Parent–child conversations about letters and pictures

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Abstract Learning about letters, and how they differ from pictures, is one important aspect of a young child's print awareness. To test the hypothesis that parent speech provides children with information about these differences, we studied parent–child conversations in CHILDES (MacWhinney, 2000). We found that parents talk to their young children about letters, differentiating them from pictures, by 1–2 years of age and that some of these conversational patterns change across the preschool years in ways that emphasize important features of letters, such as their shape. We also found that children talk about letters and pictures in distinct ways, suggesting an implicit understanding of some of the differences between letters and pictures at an early age. Some differences in parent–child conversations about letters were found as a function of socioeconomic status: Lower SES families appeared to focus more on alphabetic order than higher SES families. The general letter knowledge expressed in these conversations suggests that everyday interactions are an important component of the home literacy environment and that they differ, in some respects, as a function of child age and family background.

Keywords Print awareness · Home literacy environment · Letter knowledge · Parent–child conversations · Emergent literacy

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Introduction

Learning about the form and function of written language during the preschool years can help prepare young children for reading and writing once formal schooling begins. Studies confirm that both phonological awareness and print awareness are important aspects of early literacy (e.g., Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 1998). Of these two skills, phonological awareness has received the most attention. Much work has been done to specify what phonological awareness is, how children acquire it, and how it relates to later literacy outcomes (Ehri et al., 2001; Hulme, Snowling, Caravolas, & Carroll, 2005; Stanovich, 2000). However, there is a growing interest in young children's print awareness and recognition of its unique contributions to subsequent literacy achievement (Badian, 2000; Storch & Whitehurst, 2002; National Early Literacy Panel, 2004). Researchers who note the connection between emergent literacy skills and children's later reading and writing have encouraged further investigation into how these skills are acquired:

> Future studies should address questions concerning the developmental origins of skills such as phonological sensitivity, letter knowledge, and oral language. Such knowledge would provide a basis for the development of interventions aimed at preventing later reading difficulties in populations of children at risk. (Storch & Whitehurst, 2002, pp. 944–945)

In the present study, we respond to this call by examining the developmental origins of print awareness, and in particular the idea that parents' everyday speech to their young children provides information about the nature and function of letters.

Print awareness is a broad concept, encompassing a wide range of skills (Badian, 2000). Young children must learn the names, shapes, and sounds of individual letters, and eventually how letters are organized into words and sentences and stories that convey meaning. One important aspect of print awareness is an understanding of how print differs from another common graphic form, pictures. As symbolic objects, printed letters and pictures share some similarities: They are both two-dimensional marks made on surfaces, produced by humans, and subject to arbitrary conventions. Children must learn that print looks different than pictures and, even more importantly, that it functions differently. It takes time for children to learn this (e.g., Levin & Bus, 2003), and assessments of young children's print awareness often include items tapping their knowledge of the differences between print and pictures (e.g., Clay, 2000; Storch & Whitehurst, 2002; Puranik, Lonigan, & Kim, 2011).

Some studies have assessed the home literacy environment by asking parents how often they engage in specific literacy-relevant activities (e.g., Hood, Conlon, & Andrews, 2008; Phillips & Lonigan, 2009; Sénéchal & LeFevre, 2002) or by asking them about their beliefs (DeBaryshe, 1995; Fitzgerald et al., 1991). The results of these questionnaires suggest that many parents believe that it is important to teach their young children about print and report that they often do so. However, these studies do not provide information about parent's actual practices, nor do they help us lean what specific information about print is involved in these interactions. Do parents talk to their young children in ways that highlight the differences between

print and pictures? If so, what features of print and pictures do they emphasize? The first goal of the present study was to examine parents' talk about print across a variety of everyday contexts with children 1–5 years of age, comparing this with talk about pictures. We asked what information parent speech provides about the differences between these two symbol systems and how the patterns change with the age of the child.

Studying conversations also presents an opportunity to assess children's talk about letters in comparison to pictures, allowing us to make inferences about their understanding of the differences between these two systems. Previous studies of this issue (Lavine, 1977; Levin & Bus, 2003; Levy, Gong, Hessels, Evans & Jared, 2006) have examined children over the age of 2½ or 3. The focus on conversations in the present study allows us to ask whether even younger children differentiate between print and pictures. This is the second goal of the present study: to document whether and how children's everyday conversations with their parents show a knowledge of distinctions between letters and pictures and to study how such knowledge may change between 1 and 5 years of age.

To achieve our goals, we examined parent–child conversations transcribed in the CHILDES database (MacWhinney, 2000), which includes numerous conversations in a wide range of contexts. Most of the transcripts in CHILDES were originally collected for studies of children's spoken language development, and so can be used to assess patterns in talk about written language across a range of contexts where print is not often the direct focus. As shown in a previous study (Robins & Treiman, 2009), this approach can provide useful information about the home literacy environment. Use of these corpora also presents challenges: Because the transcripts in CHILDES were collected in different contexts and in the service of different research projects, there is a good deal of variation in the length and number of transcripts for each child. Researchers have tried to control for these differences by limiting the analyses to a particular corpus or to a particular set of children that can be tracked at multiple ages. Although this strategy confers control, it limits the number of utterances available for study. In the present study, we chose to control for differences across corpora using a statistical procedure, multilevel modeling, that incorporates characteristics of the utterance, child, and corpus into each analysis. This allowed us to investigate multiple factors that could influence conversational patterns while controlling for differences across the transcripts and without limiting the size of our data set. Indeed, we included virtually all conversations between US parents and children in CHILDES that occurred when children were between 1;0 (years; months) and 5;0. With this very large sample of speech, much larger than could be gleaned from a single study, we could compare talk about letters and pictures and ask how it might change across this age range.

Some of the researchers who submitted transcripts to CHILDES provided information about the socioeconomic class (SES) of their participants, determined by parent education and income. For example, one set of transcripts came from the Home-School Study of Literacy and Language Development (Dickinson & Tabors, 2001), which focused exclusively on low-income families. As previous studies have suggested that children from low SES families do not have the same exposure to literacy-enhancing activities and complex speech as children from higher SES

families (Aram & Levin, 2004; Hart & Risley, 1995; Raikes et al., 2006), we made this a third goal of our study: to assess whether there are differences across SES in the patterns of parent–child talk about letters and pictures. Our analyses relied on classifications of SES made by the original researchers, and the specific standards that were used differed somewhat across corpora. So, while a number of the individual studies provide detailed information about family income and related characteristics, we used a more general distinction between lower and higher SES that was applicable across studies. For this reason, we consider our third goal to be more exploratory than the first two.

We carried out five analyses of patterns in parent and child speech about print and pictures. Each analysis was motivated by previous studies of children's early letter knowledge and parent–child conversations that suggest ways of speaking which are more natural to use in referencing print than in referencing pictures. Specifically, the analyses focused on the features ascribed to letters and pictures (*attributes*), whether parents and children claimed to own these symbols (*possessive pronouns*), the types of actions described (*action verbs*), the functions mentioned (*sound and sequence verbs*), and the status of the symbols to which parents and children referred (*physical presence*). The distinctions themselves are straightforward; our analyses ask whether they are prevalent enough that young children could receive information about the two systems from these patterns in talk. Across the five analyses, we pursued our three research goals: to identify patterns in parent speech about letters as compared to pictures and how these patterns change across the age range of 1;0–5;0, to identify patterns in children's speech about these two symbol systems across this age range, and to identify differences in both parent and child speech as a function of SES.

General method

Utterances for analysis

All utterances included in the analyses were acquired from CHILDES (MacWhinney, 2000). To be included in the study, the transcript had to involve U.S. English-speaking mothers or fathers and their normally developing children between 1;0 and 5;0. The conversations also had to be transcribed according to the CHILDES guidelines such that letter utterances could be identified by a simple search function (done via an @l tag after each such utterance). All transcripts meeting these criteria as of November 2009 were included (32 corpora and 533 children).[1] We identified a subset of the eligible transcripts that contained utterances of interest: individual letter names, the word *letter*, and the word *picture*. Because CHILDES is based on audio transcripts, we could not include utterances that did not mention letters or

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[1] Corpora that were included were: Bates, Bernstein, Bliss, Bloom70, Bloom73, Bohannon, Brown, Clark, Cornell, Demetras1, Demetras2, Feldman, Gleason, Haggerty, Hall, Higginson, HSLLD, Kuczaj, MacWhinney, Morisset, Nelson, New England, Post, Providence, Sachs, Snow, Suppes, Tardiff, Valian, VanHouten, VanKleeck, and Warren. The corpora are available for download on the CHILDES website at http://childes.psy.cmu.edu/ (MacWhinney, 2000).

pictures explicitly, as in *look at this round one*. Our searches yielded utterances such as *paper begins with a p* and *I am making a picture*. Utterances from researchers, children other than the target child, or visitors were not analyzed. Instances of letter and/or picture utterances were found in 31 of the 32 corpora from a total of 339 children and their parents. There were 20,616 utterances in all, 16,869 for letters and 3,747 for picture. As individual corpora differed in how they identified the date of transcription (e.g., by date of recording or date of publication), this variable was not included in formal analyses. Utterances of *letter* and *picture* were, however, similar in the range of transcription dates represented in CHILDES. There were 8,551 utterances of *letter* and letter names from transcripts collected prior to 1990 and 8,318 utterances from transcripts collected between 1990 and the present. Similarly, there were 1,605 utterances of *picture* prior to 1990 and 2,142 from 1990 to the present.

Because few transcripts were available for lower SES families prior to age 3;0, the analyses that we reported with SES as a variable only included utterances collected between child age 3;0–5;0. This subset included 7,045 utterances from 14 corpora and 137 children.

Coding

Each utterance of *letter* and *picture* was coded for a set of features that were applicable across corpora. An experienced researcher served as the primary coder. A second coder used the same set of coding instructions to analyze approximately 5% of the utterances (850 for *letter*, 200 for *picture*), randomly selected from the full set. Overall, the two coders agreed 97% of the time, and inter-rater agreement was at least 90% for each feature. We calculated the Cohen's kappa coefficient for each coding. All kappa scores except one were above .67, and all were significant at $p < .001$. The one low kappa score was .26 on the coding for sound verbs in Analysis 4. The low kappa score resulted from the rarity of sound verbs; Cohen's kappa scores depend upon the proportion of scores in each coding category. The inter-rater agreement for sound verbs was 97%.

Statistical analysis

Main analysis

The analyses were carried out at the utterance level, using multilevel models. We used the lme4 software package (Bates, Maechler, & Bolker, 2011). Multilevel models provide more flexibility and power than traditional statistical analyses (Jaeger, 2008). By treating corpus and child as random factors, we were able to statistically control for differences among transcripts in these respects. We asked whether the occurrence of each binary feature of interest was predicted by the age of the child (in months), the nature of the referent (letter or picture), and the speaker (child or parent). In addition to the main effect of each variable, the models included all possible interactions between the factors. Age, the only non-binary fixed effect, was centered in each analysis.

Supplemental analysis

For each feature, a supplemental model was created to analyze the utterances of the subset of children for whom SES information was available. We used the same basic multilevel model as in the main analysis, again controlling for differences across transcripts from different corpora and parent–child pairs. We included all of the main effects and interactions that were significant in the main analysis, plus the main effect of SES (lower or higher) and the interaction of SES with each previously significant effect.

Analysis 1: attributes

The way in which an object is described can call attention to its important features. For letters, shape is particularly important. To identify a letter, as US children begin to do as early as 2;6 (Worden & Boettcher, 1990), children need to understand that a letter's shape, and not its color or other characteristics, is relevant for making it the particular letter that it is: A *B* is still a *B* whether it is blue, pink, or yellow. Of course, this is not something that children know automatically. If parents use different attributes with *letter* and with *picture*, saying for example, *round O* or *curved letter* versus *pretty picture*, this could indicate a difference in the features that are most relevant for identifying the two types of symbols. In this first analysis, we asked whether there are differences in the attributes used in utterances of *letter* and *picture* and whether the features emphasized in these utterances change across the preschool years.

Method

Coding

We first coded each utterance of *letter* (the word *letter* or an individual letter name) and *picture* for whether it contained an attribute. For example, *that's a nice picture* has an attribute (*nice*) associated with *picture*, whereas *D-O-G spells dog* does not *have* an attribute. When an attribute was included, we classified it as descriptive or evaluative. A descriptive attribute detailed a basic, objective property. The descriptive attributes we found were of four general types: color, shape, size, and material. The utterances *Here's the pink Q* (color) and *That's a small picture* (size), for instance, were marked as descriptive. Evaluative attributes involved a subjective opinion, as in *This would be a good letter* or *Are you drawing a pretty picture*. Amongst descriptive attributes we distinguished shape attributes, the ones most relevant for identifying letters, from those that are less relevant, namely, color, size, and material.

Results

Table 1 shows the proportion of child and parent utterances of *letter* and *picture* containing attributes as a function of child age. More attributes were used with

Table 1 Proportion of utterances of letter and picture containing attributes (descriptive + evaluative), by child age and referent (raw numbers in parentheses)

Child age	Child		Parent	
	Letter	Picture	Letter	Picture
1;0–2;0	.02 (26/1,223)	.03 (3/98)	.04 (120/2,668)	.09 (93/1,031)
2;0–3;0	.01 (39/2,978)	.05 (26/492)	.05 (163/3,252)	.09 (100/1,111)
3;0–4;0	.01 (28/2,410)	.04 (7/196)	.02 (19/1,041)	.10 (41/414)
4;0–5;0	.02 (39/2,472)	.05 (9/181)	.02 (23/1,005)	.14 (31/224)
Overall	.01 (132/8,903)	.05 (45/967)	.04 (325/7,966)	.10 (265/2,780)

picture than with *letter*, and parents used more attributes than children. The tendency for parents to use more attributes with *picture* than with *letter* was most pronounced for children of 4;0 and older. Children used few attributes generally, and they used attributes even less often with *letter* than with *picture*. Supporting these interpretations, a multilevel model showed main effects of referent ($p = .012$) and speaker ($p = .011$), as well as an interaction between speaker and referent ($p = .002$). Additionally, there were interactions with age, including an interaction between age and speaker ($p < .001$) and an interaction among age, speaker, and referent ($p < .001$).

The supplemental model that included SES found a four-way interaction involving age, speaker, referent, and SES ($p = .017$). This interaction reflected the fact that the previously mentioned tendency for parents to use more attributes than children, particularly for *picture* at the later ages, was especially pronounced for higher SES parents. After age 4;0, higher SES parent utterances of *picture* contained attributes 19% of the time, whereas lower SES parent utterances of *picture* contained attributes only 8% of the time. Children of the two demographic groups were fairly similar in their use of attributes with *letter* and *picture* throughout the 1;0–5;0 age range. Parents of both groups were also similar in their patterns of use until around age 4;0, after which point parents from the higher SES group used a higher proportion of attributes with *picture* utterances than parents from the lower SES group.

Of primary interest are the types of attributes that parents and children used, and our next model examined ways in which attribute type varied across speaker, child age, and referent. Parents and children used far more evaluative attributes with *picture* than with *letter*, leading to a significant main effect of referent type ($p = .046$). For *picture*, 74% of the attributes were evaluative and the remaining 26% were descriptive. That is, parents and children tended to offer a subjective opinion with the word *picture*. For *letter*, only 12% of the attributes were evaluative. The majority of the attributes that were given to *letter* utterances, 88%, described the color, size, shape, or material of the letter. There were no significant effects of speaker or age. That is, differences between the properties attributed with *picture* and with *letter* were found in the speech of both parents and children, even for the youngest children in the study. No effects of SES were detected in the supplemental model.

Table 2 Proportion of shape attributes out of total descriptive attributes, by child age and referent (raw numbers in parentheses)

Child age	Letter	Picture
1;0–2;0	.09 (12/131)	.00 (1/15)
2;0–3;0	.08 (16/191)	.16 (7/43)
3;0–4;0	.43 (16/37)	.10 (1/10)
4;0–5;0	.68 (14/30)	.08 (1/12)
Overall	.18 (74/403)	.11 (10/80)

Our final analyses focused on descriptive attributes, asking whether they referred to shape, the property most relevant for distinguishing letters from one another. As Table 2 shows, shape attributes were rarely used with *picture* and the proportion of such use showed little variation across ages 1;0–5;0. For *letter* utterances, however, the proportion of shape attributes increased after age 3;0. As children grew older, both parents and children were more likely to talk about the shape of letters rather than their color, size, or material. A multilevel model showed main effects of child age ($p < .001$) and referent ($p = .032$), as well as an interaction between age and referent ($p = .037$). A Fisher's exact test showed that the use of shape attributes was not significantly associated with referent type before age 3;0. That is, for the earliest years in the age range we studied, shape attributes were as likely to be used with *picture* as with *letter*. From age 3;0–5;0, however, the association between shape attributes and referent was significant ($p < .001$), such that shape attributes were used reliably more often with *letter* than with *picture*. No effects involving SES were detected in the supplemental model.

Discussion

In everyday conversations, parents and children focused on different features of letters and pictures, as reflected in their patterns of attribute use with *letter* and with *picture*. Although parents and children did not use as many attributes with *letter* as with *picture*, the attributes that they used for *letter* were different. Parents focused on the basic, descriptive features of letters from child age 1;0, and by around age 3;0, particularly on their shapes. This way of speaking provides information that letters are identified by their objective features, and it also emphasizes the objective feature most relevant for letter identification, shape. This emphasis on letter shape was not an unchanging feature of the home literacy environment during the preschool years, but rather emerged gradually as children grew older.

Although children did not use attributes as often as their parents did, they showed similar patterns of attribute use. This finding suggests that children have a general grasp of the importance of the objective features of letters from a very early age, as well as a particular focus on letter shape by around age 3;0. Our results point to an important aspect of emergent literacy that has not been addressed in previous studies of children's letter knowledge, which have focused on children's ability to identify letters by name and recite the alphabet and have not included children younger than 2;6 (Evans, Bell, Shaw, Moretti, & Page, 2006; Worden & Boettcher, 1990). By

including younger children, we observe a gradual increase in the focus on the literacy-relevant features of letters.

Analysis 2: pronouns

Conversations about letters and pictures might differ in terms of who is said to possess the letter or picture being discussed. Previous studies suggest that children tend to be possessive of the letters in their own names, as when a boy named Matthew pointed at an *M* and declared *That's my letter!* (Welsch, Sullivan, & Justice, 2003). Although the researchers in this study claimed that young children often make such comments, we do not know how common such possessive statements are, nor do we know whether children make such statements more commonly with letters than with units of other symbol systems, such as pictures. We explored this issue by looking at all utterances about letters and pictures that contained possessive pronouns, such as *my letter*, *your picture*, and *our ABCs*, and by asking which person the pronoun referred to.

Method

Coding

We first marked all utterances of *letter* and *picture* for whether they included a pronoun. Utterances like *but that's her letter!* and *I like my picture* included a pronoun, whereas *I am writing ABC* did not. Then, for all utterances of *letter* and *picture* that involved pronouns, we asked who the pronoun referred to. We distinguished between pronouns that referred to the child and pronouns that referred to other people. For example, if the child said *that's my letter*, the utterance was coded as a child pronoun. If the child said *Is this your picture*, then that would be coded as referring to someone other than the child.

Results

As Table 3 shows, use of pronouns with letters was infrequent across the 1;0–5;0 age span for both parents and children, but there was an increase in pronoun use with pictures. This pattern was supported by the results of a multilevel analysis including factors of child age, speaker, and referent, which showed an interaction of referent and child's age ($p < .001$). No effects of SES were detected in the supplemental model.

Table 4 shows data on the proportion of pronouns that referred to the child. The majority of the pronouns used by parents and children referred to the child, and such pronouns were especially common when children themselves talked about letters. When children talked about possessing an object, using the pronoun *my* or *mine,* they were more likely to be talking about a letter than a picture, saying something like *here is my A*. The multilevel analysis showed a significant interaction between speaker and referent ($p = .043$), as well as a significant main effect of referent

Table 3 Proportion of utterances involving pronouns, by child age and referent (raw numbers in parentheses)

Child age	Letter	Picture
1;0–2;0	.01 (28/3,891)	.05 (59/1,129)
2;0–3;0	.02 (123/6,050)	.07 (120/1,603)
3;0–4;0	.02 (74/3,451)	.04 (27/610)
4;0–5;0	.02 (54/3,477)	.17 (68/405)
Overall	.02 (279/16,869)	.07 (274/3,747)

Table 4 Proportion of utterances involving pronouns that refer to the child, by speaker and referent (raw numbers in parentheses)

Referent	Child	Parent	Overall
Letter	.88 (106/120)	.79 (126/159)	.47 (132/279)
Picture	.58 (62/107)	.71 (119/167)	.66 (181/274)

($p = .029$). There were no effects of age, showing that the tendency to consider letters as belonging to children held at all age levels. The supplemental model showed a main effect of SES on the proportion of child pronouns ($p = .009$). Lower SES parents and children had a higher proportion of pronouns that referred to the child (84%) than did higher SES parents and children (64%).

Discussion

Parents and children used possessive pronouns when they talked about letters and when they talked about pictures, although they were more likely to use pronouns with pictures. Use of pronouns was especially prominent for older preschoolers and their parents. Across both letters and pictures, many of the pronouns referred to the child. Pronouns referring to the child were especially common when children talked about letters. Welsch et al. (2003) suggested that children frequently talk about the letters of their own names as belonging to them by saying such things as *my letter*. We too found that children occasionally spoke this way about the letters of their own names. However, the majority of the instances where children used *my* or *mine* with *letter*, 63%, were for the letters A, B, and C. Our results suggest that the conventional way of speaking about the alphabet as belonging to someone, as in the Alphabet Song and its locution *now I know my ABCs,* influences the way young children speak about possessing letters. Moreover, children and parents in lower SES families used more pronouns that referred to the child than did parents and children in higher SES families. Again, the pronouns referring to the child were in regard to letters, particularly in regard to the child's possession of the letters A, B, and C. Of all of the letters attributed to the child, 43% were A, B, or C for lower SES families, whereas 26% were A, B, or C for higher SES families. This suggests that the Alphabet Song is a particular point of emphasis in lower SES families in the age range that we examined.

Analysis 3: action verbs

The third analysis asked whether there were differences in the verbs that parents and children used to signify actions toward letters and pictures. We sorted utterances of *letter* and *picture* into semantic categories based upon types of actions. Robins and Treiman ([2009](#)) studied use of the verbs *write, draw*, and *spell* in parent–child conversations and found that, from a young age, parents and children tended to use these verbs with appropriate objects, saying such things as *draw a picture* and *write your name*. We went beyond that previous study by examining all of the action verbs that were used with letters and pictures, distinguishing between physical action verbs (e.g., *hit, throw*), mental action verbs (e.g., *think, know*), generic production verbs (e.g., *do, make*), and specific production verbs (e.g., *draw, write*). We asked what the patterns in verb use show about the similarities and differences between letters and pictures and whether these patterns change as the child grows older.

Method

Coding

For all of the utterances that contained verbs, we first distinguished between verbs that involved an action and those that did not. For example, *I am making letters* would count as an action because of the verb *make*, whereas *This is a picture* and *E is for* egg do not involve an action verb. Within the set of action verbs, we distinguished between verbs that described physical actions (*hit, throw, write, make*) and verbs that described mental actions (*look, recognize, understand, remember*). *I am smashing the L* includes a physical action verb, *smash*, whereas *I am thinking of a picture* includes a mental action verb, *think*. Action verbs such as *have* and *got*, which are not easily characterized as either physical or mental, were excluded from these more detailed analyses. Within the set of mental action verbs, we further distinguished between perceptual mental actions (*look, see*) and cognitive mental actions (*think, know*). Utterances that involved multiple verbs were coded once for each verb.

Additionally, we identified a restricted set of physical action verbs that picked out physical actions that involved an action directed at creating a letter or a picture, such as *making* a letter or *drawing* a picture. We termed these productive actions, and contrasted them with basic action verbs that involved treating a letter or picture like any other physical object, such as *smashing* a letter or *throwing* a picture. Among productive action verbs we made two further distinctions. First, we coded them as being either generic (*do, make, copy*) or specific (*draw, spell, write; print* would have been included as a specific action verb but it never occurred). Second, we coded the specific production verbs for whether they were used appropriately (i.e., writing verbs for letters, drawing verbs for pictures). For example, it is appropriate to say *draw a picture* and *write your letters*, but it is usually odd to say the reverse.

Table 5 Proportion of action verbs that were physical action verbs for letter and picture, by child age and speaker (raw numbers in parentheses)

Child age	Child	Parent
1;0–2;0	.88 (50/57)	.58 (398/688)
2;0–3;0	.75 (265/353)	.60 (584/966)
3;0–4;0	.72 (178/246)	.59 (198/337)
4;0–5;0	.72 (233/322)	.59 (153/259)
Overall	.78 (726/928)	.59 (1,333/2,250)

Results

An analysis of the proportion of verbs that were action verbs showed a main effect of speaker ($p = .005$), such that children used a greater proportion of action verbs than their parents did. Fifty percent of children's verb utterances were mental or physical actions, whereas 44% of parents' verb utterances were actions. The small but significant tendency for children to use more action verbs persisted throughout the 1;0–5;0 range, and no effects of SES were detected.

Parents and children differed further in the types of action verbs they used when talking about letters and pictures. As Table 5 shows, parents and children tended to favor physical action verbs over mental ones. Children used a higher proportion of physical action verbs than parents did, although children's proportion of physical action verbs declined over the 1;0–5;0 age range, while parent usage stayed relatively constant. These interpretations were supported by a main effect of speaker ($p < .001$), which was modified by an interaction with age ($p = .013$). There were no differences in the use of physical action verbs across referent: the tendency to favor physical action verbs held for both utterances of *letter* and utterances of *picture*. The supplemental model did not reveal any effect of SES.

A minority of the mental action verbs, 32%, were cognitive. This proportion did not vary significantly as a function of age, speaker, or referent, and the supplemental analysis showed no effects of SES.

Looking at physical action verbs, we found a difference between basic and productive verbs in terms of speaker. Children used a higher proportion of productive physical actions than parents did: 79% as compared to 76% for parents. Although the difference between parents and children was small, the effect of speaker was statistically significant ($p = .046$). There were no significant effects involving SES. Of the productive action verbs, 46% were generic, with no reliable variation as a function of age, speaker, or referent and no variation as a function of SES in the supplemental model.

There were only four utterances of specific production verbs with pictures that were inappropriate, all from children (e.g., *write a picture*). This meant that we were unable to run a multilevel model for appropriate production verbs that included referent.[2] However, a Fisher's exact test showed that the proportion of appropriate

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[2] Because there were so few instances of utterances like *write a picture*, there were no inappropriate utterances for picture in some age ranges. This resulted in near-perfect coefficients and a large standard error for the effect of referent. This is a familiar problem for models that use the Wald statistic, as multilevel models do (Menard, 2002).

Table 6 Proportion of appropriate productive action verbs for letter, by child age and speaker (raw numbers in parentheses)

Child age	Child	Parent
1;0–2;0	1.00 (14/14)	.79 (27/34)
2;0–3;0	.70 (33/47)	.77 (48/62)
3;0–4;0	.89 (8/9)	1.00 (14/14)
4;0–5;0	.71 (22/31)	1.00 (21/21)
Overall	.76 (77/101)	.84 (110/131)

utterances was significantly associated with referent ($p < .001$), with more inappropriate utterances with *letter* (19%) than with *picture* (less than 1%). The results for *letter* utterances are shown in Table 6. Parents and children were, for the most part, appropriate in their use of productive action verbs for *letter*, although parents were more appropriate than children. All of parents' inappropriate utterances were before age 3;0, whereas children had some inappropriate utterances throughout the 1;0–5;0 age range. Our results were supported by a multilevel model involving only letters, which showed a main effect of speaker ($p = .004$) that was moderated by an interaction with age ($p = .005$). No effects of SES were found.

Discussion

Our results show that parents and children often talk about letters and pictures as the subjects of actions, especially physical actions. This general pattern of speaking highlights similarities between these two symbol systems, emphasizing that both letters and pictures can be depicted as physical objects. Parents and children often talked about letters and pictures as objects that can be thrown, bitten, and torn. Children used a lower overall proportion of mental action verbs than parents did, probably reflecting their general tendency to engage in and talk about physical as opposed to mental actions. When talking about mental actions, both parents and children tended to use perceptual verbs like *look* and *see* rather than cognitive state verbs like *believe*, *think*, and *know*. This finding resonates with previous research showing that use and understanding of cognitive verbs is difficult for young children and emerges gradually over the preschool years (Bartsch & Wellman, 1995).

When talking about physical actions with letters and pictures, both parents and children often used generic production verbs (*do* and *make*) for both systems. This may make understanding the difference between the two symbolic forms more difficult. Robins and Treiman (2009) found that children used the verbs *do* and *make* more often than their parents did for drawing objects (pictures), but not for writing objects (words and names). The present results, with a larger sample, modify that conclusion. We found here that both parents and children used a high proportion of generic verbs, with no differences between parents and children for either pictures or letters. Talking about letters and pictures as things to be made or produced emphasizes that neither occurs naturally; both are artificial symbols that people produce. Children's talk about *making letters* and *making pictures* may reflect a belief that the skills required for producing these symbols are similar.

Despite these similarities in talk about letters and pictures, the present results support the conclusion from previous research that children recognize differences in how the verbs *write, spell*, and *draw* should be used (Robins & Treiman, 2009). Most of the productive actions that children talked about with letters were appropriate, using *write* or *spell*, not *draw* or *color*. Utterances like *draw an A* muddy the difference between the two systems and, for the most part, neither parents nor children were inclined to speak in this way. The results suggest that children make some distinctions between writing and drawing as early as 1;0 or 2;0, even though they do not yet understand many of the conventions that differentiate letter and picture production.

Analysis 4: sound and sequence verbs

The verbs that parents and children use when they talk about letters and pictures may also provide information about the functions of these symbols. As our main interest is in talk about letters, and how it compares to talk about pictures, this analysis asks about patterns in the use of verbs that could highlight the functions of letters: verbs indicating sounds and verbs indicating sequences. For example, previous case studies of parent–child interactions have indicated that parents say things such as *The letter M makes a MMM sound* (Neumann, Hood, & Neumann, 2008), using sound verbs. If parents in general talk this way, then this could highlight the function of letters to represent sounds in spoken language. Parents might also indicate the function of letters by talking about them as coming in a particular order, through use of verb phrases such as *next to* and *starts with*. Parents can, of course, talk about pictures as making sounds and coming in sequences, but if these ways of speaking are more common with letters than with pictures this could provide information about the nature of print. In this analysis, we asked whether these ways of speaking about the function of letters are widespread in conversations between parents and preschool children and whether parents and children are more likely to speak in these ways for letters than for pictures.

Method

Coding

All utterances of *letter* and *picture* that involved verbs were coded for whether they involved the letter or picture making a sound. To qualify for this category, the verbs could either involve a letter or picture as object (e.g., *singing the ABCs* or *that says D-O-G*), or subject of the sound making (e.g., *the letter m says mmm* or *what is the picture telling us*). All utterances of *letter* and *picture* that involved verbs were also coded for whether they indicated a temporal or physical sequence. For example, *g comes after e* and *what is the next picture* were counted as verbs indicating a sequence.

Results

Sound verbs were uncommon, constituting only 3% of total verb utterances. The multilevel model did not show any effects of age, speaker, or referent. Although there was a trend toward more sound verbs for letters than for pictures, the difference was not statistically significant. The supplemental model did not show any differences due to SES.

Sequence verbs, on the other hand, were significantly more common for letters (6%) than for pictures (less than 1%). The fact that there were only three utterances of *picture* that involved a temporal or physical ordering led to difficulties in creating a multilevel model for sequence verbs (see Footnote 1). A Fisher's exact test, however, showed that the use of sequence verbs was significantly associated with referent ($p < .001$). When looking only at letters, we found that parents used more sequence verbs than children, 7% as compared to 3%, and that sequence verbs were more common when children were older. This was supported by a multilevel model for *letter* utterances only, excluding referent as a variable, which showed main effects of both speaker ($p = .05$) and age ($p < .001$). No SES differences were detected.

Discussion

US parents highlight some, but not all, of the functions of letters in conversations with their preschool children. The parent in a previous case study (Neumann et al., 2008) who emphasized that letters make sounds appears to be unusual; the parents (and children) in the present and very large sample rarely spoke of letters as making sounds. Parents did highlight another function of print: that letters belong in temporal and physical order. These utterances were found even at the youngest ages, suggesting that, from an early age, children receive information that letters come in sequences but pictures usually do not. Interestingly, 75% of the order verbs used with *letter* referred to the first *letter*: They were either *begins with*, *starts with*, or *comes first*. This may help to explain why children focus on the first letter of familiar words, such as their name (Treiman, Cohen, Mulqueeny, Kessler, & Schechtman, 2007). Learning that letters come in sequences could help set the stage for learning what is special about letters, but it is just a first step. It does not tell a child why a particular sequence of letters is important.

Analysis 5: physical presence

For the final analysis, we asked whether utterances of *letter* and *picture* might differ in whether the object referred to was present while it was being discussed. Much of children's early conversation is about objects that are present and visible in their environment. However, parents sometimes speak to their young children about objects that are absent, and children improve in their ability to understand and form utterances that refer to absent objects over the preschool years (Gallerani, Saylor, & Adwar, 2009; Swingley & Fernald, 2002). We extended this line of work by asking

whether children talk about a symbolic object, like a letter, when that object is not present and visible in their environment. We asked whether reference to letters and pictures that were not present changed over time, and whether this change was different across the two symbol systems.

Method

Coding

All utterances of *letter* and *picture* were coded for whether they referred to an item that was present. Judgments of whether the letter or picture was present were based on the utterance itself, surrounding lines of text in the transcript, and any context notes in the transcription. For example, if a child said *N-O spells no! No, mommy!* while he and his mother were getting ready to leave the house, then the utterance was coded as involving letters that were absent because nothing in the context indicated that these letters were visible to the child. In contrast, the utterance *I am reading letters* was coded as present because the utterance implies that the letters are visible. In ambiguous cases, the utterance was coded as referring to an absent object.

Results

Table 7 shows the proportion of utterances that referred to present objects. Overall, there were more utterances that referred to letters and pictures that were present than to letters and pictures that were absent. Utterances were more likely to refer to a present object when the child was younger, when the parent was speaking, and when the object was a picture. As the children grew older, parents and children were more likely to talk about letters that were absent, but they did not show the same trend for talk about pictures. This trend toward talk about absent letters started earlier for children than for parents. By age 3;0 children had cut their references to present letters in half, whereas the same did not occur for parents until the child was around 4;0. These trends were supported by main effects of age ($p < .001$), speaker ($p = .001$), and referent ($p < .001$), as well as an interaction of age and referent ($p = .02$) and of age, speaker, and referent ($p = .02$).

The supplemental model showed a main effect of SES ($p < .001$) as well as an interaction of SES with age ($p < .001$). Higher SES parents and children had a higher proportion of utterances that referred to physically present objects (50% as compared to 47%), and they showed less decline across the 3;0–5;0 age range than lower SES children and parents did. After age 4;0, higher SES parents and children still referred to letters and pictures that were physically present 47% of the time, whereas the proportion of such utterances for lower SES families had declined to 39%.

Discussion

The results suggest that talk about letters and pictures differ not only in the types of words used but also in the status of the objects referred to. Previous studies have

Table 7 Proportion of utterances of letter and picture that referred to a physically present object, by child age and speaker (raw numbers in parentheses)

Child age	Child		Parent	
	Letter	Picture	Letter	Picture
1;0–2;0	.69 (840/1,223)	.83 (81/98)	.71 (1,897/2,668)	.93 (962/1,031)
2;0–3;0	.57 (1,586/2,798)	.89 (439/492)	.76 (2,484/3,252)	.92 (1,022/1,111)
3;0–4;0	.36 (866/2,410)	.88 (172/196)	.69 (722/1,041)	.90 (371/414)
4;0–5;0	.39 (959/2,472)	.73 (133/181)	.44 (442/1,005)	.68 (152/224)
Overall	.48 (4,251/8,903)	.82 (825/967)	.70 (5,545/7,966)	.90 (2,507/2,780)

shown that children develop the ability to understand and produce utterances that refer to objects that are absent by around age 3;0 (Gallerani et al., 2009; Swingley & Fernald, 2002), and our results show that children can do the same with symbolic objects. Although preschool children can talk about symbolic objects when they are not present, they did not do this equally for all symbols. When talking about pictures, parents and children were most often talking about a picture that could be seen while the conversation took place. The same was true for conversations about letters when children were below age 3;0. As children grew older, they and their parents were more likely to talk about letters that were absent from the conversational environment.

What do parents and children talk about when they refer to absent letters? Many of these utterances involved reciting the alphabet sequence, spelling words, or talking about letters associated with words, especially the child's name (e.g., *My name has a B in it!*). The tendency to talk about absent letters was more prominent for lower SES families than higher SES families, and the difference between SES groups appeared to be due in part to the alphabetic sequence. When referring to absent letters, lower SES families were reciting an alphabetic sequence 43% of the time, as compared to 36% for higher SES families. These results resonate with the finding of Analysis 2 that lower SES families put more emphasis on the alphabet than do higher SES families.

General discussion

Learning about print during the preschool years helps prepare young children for later reading and writing (Snow et al., 1998; Whitehurst & Lonigan, 1998). Researchers have identified several important components of children's emergent literacy, including phonological awareness (Ehri et al., 2001; Hulme et al., 2005; Stanovich, 2000) and print awareness (Badian, 2000; Storch & Whitehurst, 2002; National Early Literacy Panel, 2004). The current study was designed to offer a detailed description of one activity that may help young children to acquire print awareness: parent–child conversations about letters during the preschool years. As a descriptive study of the home literacy environment, in particular about the information that children receive about the differences between letters and pictures,

the present study does not contribute to discussions of causal connections between early print awareness and later literacy. Instead, it steps back to investigate a potential source of print awareness—everyday conversations with parents—in much greater detail and with a much larger sample than has been done before. By identifying patterns in everyday talk about letters and pictures, we offer a characterization of literacy-relevant activities in the home environment of preschool children (Evans, Shaw, & Bell, 2000; Levy et al., 2006; Phillips & Lonigan, 2009), and set the stage for future work on how the home environment contributes to later progress.

Our study had three specific goals. The first goal was to determine whether, in everyday conversation with their preschool children, parents talk about letters and pictures in ways that provide information about the differences between these two symbol systems. We found that, even with children as young as 1;0, parents talk about the basic features of letters' appearance but not much about letters' aesthetic properties, such as whether they are pretty or ugly. Instead, parents' talk about the features of letters tends to focus on their descriptive or objective features. As children grow older, especially after the age of 3;0, parents focus on one such feature, letter shape. Also, parents talk to their young children about letters coming in sequences, focusing especially on the first letter of the sequence, but they rarely speak this way for pictures. These patterns in parent speech highlight what is important for identifying letters individually (in terms of their shape) and in groups (by the order in which they are presented).

Not all of the patterns in parent speech are equally informative regarding the difference between letters and pictures. For example, parents use the verbs *make* and *do* equally often for letters and pictures. Emphasizing that letters and pictures do not occur naturally, but must be created, provides children with information about the conventional nature of these symbols. But using the same verbs for both systems may make them seem more similar than they are. Further, some potentially useful topics were infrequent in parent speech about letters. Notably, the parents in this study rarely talked to their young children about letters making sounds. This may help to explain why U.S. children's knowledge is more advanced for letter names than for letter sounds (Worden & Boettcher, 1990).

The second goal of our study was to examine patterns in children's speech as a clue to what they understand about the similarities and differences between letters and pictures. At the age of 1;0–2;0, we found, children show an implicit understanding that aesthetics are more important for pictures than letters. At 3;0–5;0, as they are starting to reliably identify some letters (Evans et al., 2006; Worden & Boettcher, 1990), children recognize that shape is more important for identifying letters than are color, size, or material. Children also talk about *writing letters* and *drawing pictures*, but rarely the reverse. This suggests that they are aware that there are some differences in the production of letters and pictures (Robins & Treiman, 2009). Further, by around 3;0, children speak about letters even when the letter being referred to is not visible, but they are less likely to do the same with pictures. These results represent a significant advance over previous studies of children's early letter knowledge in that we have focused not on which specific letters children recognize but on what children know about letters more

generally. We show that children make some distinctions between letters and pictures in their earliest talk about them, before they can write or recognize specific letters.

The third goal of our study was to examine possible SES differences in parents' and children's speech about letters and pictures, following from previous studies that have documented differences in aspects of the home literacy environment as a function of SES (Aram & Levin, 2004; Hart & Risley, 1995; Raikes et al., 2006). As we had to rely on information that was provided by previous researchers, and as we were able to address this issue only in families with children of 3;0 and older, the results of this analysis are more exploratory. Even treating SES as a dichotomy, we found some influences of SES on patterns of talk about letters and pictures. Our results suggest that lower SES families in the U.S. place a greater emphasis on the alphabetic sequence than higher SES families. Specifically, lower class families were more likely to talk about the letters A, B, and C as belonging to children (e.g., asking *do you know your ABCs?*) and to recite letters in alphabetic sequence. While knowing the letters of the alphabet is important, the conventional order of the Latin alphabet is arbitrary. Learning to sing or recite the alphabet in order does not tell one what the letters are for, and the conventional alphabetic order is not as important for reading and writing as the order of letters in particular words. All parents want their children to succeed, but lower SES parents may direct their children toward less relevant aspects of emergent literacy by focusing on alphabetic order. Our findings are consistent with those of previous studies in which lower SES mothers report believing that helping children with basic letter-related skills, such as memorizing the alphabet, is more important than fostering enjoyment in learning to read (DeBaryshe, 1995; Fitzgerald et al., 1991).

A strength of our study is that, by taking advantage of the information available in CHILDES, we could examine a much larger sample of conversations, everyday activities, and families than we could have otherwise. Our sample was larger than that of most previous studies of the home literacy environment, and our analyses more detailed. A limitation of our approach is that, because recording and transcribing conversations for inclusion in CHILDES takes time, there is the potential for a gap between the patterns observed and current home literacy practices. While it is possible that the nature of parent–child conversations has changed to some extent over time, we believe that the present study offers important insight into how these conversations can be studied and into the nature of those conversations. Additionally, it provides an important and previously unavailable baseline for future comparisons.

Although much research remains to be done, our results suggest that everyday interactions are an important component of the home literacy environment and that they differ, in some respects, as a function of child age and family background. As our study shows, not all talk about print is equal: References to print differ in the information they provide about how letters work and about how letters differ from other symbol systems in the environment. In future studies, it will be important to learn more about which ways of talking about print are most helpful to young children as they learn to read and write, as well as how these ways of talking can be encouraged among parents, teachers, and other early childhood professionals (Aram

& Biron, 2004; Aram & Levin, 2004; McBride-Chang et al., 2011; Zucker, Justice, & Piasta, 2009).

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