

Talking about writing: What we can learn from conversations between parents and their young children

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ABSTRACT

In six analyses using the Child Language Data Exchange System known as CHILDES, we explored whether and how parents and their 1.5- to 5-year-old children talk about writing. Parent speech might include information about the similarity between print and speech and about the difference between writing and drawing. Parents could convey similarity between print and speech by using the words *say*, *name*, and *word* to refer to both spoken and written language. Parents could differentiate writing and drawing by making syntactic and semantic distinctions in their discussion of the two symbol systems. Our results indicate that parent speech includes these types of information. However, young children themselves sometimes confuse writing and drawing in their speech.

Written language is glottographic: it symbolizes the sounds of speech (Sampson, 1985). For example, the written word *dog* symbolizes a dog through its relation to a spoken word in English. To learn how to read and write, children need to understand that the printed word *dog* represents a spoken word, which is itself a symbol.

Young children do not always appreciate writing's glottographic nature, often treating writing as if it were much like drawing. Between the ages of 2 and 4, children's attempts at writing and drawing look nearly identical and are difficult for even the children's own parents to distinguish (Levin & Bus, 2003). There are also mechanical similarities in how young children create the basic elements of each system (Adi-Japha & Freeman, 2001). Although children improve in their ability to produce distinct markings for writing and drawing throughout the preschool years, their writings continue to contain pictorial elements. For example, 3- to 5-year-olds sometimes assume that printed words should look like what they represent, using surface features of a word such as its size, color, or location on the page to determine which word it is (Bialystok, 1991; Levin & Bus, 2003; Levin & Tolchinsky Landsmann, 1989; Lundberg & Tornéus, 1978). Young

children's understanding of drawing is better developed, with 3-year-olds showing a grasp of the intentional nature of pictures (Bloom & Markson, 1998; Gelman & Ebeling, 1998). Between the ages of 3 and 4, children see the meanings of pictorial representations as relatively fixed, but they have difficulty understanding that printed words have stable meanings (Apperly, Williams, & Williams, 2004; Bialystok, 2000; Bialystok, Shenfield, & Codd, 2000). The developmental process by which children come to understand the glottographic nature of written language is long and complex (Bialystok, 1992; Olson, 2002).

What experiences help children to understand the nature of written language? Formal instruction in school is one such experience. In the United States, explicit instruction about the nature of print often begins in kindergarten (around age 5), when children are taught the sounds of letters. Teaching children that *m* makes the sound /m/ or that *s* makes the sound /s/ can help them to understand that writing represents speech. Much research has focused on formal instruction, asking which types of explicit instruction best help children learn about the nature of writing (e.g., Snow & Juel, 2005).

Although instruction in school helps children understand the nature of writing, children learn about some aspects of writing before formal instruction begins. These facets of development are often referred to as emergent literacy (e.g., Whitehurst & Lonigan, 1998). Many features of written language are visible in the child's environment. For example, writing is generally presented on lines, adjacent symbols are not usually identical, and the marks do not resemble the objects they depict. Children learn about some of these surface properties of writing from exposure to print around them (Ganopole, 1987; Lavine, 1977). Although this exposure helps children become familiar with the general features of written language, it does not always result in knowledge about specific units of print. For example, children's identification of the label on a soft drink bottle may remain unchanged even when essential features of the word, such as letters or letter order, have been changed (Masonheimer, Drum, & Ehri, 1984).

Children are exposed to print and letters in various situations. For example, they are exposed to labels for commercial products, as mentioned above, and to writing in books. A number of studies have focused on storybook reading as a contributor to emergent literacy, assessing the home literacy environment by examining the frequency of book reading. However, preschool children spend more time looking at the pictures than at the print in books (Evans & Saint-Aubin, 2005; Justice, Skibbe, Canning, & Lankford, 2005). This means that storybook reading may play a relatively small role in fostering print knowledge. Activities that focus on writing and letters themselves may be stronger predictors of children's emergent literacy skills. For example, North American children are encouraged to sing the alphabet song and to identify letter shapes. Time spent engaging in such letter-related activities predicts children's later reading and spelling skills (Evans, Shaw, & Bell, 2000). Children's literacy-related interactions with parents are not confined to routine activities such as singing the alphabet song and reading stories before bedtime (Aram & Levin, 2002). Throughout the day, parents may intervene as their children attempt to scribble words while playing or to identify printed words. Such activities may also foster children's literacy skills (Aram, 2006; Aram & Biron, 2004; Aram & Levin, 2004; Sénéchal, 2006; Sénéchal & LeFevre, 2002).

Previous findings provide a host of evidence about children's emergent literacy in the preschool years and present a variety of ways in which the home literacy environment may be measured. However, the studies may have missed some of the everyday interactions that provide children with information about writing. In the present study, we explore the hypothesis that parents talk to even young children about writing and that the ways in which they do so provide evidence about how print works. This may happen even when writing is not the focus of attention. For example, in one conversation that we examined, a father tells his 2-year-old son that he'll be ready to play *as soon as I'm done writing my name* (Kucjaz, 1976). The father is not teaching his son how this or other names are written, nor is he intervening in his son's attempt to write. However, the father is conveying the idea that writing is a way of representing names. If conversations that touch on writing are common, they could provide children with information about the nature of print. Investigating the ways in which parents and children talk about language may also allow us to detect knowledge about written language that young children have but that is missed in studies that require them to perform more complex tasks.

Research in other domains has shown that parent speech is a rich source of information that children can use to understand aspects of the world around them. For example, parents' generic noun phrases such as *birds lay eggs* and *dogs have fur* provide information to young children about the nature of animal categories (Gelman, 2003). Although these are not explicit statements about the essential features shared by members of a species, they imply that the property in question refers to the category as a whole rather than to just some individuals. Parent speech also provides children with information regarding number words (Bloom & Wynn, 1997), category membership (Waxman & Markow, 1995), parts of speech (Brown, 1957), proper names (Hall, Lee, & Belanger, 2001), and the distinction between count and mass nouns (Hall et al., 2001; Soja, 1992).

To test the idea that parents speak to their young children about writing in ways that could provide information about the nature of print, we examined parent-child conversations in the Child Language Data Exchange System (CHILDES) database (MacWhinney, 2000) that involved children between the ages of 1 year, 6 months (1;6) and 5;0. This database contains transcripts of parent-child conversations that were collected by various researchers in service of diverse research questions. Using this database is advantageous for addressing our research question, for it provides conversations across a range of everyday situations. Our first question is whether parents and their young children talk about writing. If they do, then we can study the structure of this speech and what information it reveals about the nature of written language.

We report six specific analyses. The first two analyses explored the idea that adults might talk about writing in some of the same ways that they talk about spoken language. For example, an adult may tell a child that the printed word *dog* says *dog*, just as they tell a child that a person says *dog*. Such speech patterns could convey to children the similarity between speech and writing. To examine these issues, Analyses 1 and 2 explored parents' use of the words *say*, *name*, and *word* in reference to spoken and written language. The other analyses addressed the question of whether parents speak about writing differently than drawing. Speaking about the two systems in distinct ways could reinforce the idea that

writing and drawing are different symbol systems. Analyses 3 to 6 therefore examined syntactic and semantic ways in which parent speech about writing may differ from parent speech about drawing.

In each of the six analyses, we also examined children's speech in an attempt to gain insights into their developing knowledge of writing. Children's understanding of the nature of writing has previously been assessed by examining their production and identification of various symbols. But young children have limited motor skills and do not always cooperate with or understand experimental tasks. By looking at spontaneous interactions between parents and their young children, we may gain new insights into children's understanding of writing. For example, we can ask whether young children confuse writing and drawing in their talk about the two systems in the same way that they often produce very similar products when asked to write and when asked to draw (Levin & Bus, 2003). We do not have sufficient data on each parent-child pair to determine whether differences among parents in their speech correlate with or predict children's speech. In addition, because CHILDES does not provide information on the children's reading and writing skills, we cannot examine whether parent speech predicts children's later literacy skills. A better understanding of how parents and children speak about writing, however, should set the stage for future studies of these issues.

ANALYSIS 1

Parents might indicate that writing is a code for speech by using the same words to designate written and spoken language. The word *say* is an example of this. Parents may use *say* to refer to something that is spoken, as in *Don't say that*, or something that is written, as in *What does that sign say?* Such speech could provide information about the similarity between print and speech. We examined use of *say* for written and oral language by parents of children aged 1;6 to 5;0, as well as children's usage in this age range. Specifically, we asked whether parents use *say* for both types of language and whether children do the same.

Method

Participants. This and the following analyses were conducted using transcripts of conversations from the CHILDES database (MacWhinney, 2000). English-language transcripts from both the US and UK corpora that were available on the CHILDES website in August 2005 were considered for analysis.¹ To be included in the analysis, the target child had to be recorded during the period of 1;6 to 5;0 and the child had to be considered to be developing normally. A total of 607 children met the requirements and were included in the analyses. The majority of the transcripts (approximately two-thirds) involved children from middle- to upper middle-class families, although one-fifth involved working-class families. The length and number of conversations available for any one child varied according to the purposes and methods of the original researchers. A number of the children were recorded on one occasion and others were recorded more than once. Transcripts were grouped by the child's age. In Analysis 1 we used seven groups representing 6-month periods across the 1;6-5;0 age span (1;6-2;0, 2;0-2;6, etc.).

Procedure. Searches for this and the following analyses were conducted using the CHILDES data analysis (CLAN) programs (MacWhinney, 2000). All utterances of *say* and its inflected forms (*says, saying, said*) by the parents and child were included. Mother and father utterances were collapsed as parent utterances. Utterances from researchers, other children, or unspecified speakers were excluded from this and the following analyses, as were exact repetitions of previous utterances.

Each utterance of *say*, by the parent or child, was analyzed to determine whether it referenced spoken or written language. For example, *Daddy says I can have some* was coded as *spoken* because the word *say* here refers to the father's spoken language. *What does that letter say?* was coded as *written* because *say* here refers to writing. In this and the following analyses, the searches included nine lines of text both before and after the relevant utterance to aid in interpretation of its meaning. If the use of *say* was unclear from this context, the item was coded as *ambiguous*. For example, Wendy at age 2;0 uttered *I be say*, which was never clarified in context, and so the utterance was coded as *ambiguous* (Warren-Leubecker & Bohannon, 1984).

For child utterances of *say* in reference to spoken and written language, we further asked whether the child or the parent initiated the utterance. For example, if a mother asked *What does the book say?* and her child replied *It says penguins*, then the utterance was coded as *cued* because the child's use of *say* was arguably prompted by the mother's initial usage. If the child him- or herself, without prompting, said something like *The card says my name*, then the utterance was coded as *spontaneous*. The parent utterance did not have to be a direct question to be considered a possible cue. For example, *Daddy says you cannot go outside* followed by *Why is Daddy saying that?* was considered *cued*. We coded a child's utterance as *cued* if the prompt occurred within the three prior lines of text. Sometimes a parent and child used *say* back and forth several times in one conversation. In these instances, even when the adult utterance was in the right position to be considered a prompt for the child's speech, it was only recorded as such if the child did not have a previous utterance in the conversation that was coded as *spontaneous*.

In this and all subsequent analyses, a second researcher performed duplicate searches of either five or six different corpora included in the analyses to test how reliably the appropriate utterances were being found. The two searches always found the same utterances. The second researcher also coded the utterances found during this search, which ranged across analyses from 8% to 31% of the total utterances. For Analysis 1, the two coders agreed 96% of the time on the coding of *spoken, written, or ambiguous*. Agreement on judgments of *cued versus spontaneous* utterances was 95%. The final analyses were based on the coding of the first and more experienced researcher.

Results and discussion

Table 1 shows the data on utterances of *say* referring to written and spoken language by parents and children. Parents occasionally used *say* for written language from the earliest age analyzed. For example, one mother was reading a book to her daughter when the daughter was 1;7 and explained *It says drink your milk!* (Bernstein-Ratner, 1984). Children in the 1;6–2;0 age group never used *say* in

Table 1. *Use of say for spoken and written language by parents and children in analysis 1*

Child Age (years;months)	Say Utterances		
	No. for Writ. Lang.	No. for Spok. Lang.	Propor. for Writ. Lang.
Parent			
1;6-2;0	46	1840	0.03
2;0-2;6	201	3063	0.06
2;6-3;0	270	2692	0.09
3;0-3;6	165	1002	0.14
3;6-4;0	51	933	0.05
4;0-4;6	33	938	0.03
4;6-5;0	53	1199	0.04
Total	819	11667	0.07
Child			
1;6-2;0	0 (—)	45 (0.29)	0.00
2;0-2;6	19 (0.73)	474 (0.13)	0.04
2;6-3;0	73 (0.38)	811 (0.13)	0.08
3;0-3;6	59 (0.14)	640 (0.14)	0.08
3;6-4;0	24 (0.25)	306 (0.12)	0.07
4;0-4;6	37 (0.00)	311 (0.09)	0.10
4;6-5;0	65 (0.08)	1578 (0.10)	0.04
Total	277 (0.22)	4165 (0.12)	0.06

Note: The proportions in parentheses for child data are proportions of cued utterances.

reference to written language. The right column of Table 1 shows the proportion of utterances of *say* referring to written language out of the total utterances in reference to both written and spoken language. Although this proportion was slightly higher for parents than children, the difference was not significant by a chi-square test pooling across age groups, $\chi^2(1, N = 1931) = 1.13, p > .30$.

Across the seven age groups, as Table 1 shows, the children always had more spontaneous than cued utterances of *say* for spoken language. However, there were some changes in the proportion of spontaneous use of *say* for written language across the age groups. There were no utterances of *say* for written language in the 1;6-2;0 age range, as mentioned above. In the 2;0-2;6 age range, children had more cued than spontaneous utterances of *say* for written language. The proportion of cued utterances was relatively high in the 2;6-3;0 age range as well. Chi-square tests revealed that the proportion of cued utterances of *say* was significantly higher for written language than for oral language in these two age ranges, $\chi^2(1, N = 493) = 52.38, p < .001$, and $\chi^2(1, N = 884) = 35.44, p < .001$, respectively. In the remaining age ranges, there were more spontaneous than cued utterances and the differences between written and oral language in the proportion of cued

Table 2. *Age of child (years;months) at first use of say, word, and name for written language by parent and child in Analyses 1 and 2*

Child (Corpus)	Age Range of Avail. Files	Say		Word		Name	
		Parent	Child	Parent	Child	Parent	Child
Abe (Kuczaj)	2;4–5;0	2;7	2;8	3;1	3;10	2;6	2;7
Adam (Brown)	2;3–5;0	2;7	2;11	2;11	2;11	2;3	2;3
Naomi (Sachs)	1;6–4;9	2;5	3;3	3;5	5;0	3;3	5;0
Nathaniel (Snow)	2;5–3;9	2;5	2;7	2;6	3;10	2;6	3;10
Nina (Suppes)	1;11–3;3	2;0	2;10	2;3	2;11	2;10	2;10
Peter (Bloom)	1;9–3;1	2;0	3;1	3;2	3;2	2;1	1;10
Sarah (Brown)	2;3–5;0	2;11	3;5	4;3	4;9	2;4	2;8
Average		2;5	3;0	3;1	3;9	2;6	3;0

utterances were not significant by chi square tests. Thus, children between 2;0 and 3;0 sometimes responded with an utterance of *say* for written language, as when asked *Can you read what this says?* However, they did not often initiate such utterances on their own until after age 3;0.

For seven parent-child pairs in CHILDES, enough files were available to look at the use of *say* longitudinally. Six of these children were from middle- to upper middle-class families and one was working class. We asked whether the parents used *say* for written language before the children did. The first column of data in Table 2 shows these children's ages at the first use of *say* for written language by parents and children. This was calculated as the child's age in months when the utterance was recorded. For children, the relevant utterance had to be spontaneous. The parents' first use of *say* for written language occurred on average when the children were 2;5, and a Wilcoxon signed ranks test revealed that the parents used *say* earlier than the children did, $T(6) = 28, p < .01$.

The results of Analysis 1 show that parents talk about written words with children even when the children are quite young, interpreting writing for the children in terms of what print *says*. Parent use of *say* for written language as well as spoken language may provide a clue about the glottographic nature of writing. By 3;0–3;6, children sometimes use *say* on their own to talk about writing, even though they probably could read or write few if any words at this age. This result is striking given that previous research has shown that young children have difficulty grasping the meaning of communicative verbs such as *say* (Papafragou, Cassidy, & Gleitman, 2007). Although parent use of *say* for written language provides information as to the glottographic nature of writing, parents used *say* much less often for written language than for spoken language throughout the age range studied. Given this, Analysis 2 investigated other words that parents may use more frequently in discussions of writing.

ANALYSIS 2

Parents sometimes talk to their children about words. *Word* can refer to any independent unit of language. If parents focus on words as written objects, this

could imply that all sorts of things can be conveyed in writing, including actions, people, places, ideas, and even grammatical words. If parents instead focus on names, this might convey the idea that writing is a symbol system used mainly for labeling people. In Analysis 2 we therefore compared use of *word* and *name* for written language. Although *word* is more general than *name*, children's own names are very important to them (Justice, Pence, Bowles, & Wiggins, 2006; Mandel, Jusczyk, & Pisoni, 1995; Treiman, Cohen, Mulqueeny, Kessler, & Schechtman, 2007). Many children become proficient at writing their own names before other words (Levin, Both-De Vries, Aram, & Bus, 2005). Therefore, parents and children might devote much of their discussion of writing to names, implying that written language is primarily used for symbolizing names.

Method

Participants. Analysis 2 was conducted using the same age groups as Analysis 1.

Procedure. All utterances of *word* and *name* by the target child and his or her parents were initially examined. The three coding levels used in Analysis 1 (*spoken*, *written*, and *ambiguous*) were applied to this analysis; utterances of *word* and *name* coded as written were selected for further analysis. For example, *Do you know how to write your name?* was coded as a written utterance because it refers to the printed form of the child's name. For children's utterances of *word* and *name*, we distinguished cued and spontaneous utterances as in Analysis 1. A second researcher searched for and coded utterances of *word* and *name* as described earlier. The two coders agreed on 95% of their judgments, including the spoken, written, or ambiguous judgment and the cued or spontaneous judgment.

Results and discussion

Table 3 shows data on use of *name* and *word* for written language by parents and children. Both parents and children used *name* for written language more often than *word*. However, differences in parents' and children's proportional use of *name* occurred after age 3;0. Prior to this age, the name/word ratios for parents and children were statistically indistinguishable, $\chi^2(1, N = 483) = 3.17, p > .10$. After 3;0, children favored *name* over *word* for written language more strongly than their parents did, $\chi^2(1, N = 543) = 36.45, p < .001$. This result suggests that, starting around their third birthday, children become especially preoccupied with the written representation of names. They focus on this type of writing even when their parents are talking more about the written representation of words in general.

The proportion of children's cued uses of *word* and *name* for written language is also shown in Table 3. The ratio of cued to spontaneous utterances was not significantly different for *word* and *name* across the age ranges, $\chi^2(1, N = 439) = .50, p > .10$. Collapsing over *word* and *name* utterances, the ratio of cued to spontaneous utterances was higher for children of 1;6–2;0 than for older children, $\chi^2(1, N = 439) = 43.84, p < .001$. That is, many of young children's uses of *name* and *word* to refer to written language are prompted by parents.

Table 3. *Number of uses of name and word for written language by parents and children in Analysis 2*

Child Age (years;months)	Parent		Child	
	Name	Word	Name	Word
1;6-2;0	15	12	17 (0.50)	6 (0.65)
2;0-2;6	98	32	43 (0.12)	8 (0.12)
2;6-3;0	126	28	84 (0.07)	14 (0.21)
3;0-3;6	36	39	31 (0.30)	10 (0.16)
3;6-4;0	30	18	24 (0.00)	4 (0.21)
4;0-4;6	13	37	49 (0.14)	14 (0.00)
4;6-5;0	58	45	100 (0.14)	35 (0.35)
Total	376	211	348 (0.16)	91 (0.14)

Note: The proportions in parentheses for child data are proportions of cued utterances.

Data from the same seven children identified for longitudinal study in Analysis 1 were used to look at the use of *word* and *name* longitudinally. We asked whether parents used *name* and *word* for written language before their children did, and also whether parents and children tended to use these words in a particular order. The right columns of Table 2 show the children's ages at the first use of *word* and *name* for written language by parents and children. This was calculated as in Analysis 1. When the target word was never used in the available files, the first use was recorded as 1 month after the final file for that child. Pooling over *word* and *name*, a Wilcoxon signed ranks test indicated that parents used these words to refer to written language significantly earlier than their children did, $T(10) = 97$, $p < .001$. In addition, *name* was used significantly earlier than *word*, pooling over parents and children, $T(11) = 57$, $p < .05$. The finding that *name* is used first, by both parents and children, suggests that written names are salient for both.

Parents' use of *word* and *name* to refer to both spoken and written language may provide information about the relation between speech and print. Specifically, the fact that these words are used for both systems may be a clue that writing is quoted speech. However, the emphasis on names in discussions of writing may imply that writing is primarily a system for symbolizing names. Both parents and children emphasized names, and children did so especially after their third birthday. Children's attentiveness to names may attract them to print, while at the same time delaying their understanding of the deeper properties of written language.

ANALYSIS 3

In this and the following analyses, we examine whether parents differentiate between writing and drawing in their speech and whether children do the same. People may use different words in discussions of the two systems, suggesting that the systems are distinct. As mentioned earlier, research has indicated that syntactic

distinctions in adult language provide information about how semantic categories should be differentiated. For example, the distinction between count and mass nouns is marked in English by the presence or absence of the indefinite article *a* or *an*; count nouns such as *table* are often preceded by an indefinite article, whereas mass nouns like *water* generally are not. Three- and 4-year-old children appear to attend to this syntactic clue with nonwords (e.g., *This is a zav* vs. *This is zav*) and use it to decide whether a nonword refers to a discrete object or an uncountable substance (Hall et al., 2001).

A similar pattern occurs with quoted forms. Normally, quoted speech is presented without any determiner. For example, one might report *She said it is raining*, but not *She said a it is raining*. *Draw* is like most verbs in English, in that its argument is not a quoted form. Thus, determiners are permitted and, in the case of singular count nouns, required. For example, we say *Draw a kitten*, but not normally *Draw kitten*. The verbs *write* and *spell*, by contrast, require quoted forms as their arguments. One says *Write kitten* and *Spell kitten* but not usually *Write a kitten* or *Spell the kitten*. This syntactic difference, if present in speech to young children, would indicate not only that writing and drawing are different but also that references to writing lack a determiner because they are quoting speech. We asked whether parents make such a syntactic distinction between writing and drawing and whether children of various ages do so as well.

Method

Participants. Files were sorted into three year-long age groupings (2;0–3;0, 3;0–4;0, 4;0–5;0) because relatively few utterances met the criteria for inclusion. The 1;6–2;0 range was excluded because there was only one relevant utterance in this range.

Procedure. All utterances of *draw*, *write*, and *spell*, including forms such as *drawed*, *writing*, and *spells*, by the child and his or her parents were included in the analysis. For present purposes, only uses of *draw*, *write*, and *spell* with singular count nouns were considered. Utterances of *write* and *spell* were collapsed for comparison to utterances of *draw*. With these nouns, a judgment was made about the presence or absence of a determiner. Thus, four coding options were possible: *write/spell* without determiner, *write/spell* with determiner, *draw* without determiner, and *draw* with determiner. A second coder analyzed a portion of the utterances, following the procedures mentioned earlier. The percentage of agreement for assigning utterances to the four categories was 98%.

Results and discussion

Table 4 shows data on parent and child use of determiners with the target verbs. We were interested in whether parents and children used *draw*, *write*, and *spell* appropriately—that is, with no determiner for *write* and *spell* and determiner for *draw*—across the age range studied. In categorizing utterances this way, we assumed that someone who says *write a cat* means for *cat* to be written, not *a cat*. The proportion of utterances with appropriate determiner use was calculated for

Table 4. *Determiner use with draw, write, and spell by parents and children in Analysis 3*

Child Age (years;months)	Draw			Write/Spell		
	Uses With Determ.	Total Uses	Propor. Appro. Determ. Use	Uses Without Determ.	Total Uses	Propor. Appro. Determ. Use
Parent						
2;0-3;0	288	288	1.00	32	33	0.97
3;0-4;0	27	27	1.00	5	5	1.00
4;0-5;0	15	15	1.00	32	32	1.00
Total	330	330	1.00	69	70	0.99
Child						
2;0-3;0	112	189	0.59	21	77	0.27
3;0-4;0	16	19	0.84	2	2	1.00
4;0-5;0	37	41	0.90	26	33	0.79
Total	165	249	0.66	49	112	0.44

both parents and children. Parents almost always used determiners appropriately with *draw*, *write*, and *spell* across the three age ranges. Parents always used a determiner for singular, concrete objects with *draw*. For example, Adam's mother (Brown, 1973) asked him at age 2;3, *Are you drawing a kitty?* and at age 4;3 *Why don't you draw me a whale?* Parents' use of determiners with *write* and *spell* was appropriate 99% of the time. There was only one parent error for *write* when Adam's mother said, *Why don't you write a tomato for me?* when Adam was aged 2;7. There were no significant differences in parent's appropriate use of determiners with *draw* and with *write* and *spell*. Parents' clear differentiation between *write* and *draw* with children between 2 and 3 years of age is notable given that children of this age make few if any distinctions between writing and drawing in their own productions (Levin & Bus, 2003) and given that, as we show below, children of this age do not make the appropriate distinction in determiner use in their own speech.

For children, we first asked whether they used determiners at different rates for *draw* than for *write* and *spell*. Between ages 2 and 3, children used determiners for some of their *draw*, *write*, and *spell* utterances (59% for *draw*, 73% for *write* and *spell*). However, children used determiners significantly more with *write* and *spell* than with *draw*, $\chi^2(1, N = 266) = 4.27, p < .05$, the opposite of the conventional pattern. At this young age, children seem to know that determiners are sometimes needed in these contexts but are unclear as to when. The lack of appropriate differentiation between *write/spell* and *draw* shows how children confuse the two systems at this age. Between 3 and 4 years of age there were few analyzable utterances. Children aged 4;0 to 5;0 used determiners 90% of the time for *draw*, compared to only 21% for *write* and *spell*. The difference was significant,

$\chi^2(1, N = 74) = 36.13, p < .001$, and its direction accords with the conventional pattern. Thus, children between four and five do not use a determiner very often with *write* and *spell*, following a convention about determiner use with these verbs and suggesting some ability to differentiate between writing and drawing.

We further asked whether children's ability to use determiners appropriately differed for *draw* and for *write* and *spell*. To address this question, we did a chi-square test comparing the appropriate use of determiners with *draw* and with *write* and *spell* across the entire age range. The rate of appropriate determiner use was higher for *draw* than for *write* and *spell*, $\chi^2(1, N = 361) = 16.22, p < .001$. Thus, even as children improved in their use of determiners, they made more mistakes with *write* and *spell* than with *draw*. Even 4- to 5-year-olds, who had settled on mostly appropriate determiner usage, still made determiner errors with *write* and *spell* around 20% of the time. For example, Sarah at age 4;6 (Brown, 1973) said *Write a carriage*. Children's higher error rate with *write* and *spell* than with *draw* suggests that they continue to have some difficulty understanding the nature of writing, sometimes conceiving of it as the drawing of specific two-dimensional shapes (Levin & Bus, 2003).

ANALYSIS 4

People may differentiate writing and drawing with the verbs and direct objects used in talk about each system. We explore this possibility in Analysis 4 through an examination of the verbs that parents and children used with the common direct objects of each symbol system. Certain direct objects, such as *picture* and *drawing*, are only appropriately used with *draw*; other direct objects, such as *word*, *name*, and *letter*, are only appropriately used with *write* or *spell*. For example, it is appropriate to say *Draw a picture* and *Write a word*, but it is very odd to say the reverse. There are also neutral verbs, like *do* and *make*, which may be used for both symbolic systems. For example, a child could say *Do a drawing* or *I'm making my letters*. The purpose of Analysis 4 was to investigate whether parents and children used write-only verbs with the common objects of writing and draw-only verbs with the common objects of drawing. We were also interested in the use of neutral production verbs with the common objects of both systems.

Method

Participants. Files were sorted into three year-long age groupings (2;0–3;0, 3;0–4;0, 4;0–5;0) for the same reasons as in Analysis 3.

Procedure. All utterances that included *name*, *letter*, *word*, *sentence*, *picture*, or *drawing* were considered. Only those utterances that used one of the target words as a direct object with one of the target production verbs were included. That is, the utterance had to refer to actively producing a written word, picture, or some such product. The target verbs were divided into three categories. *Write-only* verbs were *write* and *spell*. A child might use one of these to say such things as *Spell my name*. *Draw-only* verbs were *draw*, *color*, and *paint*. For example, a child could say *I am coloring a picture*. Two *neutral* verbs, *make* and *do*, were also included

Table 5. Number of verbs of different types used with common objects of drawing and writing by parents and children in Analysis 4

Child Age (years;months)	Drawing Objects			Writing Objects		
	Draw-Only Verb	Write-Only Verb	Neutral Verb	Draw-Only Verb	Write-Only Verb	Neutral Verb
Parent						
2;0-3;0	123	0	124	10	101	25
3;0-4;0	23	0	6	1	30	6
4;0-5;0	13	0	8	4	30	10
Total	159	0	138	15	161	41
Child						
2;0-3;0	26	2	49	10	47	11
3;0-4;0	17	3	23	5	28	12
4;0-5;0	9	0	16	10	49	18
Total	52	5	88	25	124	41

because children can use them to refer to objects in either system. The two coders agreed on 96% of their judgments.

Results and discussion

Table 5 shows information about the verbs that parents and children used with the target direct objects. Parents never used a write-only verb with a drawing object. That is, no parent utterances like *Spell a drawing* or *Write a picture* were found. However, parents sometimes used draw-only verbs with writing objects throughout the age range analyzed. For example, parents occasionally said *Draw your letters* or *Color your name*. Children sometimes used write-only verbs with drawing objects and draw-only verbs with writing objects, saying things like *I am writing a picture* and *I am drawing my name*. All utterances like the former, with write-only verbs and drawing objects, came from children. This difference between parent and child use of write-only verbs was statistically significant, $\chi^2(1, N = 216) = 14.26, p < .001$. In addition, children used reliably more draw-only verbs with writing objects than parents did, $\chi^2(1, N = 325) = 5.10, p < .05$. In other words, children produced utterances like *draw my name* more often than parents. These results suggest that children have some difficulty using the verbs appropriately even when parents provide them with appropriate examples. Both parents and children were more likely to use *draw* inappropriately than *write* and *spell* inappropriately, $\chi^2(1, N = 541) = 16.99, p < .001$, collapsing across parents and children.

Collectively, these results suggest that parents are strict in their talk about writing: they never suggest to children that writing can be the same as drawing. However, parents speak about drawing with some looseness, occasionally saying

things like *Draw your name*. In these instances, parent speech may be thought to imply that writing is a type of drawing that involves sequences of shapes rather than a distinct system for symbolizing language. Still, parent statements like *draw your name* were much less common than statements like *write your name*. This is a notable finding considering that the written names and letters produced by children at the younger end of the studied age range are unrecognizable scribbles that look quite similar to the scribbles they produce when drawing (Levin & Bus, 2003).

Both parents and children used neutral verbs with writing and drawing objects throughout. A chi square test revealed that children used more neutral verbs than draw-only or write-only verbs when talking about drawing objects, whereas the reverse pattern held for parents, $\chi^2(1, N = 442), p < .01$. There was no significant difference between parent and child use of neutral verbs versus specific verbs for writing, $\chi^2(1, N = 407) = .45, p > .10$. Both parents and children used specific verbs more than neutral verbs when talking about writing, and neutral verbs use was significantly more common with draw-only objects (e.g., *make a picture*) than with write-only objects (e.g., *do my letters*), $\chi^2(1, N = 849) = 88.79, p < .001$. Despite these differences between writing and drawing, the fact that parents sometimes used neutral verbs for both writing and drawing may allow children to think of the two symbol systems as similar. This generic usage persisted across the age range studied, and it could potentially contribute to children's difficulty in grasping the distinction between writing and drawing.

The verbs that parents use with the common objects of writing and drawing provide information about the distinction between the two systems. However, parents occasionally speak of writing as a form of drawing, and this may provide less straightforward information about the nature of print. Analysis 5 further investigated parent speech about writing and drawing by exploring the direct objects used with the common verbs of both systems.

ANALYSIS 5

People may differentiate writing and spelling from drawing by using different types of direct objects with the respective verbs. Although many words and phrases can be the object of all three verbs, words such as *picture* can only be used with *draw*. Other words, such as *word*, *name*, and *letter* can only be used with *write*. We asked whether parents made a distinction between the direct objects used with the verbs *draw*, *write*, and *spell* and whether children of various ages made this distinction in their own speech.

Method

Participants. Files were sorted into three year-long age groupings (2;0–3;0, 3;0–4;0, 4;0–5;0) for the same reasons as in Analyses 3 and 4.

Procedure. The target words for Analysis 5 were forms of *draw*, *write*, and *spell*. Every utterance of *draw*, *write*, and *spell* that featured a direct object (e.g., *I can draw a kitty, I want to write cat*) was included. *Color* and *paint* were not used

Table 6. *Use of draw and write/spell with appropriate direct objects by parents and children in Analysis 5*

Child Age (years;months)	Draw			Write/Spell		
	Use With Appro. Objects	Total Use With Both Object Types	Propor. Appro.	Use With Appro. Objects	Total Use With Both Object Types	Propor. Appro.
Parent						
2;0-3;0	162	172	0.94	147	147	1.00
3;0-4;0	25	26	0.96	36	36	1.00
4;0-5;0	7	8	0.88	60	60	1.00
Total	214	227	0.94	243	243	1.00
Child						
2;0-3;0	55	87	0.63	83	95	0.87
3;0-4;0	22	25	0.88	35	38	0.92
4;0-5;0	16	25	0.64	91	92	0.99
Total	93	137	0.68	209	227	0.92

in this analysis, unlike in Analysis 4, because there were few relevant utterances. The corresponding direct object was classified into one of three categories. If the object was one that could be used with either symbol system (e.g., *this, that, kitty*), then it was coded as *both*. If the object was one that it would only be appropriate to draw (e.g., *pictures*), then it was coded as a *draw-only object*. If the object was one that it would only be appropriate to write (e.g., *letter, name, word*), then it was coded as a *write-only object*. There was 97% agreement between the two coders.

Results and discussion

Table 6 shows the data on parent and child use of *draw*, *write*, and *spell* with direct objects. Parents had no inappropriate uses of *write* or *spell*. That is, a parent never said something like *Can you write a picture?* However, parents did use *draw* inappropriately on a few occasions. For example, parents occasionally said *Can you draw your name?* These inappropriate utterances were found throughout the age range studied. The proportion of appropriate utterances by parents was significantly higher for *write* and *spell* than for *draw*, $\chi^2(1, N = 470) = 14.30, p < .001$. Children made some inappropriate utterances in both directions, using *draw* for write-only direct objects and *write* for draw-only direct objects. These errors were found throughout the period studied. Children had a significantly lower proportion of appropriate utterances of *draw* than for *write* or *spell*, $\chi^2(1, N = 364) = 35.36, p < .001$. They more frequently said something like *Draw my letters* than *Write a picture*. Thus, both parents and children tend to use *draw* more loosely than *write* and *spell*.

Although there was a significant difference in the appropriate use of *draw* versus *write* and *spell*, pooling over all the verbs children did show a significant increase in the proportion of appropriate use over time, $\chi^2(1, N = 362) = 15.32, p < .001$. Children's appropriate utterances of *draw*, *write*, and *spell* went from 75% between 2;0 and 3;0 to 91% between 4;0 and 5;0. There was no significant increase in the proportion of appropriate use for parents across the three age ranges, $\chi^2(1, N = 449) = 1.45, p > .10$. Pooling over *draw*, *write*, and *spell*, parent use was between 97% and 99% appropriate throughout the age range studied.

Although children displayed some confusion as to the objects that can be symbolized by writing and drawing, there were some signs that older children and their parents began talking about certain types of objects that are only properly symbolized by writing. There are two examples of this. First, there were five instances for parents and seven instances for children when nonpicturable function words were used as the objects of *write* or *spell*. These words were *at*, *is*, *no*, *not*, *of*, and *with*. All use of *write* and *spell* with these objects, for both parents and children, occurred after the child age of 3;6. Although there were few examples of this sort with *write* and *spell*, there were no occurrences with *draw*. That is, neither parents nor children ever said things like *draw at* or *draw with*. Second, there were nine instances where parents and children used a stretch of quoted speech as the direct object of writing. For example, at age 4;1 Abe (Kuczaj, 1976) was making a card and instructed his mother to *write from Abe to Rob and Rich and Mike*. Phrases never occurred as the object of *draw*; parents and children only used lines of quoted speech as direct objects of *write* or *spell*. Together, these examples suggest that some parents give children at least occasional information that writing is a system for symbolizing speech by the end of the children's preschool years.

Names constituted a large proportion of the direct objects that parents and children used with *draw*, *write*, and *spell* (161 utterances of *name* and specific personal names for *draw*, 368 utterances of *name* and personal names for *write* and *spell*). Children often used a draw-only verb with *name*, as in *Draw my name* or *Draw your name*. Although children made such errors with several pronouns (*your*, *mine*, *their*), adults only used *draw* with *name* when they were saying to the child *Draw your name*. They did speak about writing names other than the child's, but they only used *draw* when referencing the child's own name. Thus, parent use of *draw* with *name* as a direct object seems to be limited to discussion of the child's name and is not a way that parents discuss names in general. Parent utterances such as *draw your name* may mislead children, in that they simultaneously invite children to see writing as pictorial representation and as a system specialized for symbolizing names.

ANALYSIS 6

In the final analysis, we examined the feedback that parents give their children concerning the child's ability to write and draw. Parents rarely provide young children with explicit feedback regarding the grammaticality of their spoken utterances (Brown & Hanlon, 1970). What feedback, if any, do parents provide about children's ability to write and their ability to draw? If parents are more positive about children's drawing abilities than about their writing abilities, this

may convey the idea that writing is a difficult and complex system that requires special abilities.

Method

Participants. Files were grouped into 6-month periods across the 1;6–5;0 age span.

Procedure. Analysis 6 included all utterances of *write*, *draw*, and *spell*. *Write* and *spell* were collapsed for comparison to *draw*. We asked what information the utterances contained about the child's ability to draw and write. Two distinctions were coded. First, a statement could accept or reject a person's ability to draw or write. For example, *That's a pretty drawing* was considered an acceptance of a person's ability to draw, whereas *You cannot write* was a rejection of the person's writing ability. Second, the subject of the ability judgment was categorized as the child, an adult (parents, investigator, or other), an animate but inappropriate reference (e.g., a dog, cat, or cartoon character), or an unspecified or ambiguous other. The percentage of agreement between the two coders was 98%.

Results and discussion

There were 6253 utterances analyzed for judgments of ability: 2815 from children and 3438 from adults. Across all verbs, ages, and speakers, there were only 7 statements of rejection, all of which were for *write* and *spell*. Rejections for *spell* all involved individual words. For example, Nina's mother (Suppes, 1974) informed her *You don't know how to spell your name yet* when Nina was 3;1. Even when a parent rejected the child's ability to write, the statement was sometimes misleading. For example, Adam's mother (Brown, 1973) informed him at age 2;3 that he could not write by saying *You can't write* and by telling the investigator *He [other child] can write, but Adam can't yet*. A little later in the same conversation, though, she asked Adam *What are you writing?* Thus, parent speech does not seem to provide much direct information regarding differences in their child's ability to draw and write. Instead of criticizing children's abilities, parents encourage children to be interested in writing and drawing.

In a few instances, children attributed the ability to write and draw to objects that cannot have these abilities. This occurred 11 times across the studied age range. Adam (Brown, 1973) credited tractors and dogs with the ability to write at age 2;3 and Sarah (Brown, 1973) said at age 3;3 that Bugs Bunny can write. Parents occasionally participated in this way of speaking. There were four such utterances, all in response to child utterances. For example, Adam said at age 2;3 *Doggie writing*, and his mother replied *What did the doggie write?* Thus, in trying to interest children in writing, parents may sometimes speak about writing in loose ways.

The results of Analysis 6 suggest that parents in the United States and the United Kingdom give their children little or no direct feedback on their ability to write and draw, just as they give children little or no direct feedback on their spoken syntax (Brown & Hanlon, 1970). Instead, parents encourage their children to engage in

the activity of writing, regardless of the children's ability. By encouraging children to write, parents may foster the attention to print that is necessary for children to understand the nature of writing.

GENERAL DISCUSSION

To master reading and writing, children must grasp that written language symbolizes the sounds of spoken language. Children receive some information about the nature of written language before they enter school through such activities as being helped to print words. In the present study, we investigated an additional way in which children may learn about writing. We found that parents speak to their children about written language beginning when the children are quite young, and that they do so in ways that provide information about the glottographic nature of written language. Parent speech provides helpful information that writing is quoted speech by invoking similarities between speaking and writing. Parents used *say*, *word*, and *name* for both spoken and written language. Allowing the same linguistic items to feature in speech and print provides evidence of the glottographic nature of written language. In addition, parents indicate that writing is different from drawing by making distinctions in their discussions of the two systems. With singular count nouns, parents almost always use a determiner with *draw* and almost never with *write* or *spell*. These results suggest that parent speech provides children with information about the nature of written language before the children enter school.

However, some parent speech may be misleading as to the glottographic nature of print. When discussing writing with their young children, parents talk about names more often than words. The emphasis on names may hinder a full understanding of the relation between speech and print. Children need to understand that any word that can be spoken can be written. Some children appear to understand this by the age of 5, saying things such as *write of*, but the emphasis on names might make this realization more difficult. Further, parents sometimes speak of writing as if it were a form of drawing, suggesting that children draw their names. Speaking of writing in this way may make writing and drawing seem less different than they are. We also found that parents support young children's attempts at writing, rarely saying that children are unable to write. The lack of negative feedback may allow children to believe that it is appropriate to understand writing as a form of drawing.

There are, of course, reasons why parents speak this way. Parents have an incentive to focus on the aspects of writing that are most interesting to children, such as the children's own names. Linking writing to drawing may also encourage children to engage in the process of learning to write, as drawing is an enjoyable activity for most young children. Because parents want to interest children in writing, they have little motivation to criticize children's abilities. The technical difficulties in learning to write may also influence parents' speech. Forming the small and detailed symbols of writing is hard for young children, and so there is a focus on the surface, mechanical aspects of writing. This may make writing seem more like drawing than it actually is. Viewing writing as a mechanical process may be helpful when learning to form specific letters. However, it may delay children's

understanding of the deeper nature of writing. Children may think that the ability to write is purely a mechanical achievement and that the stumbling block they face is learning to make the symbols, not learning the deeper nature of the system.

Collectively, our results suggest that, as in many other domains (essentialism: Gelman, 2003; category membership: Waxman & Markow, 1995; count/mass noun distinction: Hall et al., 2001), parent speech provides information to young children about the nature of the world around them. A good deal of information about written language is available to children in literate societies prior to when they attend school and receive formal instruction. As previous studies show, young children can learn about some of the graphic features of writing (Ganapole, 1987; Treiman et al., 2007) the alphabet (Evans et al., 2000), and even specific words (Aram, 2006; Aram & Levin, 2004) through such experiences. The current findings add that children receive information about the symbolic function of writing through conversations with their parents. Implicit information in parent speech indicates that writing works differently than drawing, and even that it symbolizes speech, before children are explicitly taught how it is that writing does so. A full understanding of how writing works of course requires the child to grasp exactly how writing goes about symbolizing spoken language. This further understanding may not happen until children receive formal instruction in school. Although some aspects of literacy learning may require explicit instruction, children do receive information about how writing works from informal interactions with their parents.

Our results also shed light on the ways in which young children understand writing. Their talk about writing changes across the preschool period, suggesting a respective set of changes in how they understand the glottographic nature of print. Previous studies have used children's ability to produce writings distinguishable from drawings and to recognize the difference between words and pictures to assess their understanding of writing. Although success at these tasks indicates knowledge about print, failure does not necessarily imply a lack of knowledge. The nature of our study allowed us to examine very young children who cannot easily participate in most production and recognition tasks. We found that children make some distinctions between writing and drawing from a young age but that the process of distinguishing the two systems is not complete even as children begin to do things such as produce their written names. This is shown, for example, by 4- and 5-year-olds' statements such as *draw my name*.

The results in our study suggest that studies that focus on features of homes and families such as number of books in the home or time spent reading stories or teaching about letters have missed much of the richness of literacy-related activities that occur in homes. In particular, such studies have missed many of the conversations that mention writing. Our results show that such conversations occur sporadically across a host of contexts beginning when children are quite young, and that they may provide children with useful information. In future research, it will be important to determine whether children take advantage of this information by examining early parent-child conversations about writing in relation to children's later literacy skills. This was not possible in the current study, but our work sets the stage for future work by providing information about the types of parent speech that may be important.

Our use of the CHILDES data, although allowing us insight into literacy-related discussions that occur in homes, had certain other limitations. Although we had a large sample, there were certain age ranges for which only small amounts of data were available. Our analyses were confined to English, and it would be valuable to examine data from other languages and cultures to provide a more complete understanding of language-specific and language-universal cues. In addition, it is important to examine parent-child conversations about writing as a function of social class and parent education. The CHILDES sample is skewed toward middle- and upper middle-class families, as mentioned earlier, but differences as a function of social class and education would be anticipated on the basis of previous findings (e.g., Hart & Risley, 1995). In the present study, we did not have enough data to allow for separate analyses of different subgroups.

Although much work remains to be done, our results show that children are exposed to information about certain aspects of writing in conversations with their parents even before formal instruction in reading and writing begins and even before they produce anything resembling conventional writing. Parent speech indicates similarities between spoken and written language, as well as differences between writing and drawing. The present findings thus offer insight into the environmental input that may help children develop an understanding of the nature of written language. The findings also show that children's speech about writing offers insight into their understanding of writing's nature, supplementing the information about children's understanding of writing that is available in other ways.

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NOTES

1. The corpora are available on the CHILDES website at <http://childes.psy.cmu.edu/> (MacWhinney, 2000). Please contact the authors for a list of the 34 corpora that were used in the present study.

REFERENCES

- Adi-Japha, E., & Freeman, N. H. (2001). Development of differentiation between writing and drawing systems. *Developmental Psychology, 37*, 101-114.
- Apperly, I. A., Williams, E., & Williams, J. (2004). Three- to four-year-olds' recognition that symbols have a stable meaning: Pictures are understood before written words. *Child Development, 75*, 1510-1522.
- Aram, D. (2006). Early literacy interventions: The relative roles of storybook reading, alphabetic activities, and their combination. *Reading and Writing, 19*, 489-515.
- Aram, D., & Biron, S. (2004). Joint storybook reading and joint writing interventions among low SES preschoolers: Differential contributions to early literacy. *Early Childhood Research, 19*, 588-610.

- Aram, D., & Levin, I. (2002). Mother-child joint writing and storybook reading: Relations with literacy among low SES kindergartners. *Merrill-Palmer Quarterly*, 48, 202-224.
- Aram, D., & Levin, I. (2004). The role of maternal mediation of writing to kindergartners in promoting literacy in school: A longitudinal perspective. *Reading and Writing*, 17, 387-409.
- Bernstein-Ratner, N. (1984). Patterns of vowel modification in motherese. *Journal of Child Language*, 11, 557-578.
- Bialystok, E. (1991). Letters, sounds, and symbols: Changes in children's understanding of written language. *Applied Psycholinguistics*, 12, 75-89.
- Bialystok, E. (1992). Symbolic representation of letters and numbers. *Cognitive Development*, 7, 301-316.
- Bialystok, E. (2000). Symbolic representation across domains in preschool children. *Journal of Experimental Child Psychology*, 76, 173-189.
- Bialystok, E., Shenfield, T., & Codd, J. (2000). Languages, scripts, and the environment: Factors in developing concepts of print. *Developmental Psychology*, 36, 66-76.
- Bloom, P., & Markson, L. (1998). Intention and analogy in children's naming of pictorial representations. *Psychological Science*, 9, 200-204.
- Bloom, P., & Wynn, K. (1997). Linguistic cues in the acquisition of number words. *Journal of Child Language*, 24, 511-533.
- Brown, R. (1957). Linguistic determinism and the part of speech. *Journal of Abnormal and Social Psychology*, 55, 1-5.
- Brown, R. (1973). *A first language: The early stages*. Cambridge, MA: Harvard University Press.
- Brown, R., & Hanlon, C. (1970). Derivational complexity and order of acquisition in child speech. In J. R. Hayes (Ed.), *Cognition and the development of language* (pp. 11-53). New York: Wiley.
- Evans, M. A., & Saint-Aubin, J. (2005). What children are looking at during shared storybook reading: Evidence from eye monitoring. *Psychological Science*, 16, 913-920.
- Evans, M. A., Shaw, D., & Bell, M. (2000). Home literacy activities and their influence on early literacy skills. *Canadian Journal of Experimental Psychology*, 54, 65-75.
- Ganopole, S. J. (1987). The development of word consciousness prior to first grade. *Journal of Reading Behavior*, 19, 415-436.
- Gelman, S. A. (2003). *The essential child*. New York: Oxford University Press.
- Gelman, S. A., & Ebeling, K. S. (1998). Shape and representational status in children's early naming. *Cognition*, 66, B35-B47.
- Hall, D. G., Lee, S. C., & Belanger, J. (2001). Young children's use of syntactic cues to learn proper names and count nouns. *Developmental Psychology*, 37, 298-307.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Brookes.
- Justice, L. M., Pence, K., Bowles, R. B., & Wiggins, A. (2006). An investigation of four hypotheses concerning the order by which 4-year-old children learn the alphabet letters. *Early Childhood Research Quarterly*, 21, 374-389.
- Justice, L. M., Skibbe, L., Canning, A., & Lankford, C. (2005). Pre-schoolers, print and storybooks: An observational study using eye movement analysis. *Journal of Research in Reading*, 28, 229-243.
- Kuczaj, S. (1976). *-Ing, -s and -ed: A study of the acquisition of certain verb inflections*. Unpublished doctoral dissertation, University of Minnesota.
- Lavine, L. O. (1977). Differentiation of letterlike forms in prereading children. *Developmental Psychology*, 13, 89-94.
- Levin, I., Both-De Vries, A., Aram, D., & Bus, A. (2005). Writing starts with own name writing: From scribbling to conventional spelling in Israeli and Dutch children. *Applied Psycholinguistics*, 26, 463-477.
- Levin, I., & Bus, A. (2003). How emergent writing based on drawing? Analyses of children's products and their sorting by children and mothers. *Developmental Psychology*, 39, 891-905.
- Levin, I., & Tolchinsky Landsmann, L. (1989). Becoming literate: Referential and phonetic strategies in early reading and writing. *International Journal of Behavioral Development*, 12, 369-384.
- Lundberg, I., & Torn us, M. (1978). Nonreaders' awareness of the basic relationship between spoken and written words. *Journal of Experimental Child Psychology*, 25, 404-412.
- MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk* (3rd ed.). Mahwah, NJ: Erlbaum.

- Mandel, D. R., Jusczyk, P. W., & Pisoni, D. B. (1995). Infants' recognition of the sound patterns of their own names. *Psychological Science*, *6*, 314–317.
- Masonheimer, P. E., Drum, P. A., & Ehri, L. C. (1984). Does environmental print identification lead children into word reading? *Journal of Reading Behavior*, *16*, 257–271.
- Olson, D. R. (2002). What writing does to the mind. In E. Amsel & J. P. Byrnes (Eds.), *Language, literacy, and cognitive development: The developmental consequences of symbolic communication* (pp. 153–165). Mahwah, NJ: Erlbaum.
- Papafragou, A., Cassidy, K., & Gleitman, L. (2007). When we think about thinking: The acquisition of belief verbs. *Cognition*, *105*, 125–165.
- Sampson, G. (1985). *Writing systems*. Stanford, CA: Stanford University Press.
- Sénéchal, M. (2006). Testing the home literacy model: Parent involvement in kindergarten is differentially related to Grade 4 reading comprehension, fluency, spelling, and reading for pleasure. *Scientific Studies of Reading*, *10*, 59–87.
- Sénéchal, M., & LeFevre, J. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, *73*, 445–460.
- Snow, C. E., & Juel, C. (2005). Teaching children to read: What do we know about how to do it? In M. J. Snowling & C. Hulme (Eds.), *Science of reading: A handbook* (pp. 501–520). Malden, MA: Blackwell.
- Soja, N. N. (1992). Inferences about the meanings of nouns: The relationship between perception and syntax. *Cognitive Development*, *7*, 29–45.
- Suppes, P. (1974). The semantics of children's language. *American Psychologist*, *29*, 103–114.
- Treiman, R., Cohen, J., Mulqueeny, K., Kessler, B., & Schechtman, S. (2007). Young children's knowledge about printed names. *Child Development*, *78*, 1458–1471.
- Warren-Leubecker, A., & Bohannon, J. N. (1984). Intonation patterns in child-directed speech: Mother-father speech. *Child Development*, *55*, 1379–1385.
- Waxman, S. R., & Markow, D. B. (1995). Words as invitations to form categories: Evidence from 12- to 13-month-old infants. *Cognitive Psychology*, *29*, 257–302.
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, *69*, 848–872.