

BRIEF RESEARCH REPORT

**Parent–child conversations about literacy:
a longitudinal, observational study***

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ABSTRACT

Conversations about literacy-related matters with parents can help prepare children for formal literacy instruction. We studied these conversations using data gathered from fifty-six US families as they engaged in daily activities at home. Analyzing conversations when children were aged 1;10, 2;6, 3;6, and 4;2, we found that explicit talk about the elements and processes of reading and writing occurred even when children were less than two years old and became more common as children grew older. The majority of literacy-related conversations included talk about alphabet letters. Literacy-related conversations occurred in a variety of contexts, not only book-reading.

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There were few differences as a function of family socioeconomic status in the proportion of utterances during the sessions that occurred in literacy-related conversations. At older ages, however, children in families of lower socioeconomic status bore more of the conversational burden than children in families of higher status.

INTRODUCTION

Children learn many things about the world through first-hand experience, but they also learn through conversations with other people. Linguistic input from more knowledgeable others is especially important in domains where important concepts are not readily accessible through direct observation (Gelman, 2009). Reading is one such domain. For example, hearing an adult say “That word says dog” while pointing at some small black marks may help a child realize that the marks serve a purpose. The present study investigated conversations between parents and their young children in the home that touch on elements and processes of reading and writing.

Literacy-related conversations could occur in a number of settings, but most studies of these conversations have examined story-book reading. In this context, parents and children talk less about printed words and letters than about story content and illustrations (e.g., Haden, Reese, & Fivush, 1996; Hindman, Connor, Jewkes, & Morrison, 2008; Price, Kleeck, & Huberty, 2009; Yaden, Smolkin, & Conlon, 1989). However, parents report in questionnaire studies that they sometimes teach their children about letters of the alphabet through games and other activities (Burgess, 2011; Martini & Sénéchal, 2012; Wood, 2002). Thus, we did not limit the present investigation of literacy-related conversations to the book-reading context.

We used data from the Chicago Language Development Project, a study in which parents and children were videotaped every four months, starting from when children were 1;2 (years; months), as they went about their daily activities. Parents’ and children’s talk during each 90-minute videotaped session was transcribed and supplemented with information about the activities in which they were engaged and the objects that were involved. We defined literacy-related conversations as those that included explicit talk about alphabet letters, printed words, reading, writing, spelling, book conventions (e.g., which page of a book is read first), and phonological awareness, and we asked how often such conversations occurred when children were aged 1;10, 2;6, 3;6, and 4;2. Because letter-related conversations appear to have a special link with later decoding skills (Evans, Shaw, & Bell, 2000; Sénéchal & Lefevre, 2002), we also conducted analyses of this subset of literacy-related conversations.

Our first goal was to determine how the frequency of literacy-related conversations varied with the age of the child and the context of the

conversation; for example, whether it occurred during book-reading or toy play. Several studies have observed literacy-related conversations involving children as young as one to two years (Robins & Treiman, 2009; Robins, Treiman, Rosales, & Otake, 2012; Treiman, Schmidt, Decker, Robins, Levine, & Demir, 2015), but these studies do not provide information about the proportion of talk in children's homes that is devoted to literacy-related matters or how the frequency of such talk may vary across contexts. A previous study using data from the Chicago Language Development Project found that parents were increasingly likely to mention letters of the alphabet as their children increased in age from 1;2 to 4;2, but this study did not examine other types of literacy-related talk, nor did it examine talk by children (Treiman *et al.*, 2015).

A second goal of our study was to examine the extent to which children contributed to literacy-related conversations. In a study of mealtime conversations involving parents and three-year-olds, Aukrust and Snow (1998) found that the proportion of utterances contributed by children was lower for some types of talk, such as explanations about the workings of household appliances, than to other types of talk, such as discussions of the taste of food. Here we asked whether the proportion of utterances contributed by children was lower in conversations about literacy-related matters than conversations about other topics. We also asked whether the proportion of utterances contributed by children increased as they got older, as would be expected given children's increasing language proficiency.

A third research question was whether the frequency of literacy-related conversations and the rate of child participation in these conversations varied with the family's socioeconomic status (SES). The common view that the early home literacy environment is richer in higher-SES families than lower-SES families and that this helps to explain SES-related differences in academic achievement (e.g., Neumann, 2016; Strang & Piasta, 2016) leads to the expectation that the proportion of utterances devoted to conversations about literacy-related matters would be higher in higher-SES families. Indeed, questionnaire studies suggest that reading books to children is a more common activity in higher-SES than lower-SES US homes (e.g., Chen, Pisani, White, & Soroui, 2012; Kuo, Franke, Regalado, & Halfon, 2004; Schaub, 2015; Yarosz & Barnett, 2001). Questionnaires are subject to social desirability biases, however, and respondents do not always remember the details of how they spend their time. It is important to examine possible SES differences directly.

To summarize, we used longitudinal, observational data to examine the proportion of utterances in young children's homes that occurred in conversations about literacy-related matters in general and about a specific literacy-related topic – alphabet letters. We asked how the proportion of talk during the home visits that was devoted to these topics varied with

children's age, the context of the conversation, and the SES of the family. We also examined the degree to which children contributed to the conversations.

METHOD

Participants

We used data from fifty-six children (29 boys) and their parents from the Chicago Language Development Project. Sixty-four families who were representative of the greater Chicago area in ethnicity and income were selected for the project. All the parents spoke English as the primary language. The project includes twelve home visits before children entered kindergarten, and we used data from all fifty-six families for whom transcripts were available for the visits when children were 1;10, 2;6, 3;6, and 4;2. The primary caregiver was the mother in forty-nine families and the father in one; the parents in the other families reported that they shared caregiving duties. Forty children were reported to be White, ten African American, and six of two or more races. Eight of the children were reported to be Hispanic.

Information about the parents' education level and the family's income was collected categorically in a questionnaire that was given at or before the first home visit. Each category for education was assigned a value equivalent to years of education. We used the value for the primary caregiver for families that reported a single primary caregiver and the average for the two caregivers for families that reported two. The categories for family income, which ranged from less than \$15,000 to over \$100,000 per year, were transformed into a scale by using the midpoints of the incomes in each category except the highest, which was coded as \$100,000. As in several previous studies using data from the Chicago Language Development Project (e.g., Rowe & Goldin-Meadow, 2009; Treiman *et al.*, 2015), we used principal components analysis to combine education and income into a composite measure of SES with a mean of 0 and a standard deviation of 1.0.

Procedure

Home visits. Visits were conducted by research assistants, each of whom continued with a family over a series of visits. At each visit, the researcher videotaped the parent and child for a target length of 90 minutes. Because the goal was to obtain a picture of typical parent-child interactions, the researcher did not bring toys or books and did not engage the child in conversation. Families were asked to carry out their normal daily activities, and they did not know that literacy-related conversations would be studied. All speech in the videotaped sessions by the parent and the child

of interest was transcribed. Transcription reliability was established by having a second individual transcribe 20% of each transcriber's videotapes. Reliability was achieved when coders agreed on 95% of transcription decisions about an utterance, which was defined as a sequence of words that was preceded and followed by a pause, a change in a conversational turn, or a change in intonation pattern.

Coding of literacy-related conversations. We coded conversations as literacy-related if they included explicit talk about alphabet letters, printed words, reading processes and conventions, writing, spelling, or rhyming. Letter-related conversations were the subset of these conversations that included talk about letters. Table 1 shows some sample literacy-related conversations. We determined whether each conversation occurred while participants were looking at or reading a book or other written text, writing or drawing, looking at or playing with toys, or doing something else (e.g., dressing, eating). We coded these contexts as text, writing/drawing, toy play, and 'other', respectively. We did not separate writing and drawing because the two activities were sometimes intermingled or difficult to distinguish. We considered that a new conversation began when the context changed, as when a parent and child transitioned from discussing a book to eating dinner, or when the focus of the conversation changed, for example, from talking about letters on a puzzle piece to discussing a program on television. A second individual coded the data from nine home visits. The percentage of agreement between coders was 94% for whether a conversation was literacy related, 96% for whether a conversation was letter related, 86% for the context coding, and 96% for conversation start and stop points.

RESULTS

Literacy-related conversations

The first column of data in Table 2 shows the total number of utterances that occurred in literacy-related conversations in each conversational context at each age. The second column shows the total number of utterances in the context, and the third column gives the proportion of the utterances that occurred in literacy-related conversations. We present the data this way rather than calculating proportions for each family for each age and context and averaging those proportions because the distributions of the proportions were skewed, with large standard deviations.

To analyze the data statistically, we used negative binomial regression. This procedure is appropriate for count data, here the number of times that a certain type of utterance occurred. Our dependent variable was the number of utterances that were part of a literacy-related conversation. The offset variable, namely the number of times the event could have occurred,

TABLE 1. *Examples of literacy-related conversations involving children of different ages*

Age 1;10 (text context)
 Child: This a book
 Parent: mm hmm
 Child: Mommy read book
 Child: Mommy read book
 Parent: Mommy read the book?
 Parent: OK
 Parent: Which book do you want to read?
 Parent: This book or this book?
 Child: This book

Age 2;6 ('other' context)
 Parent: Want to put your socks on and then we'll read a book?
 Child: Um, um read a book yes
 Parent: Want to go get a book to read?
 Child: Yeah
 Child: It's good to get
 Parent: Did you find something in your ear?
 Child: Yeah, and I got it out
 Parent: OK
 Parent: Want to go get a book?
 Child: Pooh Pooh (followed by unintelligible speech)
 Child: This one
 Child: Let's read this one
 (conversation continues)

Age 3;6 ('other' context)
 Child: How you spell
 Child: How you spell Megawan?
 Parent: I don't know
 Parent: M
 Child: T
 Parent: M
 Parent: E
 Child: T
 Parent: E
 Child: T
 Parent: No, M E

Age 4;2 (writing/drawing context)
 Parent: Let me write your name
 Child: I want to write my name
 Parent: Well, mommy's going to show you how to write your name
 Child: (unintelligible)
 Parent: You got to put the line on your J

was the number of utterances. These values were calculated for each context for each family at each session. Using the `glm.nb` program in the MASS package in R (Venables & Ripley, 2002), we fit negative binomial regression models with the age of the child (calculated to two decimal points in years), the context, and the composite measure of family SES as predictors. Continuous dependent variables were centered, and text was

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TABLE 2. *Number and proportion of utterances in literacy-related conversations as a function of child age and context*

Age	Context	Number of utterances in literacy-related conversations	Total number of utterances	Proportion of utterances in literacy-related conversations
1;10	Text	1146	8950	.128
	Writing/drawing	203	3952	.051
	Toy play	166	21341	.008
	Other	978	44289	.022
	All	2493	78532	.032
2;6	Text	1885	7348	.257
	Writing/drawing	383	4616	.083
	Toy play	2207	43457	.051
	Other	694	33892	.020
	All	5169	89313	.058
3;6	Text	946	2747	.344
	Writing/drawing	1463	9057	.162
	Toy play	1237	38981	.032
	Other	548	40348	.014
	All	4194	91133	.046
4;2	Text	1385	5930	.234
	Writing/drawing	1743	7098	.246
	Toy play	2010	43918	.046
	Other	499	26608	.019
	All	5637	83554	.067
All ages	Text	5362	24975	.215
	Writing/drawing	3782	24723	.153
	Toy play	5620	147697	.038
	Other	2719	145137	.019
	All	17493	342532	.051

the reference level for the categorical variable of context. Family identification number was included as a covariable.

We first fit a model with main effects of child age, context, and SES. Using likelihood ratio tests, we compared this model to a model that included the interaction between age and SES, a model that included the interaction between age and context, and a model that included the interaction between SES and context. Adding the interaction between age and SES did not significantly improve the fit of the model ($p = .20$), but adding the interaction between age and context improved the fit, as did adding the interaction between SES and context ($p < .002$ for both). Our final model, which included the main effects of age, context, and SES, the interaction between age and context, and the interaction between SES and context, was not a significantly poorer fit than a model that also included the three-way interaction of age, context, and SES ($p = .20$).

The final model showed a main effect of age, such that the likelihood that an utterance was part of a literacy-related conversation increased significantly

as children got older ($\beta = 0.49$, $SE = 0.15$, $p = .001$). The likelihood that an utterance was part of a literacy-related conversation was significantly higher if the utterance occurred in a text context than if it occurred during writing/drawing ($\beta = 0.95$, $SE = 0.23$, $p < .001$), toy play ($\beta = 3.21$, $SE = 0.19$, $p < .001$), or in 'other' contexts ($\beta = 2.82$, $SE = 0.18$, $p < .001$). The main effects of age and context were qualified by a statistically significant contrast between age and the text versus 'other' contrast ($\beta = -0.66$, $SE = 0.20$, $p < .001$), as well as by significant interactions between SES and the contrast between the text and toy play contexts ($\beta = 0.65$, $SE = 0.20$, $p < .001$) and SES and the contrast between the text and 'other' contexts ($\beta = 0.75$, $SE = 0.19$, $p < .001$).

To shed light on the interactions involving context, we conducted analyses for each context using main effects of age and SES. We found a significant effect of age in each of the text, writing/drawing, and toy play contexts (text: $\beta = 0.41$, $SE = 0.08$; writing/drawing: $\beta = 0.65$, $SE = 0.16$; toy play: $\beta = 0.67$, $SE = 0.15$; $p < .001$ for all), such that the likelihood that an utterance was a part of a literacy-related conversation increased reliably as children grew older. There was no significant effect of SES in these contexts ($p > .09$). In contexts classified as 'other', there was no significant effect of age but a significant effect of SES, such that the likelihood that an utterance was a part of a literacy-related conversation was greater in higher-SES than lower-SES families ($\beta = 12.54$, $SE = 4.60$, $p = .006$). To illustrate, the mean proportion of utterances in literacy-related conversations in 'other' contexts was .015 ($SD = .043$) in the 25 families with a value below zero on the composite measure of SES and .041 ($SD = .134$) in the 31 families with a value above zero.

Letter-related conversations

Table 3 provides information about one important type of literacy-related conversations, those related to letters. It shows the number of utterances in letter-related conversations, the total number of utterances, and the proportion of utterances that occurred in letter-related conversations as a function of age and context. A comparison of the numbers in Table 3 with those in Table 2 shows that the majority of literacy-related conversations included talk about letters. As in the analyses of literacy-related conversations in general, we fit a negative binomial regression model with main effects of age, context, and SES. Using likelihood ratio tests, we found that this model was not a significantly poorer fit than models that included the two-way interactions. A model with the main effects of age and context was not a significantly poorer fit than a model that also included the main effect of SES ($p > .27$ for all model comparisons), so our final model included main effects of age and context.

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TABLE 3. *Number and proportion of utterances in letter-related conversations as a function of child age and context*

Age	Context	Number of utterances in letter-related conversations	Total number of utterances	Proportion of utterances in letter-related conversations
1;10	Text	479	8950	.054
	Writing/drawing	90	3952	.023
	Toy play	53	21341	.002
	Other	55	44289	.001
	All	677	78532	.009
2;6	Text	564	7348	.077
	Writing/drawing	235	4616	.051
	Toy play	2125	43457	.049
	Other	163	33892	.005
	All	3087	89313	.035
3;6	Text	449	2747	.163
	Writing/drawing	1332	9057	.147
	Toy play	1114	38981	.029
	Other	335	40348	.008
	All	3230	91133	.035
4;2	Text	924	5930	.156
	Writing/drawing	1530	7098	.216
	Toy play	1630	43918	.037
	Other	210	26608	.008
	All	4294	83554	.051
All ages	Text	2416	24975	.097
	Writing/drawing	3187	24723	.129
	Toy play	4922	147697	.033
	Other	763	145137	.005
	All	11288	342532	.033

According to the final model, the likelihood of an utterance being a part of a letter-related conversation increased significantly as children got older ($\beta = 0.78$, $SE = 0.12$, $p < .001$). An utterance was significantly more likely to be part of a letter-related conversation if it occurred in the text context than if it occurred during toy play ($\beta = 2.36$, $SE = 0.30$, $p < .001$) or in ‘other’ contexts ($\beta = 3.40$, $SE = 0.30$, $p < .001$). The difference between text and writing/drawing was not statistically reliable ($p = .31$). Thus, whereas literacy-related conversations as a whole were significantly more likely to occur in text contexts than writing/drawing contexts, letter-related conversations were statistically equally likely to occur in these contexts.

Children’s contributions to conversations

Table 4 shows the proportion of utterances by children as opposed to parents in literacy-related conversations and, for comparison, in all other talk in the sessions. The small number of cases in which a child and a parent were coded

TABLE 4. Mean (and standard deviation) proportion of utterances by children of different ages in literacy-related conversations and conversations without literacy-related content

Age	Type of conversation	Mean (standard deviation) proportion of utterances by children
1;10	Literacy-related	.261 (.262)
	Not literacy-related	.274 (.157)
2;6	Literacy-related	.340 (.192)
	Not literacy-related	.390 (.126)
3;6	Literacy-related	.415 (.262)
	Not literacy-related	.440 (.118)
4;2	Literacy-related	.422 (.249)
	Not literacy-related	.472 (.166)

as producing an utterance simultaneously were excluded from these analyses. The data were more normally distributed than the data on the proportion of literacy-related utterances, making mixed-model analyses appropriate. We used the package *lme4* (Bates, Mächler, Bolker, & Walker, 2015), treating family as a random factor. Our first model included the fixed factors child age, SES, and conversation type (literacy-related vs. not). Adding interactions between age and conversation type and between SES and conversation type did not significantly improve the model's fit ($p > .37$), but adding the interaction between age and SES did ($p < .001$). Because a model that also included the three-way interaction did not offer a significant improvement ($p = .56$), we retained the model with main effects of age, SES, and conversation type and the interaction between age and SES.

The final model showed a significant main effect of age, such that the proportion of utterances contributed by children increased as they grew older ($\beta = 0.07$, $SE = 0.01$, $p < .001$). There was also a main effect of conversation type, such that children were significantly less likely to contribute to conversations about literacy than those about other topics ($\beta = -0.03$, $SE = 0.02$, $p = .041$). The main effect of SES was significant ($\beta = -0.04$, $SE = 0.02$, $p = .022$), such that the proportion of utterances contributed by children was lower in higher-SES than lower-SES families. Because there was also an interaction between SES and age ($\beta = 0.04$, $SE = 0.01$, $p < .001$), we conducted separate analyses for each session using SES as a factor. We found no reliable effect of SES at child ages 1;10 and 2;6 ($p > .44$) and a trend toward less participation by children in higher-SES families at 3;6 ($p = .06$). There was a robust effect of SES at 4;2, such that the proportion of utterances contributed by children was lower in higher-SES than lower-SES families ($p < .001$). Table 5 shows the mean proportion of utterances contributed by children out of all talk

TABLE 5. Mean (and standard deviation) proportion of utterances by children in sessions as a function of child age and SES (below vs. above zero on composite measure of SES)

Age	SES	Mean (standard deviation) proportion of utterances by children
1;10	Lower	.268 (.234)
	Higher	.238 (.223)
2;6	Lower	.314 (.204)
	Higher	.367 (.200)
3;6	Lower	.443 (.249)
	Higher	.392 (.215)
4;2	Lower	.515 (.276)
	Higher	.374 (.189)

in a session as a function of the child's age and whether the family's score on the composite measure of SES was below or above zero.

DISCUSSION

Learning to produce and interpret written language is vital for success in modern societies. Although formal instruction in these skills begins at school, learning about written language begins at home, often through informal discussions between children and parents about literacy-related topics. Given the role of these experiences in preparing children for school (e.g., Evans *et al.*, 2000), it is important to study the characteristics of the home literacy environment. The present study did so not by using questionnaires, as in many previous studies (e.g., Chen *et al.*, 2012), but by analyzing talk that was recorded during daily activities at home.

Averaging across contexts and ages, 5.1% of parents' and children's utterances were part of a conversation about a literacy-related matter. This figure is striking given the many topics that parents and children have to discuss and given that we had a fairly restricted definition of literacy-related conversations. Conversations about the elements and processes of reading and writing were considered literacy-related, but play that incorporated themes from a book, for example, was not. The proportion of utterances that were part of a literacy-related conversation increased from 3.2% at child age 1;10 to 9.0% at 4;2. Literacy-related conversations covered a range of matters, but the majority included talk about alphabet letters, a type of talk that appears to be helpful for learning to decode written words (Evans *et al.*, 2000; Sénéchal & Lefevre, 2002). Although children contributed a smaller proportion of utterances to literacy-related conversations than to conversations about other topics, the literacy-related conversations were by no means monologues by parents.

Previous studies have focused on story-book reading as a context for literacy-related talk, and the overall rate of literacy-related utterances in our study was significantly higher in the text context than in any of the other contexts. However, text contexts and writing/drawing contexts were statistically equally likely to give rise to letter-related conversations. This latter result highlights writing as an important but often under-appreciated context for learning about letters (Levin, Aram, Tolchinsky, & McBride, 2013; Skibbe, Bindman, Hindman, Aram, & Morrison, 2013).

Our results suggest a need to re-evaluate some conclusions that have been drawn about the talk that occurs when parents read books to their young children. In particular, the statement that explicit talk about literacy-related topics 'rarely' occurs in this context (Aram & Aviram, 2009, p. 188; Hindman, Skibbe, & Foster, 2014, p. 291; Piasta, Justice, McGinty, & Kaderavek 2012, p. 810) seems too strong. The proportion of utterances in text contexts that were part of a literacy-related conversation was 21.5% in our study, pooling across ages, and the proportion of utterances in text contexts that were part of a letter-related conversation was 9.7%. These figures are probably more representative of what normally occurs in homes than are the results of studies in which parents are asked to read unfamiliar books to their children, sometimes in a laboratory setting.

Surprisingly, given the common view that the home literacy environment is richer in higher-SES than lower-SES families (e.g., Neumann, 2016; Strang & Piasta, 2016), we found few differences as a function of SES in the proportion of talk during the home visits that was devoted to literacy-related matters. The rate of letter-related talk did not differ significantly as a function of SES, and the rate of literacy-related talk as a whole did not differ significantly as a function of SES in text, writing/drawing, or toy play contexts. In contexts that did not involve texts, writing, drawing, or toy play, the proportion of utterances that occurred in a literacy-related conversation, although low in all families, was significantly higher in higher-SES than lower-SES families. If this finding can be replicated, it would suggest that certain materials, including books or blocks with letters on them, elicit talk about writing to a similar extent in families varying in SES. Differences in families' orientations toward literacy may be more likely to emerge when situational encouragement is not present.

The most notable SES difference that we found concerned the degree to which children versus parents contributed to conversations. Whether the topic of the conversation was literacy or some other matter, the proportion of utterances contributed by children was lower in higher-SES families than lower-SES families during the later sessions of the study. This finding fits with other reports that lower-SES parents tend to talk less with their children than higher-SES parents and that these differences

may increase over the first years of life (e.g., Hoff, Laursen, & Tardif, 2002; Torr, 2004; Vanormelingen & Gillis, 2016). If children carry much of the conversational load in conversations about literacy and other topics, concepts that are new to children may not come up as often, children's requests for information may not be answered, and children may be asked fewer questions that encourage them to make observations and demonstrate their knowledge (Robins, Ghosh, Rosales, & Treiman, 2014).

Several programs designed to improve the literacy skills of children, including children at risk of poor academic performance due to low SES, have encouraged parents and preschool educators to talk about and point to print when reading books to children (Justice & Ezell, 2002; Justice, McGinty, Piasta, Kaderavek, & Fan, 2010; Piasta *et al.*, 2012). Our findings suggest the potential value of targeting other activities, including those involving production of writing. More generally, it may be beneficial to encourage adults to talk more with children and to take a large role in the conversations (Ridge, Weisberg, Ilgaz, Hirsh-Pasek, & Golinkoff, 2015; Suskind *et al.*, 2016). One would not want to encourage conversations that leave no room for participation by children, but lower-SES children may benefit if parents took more of the conversational load.

The present study shows the value of obtaining objective information about the home literacy environment by examining it directly. The results show that conversations about letters and other literacy-related matters occur when parents and children read together, and more often than is generally acknowledged, but that book reading is not the only setting for such conversations. The results further show that SES differences in the early home literacy environment may lie less in the proportion of parents' and children's talk that deals with literacy-related matters than in the extent to which the more knowledgeable member of the dyad, the parent, contributes to the conversations.

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