

# Maternal Shared Reading with Toddlers Born Preterm and Full-Term

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## Abstract

Reading aloud to children is a predictor of later language and literacy development. Children as young as 7 months of age benefit from shared reading experiences. The purpose of this study was to evaluate and compare mothers' shared reading to their children in two groups: children born preterm and children born full-term. Sixteen mother-child dyads, 8 mothers with children born preterm and 8 mothers with children born full-term matched for child gender and maternal education participated when the children were an average of 13 months of age. The mothers were video-recorded as they shared two books with their children. The mothers' shared book reading behaviors and use of print awareness was examined using the Toddler Emergent Literacy Checklist. There was no difference between the two groups of mothers with respect to shared book reading characteristics. Both groups of mothers used a variety of shared reading behaviors, such as labeling pictures, pointing to pictures, describing pictures, asking questions about pictures, asking the child to turn the page, and using child-directed prosody. Regarding print awareness, few of these behaviors were present in either group. Tracking print was present only in a small number of the mothers of the children born full-term. Together, these results provide new information on the early shared book reading of mothers of children born preterm and full-term.

**Keywords:** Preterm; Shared Reading; Maternal; Early literacy

## Introduction

Shared book reading has been found to increase the language and literacy skills in children with a wide range of abilities [1-5]. Although a majority of shared book reading research has been conducted with preschoolers [6], some studies have been conducted with infants and toddlers with typical development, as well as those at-risk for academic failure due to low socioeconomic status [3,7]. Parents in the United States typically begin to read to their infants when they reach 6 or 7 months of age [8,9]. According to a meta-analysis of 11 studies, shared reading with infants and toddlers furthered children's literacy and language development [10]. In fact, shared reading with infants and toddlers who were at-risk and those developing normally in their first year of life resulted in greater language gains compared to those children who were read to during their second year of life (i.e., 24-36 months of age) [11]. Thus, the first two years of a child's life appears to be an optimal period for parents to be reading to their children.

The benefits of reading to children have been documented by many researchers [6,12]. For children who have yet to learn to read, one of the benefits is that it promotes print knowledge. Print knowledge is one of the four domains of emergent literacy that is strongly linked to children's later literacy development [13]. Print knowledge consists of alphabet knowledge and concepts about print. Alphabet knowledge is awareness of the letters of the alphabet; whereas, concepts about print is known as print awareness. An example of print awareness is for a child to demonstrate that a book is for reading or a page is for turning. Justice and Ezell [14] described verbal and nonverbal print referencing techniques that adults could provide for young children that help them learn alphabet knowledge and concepts about print. These techniques include: requesting, commenting, or questioning about print verbally

and tracking or pointing. For example, adults comment about print while reading by saying "There's the letter m" or "That's the word cat." Adults also reference print by pointing to or tracking print with their fingers while reading.

The use of print referencing by adults during shared reading is infrequent based on studies of preschoolers and their parents [15] and preschoolers with unfamiliar graduate students [16]. There is evidence that training parents [15] and preschool teachers to use print referencing during shared reading with preschoolers from low-income homes results in significant gains in language and reading for these youngsters [17]. However, there are no studies that have evaluated parental print referencing with respect to when it begins and what concepts are introduced to the child. Some insight about early print concepts can be gained by understanding what adults do with respect to print referencing and how they talk during shared book reading at the earliest ages of book sharing experiences in typical and at-risk populations.

There have been six talk strategies that adults use during shared reading with 12 to 42 month olds that were identified as being associated with positive expressive language outcomes in a meta-analysis of 17 studies [18]. These facilitative strategies included: asking open-ended questions, relating the reading to the child's experiences, providing positive feedback, following up what child is interested in with a question, talk about what the child is interested in as you read, and expanding on what the child says. However, all of the strategies noted to yield medium effect sizes in the Trivette et al. [18] meta-analysis were present only for children older than two years of age. Only one study was conducted with children under the age of two in the meta-analysis [19]. Blake et al. [19] videotaped 15 toddlers from dual-parent families and 13 toddlers from single parent families. The mothers read a book to their 14 to 16 month-old children for five

minutes. The mothers could choose one lift-the-flap book from a choice of four lift-the-flap books.

The researchers coded the mothers' sentences into 10 different categories: labels, questions, comments, directives, feedback, relating to child's experiences, imitating, making a game or animating, or reading the book. The mothers most frequently used labeling, which accounted for approximately a third of their interactions. The next most frequently occurring category used was questions, which occurred 17% of the time. Labeling of pictures during storybook reading also was noted to occur often in other studies of typically developing children who have ranged in age from 9 to 18 months old [20,21]. Murphy noted that it was not until toddlers were 20 to 24 months old that their mothers moved from labeling pictures to the behavior of pointing to pictures and asking wh-questions [22].

Very little is known about the characteristics of adult shared book reading behaviors with young toddlers in at-risk populations. One study was conducted with mothers and their two-year-olds who were at risk due to prenatal cocaine exposure. Researchers found that mothers of children who had average language scores provided more facilitative interaction during shared reading compared to mothers of children who displayed poor language scores [23]. A total of 24 mother-child pairs participated in the study, with 12 of the children having expressive language skills within normal limits and the other 12 displaying impaired expressive language abilities. The mothers shared a book with their child for two minutes and were videotaped during the interaction. The researchers coded the mothers' shared book reading behavior for the following characteristics as they watched the videotapes: physical closeness, reading text, clear enunciation, expanding on the text, in tune with the child's needs and responding to them, asking a question and answering it, and who had the power during the shared book reading (i.e., who held book, talked the most, etc.). Cross et al. [23] found that the greatest difference between the groups was present in the "asking a question and answering it" category. The mothers with children who were in the normal expressive language group used this strategy more often than the mothers who had children in the low expressive language group. The authors suggested that mothers who asked a question about the book and then answered it themselves (e.g., "What's this? That's a horse.") were more sensitive to their child's level of language development. They hypothesized that perhaps by using this type of strategy, their mothers were providing their child more vocabulary learning opportunities.

Another group of children who are at-risk for impairments of language and literacy are those who are born preterm (i.e., born earlier than 37 weeks gestation age). These children have been found to score lower in the areas of language and literacy when compared to children born full-term when they are school-age [24]. Given that children born preterm are at-risk for language and literacy delays, it is important to document the characteristics of shared reading interactions and the relationship between caregiver shared reading interactions with child language outcomes. This study is a beginning step in that direction.

Infants who are born preterm are at risk for developmental delay due to a variety of factors [25]. In particular, children born preterm have been found to exhibit speech and language delays early in development and continue to experience these difficulties throughout the school years [26]. Because language is the foundation for a child's literacy development, it is not surprising that literacy abilities are an area of concern for many children born preterm. Lee et al. [26] found that children born preterm and weighing less than 2,500 grams (i.e.,

low birth weight) scored significantly lower on tests of language and literacy compared to a full-term control group when they were between 9 and 16 years of age. Degree of prematurity was a significant predictor of reading and language skills in the children born preterm even when socioeconomic status and performance IQ were controlled. Specifically, prematurity predicted the children's reading comprehension, their ability to process and match spoken sentences, and their verbal memory which consisted of creating sentences, recalling sentences, listening, and understanding relationships between words. Participating in shared reading requires skills such as linguistic processing and verbal memory. Lacking these skills, children who are born preterm may not benefit from shared reading experiences to the same extent as their full-term counterparts.

In addition, the home environments of children are especially important for setting the stage for emergent print and literacy experiences [14]. Ragusa [27] reported that very low birth weight infants born preterm are provided with fewer literacy experiences than infants born full-term. Despite this, little is known about the shared reading that has taken place between caregivers and their infants who have been born preterm. To our knowledge, there have been no studies of one-year-old children who were born preterm and their shared reading interactions with their mothers. This lack of information is surprising, given that children born preterm are at risk for language and literacy impairments. Information on the nature of mother-child shared book reading interactions would be a valuable first step in understanding the dynamics of shared book reading between this population.

The purpose of this study was to evaluate the shared book reading behaviors of mothers with their one-year-olds. Our specific research question was: Do shared reading behaviors of mothers of children born full-term differ from mothers of children born preterm? To our knowledge, this is the first attempt in the literature to evaluate these early shared reading behaviors exhibited by caregivers in children born preterm.

## Method

### Participants

Sixteen mother-child dyads participated. Eight of the mother-child dyads had children who were born preterm and eight mother-child dyads consisted of children born full-term. The mean age of the children at the time of the study in both groups was 13 months (range 9 to 16 months). Each preterm dyad was matched to a full-term dyad by age, child gender, and maternal education. These latter matching variables were selected due to evidence from the literature that gender and maternal education may play a role in child language outcome. Specifically, male gender and low maternal education place a child at risk for later negative language outcomes [28,29]. Five females and 3 males were present in each group and maternal education consisted of 5 mothers with high school education and three mothers with baccalaureate degrees. All children were Caucasian and not Hispanic or Latino.

The children born preterm were part of a larger study of children who were recruited when in the neonatal intensive care unit (NICU). The children were between 26 and 32 weeks gestational age (mean=31 weeks, sd=12.49) at the time of their birth. All but one child with a diagnosis of chronic lung disease (CLD) had minimal or no oxygen history (<5 days on ventilator). The children born preterm received

tube feedings, had head circumferences within the 10-90th percentile of the mean for post-menstrual age, and displayed no abnormal neurological signs. Infants with intracranial hemorrhage grades III and IV, neonatal seizures, periventricular leukomalacia, necrotizing enterocolitis, meningitis, sepsis, chromosomal anomalies or craniofacial malformation were excluded from the study. All children passed hearing testing conducted in the NICU. One of the children was diagnosed with CLD, four were infants of diabetic mothers, and three were unremarkable and otherwise healthy infants. Seven of the children displayed low birth weight (<2,500 grams) and the one infant with CLD was born at extremely low birth weight (<1,000 grams). The children's language abilities were assessed by interviewing the mothers using the Receptive and Expressive Emergent Language Test-3 (REEL-3) [30]. The examiner conducting the testing for the children born preterm was a certified and licensed speech-language pathologist. A graduate student in speech-language pathology conducted the testing with the children born full-term. The REEL-3 is a standardized and norm-referenced test of language development for infants to children three years of age and appropriate for research, as well as documenting language delays. Age for children born preterm was corrected for birth gestational age. None of the children tested below normal limits on the total language score on the REEL-3. The mean language standard score for the children born preterm was 103.87 (SD=12.73). The mean language standard score for the children born full-term was 105.25 (SD=13.77). There was no statistical difference for overall language ability between the two groups using the nonparametric Sign Test ( $p=.25$ ).

The children born full-term were reported by their mothers to be born between 38-42 weeks gestational age. Their mothers reported that they all passed the newborn hearing screening administered at the hospital and that there were no developmental concerns.

## Procedure

Each mother and their child participated in one session that lasted approximately 45-60 minutes. The session occurred at the child's home in a quiet area or in our laboratory play room, whichever was the most convenient for the family. The session began with the mother being asked to play with a standard set of toys. After 15 minutes or when the child became disinterested in the toys, the mother was given two books and she was asked to share them with her child as she normally would. The books were board books entitled, *Baby Touch and Feel*

*Wild Animals* [31] and *Brown Bear, Brown Bear, What Do You See?* [32]. The *Baby Touch and Feel Wild Animals* was a book with pictures of baby animals, along with the name of the animal, and the sound the animal makes or the word associated with the animal's movement, or other words semantically associated with the animal printed on the page. There was also a tactile element to each page. For example, the page that had a picture of a penguin had the words, "penguin", "waddle, waddle" and there was a soft piece of white fabric on the white oval of the penguin's stomach. The book, *Brown Bear, Brown Bear, What Do You See?* was a narrative storybook with written text and illustrations. The text is repetitive and rhymes. *Baby Touch and Feel Wild Animals* was selected as a book to use because it was thought that the photographic pictures and tactile element of the book would foster interaction between the mother and child. In contrast, *Brown Bear, Brown Bear, What Do You See?* was selected because it included more text than *Baby Touch and Feel Wild Animals*, the text rhymed, and the artwork was colorful and interesting. The shared book interaction was video- and audiotaped. The average amount of time for sharing the

books was 4.13 minutes for the children born preterm (SD: 2.20 minutes; range: 2.26 - 7.35 minutes) and 5.29 minutes for the children born full-term (SD: 2.42 minutes; range: 1.08 - 9.40 minutes). There was no significant difference between the time spent during shared reading ( $t= -.74, p=.48$ ). The mothers discontinued sharing the books after their child lost interest in them. Following the shared book reading, the mother was interviewed using the REEL-3 to determine child language level.

## Characteristics of maternal shared book reading and print awareness

Maternal shared book reading was analyzed using the audio and video tapes of the shared book reading sessions. The audiotapes were transcribed and available if needed for analyzing maternal behavior. The videotape samples of the shared book reading sessions were viewed by the first author and a second independent judge. Maternal behaviors during shared reading was evaluated using the Toddler Emergent Literacy Checklist (TELC) after viewing the videotape samples (See Appendix). The TELC contained 15 items, 9 that were related to the verbal and paralinguistic aspects of the shared book reading exchange and 6 that were associated with drawing the child's attention to the function of print or the book. The research of Justice and Ezell [14], Blake et al. [19], Trivette et al. [18], Cross et al. [23] were instrumental for determining which items to include on the checklist.

The procedure for scoring the TELC entailed watching the video of the shared reading and scoring a behavior as having occurred by checking yes or no, regardless of how many times a behavior occurred. The rationale for not counting the number of times a behavior occurred and counting only one instance on a yes/no scale was to make the checklist as feasible as possible to use and because there is no evidence that suggests the occurrence of one behavior versus three or seven would make it any more valid or important. A written transcript of the shared reading session was available to review when the videotapes were watched.

## Transcription and checklist reliability

Research assistants in speech-language pathology were trained to 90% agreement levels in transcription and then transcribed the shared book reading samples. The assistants transcribed the mothers and the children's utterances. However, all of the children in the sample were at the very beginning of the one-word stage of language development and had 1-10 words in their lexicons. Most of the vocalizations transcribed consisted of vowel productions with few words noted. Consensus reliability was utilized for transcription. The consensus procedure consisted of having the first research assistant transcribe the samples and the second research assistant making corrections on the first pass. The first pass transcriber then reviewed changes made by the second research assistant and any disagreements were discussed until a consensus was achieved. Reliability of scoring for the TELC was determined by comparing the items checked by the first viewer with the independent judgments of the second viewer of the videos. Reliability was computed by dividing the number of agreements by the number of agreements + disagreements x 100 [33]. TELC inter-judge reliability was 92.5% for the full-term group and 93.3% for the preterm group coding on the TELC. Consensus on areas of disagreement was obtained after discussion between the judges prior to data analysis.

## Results

Our specific research question was to evaluate the maternal characteristics of shared book reading to their toddlers who were born preterm and mothers reading to their toddlers born full-term. Due to the small number of participants, the results of this study should be viewed as pilot work. Observation of the mothers' shared reading behaviors was divided into two areas on the TELC: (1) those related to print awareness; and (2) those associated with the content of the mothers' talk. Beginning with print awareness, only three of the six strategies were observed (Table 1).

Unfortunately, it was not possible to evaluate the print awareness results using nonparametric statistics because there were too many ties of no behavior occurring in the matched pairs. This resulted in too small of a number of pairs left for comparison. All of the mothers in both groups pointed to or touched the picture in the book(s). A similar number of mothers in both groups asked their child to turn the page. In those instances where the parent did not ask the child to turn the page, the child was doing this behavior without prompting. The other strategy observed was maternal pointing to or tracking print. Three mothers of children born full-term used this strategy; whereas, none of the mothers of children born preterm used print tracking. The three mothers who used the point to print or track print strategy all had high school educations as their terminal degree.

Print Awareness Behavior	Mothers of Children	
	Born Preterm (n=8)	Born Full-term (n=8)
Requests about print	0	0
Comments about print	0	0
Questions about print	0	0
Adult points to or tracks print	0	3
Adult asks/tells child to turn the page	4	3
Adult points to or touches picture	8	8

**Table 1:** Frequency of Mothers Providing Print Awareness Cues During Shared Reading

Concerning the content of the mothers' talk during shared reading, there was no statistical difference between groups using the Sign test ( $x=1$ ,  $p= .109$ ). A majority of the mothers of children born full-term and the mothers of the children born preterm labeled the pictures, described the pictures, asked questions about the pictures, and used child-directed prosody (Table 2). Approximately half of the mothers related the book(s) they read to the child's own knowledge in both groups.

All of mothers of children born full-term read the title, author, and/or illustrator and also asked their child a question about the book and then answered the question when the child did not answer. None of the mothers in either of the groups talked about the beginning of the story or end of the story and only one mother of a child born preterm asked their child to make a prediction about the story or pictures in the book.

Shared Reading Behaviors	Mothers of Children	
	Born Preterm (n=8)	Born Full-term (n=8)
Reads title, author, and/or illustrator	5	8
Talks about beginning or end of story	0	0
Relates book to child's own knowledge	4	3
Ask/Tell child to make predictions	0	1
Asks questions about pictures	7	7
Asks child question about book, then answers own question if no answer from child	5	7
Labels pictures in books	8	8
Describes pictures in books	7	7
Uses sing-song, animated, or enthusiastic voice	7	8

**Table 2:** Frequency of Mothers Providing Specific Types of Shared Reading Talk

## Discussion

The shared reading interactions of mothers with their toddlers who were born preterm can be characterized as highly similar to those of mothers with their toddlers who were born full-term. The mothers in both groups provided shared reading that included teaching episodes to facilitate vocabulary through labeling pictures, but not yet referencing print awareness.

The mothers' lack of the print referencing strategies in both groups was consistent with findings of Justice and Ezell [15] and Phillips and McNaughton [34]. However, the latter researchers studied preschoolers, not toddlers, who may have already developed some knowledge of the concepts of print and still were developing their alphabet knowledge. Even so, Phillips and McNaughton [34] found that parents used print-related talk about concepts of print only 3% of the time during shared reading. They proposed that print knowledge may not be taught explicitly, but instead learned incidentally through repeated instances of shared reading or alternatively, taught in activities outside of shared reading. In the current study, there was explicit teaching that involved teaching the function of books with the mothers in both groups asking their toddlers to turn the pages of the book. A small number of mothers of the children born full-term also explicitly taught print awareness by tracking print. However, for most mothers, print awareness was not an emphasis at this early stage of development. It is not clear why only the mothers of full-term infants tracked print. Replication of this finding in a study with a larger sample is needed. One explanation for why the mothers of the children born preterm did not track print may be due to their belief that their child was developmentally not ready to benefit from tracking print. It might be that tracking print requires more attention on the part of the child compared to pointing to a picture or labeling a picture. There are data that support the idea that children born preterm are at-risk for

attention disorders [35]. Mothers of some children born preterm may be sensitive to short attention to task displayed by their children and as a result they modify their interactions accordingly when reading. Future studies of children born preterm might explore mother's rating of attention with print tracking behavior to determine if a relationship is present between these concepts.

Consistent with the findings of Martin [36], mothers of 12 to 18 month-olds allow their child to hold the book or turn the page. Martin [36] interpreted this book handling experience as a method the mother used to engage her child in shared reading. We interpret it also as an explicit teaching of the function of a book. That is, mothers are showing their child that pages are for turning. Both groups of mothers asked their children to turn the pages and in cases when this did not occur, the child was turning the pages without prompting. This is the first study to find that mothers of children born preterm display this same encouragement for page-turning.

Mothers in both groups provided consistently more shared reading talk about the book compared to print awareness behaviors. Regarding the specific types of shared reading behaviors exhibited by the mothers, there were six strategies that were used by a majority of the mothers of children born full-term. These included: Reading title, author and/or illustrator, asking questions about pictures, asking the child a question about the book and answering it if an answer was not provided by the child, labeling and describing pictures, and using sing-song, animated, or enthusiastic voice. A majority of mothers of children born preterm also asked questions about pictures, labeled and described pictures, and used variations in prosody. The finding that most mothers label, point to, and ask questions about pictures is consistent with research for mothers of children born full-term as reported in previous research [19-22]. Martin [36] found that mothers pointed to, labeled, and asked questions about pictures, such as "What's that?" when reading to their typically developing 6 month-old infants. She interpreted this behavior as a way that the mother used to engage her infant in the shared reading experience. Blake et al. [20] observed mothers primarily pointing to pictures and labeling them when reading to their 9- and 14-month old children. Pointing at pictures and verbal labeling had a significant association at 14 months of age. Our data confirm these observations from earlier studies of children born full-term and extend them to children born preterm. Mothers may use this behavior not only to engage their child in shared reading, but also as a method of establishing joint attention. By pointing to pictures and labeling them, they are actively seeking joint attention and teaching new vocabulary to their children.

We also add to the literature with the finding that a majority of the mothers of children born full-term display additional shared reading behaviors such as reading the title, author and/or illustrator, using child-directed prosody while reading to their toddler, and describing the pictures (e.g., "That panda is soft."). In all cases, the mothers read the title of the book and did not read the author or illustrator's name. The strategy of reading the book title shares with the child the elements of the book that add to understanding its function. None of the mothers in either group talked about the beginning or the end of the story, so reading the title may have served as a starting point for reading the book and establish an order of moving from the beginning to the end of the book.

Using a soft, high pitch voice with exaggerated intonation also was used by most mothers in both groups. This strategy may be beneficial in holding the child's attention and may be a natural part of the interaction. Interestingly, previous studies have noted that mothers will

point to and label, but not that they describe pictures to their children. Most of the mothers in each group described pictures. This could have occurred in the present study because one book used was a "touch and feel" format which frequently led to mothers encouraging their child to feel the material (soft, bumpy, etc.) on the pictured animals. The book also included words written as text that described the sounds the animal would make, such as "lion" and "roar" being on the same page depicting a lion. Often mothers would describe the sounds that the animals made.

The second strategy used by a majority of mothers of children born full-term and some of the mothers of the children born preterm was, "Ask child question about book, then answers own question if the child does not answer." This strategy may help children learn new words and concepts according to Cross et al. [23].

One item on the TELC that might be considered higher level or advanced strategy is "Ask/tell the child to make predictions." Only one mother used this strategy and she was the mother of a child born full-term. The act of asking the child to think about what might occur next requires means-ends causal understanding as well as understanding of temporal relations in storytelling. Most mothers may have considered this ability beyond their child's abilities.

It is important to note that while being born preterm places a child at risk for language impairment, the children born preterm in the current study displayed language skills within the range of normal limits. This may be why differences were not observed between groups; however, given the small number of matched-dyads participating, more study is needed with additional children born preterm both with and without language impairment. Children born preterm need to be monitored closely and be provided the earliest intervention that is possible [37-39]. Research concerning the efficacy of shared book reading to children born preterm is in its beginning stages and shows promise as an early intervention that may be a feasible, family-friendly approach to increasing verbal interactions designed to facilitate language and literacy. Recent studies have involved training parents either in the NICU or after leaving the NICU to use shared book reading in an effort to facilitate caregiver interaction and responsivity [40,41]. The TELC may be a useful tool for clinicians and researchers interested in early shared reading behaviors of caregivers. As a checklist, which is relatively short, it may be a useful tracking and teaching tool for working with families of young children who are facilitating language and literacy through shared reading. Future study of these children using the TELC may provide insight on their unique strengths and weaknesses that may be addressed as needed through early shared reading experiences.

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