 36 months		
	B	SE	β	B	SE	β
Maternal bookreading	-.05	.05	-.06	-.06	.05	-.07
Paternal bookreading	-.13	.05	-.14*	-.011	.06	-.01
Maternal education	.02	.02	.06	.02	.02	.07
Paternal education	.06	.03	.13	.07	.03	.15
Maternal language	-.00	.00	-.02	-.00	.00	-.04
Paternal language	.18	.29	.04	.00	.01	.04
Child gender	-.04	.14	-.01	.01	.14	.00
Language development (CDI 24 months)	.00	.00	.14**	.00	.00	.16**
Interaction paternal education and paternal bookreading	-.04	.02	-.12*			
Interaction paternal education and child CDI 24 months	.00	.00	.11***			
R^2	.10			.09		
F for change in R^2	4.08**			4.15**		

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

Children's Cognitive Development

Children's cognitive abilities were best predicted by paternal and maternal bookreading at 24 months. Other significant predictors were paternal education and child's cognitive development at age 24 months (assessed by Bayley MDI). This model explained 41% of the variance in children's cognitive development (see also Table 9).

Regression Analyses Using Parental Bookreading at 36 Months

The same hierarchical regression analyses using parental bookreading at 24 months were conducted using parental bookreading at 36 months. Story comprehension was best predicted by paternal education, 24-month CDI, as well as child gender. An interaction between paternal education and child CDI was found. This model explained 19% of the variance (see Table 6). When predicting book knowledge, only paternal education and 24-month CDI were significant predictors. We found an interaction between paternal education and 24-month CDI (see Table 7). Paternal bookreading at 36 months was a significant predictor of children's language development (see Table 8). Children's cognitive development at 36 months was best predicted by paternal education. We also found an interaction between paternal education and 24-month Bayley scores (see Table 9).

Table 8

Hierarchical Regression Predicting Language Development (PPVT Scores) With Parental Bookreading at 24 Months as Predictors (n = 429)

	Bookreading at child age 24 months			Bookreading at child age 36 months		
	B	SE	β	B	SE	β
Maternal bookreading	-.21	.50	-.02	.16	.49	.02
Paternal bookreading	-1.54	.55	-.14**	-1.52	.60	-.13*
Maternal education	.51	.23	.12*	.24	.23	.06
Paternal education	1.26	.32	.23***	.40	.28	.08
Maternal language	-.04	.06	-.03	-.03	.07	-.02
Paternal language	18.86	3.01	.37***	-.07	.11	-.03
Child gender	3.48	1.40	.11*	3.46	1.46	.11*
Language development (CDI 24 months)	.16	.03	.23***	.16	.03	.22***
Interaction paternal education and child CDI 24-months				.03	.01	.15***
Interaction father bookreading and father education	-.53	.17	-.15**	-.65	.18	-.17***
R^2	.22			.16		
F for change in R^2	14.35***			13.90***		

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

In summary, paternal bookreading at 24 months was a significant predictor of book knowledge, child language and cognitive skills. Paternal bookreading at 36 months was a significant predictor of child language skills at 36 months. Children with higher educated fathers tended to have better story comprehension and cognitive and language skills compared to lower educated fathers. Children with English-speaking fathers also tended to have better language skills. However, child characteristics also played a role. Children's earlier language and cognitive skills were significant predictors of their later language and cognitive skills. Maternal bookreading at 24 months only predicted children's cognitive skills at 36 months.

DISCUSSION

This study demonstrates that paternal bookreading at child ages 24 and 36 months was a significant predictor of child language and cognitive skills and book knowledge. There are several possible explanations for fathers' contributions to children's language and literacy development. First of all, it is possible that "more is better," meaning that more bookreading, regardless by whom, leads to better language and literacy skills among young children. It is also possible that mothers and fathers use different bookreading styles. Children may have the opportunity to learn more from bookreading sessions when parents use different

Table 9

Hierarchical Regression Predicting Bayley Scores With Parental Bookreading at 24 and 36 Months as Predictors (n = 429)

	Bookreading at child age 24 months			Bookreading at child age 36 months		
	B	SE	β	B	SE	β
Maternal bookreading	-.76	.39	-.09*	-.20	.37	-.02
Paternal bookreading	-.89	.43	-.09*	-.53	.45	-.06
Maternal education	-.12	.18	-.03	-.08	.18	-.02
Paternal education	.62	.26	.14**	.46	.22	.11*
Maternal language	-.06	.05	-.05	-.07	.05	-.06
Paternal language	2.23	2.32	.05	.05	.08	.03
Child gender	.39	1.10	.02	.53	1.11	.02
Bayley 24 months	.47	.04	.53***	.49	.04	.54
Interaction paternal education and Bayley	.03	.01	.10*	.03	.01	.09**
R^2	.41			.39		
F for change in R^2	51.34***			54.08***		

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

but possibly complementary styles. Another consideration is the identification effect: seeing a man who reads frequently could be emotionally stimulating for children (Mullan, 2010), in particular for girls, as demonstrated by the results in this study.

Other factors impacting children's emergent literacy skills included parental level of education; parents who were better educated were more likely to read to their children. Earlier research has demonstrated that parents with higher levels of education often have better literacy skills and are more aware of the benefits of bookreading. Halle (2002), for example, reported that 42% of fathers with a high school diploma read at least once a week to their children compared to 27% of fathers without a high school diploma. For mothers, these numbers were 56% and 39%, respectively (Halle, 2002). Yarosz and Barnett (2001) found that maternal level of education was related to bookreading frequency for children under the age of three (Yarosz & Barnett, 2001). Earlier analyses with the same EHS sample demonstrated that mothers and fathers with higher levels of education read more frequently to their children (Duursma et al., 2008; Raikes et al., 2006). When young children receive more bookreading at home, they also have more opportunities to develop emergent literacy skills. It is also possible that better educated fathers provide more stimulating activities for their children, such as bookreading or library visits than less educated fathers.

In this sample, girls had better story comprehension skills and language skills than boys. Girls are often more interested in reading and tend to have better language skills around three years of age (Bauer, Goldfield, & Reznick, 2002; Ortiz, Stowe, & Arnold, 2001). The fact that girls develop their language skills slightly earlier than boys could also encourage

parents to read more frequently to girls than to boys. It could be that parents deem bookreading a more appropriate activity for girls than for boys. A recent study found that parents indeed spent more time reading to their daughters than to their sons (Baker & Milligan, 2013). The authors of this study suggested that previously named reasons such as better language skills could play a role, as well as compensating for potential skill-deficits (boys might be better in cognitive skills) by reading aloud (Baker & Milligan, 2013).

It is remarkable that paternal bookreading, not maternal bookreading, predicted story comprehension, book knowledge and language skills among children. Gleason (1975) and Bernstein-Ratner (1988) reported that fathers used more complex language than mothers when interacting with their children (Bernstein-Ratner, 1988; Gleason, 1975). More recent studies found that paternal vocabulary but not maternal vocabulary was a significant predictor of child language (Pancsofar & Vernon-Feagans, 2006). A previous study with a subsample of this EHS sample demonstrated that fathers used more non-immediate talk during bookreading interactions with their children (at child ages 24, 36, and five years) than mothers (Duursma & Pan, 2011). Non-immediate talk goes beyond the context of the book and is known to have an effect on children's language development (De Temple & Snow, 2003). If indeed the fathers in this study similarly used more complex language than the children's mothers, this could provide a mechanism by which their bookreading may have influenced children's language and emergent literacy skills.

Mothers typically spend more time with children than fathers, and it is possible that they lay the groundwork for children's language development in their daily interaction with children. Perhaps fathers contribute by using more complex language when interacting with their children, which is often less frequent than mothers. However, more research is needed to draw any firm conclusions.

Limitations

Although bookreading can contribute to children's book comprehension, story knowledge and language development, this study did not examine other literacy activities associated with children's language and literacy development. Future research could include other family literacy activities such as number of books in the home, library visits, etc.

Another limitation of this study was the fact that bookreading frequency was based on self-report. This could provide a less complete picture since bookreading is considered a socially desirable activity. However, the validity of self-report could be less problematic for fathers since mothers are still considered the primary responsible parent for children. This study also showed that mothers tend to overreport paternal bookreading.

This study only examined frequency of bookreading and not quality or style of bookreading. We acknowledge though, that style or quality of bookreading is just as important as frequency. The fathers who participated in this study were often the child's biological father, married to the child's mother, and better educated than fathers who opted out of the study. The results of this study, therefore, need to be interpreted with caution. Self-selection could have played a role; fathers who are involved in their children's lives might be more likely to participate than those who are not. No information was gathered on why fathers who were approached to participate but did not declined to participate. Moreover, father presence did change over time; not all men interviewed at 24 months were the same men at 36 months and at five years.

Intervention programs have primarily focused on mothers. However, it is equally important for early intervention programs to focus on fathers. This study suggests that children's language abilities, book knowledge and story comprehension not only benefitted from maternal bookreading but also from paternal bookreading. It is important to focus on parents, fathers as well as mothers, from low-income families and families with boys. We found that parents with higher levels of education, who spoke English, families with girls, and children with better language skills, had better language development, story knowledge and book knowledge. Boys, children with poorer language abilities, and whose parents were less educated and did not speak English could possibly receive less bookreading and also profit less from the benefits of bookreading.

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