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Stephanie M. Curenton ^a; Laura M. Justice ^b

^a National Institute for Early Education Research, Rutgers University, The State University of New Jersey,

^b Ohio State University,

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Children's Preliteracy Skills: Influence of Mothers' Education and Beliefs About Shared-Reading Interactions

Stephanie M. Curenton

*National Institute for Early Education Research, Rutgers University,
The State University of New Jersey*

Laura M. Justice

Ohio State University

Research Findings: This research investigated the associations among children's preliteracy skills, mothers' education, and mothers' beliefs about shared-reading interactions for 45 Appalachian families. These variables were studied for lower income, primarily European American, families residing in a geographically isolated, small, rural community in the Appalachian Mountains. Children's performance on standardized measures of preliteracy skills pertaining to print concepts and alphabet knowledge was substantially lower than normative references, but their performance on tasks assessing their understanding of environmental print was similar to normative references. The preliteracy skills of children with more educated mothers were significantly better than those of children with less educated mothers. More educated mothers had higher ratings on a measure of parental beliefs about shared reading than less educated mothers had; however, maternal reports of the frequency of home literacy practices were similar for both groups. Mediation analyses indicated that mothers' beliefs about shared-reading interactions served as a mediator for the association between maternal education and children's understanding of reading conventions. *Practice or Policy:* Future directions for research and implications for practice are discussed.

The time period from birth to kindergarten is often referred to as the “emergent literacy stage” of reading and writing (Whitehurst & Lonigan, 2002). During these

Correspondence regarding this article should be addressed to Stephanie Curenton, National Institute for Early Education Research, Rutgers University, 120 Albany Street, Suite 500, New Brunswick, NJ 08901. E-mail: scurenton@nieer.org

years, children acquire a large variety of preliteracy skills that are positively correlated with later success in reading (e.g., Burgess, Hecht, & Lonigan, 2002; Chaney, 1994; Lonigan, 2006). Of the many literacy activities and events in which young children participate that are associated with preliteracy development, perhaps none has been more studied than parent-child shared reading (e.g., Fisch, Shulman, Akerman, & Levin, 2002; Justice & Ezell, 2000; Senechal, LeFevre, Hudson, & Lawson, 1996; Whitehurst et al., 1994).

Available meta-analyses describing the strength of the association between the frequency of parent-child shared-reading interactions and children's cognitive and literacy achievements have shown that these interactions explain a significant, albeit modest, 3% to 8% of the variance in children's outcomes (Bus, van IJzendoorn, & Pellegrini, 1995; Scarborough & Dobrich, 1994). Although this effect may be viewed as relatively small in a statistical sense, experts contend that it is of practical importance, given that parent-child shared-reading interactions are an open system that can be readily influenced by a range of effective interventions (see Lonigan, 1994). This is particularly true for lower income children, for whom research findings have shown a strong and consistent positive relationship between increased participation in shared-reading interactions and language and literacy achievements (Brody, Stoneman, & McCoy, 1994; Leseman & van den Boom, 1999; Whitehurst et al., 1994).

Studies that have investigated the value of young children's frequent participation in shared-reading interactions emphasize the importance of ensuring the quality of these exchanges because quality is viewed as a critical mediating process variable that explains the positive influence on children's language and literacy outcomes. The positive effects for the *quality* of reading experiences (as differentiated from *quantity*, or frequency) have found support in both correlational descriptive studies and experimental studies (e.g., Bennett, Weigel, & Martin, 2002; Leseman & van den Boom, 1999; Payne, Whitehurst, & Angell, 1994; Senechal, 2005; Senechal, LeFevre, Thomas, & Daley, 1998; Sonnenschein & Munsterman, 2002; Whitehurst et al., 1994). Experts contend that parents in high-quality shared-reading interactions are sensitive, responsive, and supportive (see Roberts, Jurgens, & Burchinal, 2005). In addition, high-quality shared-reading interactions are also characterized by active, engaged child involvement, including higher order extratextual conversations featuring inferential language about explanations and predictions (see van Kleeck, Vander Woude, & Hammett, 2006).

INFLUENCE OF MATERNAL EDUCATION

Numerous studies suggest that many parents view shared-reading activities as important for their children's literacy development, and they report frequently reading with their children (e.g., Frijters, Barron, & Brunello, 2000; Senechal et

al., 1996, 1998; Whitehurst et al., 1994). Nonetheless, examination of factors associated with shared-reading experiences at home has consistently pointed to socioeconomic status (SES) as influential in explaining variability in both the *quantity* (i.e., frequency) and *quality* of reading occurring in lower SES homes compared to middle- and upper SES homes (e.g., Foster, Lambert, Abbott-Shim, McCarty, & Franze, 2005; Roberts et al., 2005; Yarosz & Barnett, 2001). SES may be measured in a variety of ways, but most studies of parent-child shared reading have indexed SES through measurement of maternal education and/or maternal reading ability (e.g., Curenton, Craig, & Flanigan, 2008; Roberts et al., 2005; Yarosz & Barnett, 2001). In fact, maternal education has served as a particularly strong indicator of shared-reading quantity, with less educated mothers reading less frequently to their children than more educated mothers (Yarosz & Barnett, 2001).

Studies also suggest that shared-reading interactions occurring in low-SES homes are also qualitatively different than those in middle-SES homes (e.g., Heath, 1983; Ninio, 1980). However, even within SES strata there is substantial variability in the quality of parent-child reading exchanges. Neuman (1996) found there to be considerable variability in parent-child reading quality within her low-income sample, finding that parents who are proficient readers engage in more higher order conversations with their children during reading, such as reviewing the story plot or theme and linking the text events to children's lives. Neuman suggested that parents who are proficient readers appear to be more comfortable during reading than those who are less proficient readers, making it easier for proficient readers to engage in conversational interactions.

A recent study examining shared-reading with 72 low-income African American mothers found a positive correlation between maternal education and maternal sensitivity during reading, which is a measure of shared-reading quality (Roberts et al., 2005). Specifically, maternal sensitivity was correlated with more advanced discussion strategies about the content of the book.

INFLUENCE OF MATERNAL BELIEFS ABOUT SHARED READING

Low-quality shared-reading interactions among low-SES families may result from less educated parents holding different beliefs concerning the importance, goals, and structure of shared reading compared to the beliefs of more educated parents. Differing beliefs about shared reading may explain Roberts et al.'s (2005) findings concerning the relationship between maternal educational levels and maternal sensitivity and use of specific interactive strategies during reading interactions with toddlers.

Studies have shown that mothers within a sociocultural group can vary substantially in their beliefs concerning their role in promoting children's preliteracy skills, which can ultimately influence the frequency and quality of shared-reading experiences (Bennett et al., 2002; Hammer, Miccio, & Wagstaff, 2003). Parental belief systems are largely based on parents' own experiences as children (McGill-licuddy-DeLisi, 1982). Although several studies have examined the contribution of the frequency and quality of shared-reading experiences to children's preliteracy development, including studies focused specifically on lower SES families (e.g., Foster et al., 2005; Roberts et al., 2005), fewer studies have specifically examined how maternal beliefs about shared-reading interactions relate to children's preliteracy development. It is important to investigate the association between maternal shared-reading beliefs and children's preliteracy skills because researchers have found that parental beliefs are related not only to children's language and literacy skills but also to how parents act during reading interactions (DeBaryshe, 1995; DeBaryshe, Binder, & Buell, 2000).

The Parent Reading Belief Inventory (PRBI; DeBaryshe & Binder, 1994) was developed to assess parental beliefs about the goals and structure of shared-reading interactions. For example, the inventory measures whether parents view reading as an enjoyable activity in which the child should be actively involved and whether parents believe they should use interactive strategies to engage their child during the interaction. DeBaryshe (1995) found that low-income mothers with higher educational levels had more positive beliefs, values, and attitudes about shared reading than those with lower educational levels. Furthermore, these positive reading beliefs were associated with frequent home literacy activities, mothers' behavior during shared-reading interactions, and children's language skills.

Other researchers have also used the PRBI to examine the contribution of parental beliefs about shared reading to children's literacy skills. Bennett and colleagues (2002) conducted a study that examined how middle-class parents' reported beliefs related to their preschoolers' preliteracy skills. They studied the contribution of parental beliefs about shared reading and the frequency of home literacy practices to a latent construct termed the *family as educator model*. Of the three theoretical models tested (family as educator model, resilient family model, and parent-child care partnership model), only the family as educator model was significantly associated with children's preliteracy skills. It is important to note that of measures included as indicator variables of the family as educator model, parental beliefs about shared reading (based on the PRBI) and home literacy practices had the highest loadings, indicating that these two variables together served as the "most important components of the Family as Educator model" (Bennett et al., 2002, p. 305).

Bennett et al.'s (2002) work included primarily middle-income parents who were well educated, reported a high frequency of home literacy activities, and held

strong beliefs concerning the importance of quality shared-reading interactions. Thus, the authors noted that generalization of their findings should be interpreted cautiously. Nonetheless, this study provides a compelling case for recognizing that parental beliefs about shared-reading interactions may serve as an important mediator of children's preliteracy development.

The present study was conducted to further explore interrelationships among maternal reading beliefs and children's preliteracy skills, with a particular focus on examining these interrelationships among lower SES families. Currently, there is a great deal of attention concerning the preliteracy development of low-SES children, with studies consistently showing moderate to strong correlations between SES and children's preliteracy skills (e.g., Bowey, 1995; Chaney, 1994; Justice & Ezell, 2001; Lonigan et al., 1999) and the frequency and quality of home literacy experiences (e.g., Foster et al., 2005). With national data showing that only 15% of low-SES pupils exhibit proficient reading skills in fourth grade compared to 42% of middle- and upper SES pupils (National Center for Education Statistics, 2003), there is an increased impetus for understanding the home literacy experiences of low-SES children and using this knowledge to improve preventive programs that foster children's early success in reading development.

Our sample comprised 45 mothers and their preschoolers residing in a small, geographically isolated community in the Appalachian Mountains, a population of considerable relevance to refining theoretical models of how parental literacy beliefs about shared reading and home literacy activities may contribute to children's preliteracy skills. Studies of home literacy in Appalachian households are also important in a more practical sense, given that many children, adolescents, and adults in this region exhibit relatively low educational and literacy achievement compared to non-Appalachians (Haaga, 2004). Appalachian children perform significantly more poorly on standardized measures of language skill during the preschool years (Fish & Pinkerman, 2003), and once in school they are more likely to leave school without receiving a high school diploma and to drop out of college without receiving a degree (Haaga, 2004). Consequently, substantially fewer Appalachian adults have high school diplomas and college degrees compared to the general U.S. population, and their level of literacy skills is also comparatively low, due at least in part to less time spent in formal schooling. Although educational attainment among Appalachian adolescents and adults increased slightly during the past decade, the achievement gap between the Appalachian region and the United States as a whole actually became larger (Haaga, 2004). This was particularly true in the most economically distressed counties of Appalachia: In 2000, only 10% of the adult population in distressed counties was college educated compared to 24% of U.S. adults as a whole (Haaga, 2004).

The poor educational outcomes of Appalachian parents and children beg for more investigations of home literacy practices and preliteracy development within

this population. We asked three questions: (a) How do Appalachian preschoolers perform on standardized norm-referenced measures of preliteracy skills? (b) To what extent do more and less educated Appalachian mothers differ in their beliefs about shared reading and their reported frequency of home literacy activities? and (c) To what extent do Appalachian mothers' beliefs about shared reading mediate the relationship between maternal education and children's preliteracy skills?

METHOD

Participants

The data for this study were collected on 45 children and families in the fall of 2004. The 45 children (27 boys, 18 girls) ranged in age from 37 to 62 months, with a mean age of 53 months ($SD = 5.8$); the mean age for mothers was approximately 30 years of age ($SD = 7.77$, range = 19–51 years). In all, 37 of the mothers reported that they provided the most care for their children in the study (either alone or in conjunction with another family member) based on response to a demographic questionnaire; for the remainder, primary care was provided by another close family member such as the father, mother-in-law, or grandparents. Of the children, 43 were Euro-American and 2 were Native American. All children were native English speakers and resided in homes in which English was the primary language spoken.

The children were recruited from five preschool classrooms in an Appalachian county. This county was located in a geographically isolated region of the Appalachian Mountains, and educational achievement in the county was relatively low, with approximately 40% of adults having less than a high school diploma (compared to about 20% of the U.S. population). The median household income in this county was \$21,000 annually, and the per capita estimated income per adult was \$12,000. In our sample, only 31 parents chose to report data on their household income. The other 14 families elected not to provide this information. For those families for which household income was available ($n = 31$), the mean reported annual income was \$23,971 ($SD = \$15,006$), with a range of \$0 to \$53,000. The median annual income was \$20,000, with one third of families reporting annual household incomes of less than \$16,000.

Few private day care or preschool programs were available in the community, thus the majority of parents who opted for preschool placements enrolled their children in the classrooms we studied. Of the five classrooms, two were administered by the local Board of Education, two were blended programs administered collaboratively by the Board of Education and Head Start, and one classroom was affiliated with Even Start. Preliminary analyses indicated that there were no signif-

icant differences between classrooms on any demographic measures, such as maternal education, $F(4, 38) = 0.70, p = ns, n = 43$; or children's vocabulary, $F(4, 36) = 0.51, p = ns, n = 41$. In addition, there were no classroom differences on the study variables: home literacy practices, $F(4, 40) = 0.89, p = ns, n = 45$; maternal literacy beliefs, $F(4, 40) = 0.56, p = ns, n = 45$; Test of Early Reading Ability (3rd edition; TERA) Meaning, $F(4, 40) = 1.73, p = ns, n = 45$; TERA Print Concepts, $F(4, 40) = 0.45, p = ns, n = 45$; and TERA Alphabet, $F(4, 40) = 0.67, p = ns, n = 45$. Therefore, children from all classrooms were combined into one group for analyses.

In the present sample, information concerning maternal educational attainment was available for 43 of the 45 families. Five mothers (11.6% of the sample) had less than a high school diploma, 23 (53.5%) were high school graduates, 7 (16.3%) had completed some college, and 8 (18.6%) had college degrees. For some analyses, we divided the mothers into two groups for comparative purposes based on level of educational attainment: less educated ($n = 28$) and more educated ($n = 15$). The less educated mothers were those who had attended some high school or had received a high school diploma, whereas the more educated mothers had attended some college or had received a college degree.

General Procedures

Parental questionnaires and direct, standardized child assessments were conducted during a 4-week assessment window that commenced approximately 4 weeks after the start of the academic year. A variety of parental questionnaires and child assessments were used to study the home environment and children's language and literacy abilities. Parental questionnaires were administered by family-resource specialists during home visits to gather information about sociodemographic factors, childrearing beliefs, community activities, and parent-child relationship quality. For the present purposes, of relevance were two questionnaires used to estimate parental reading beliefs and frequency of home literacy activities, discussed subsequently. For all cases in the present study mothers were the survey respondents; therefore, the focus in the present study was on mothers' beliefs about shared reading and their reports of home literacy practices. Although maternal reports of home literacy practices may have included reports of other family members reading to the child, they focused specifically on the mothers' views of how often the family engaged in literacy practices. It is common and traditional in the literature on children's preliteracy skills for mothers to be the informants (see Bennett et al., 2002; DeBaryshe, 1995; DeBaryshe et al., 2000; Senechal et al., 1996, 1998). When meeting with mothers, family-resource specialists were instructed to read the questionnaires to parents who preferred this modality or who were unable to read the questions on their own. For these mothers, family-resource

specialists recorded parental responses on the questionnaire. Other parents completed the questionnaires on their own.

Direct child assessments were conducted by school staff (e.g., reading specialist, speech–language pathologist) following training in test administration by the second author. Children were assessed in quiet locations outside of their classrooms in sessions approximately 30 min in duration. Standardized assessment of language ability showed that these children as a group performed similarly to national samples (scaled with $M = 100$ and $SD = 10$) for receptive vocabulary ($M = 98.3$, $SD = 11.8$, $n = 41$) on the Peabody Picture Vocabulary Test–III (Dunn & Dunn, 1997). Thus, this sample consisted of children who were within normal developmental range for verbal ability.

Parental reading beliefs. Each parent completed the 42-item PRBI (DeBaryshe, 1990), which presents a series of statements to which parents respond on a 4-point scale (1 = *strongly disagree* and 4 = *strongly agree*). This inventory was designed to assess parents' attitudes about the benefits of reading, their views about how children learn from and should engage in reading, and their opinions about their skills as teachers of their children. We selected this instrument based on the finding of Bennett and colleagues (2002) that scores on the PRBI served as the second strongest indicator variable for their theoretical family as educator construct, which was positively associated with preschoolers' preliteracy skills.

Individual item responses on the PRBI are used to calculate seven subscales: Teaching Efficacy, Positive Affect, Verbal Participation, Reading Instruction, Knowledge Base, Resources, and Environmental Input (see DeBaryshe & Binder, 1994). A sum PRBI score is also calculated by adding all items; the analyses for the present research used the sum score. The alpha for the entire scale's 42 items calculated on parent responses in the current study was .85; this high coefficient indicated that the items of the scale were internally consistent and that the separate items of the scale assessed aspects of the same construct. According to Keith and Reynolds (1990), a coefficient alpha is the preferred statistic for estimates of construct reliability, and thus it is reported as a measure of internal consistency across the various assessments used in this study.

Home literacy activities. Each parent completed the 9-item Literacy-Related Activities Questionnaire used by Bennett et al. (2002). Mothers responded to a series of nine statements concerning the frequency of specific home literacy activities. The items include questions that assess the frequency of written and oral literacy activities (e.g., "How often do you or another family member read aloud to your child?" and "How often do you or another family member sing or recite rhymes to your child?"). There are also items that assess how frequently the child engages in literacy activities on his or her own (e.g., "How often does your child

look at books by himself/herself?" and "How often does your child draw pictures?"). Items are answered using a 5-point scale ranging from 1 (*hardly ever*) to 5 (*two or more times daily*). The alpha for the nine items for the current study was .80, indicating that these items were internally consistent and reliable.

Children's preliteracy skills. Children were individually administered the TERA (Reid, Hresko, & Hammill, 2001). This standardized assessment of preliteracy development comprises three subtests: Conventions, Meaning, and Alphabet. The Conventions subtest measures children's facility with general conventions of print, such as knowing where to begin reading and that print moves from left to right. The average reliability coefficient (alpha) on this subtest is .88. The Meaning subtest (average $\alpha = .90$) measures children's ability to understand the meaning and functionality of printed material that commonly appears in the environment, such as being able to identify the logo for McDonald's or Jell-O. The Alphabet Subtest assesses children's knowledge of the alphabet, particularly letter names and the distinction between numbers and letters. The average alpha on this subtest is .94. A standard score is derived for each subtest, for which the mean is 10 and the standard deviation is 3.

RESULTS

Appalachian Preschoolers' Preliteracy Skills

An initial goal of this study was to characterize the preliteracy skills of Appalachian preschoolers. Children's performance on the TERA varied among the three subtests (see Table 1). Meaning scores were considerably higher than those for Conventions and Alphabet ($M = 9.49$, $SD = 2.12$; $M = 8.00$, $SD = 1.94$; and $M = 6.73$, $SD = 2.22$, respectively). A one-way repeated measures analysis of variance was used to examine whether these differences were statistically significant, and results revealed a within-subjects effect for the subscales, Wilks's $\Lambda = .47$, $F(2, 43) = 24.33$, $p < .001$, $\eta^2 = .53$. Follow-up pairwise comparisons using the Bonferroni procedure indicated that children's scores on the Meaning subtest were significantly better than their scores on the Conventions and Alphabet subtests. Their scores on the Conventions subtest were better than their scores on the Alphabet subtest. According to Judd and McClelland (1989), effect size estimates for eta-squared can be interpreted as small (.03), medium (.10), or large (.30). These comparisons showed that Appalachian preschoolers' understanding of the meaning of print was much better than their knowledge of reading conventions and the alphabet; alphabet knowledge was an area of relative weakness.

TABLE 1
Descriptive Findings for PRBI, Literacy Practices, and TERA

<i>Measure</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Maternal beliefs (PRBI)	158.1	8.7	119–167
Home literacy practices	30.4	4.4	21–40
TERA Conventions	8.0	1.9	1–12
TERA Meaning	9.5	2.1	5–13
TERA Alphabet	6.7	2.2	4–15

Note: PRBI = Parent Reading Belief Inventory; TERA = Test of Early Reading Ability (3rd edition).

As an additional analysis, we compared our sample's preliteracy performance to that of the reference database used to norm the TERA. We determined the number of children receiving standard scores of 7 or lower for individual subtests, corresponding to -1 *SD*. According to the nationally based norm references, 16% of pupils should be expected to receive scores equal to or less than 7. In our sample, 40% of children had scores of 7 or lower on Conventions; 20% had scores of 7 or lower on Meaning; and 71% had scores of 7 or lower on Alphabet. These results showed that this sample performed similarly to national norms on measures of environmental print (Meaning subtest). However, a greater proportion of children in this sample exhibited low levels of preliteracy skills in terms of concepts about reading (Conventions subtest) and alphabet knowledge (Alphabet subtest). For the latter measure, nearly three fourths of the sample showed strikingly underdeveloped skills compared to same-age normative references.

Maternal Education, Shared-Reading Beliefs, and Home Literacy Activities

A second goal was to consider the extent to which maternal education was associated with differences not only in maternal beliefs about shared reading but also with reported frequency of home literacy practices and children's preliteracy skills. A comparison of children's preliteracy scores for less and more educated mothers is presented in Table 2. Results of a multivariate analysis of variance showed that more educated mothers had children with significantly higher scores on all three subscales. Multivariate analyses of variance are appropriate to use when analyzing data from subtests that come from the same measure and that represent different, yet related, aspects of the same construct because the multivariate effect takes into consideration Type I error. Results indicated a significant multivariate effect for maternal education, Wilks's $\Lambda = .76$, $F(3, 39) = 4.21$, $p < .02$, $\eta^2 = .25$, consistent with a medium to large effect.

TABLE 2
 Comparison of Maternal Shared-Reading Beliefs, Home Literacy Practices, and Children's Preliteracy Skills for Less and More Educated Mothers ($n = 43$)

Variable	Less Educated Mothers		More Educated Mothers	
	<i>M (SD)</i>	<i>Range</i>	<i>M (SD)</i>	<i>Range</i>
Maternal shared-reading beliefs	155.8 (9.9)	119–166	162.2 (4.3)	149–167
Literacy practices	29.6 (4.6)	21–40	31.4 (3.9)	27–39
TERA Conventions	7.4 (2.0)	1–11	9.1 (1.4)	6–12
TERA Meaning	9.0 (2.3)	5–13	10.5 (1.2)	9–13
TERA Alphabet	6.3 (2.2)	4–15	7.5 (2.1)	4–11

Note: TERA = Test of Early Reading Ability (3rd edition).

Follow-up Bonferroni pairwise comparisons of the two groups showed that children of less educated mothers had lower scores than those of more educated mothers on the Conventions and Meaning subtests. However, there were no differences between the groups in terms of the Alphabet subtest. Effect size estimates for these differences were calculated using Cohen's d (with bias corrected based on Hedges & Olkin's, 1985, factor) to include 95% confidence intervals (CIs). Effect size estimates for the three preliteracy measures ranged from medium for Alphabet ($d = 0.54$; 95% CI = 0.09 to 1.18) to large for Meaning ($d = 0.74$; 95% CI = 0.09 to 1.38) and very large for Conventions ($d = 0.92$; 95% CI = 0.26 to 1.57). None of the 95% CIs overlapped with zero, suggesting that the comparisons identified reliable differences between the two groups in preliteracy scores.

Additional analyses of variance showed that the more educated mothers provided significantly higher ratings on the PRBI compared to the less educated mothers, $F(1, 42) = 5.59$, $p < .05$ (see Table 2), and effect size estimates were consistent with a medium to large effect ($d = 0.75$; 95% CI = 0.1 to 1.39). However, there was no difference between the two groups of mothers for reported home literacy practices, $F(1, 42) = 1.65$, $p = .21$. The effect size contrast for literacy practices was consistent with a small to medium effect ($d = 0.4$; 95% CI = -0.23 to 1.04), but the 95% CI overlapped with zero, thus indicating that more and less educated mothers did not differ reliably in their reported home literacy practices. The results of these analyses thereby suggested that a distinguishing characteristic of more and less educated mothers was not the *frequency* of home literacy activities, but their beliefs concerning the value and importance of shared-reading interactions.

Maternal Shared-Reading Beliefs as a Mediating Variable

Table 3 presents, for descriptive purposes, the correlation coefficients representing associations among study variables. These results indicated that characteristics of

TABLE 3
Correlations Among Measures

Measure	1	2	3	4	5	6
1. TERA Conventions	—	.30*	.30*	.44**	.59**	.30*
2. TERA Meaning		—	.27	.31*	.32*	.18
3. TERA Alphabet			—	.34*	.16	.21
4. Mother's education				—	.40**	.21
5. Maternal reading beliefs					—	.33*
6. Home literacy practices						—

Note: TERA = Test of Early Reading Ability (3rd edition).

* $p < .05$. ** $p < .01$.

the mothers, namely their education level, beliefs about shared reading, and reported literacy practices, each had significant associations with one or more measures of children's preliteracy skills. For instance, maternal education was significantly and positively associated with children's scores on all three preliteracy measures ($r_s = .44, .31, \text{ and } .34$, respectively, for Conventions, Meaning, and Alphabet). In addition, maternal education was significantly associated with mothers' beliefs about shared reading ($r = .40$), but maternal education was not associated with reported home literacy practices, suggesting that advances in education level were associated with more positive beliefs about shared-reading activities but not with differences in how often the mothers reported engaging in literacy-related activities.

Maternal beliefs about shared reading were significantly related to children's scores on two preliteracy measures ($r_s = .59 \text{ and } .32$, respectively, for Conventions and Meaning), but mothers' reports of home literacy practices were associated with only one preliteracy measure, the Conventions subtest ($r = .30$). The significant moderate correlation between maternal education and beliefs about shared reading suggested the possibility that mothers' beliefs may have been a mediating factor in the relationship between education and children's preliteracy skills. In contrast, because of the nonsignificant relationship between education level and home literacy practices, mothers' reports of home literacy practices could not function as such a mediator (see Baron & Kenny, 1986).

To consider the possibility that the relationship between maternal education and children's preliteracy skills was mediated by maternal beliefs about shared reading, we conducted two mediation analyses per Baron and Kenny's (1986) regression procedures. The first analysis tested the hypothesis that maternal beliefs about shared reading mediated the relationship between maternal education and children's knowledge of reading conventions (based on the TERA Conventions subtest; see Table 4). The second analysis tested the hypothesis that maternal beliefs mediated the relationship between maternal education and children's knowledge of print meaning (based on the TERA Meaning subtest; see Table 5). There was no

TABLE 4
Steps in Mediation Analysis for Children's Scores on Conventions

<i>Variable</i>	<i>b (SE)</i>	<i>B</i>	<i>t</i>	<i>p</i>
Children's reading conventions (DV)				
Step 1: (IV predicts DV)				
Maternal education	0.89 (0.28)	.44	3.14	<.01
Maternal reading beliefs (MV)				
Step 2: (IV predicts MV)				
Maternal education	3.63 (1.30)	.40	2.80	<.01
Children's reading conventions (DV)				
Step 3: Mediation analysis				
Maternal education	0.49 (0.27)	.25	1.82	.08
Reading beliefs	0.11 (0.03)	.49	3.64	<.01

Note: DV = dependent variable; IV = independent variable; MV = mediator.

TABLE 5
Steps in Mediation Analysis for Meaning

<i>Variable</i>	<i>b (SE)</i>	<i>B</i>	<i>t</i>	<i>p</i>
Children's print meaning (DV)				
Step 1: (IV predicts DV)				
Maternal education	0.67 (0.32)	.31	2.12	<.05
Reading beliefs (MV)				
Step 2: (IV predicts MV)				
Maternal education	3.63 (1.30)	.40	2.80	<.01
Children's print meaning (DV)				
Step 3: Mediation analysis				
Maternal education	0.46 (0.34)	.22	1.36	.18
Reading beliefs	0.06 (0.04)	.24	1.51	.14

Note: These mediation analyses were not significant; thus, mediation had not occurred. DV = dependent variable; IV = independent variable; MV = mediator.

mediation analysis conducted for alphabet knowledge because scores on this subtest were not significantly correlated with the mediator variable. Figure 1 and Table 4 present this analysis for the Conventions subtest of the TERA, confirming that mothers' beliefs about shared reading mediated the relationship between maternal education and children's reading convention knowledge. However, as detailed in Table 5, mothers' beliefs did not mediate the relationship between maternal education and children's understanding of the meaning of print. These findings suggested that maternal beliefs represented an important variable when considering the relationship between maternal education and certain aspects of children's preliteracy development (*viz.*, their understanding of reading conventions).

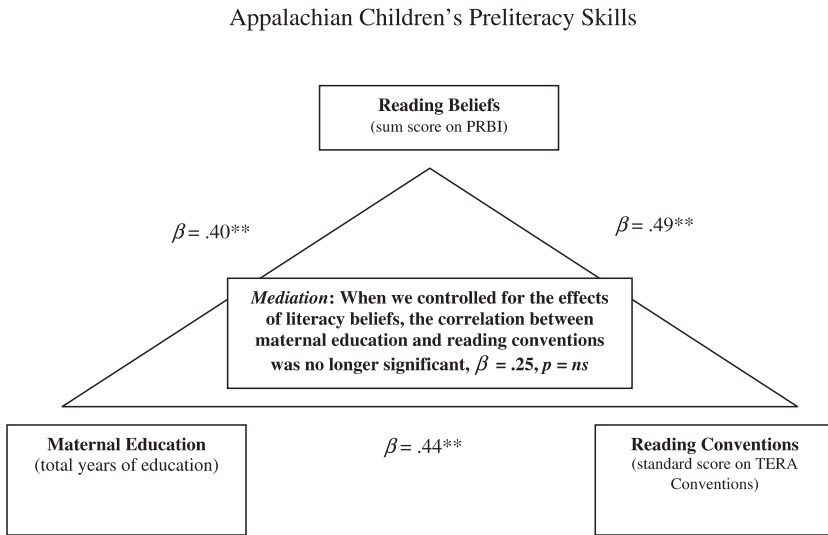


FIGURE 1 Mothers' shared-reading beliefs mediated the association between maternal education and reading conventions ($n = 43$). $**p < .01$. PRBI = Parent Reading Belief Inventory; TERA = Test of Early Reading Ability (3rd edition).

DISCUSSION

Appalachian Children's Preliteracy Skills

The purpose of this study was to examine the associations among mothers' beliefs about shared reading, mothers' reported home literacy activities, and children's preliteracy skills for a sample of lower SES Appalachian families. Results from this study support other research by finding that significant portions of Appalachian children are at risk for poor preliteracy skills (Fish & Pinkerman, 2003). As a group, the children in our sample exhibited lower scores compared to normative references for two of three aspects of preliteracy studied, with a corresponding 40% and 71% of children receiving scores that were one standard deviation less than the mean on the Conventions and Alphabet subtests, respectively. Thus, a significant portion of our sample may be considered at risk in their preliteracy development in terms of their knowledge of letters and print concepts.

These findings have meaningful implications for children's long-term school success because the ability to recognize letters and understand print concepts is related to children's reading abilities during the early elementary grades (Whitehurst & Lonigan, 2002). Children who enter kindergarten with inadequate skills in these areas may find reading difficult as they progress through elementary school. These findings have meaningful short-term implications as well, because children with

lower than average preliteracy skills may have difficulty following the classroom curriculum, which is often geared toward the skills of the average student (Rock & Stenner, 2005). Thus, findings from this study highlight the fact that there is a great need for high-quality systematic attention to emergent literacy development (particularly in terms of alphabet knowledge and print concepts) within preschool classrooms serving lower income Appalachian children.

Influence of Maternal Education

Despite the fact that the children in this study, as a group, displayed higher risks for poor literacy, mother's education was found to be an important factor associated with children's skills in two areas: their understanding of reading conventions and print meaning. Children of mothers who were more educated had higher scores in these two areas than children of mothers with lower educational backgrounds. These results suggest that mothers with relatively more education may be more inclined to explicitly highlight features of reading while sharing storybooks and features of print in everyday activities, such as when grocery shopping or eating at McDonald's, in contrast to mothers with less education. The effect size for these contrasts was large, indicating that children who had mothers with education beyond high school had scores that were almost one standard deviation greater than children whose mothers had only a high school education or less. Thus, higher maternal education was found to be a salient protective mechanism in preliteracy development among this sample.

According to our results, one factor that may have been driving this group difference is that more highly educated mothers had different *beliefs* about how to engage their child during shared-reading interactions in comparison to less educated mothers. Although both groups reported participating in home literacy activities with the same frequency, the more educated mothers had higher scores on the PRBI, indicating that they had more positive beliefs about shared reading. Thus, attaining an advanced education was not associated with a difference in behavior (i.e., more frequent home literacy activities) but rather a difference in the process by which mothers shared books with their children, with higher belief scores corresponding to views that shared reading is an activity that should be enjoyable and one in which the child should be actively involved. Thus, maternal beliefs about shared reading represent a key differentiating factor in the literacy socialization experiences for children of less and more educated mothers.

Furthermore, the findings from the present study illustrate how beliefs about shared reading may be a stronger influence on children's preliteracy skills than maternal reports of the frequency of home literacy activities because maternal beliefs were related to children's understanding of the meaning of print and reading conventions, but self-reports of home literacy practices were related only to read-

ing conventions. It is important to note that the present research may underestimate the effects of frequent home literacy activities due to the manner in which the frequency of home literacy practices was assessed. Although the procedure used to assess frequency followed a common format used in the field (e.g., Bennett et al., 2002; Frijters et al., 2000; Senechal et al., 1996, 1998), other methods for assessing frequency may have yielded different results. For instance, the present findings contradict the seminal work of Purcell-Gates (1996), whose careful ethnographic observations within low-income children's homes found that the frequency of observed reading behaviors in the home was related to children's understanding of reading conventions. Purcell-Gates's measure of frequency included a wide variety of *observed* instances of adult interactions with literacy, ranging from reading food labels and magazines to participating in shared reading and spelling homework assignments with children. In contrast, in the present study parents were asked to *report* on a much narrower range of literacy instances. Other researchers have criticized such parental reports of home literacy activities as highly susceptible to social desirability (Evans, 1998; Senechal et al., 1996, 1998). Future studies may benefit from including measures of parental report as well as observational measures of parents' literacy-related activities in the home.

Mothers' Beliefs About Shared Reading as a Mediator

A particularly interesting finding in this study was that maternal beliefs about shared reading served as a mediator for the relationship between maternal education and the preliteracy skills of Appalachian preschoolers. Analyses indicated that mothers' beliefs about shared reading mediated the association between maternal education and children's understanding of the conventions of reading. In contrast, beliefs about shared reading did not mediate the association between maternal education and children's understanding of the meaning of print. The reason for these differing results may be because the skills associated with understanding the conventions of reading are *specifically* learned and taught during shared reading, but the skills associated with understanding the meaning of print are learned during everyday interactions in a literate environment. For instance, items for the Conventions subtest ask children to recognize the proper way to hold a book, recognize a title, and recognize where to begin reading on the page. However, the items for the Meaning subtest ask children to recognize packaging for candy and environmental print such as exit signs.

The results of these mediation analyses highlight the fact that maternal beliefs about shared reading should be viewed as an internalized *psychological process* variable that helps to account for the association between maternal educational level and children's preliteracy concepts. As our findings demonstrate, once mothers' beliefs about shared reading are partialled out, the association between their education level and children's understanding of print is no longer significant. Ac-

According to Baron and Kenny (1986) mediator variables are the mechanism by which external characteristic variables, such as maternal education, take on internal psychological meaning. Thus, in our study, mother's education level served as an external marker that represented internal psychological beliefs and values about how mothers should share books with children and how children should verbally participate in these activities.

There are several reasons why mothers' beliefs about shared-reading interactions may serve as a mechanism for influencing children's knowledge of reading conventions. First, items on the PRBI asked the mother to rate her beliefs regarding the level of participation and involvement they believe children should have during shared-reading interactions. For instance, mothers were asked to endorse how strongly they agreed or disagreed with statements like "I ask my child lots of questions when we read" and "When I read, I try to sound excited so my child is interested." Mothers who agree with statements such as these may be creating an environment in which children are more actively involved during the interaction. Children's active involvement in shared reading and other literacy activities is an important and unique predictor of the amount of learning that occurs in such activities (Justice, Chow, Capellini, Flanigan, & Colton, 2003).

Second, mothers' beliefs may serve as a vehicle between maternal education level and children's understanding of reading because advances in education may signal a heightened awareness of the importance of shared-reading activities for facilitating children's growth as readers. Findings from observational research indicate that mothers who view reading as important engage in more extratextual talk with their children during the reading interaction than mothers who do not view reading as important (Bus, Leseman, & Keultjes, 2000). Extratextual conversations that focus on print and features of print or reading have consistently been found to positively affect children's preliteracy skills (Justice & Ezell, 2000, 2002).

Other researchers have found that parental beliefs as measured by the PRBI are related to how parents and children interact during reading activities (DeBaryshe et al., 2000), and our findings support research reporting higher preliteracy skills in children of mothers who view home literacy activities as a source of enjoyment and entertainment compared to mothers who view literacy activities as an opportunity to *drill* skills (Sonnenschein et al., 1997). The present results are compelling because they suggest that it is not simply a matter of "going through the motions" (i.e., simply reading a book to a child) that enhances children's knowledge of reading; rather, it is more a matter of *intentionally* engaging the child during the activity.

Implications for Practice

The present research shows that low-SES preschoolers residing in a rural, isolated Appalachian community exhibit substantially underdeveloped preliteracy skills,

particularly in the area of alphabet knowledge and conventions. Maternal education was significantly associated with such differences, with higher maternal education serving as a protective factor for children's preliteracy achievements. Of interest is that the relationship between maternal education and one aspect of children's preliteracy skills (knowledge of reading conventions) was fully mediated by maternal beliefs about shared-reading interactions. In the next paragraphs, we discuss several implications for practice based on this work.

First, the necessity of preliteracy interventions for young, at-risk children is clearly suggested by these findings. Current educational policies emphasize the importance of ensuring that all children enter school "ready to learn." As this study shows, some children are particularly vulnerable to not achieving adequate levels of readiness within the area of preliteracy development. The results show that, with nearly three fourths of the present sample performing more than one standard deviation below the mean on a standardized measure of alphabet knowledge, some populations of children are not achieving their full readiness potential. Although they live in a rural area, isolated Appalachian children have not historically been identified as among those populations most at risk (e.g., Snow, Burns, & Griffin, 1998). The present research suggests that these children exhibit as many challenges in preliteracy development as other populations of children who characteristically are focused upon in preliteracy research and policy reports.

Second, our results suggest that alphabet knowledge might be less impacted by the frequency of shared reading and mothers' beliefs about shared reading relative to other aspects of preliteracy development. Neither mothers' shared-reading beliefs nor their reported literacy activities were associated with children's scores on the Alphabet subtest (e.g., letter recognition). This finding is important because alphabet knowledge is consistently shown to be a unique predictor of children's later performance in word recognition (see National Early Literacy Panel, 2004) and because alphabet knowledge was the area in which the present sample exhibited greatest risk. There is support in the observational literature that participation in shared-reading experiences has relatively little effect on preschoolers' print-related skills, presumably due to the lack of explicit focus on letters and words that typically occurs within shared-reading interactions (see Justice & Ezell, 2000, 2002, 2004). Mothers reading with preschoolers rarely comment on or ask questions about print (Justice & Ezell, 2000). Likewise, preschool children seldom even *look* at numbers and words within storybooks (Evans & Saint-Aubin, 2005; Justice, Skibbe, Canning, & Lankford, 2005) or ask questions or make comments about them (Shapiro, Anderson, & Anderson, 1997). Nonetheless, researchers have shown that inclusion of explicit references to print (both nonverbal and verbal) within adult-child reading interactions may promote children's print-related knowledge, including alphabet skills (see Justice & Ezell, 2002). Therefore, interventions designed to enhance low-income children's preliteracy skills might include a parent education component on how to maximize children's interactions

with and attention to print within storybook shared reading, including reference to how parents can embed conversations about the alphabet within these interactions to facilitate children's alphabet knowledge.

Finally, findings from our sample have implications for intergenerational macro-level interventions, such as those designed to encourage parental education among low-income mothers. Our results suggest that mothers' opportunities with higher education are associated with positive literacy beliefs. Therefore, parent-level interventions that facilitate mothers' abilities to continue their education may *indirectly* increase children's literacy skills because mothers internalize positive ideas about reading as they continue on in their education.

Directions for Future Research

Although this work presents interesting findings, the results must be generalized with caution due to limitations in sample and design. An important limitation is that the sample may not be representative of wider segments of the Appalachian population or low-SES families because our sample represented a small number of families residing in a single community. Future research on this topic should strive to obtain larger samples of participants so that results can be compared across different populations to ensure generalizability. A second limitation is that our design involved maternal self-reports concerning reading beliefs and home literacy practices. Social desirability is always a concern for researchers who use parental reports to estimate the frequency of home literacy activities, given that many parents are aware of the benefits of home literacy practices and may feel compelled to embellish the reporting. Likewise, there are disadvantages to having the same respondent (i.e., the mother) complete questionnaires detailing both literacy beliefs as well as literacy practices, which could result in mothers with higher beliefs also reporting more frequent reading interactions. Limitations such as these, which are frequently observed in survey research, can be addressed in future research by combining survey and observational data. The use of multiple measures, including observation of actual literacy behaviors in the home (see Purcell-Gates, 1996) and of parent-child interaction during shared reading, would provide a richer and more accurate portrayal of home literacy socialization practices. Structured observations of parent-child interactions would also allow researchers to understand the extent to which parental beliefs directly relate to practices during shared reading. Prior research using the PRBI with low-income and working-class, ethnically diverse rural populations in North Carolina indicated that there is a significant link between parents' reported reading beliefs and their behavior during shared reading (DeBaryshe, 1995), but the present methods precluded investigation of such linkages.

Despite these limitations, this study has several strengths that make it a significant contribution to the field. First, it is one of the few studies (see Fish, 2001; Fish

& Pinkerman, 2003) examining literacy and language development in Appalachian preschoolers. The present work provides important developmental information on this population and will be informative to future research that attempts to model influences on preliteracy skills in Appalachian preschoolers. Second, this study provides a glimpse into Appalachian mothers' attitudes about reading and lays the foundation for future research using structured observations of this population. This study suggests the importance of investigating (a) how maternal beliefs relate to children's preliteracy skills and (b) the bidirectional relationship between maternal literacy beliefs and educational access. Third, this research is useful for designing both policy-level (macrolevel) and parent-child (microlevel) literacy interventions because the findings suggest that interventions should focus on impacting children's preliteracy skills not only directly via shared-reading interventions, but also indirectly via advances in mothers' educational opportunities.

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