

# ***Effects of Two Shared-Reading Interventions on Emergent Literacy Skills of At-Risk Preschoolers***

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*The effects of 2 preschool-based shared-reading interventions were evaluated with 95 children, ages 2- to 5-years, from low-income families. Language skills of the children were below age-level as measured by standardized tests. Children were pretested and randomly assigned to 1 of 3 conditions: (a) no-treatment control, (b) typical shared-reading condition, and (c) dialogic (interactive) shared-reading condition. For both intervention conditions, undergraduate volunteers read to children in small groups. Following the 6-week intervention, children were posttested on measures of oral language, listening comprehension, and phonological sensitivity. Both interventions produced positive effects. Results favoring dialogic reading were found on a measure of descriptive use of language, whereas results favoring typical shared-reading were found on measures of listening comprehension and alliteration detection.*

If looking is not enough, what is one to do? How can the observer quicken his or her sensitivity to the critical feature of the observed? The answer to this question was given to me more than 30 years ago, long before I was ready to appreciate it, by my first mentor in graduate school, Walter Fenno Dearborn. In his quiet, crisp New England accent, he once remarked: "Bronfenbrenner, if you want to understand something, try to change it." (Bronfenbrenner, 1977, p. 517)

According to the Carnegie Foundation for the Advancement of Teaching report (1991), *Ready to learn: A mandate for the nation*, 35% of children in the United States lack the vocabulary and sentence structure skills necessary for full participation in the educational process. Although aspects of these conclusions are subject to debate—are children unready for schools or schools unready for children—there is little doubt about the significant mismatch between what many children bring to school and what schools expect of children. Children from low-income families appear to

be particularly at risk for educational problems. Socioeconomic status (SES) has been reported as one of the strongest predictors of school performance at the beginning of first grade (Alexander & Entwisle, 1988), and when schools are ranked by the median SES of their students, SES correlates .68 with academic achievement (White, 1982).

Studies have found that children from low-income families are (a) at risk for reading difficulties (Dubrow & Ippolito, 1994; Juel, Griffith, & Gough, 1986; Smith & Dixon, 1995), (b) more likely to be slow in the development of language skills (Juel et al., 1986; Lonigan & Whitehurst, 1998; Whitehurst, 1997), and (c) less developed in letter knowledge and phonological sensitivity prior to school entry (Bowey, 1995; Lonigan, Burgess, Anthony, & Barker, 1998; Raz & Bryant, 1990) than children from higher income families. Such differences in language, letter knowledge, and phonological sensitivity relate to later differences in word decoding skills and reading

comprehension (Butler, Marsh, Sheppard, & Sheppard, 1985; Raz & Bryant, 1990; Share, Jorm, MacLean, & Mathews, 1984; Stevenson & Newman, 1986). The relation between children's skills when they enter school and their later academic performance is strikingly stable (Baydar, Brooks-Gunn, & Furstenberg, 1993; Juel, 1988; Stevenson & Newman, 1986; Tramontana, Hooper, & Selzer, 1988). Children who experience early difficulties in learning to read are unlikely to catch-up to their peers. Children who enter school with limited reading-related skills are at high risk of qualifying for special education services. In fact, a majority of children referred for special education evaluation are referred because of unsatisfactory progress in reading (Lentz, 1988). Moreover, as noted by Stanovich (1986) deficits in reading skills may be relatively specific initially, but this specificity breaks down as the reciprocal relations between reading and achievement in other areas increases.

Significant social class differences in oral language and other preliteracy skills may be associated partially with differences in shared-reading in the home as well as other opportunities for language interaction (Hart & Risley, 1992, 1995). Numerous studies have documented differences in the pattern of book ownership and frequency of shared-reading between families with lower SES and families with higher SES (Adams, 1990; Anderson & Stokes, 1984; Feitelson & Goldstein, 1986; Heath, 1982; Raz & Bryant, 1990; Teale, 1986). McCormick and Mason (1986) reported that 47% of their sample of public-aid parents reported no alphabet books in the home, whereas only 3% of their sample of professional parents reported the absence of such books. Many educators, parents, and the popular press hold the view that shared-reading is a critical variable in children's acquisition of literacy (Adams, 1990; Bush, 1990; Commission on Reading, 1985). In fact, several correlational studies do suggest a link between early shared-reading and later reading and academic performance (Crain-Thoreson & Dale, 1992; Mason, 1992; Moon & Wells, 1979; Stevenson & Fredman, 1990; Wells, 1985).

The finding of a link between early shared-

reading and acquisition of literacy skills, coupled with the observed differences in patterns of literacy exposure in the lives of children from lower and higher SES groups suggests that shared-reading may provide one means of intervention to improve the early literacy skills of at-risk children from lower income families. Despite a widespread belief and suggestive correlational evidence that a linkage between early experiences with shared-reading and later literacy and academic skills exists, several recent reviews have noted that evidence for a strong causal connection between shared-reading during the preschool years and children's literacy development is weak (Bus, van Ijzendoorn, & Pellegrini, 1995; Lonigan, 1994; Scarborough & Dobrich, 1994). In fact, relatively few experimental studies would allow strong causal conclusions to be made about the efficacy of shared-reading interventions.

Whitehurst and colleagues (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Lonigan & Whitehurst, 1998; Whitehurst et al., 1988; Whitehurst, Arnold, et al., 1994) have demonstrated that a specific program of shared-reading, called *dialogic reading*, can produce substantial changes in preschool children's language skills. Dialogic reading involves several changes in the way adults typically read books to children. Central to these changes is a shift in roles. During typical shared-reading, the adult reads and the child listens, but in dialogic reading the child learns to become the storyteller. The adult assumes the role of an active listener, asking questions, adding information, and prompting the child to increase the sophistication of her or his descriptions of the picture book. As the child becomes accustomed to her or his role as the storyteller, the adult shifts more of the responsibility for telling the story to the child. For example, in the first phase of dialogic reading, the child is asked to name or describe objects or actions pictured in the book (e.g., "What is the dog doing?"); in the second phase of the program the adult asks open-ended questions (e.g., "What's happening on this page?") allowing the child to determine what to say. Child responses to the book are en-

couraged through praise and repetition, and more sophisticated responses are modeled by expansions of the child's utterances.

In studies comparing dialogic reading to a similar frequency of typical picture book reading with typically developing children from middle- to upper-income families, dialogic reading produced superior effects on children's language skills (Arnold et al., 1994; Whitehurst et al., 1988). Positive effects of the dialogic reading program also have been found with groups of children from low-income families (Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994). For example, Lonigan and Whitehurst (1998) randomly assigned 91 children, 2- to 5-years-old, who were attending subsidized child care in Tennessee, to either a (a) no-treatment control group, (b) teacher-conducted small group dialogic reading in the child care center, (c) parent-conducted dialogic reading at home, or (d) combination of small group dialogic reading in the child care center and dialogic reading at home. Standardized oral language measures administered prior to and following the 6-week intervention revealed that children in the center-based conditions experienced more growth in vocabulary, whereas children in the home-only condition experienced more growth in their descriptive use of language. Moreover, the effects of the intervention extended to more naturalistic measures of oral language.

Despite these positive effects, both Lonigan and Whitehurst (1998) and Whitehurst, Arnold, et al. (1994) found substantial variability in teacher compliance with the dialogic reading program schedule, which significantly moderated the program's effects. Furthermore, centers tended not to continue the intervention outside of the experimental context (Whitehurst, Arnold, et al., 1994). These findings suggest that preschool teachers may view the dialogic reading program as too laborious to be a practical and effective center-based intervention for large numbers of children at risk for educational disability. Whereas studies conducted with children from middle- and

upper-income families indicate that dialogic reading produces effects on children's vocabulary superior to that obtained with typical shared-reading (Arnold et al., 1994; Whitehurst et al., 1988), other evidence indicates that any form of shared-reading is a low frequency activity in the lives of many children from lower income families. It is unknown if dialogic reading offers benefits beyond those of typical shared-reading for children from low-income families. It may be that simply increasing the frequency with which these children are exposed to typical shared-reading activities may be sufficient to promote the development of emergent literacy skills. If typical shared-reading with children from low-income families produced effects similar to those of dialogic reading, then the less structured and less intensive shared-reading approach may be a more practical, easier to implement, and effective center-based intervention.

The present study was designed to examine the differential efficacy of center-based dialogic reading and typical shared-reading with children from low-income families. Previous studies have shown that center-based dialogic reading produces somewhat smaller effects than home-based dialogic reading although it is unclear if this is a function of variability in teacher compliance with the intervention (Lonigan & Whitehurst, 1998; Whitehurst, Arnold et al., 1994). Our study, therefore, also assessed the contribution of preschool-based shared-reading when it was implemented under conditions of high compliance. Undergraduate volunteers, rather than childcare teachers, delivered the intervention following the small group center-based format used by Lonigan and Whitehurst (1998). Finally, despite a large literature identifying phonological sensitivity as a critical factor in the ease with which children learn to read (Bryant, MacLean, Bradley, & Crossland, 1990; Wagner, Torgesen, & Rashotte, 1994), most prior investigations of dialogic reading have looked solely at effects on children's oral language, which is only one emergent literacy skill related to children's subsequent reading achievement (Whitehurst & Lonigan, 1998).

Thus, in addition to examining the effects of the interventions on children's oral language, we also examined the effects on phonological sensitivity and listening comprehension.

## **METHOD**

### ***Participants***

Children recruited for this study were from low-income families and attended one of five child care centers in Florida that primarily served children whose parents qualified for public subsidy of child care costs. Of the 110 children initially recruited, 15 left their center before the study ended, thus our sample was comprised of 95 children who completed both pretest and posttest. There were no differences on the standardized measures used at pretest between the 95 children in our sample and the 15 who could not be posttested (all  $ps > .26$ ). At pretest, the 95 children in our sample ranged from 25 to 64 months ( $M = 45.11$ ,  $SD = 9.99$ ). Females comprised 46% of our sample, and African Americans 77%. Pretest scores on standardized measures of receptive and expressive vocabulary skills were in the low average to below average range demonstrating the at-risk status of the children as a group. The mean receptive vocabulary standard score on the Peabody Picture Vocabulary Test-Revised was 81.2 ( $SD = 17.49$ ) and the mean expressive vocabulary standard score on the Expressive One-Word Picture Vocabulary Test-Revised was 85.7 ( $SD = 12.26$ ).

### ***Child Care Centers***

Four of the five childcare facilities that participated in this research served primarily children of families eligible for subsidized childcare. Three of these centers were run by an agency contracted by the State of Florida to provide childcare services to low-income families. The fourth center was a private nonprofit entity and the fifth was affiliated with a church, and approximately 25% of the families it served received a state subsidy for childcare. Each center met Florida licensing requirements for childcare centers, and all were located within an urban area. Although no formal evaluation of center quality was

conducted, considerable variation in terms of facility and staff quality was observed casually. Teacher-led literacy activities in the centers consisted primarily of whole-class shared-reading and occasional instruction in letter knowledge. No special education services were provided to children in any of the centers.

### ***Procedure***

**Design.** The study was conducted in two waves across 2 school years. Recruitment was conducted from centers at the beginning of fall and spring terms. Consent forms describing the project were sent to all parents and project personnel were available at the centers to explain the purpose and potential benefits of the study. All children whose parents or guardians returned completed consent forms were pretested on measures of oral language ability and phonological sensitivity. Children in the second wave also completed a test of listening comprehension. Following pretesting, all children were randomly assigned within centers to one of three experimental conditions. The three experimental conditions were *typical* shared-reading, *dialogic* reading, and a *no-treatment* control condition. There were 51 children in the first wave ( $ns = 14$ , 21, and 16 for typical, dialogic, and control groups, respectively) and 44 children in the second wave ( $ns = 15$ , 13, and 16 for typical, dialogic, and control groups, respectively). Following random assignment, children within each reading condition were grouped by age so that the small reading groups within each center were composed of children of similar ages. All intervention sessions within and across centers in the fall and spring were conducted concurrently. After 6 weeks of these experimental conditions, children were posttested.

For the two reading conditions, undergraduate volunteers engaged children in typical or dialogic book reading. Each reading group consisted of 3 to 5 children. Intervention sessions were scheduled daily for 10 to 15 minutes and took place in a location outside the classroom. Children in the no-treatment group were provided with no activities beyond the

standard preschool curriculum. Volunteer readers completed a daily log specifying when each intervention session occurred and who was present. In addition, all reading sessions were audio recorded.

Volunteer readers received training in dialogic reading style using a videotape training method (Arnold et al., 1994; Whitehurst, Arnold, & Lonigan, 1990) modeled closely on previously used direct training procedures (e.g., Whitehurst et al., 1988). The videotape presented the two phases of dialogic reading. (A "how-to" description and other resources related to dialogic reading is available on-line at <http://www.whitehurst.sbs.sunysb.edu/readprojset.html>.) The procedures were presented as a set of guidelines and were followed by taped vignettes of adult-child book reading that exemplified the guidelines. Vignettes of adult-child reading that did not conform to the guidelines also were presented. Trainees critiqued the vignettes according to the dialogic reading guidelines and indicated what the reader should have done differently. Following the videotape, the trainer engaged trainees in one-on-one role-plays, which involved presenting the trainee with various examples of child behavior, and providing the trainee with feedback on her or his use of the dialogic reading guidelines. The Phase 1 training session took about 30 minutes per trainee and the Phase 2 session, which was introduced at the start of the 4th week of intervention for all children in the dialogic reading group, lasted about 20 minutes.

During typical shared-reading, the undergraduate volunteer simply read the text of the book, commented on the pictures, and answered any questions the children asked. Because typical shared-reading progressed though a book faster than dialogic reading, children in the typical shared-reading groups generally were read two books per session, compared to one book for the dialogic reading groups. The same standard set of books was used for both typical and dialogic reading groups. Books were chosen for their potential to support vocabulary growth, and each had numerous colorful illustrations that could support a story narrative and that could serve as

a basis for introducing new vocabulary to children. Picture books that relied heavily on the written text to convey the story were not used because such books generate more straight reading by adults and decrease children's opportunities to participate actively in storytime. Most books used for the intervention were not present in the classrooms prior to the start of the intervention, and children had no access to the books between intervention sessions.

*Assessments.* At both pretest and posttest the children in both waves of the study completed the three standardized tests of oral language described in Table 1. These three tests were used to provide continuity with previous research and to assess the domain of vocabulary and expressive skills that the dialogic reading program is intended to affect. Correlations between pretest and posttest scores for the control group, which ranged from .87 to .59, indicated that these tests have moderately high reliability across time and form (i.e., for the PPVT-R) within this population. At pretest, scores between the three tests were only moderately correlated (ranging from  $r = .40$  to  $r = .65$ ), suggesting that they assessed different dimensions of oral language. Children from the second wave of the study also completed the WJ-LC (see Table 1).

Four measures of phonological sensitivity were administered to children at pretest and posttest. Phonological tasks were patterned after tests developed by MacLean, Bryant, and Bradley (1987), and Wagner et al. (1994). A brief description of these tasks is presented in Table 1 (for a complete description of each phonological sensitivity task and items included in each task see Lonigan et al., 1998). Scores on the phonological sensitivity measures are correlated with letter knowledge and text reading abilities (Burgess & Lonigan, 1998; Lonigan et al., 1998). Each phonological sensitivity task was preceded by practice trials to teach children the task (e.g., blending or deleting word sounds, identifying rhyme). On practice trials, if a child missed an item, the tester responded with correction, explanation, and re-administration; if the child provided a correct answer, the tester responded

**Table 1.****Description of Assessment Tasks Administered at Preintervention and Postintervention**

Domain and Tasks	Task Description	$\alpha^a$
<b>Oral Language Measures</b>		
<i>Peabody Picture Vocabulary Test-Revised</i> (PPVT-R; Dunn & Dunn, 1981)	Measure of receptive vocabulary skills: Child required to point to one of four pictures that represent an object or action named by the examiner (e.g., "Point to bus."). Form L used at pretest and Form M used at posttest.	.80
<i>Expressive One-Word Picture Vocabulary Test-Revised</i> (EOWPT-R; Gardner, 1990)	Measure of expressive vocabulary skills: Child required to provide names for pictures of common objects, actions, or concepts.	.94
Verbal Expression subscale, <i>Illinois Test of Psycholinguistic Abilities</i> (ITPA-VE; Kirk, McCarthy, & Kirk, 1968)	Measure of verbal fluency: Child required to describe 4 common objects (ball, block, envelope, button).	.86
Listening Comprehension subtest, <i>Woodcock-Johnson Psychoeducational Battery</i> (WJ-LC; Woodcock & Johnson, 1977)	Child verbally presented with an incomplete sentence frame and required to complete the sentence by supplying the correct word (e.g., "Candy tastes ____").	.83
<b>Phonological Sensitivity Measures</b>		
Rhyme Oddity Detection	Child shown three pictured words (e.g., fish, dish, <i>sun</i> ) named by the examiner and asked to select the one that "did not sound the same as," or "was different than" the other two words (11 test trials).	.63
Alliteration Oddity Detection	Child shown three pictured words (e.g., car, cat, <i>sun</i> ) named by the examiner and asked to select the one that is "different at the start of the word" from the other two (11 test trials).	.44
Sound Blending	Child required to combine word elements to form a new word. First 12 test trials presented verbally and with pictures; the final 10 test trials presented verbally. Initial items in both picture and nonpicture trials required blending single-syllable words to form compound words; later items involved blending nonword-syllables or phonemes (22 test trials, discontinued after 5 consecutive errors).	.96
Sound Elision	Child required to say a word minus a specific sound. First 9 trials presented verbally and with pictures; the final eight trials presented verbally. Initial items within both picture and nonpicture trials consisted of compound words; later items involved deletion of nonword-syllables or phonemes (17 test trials, discontinued after 5 consecutive errors).	.89

<sup>a</sup>Internal consistency from published norms for standardized oral language tests or from Lonigan, Burgess, Anthony, and Barker (1998) for phonological sensitivity tasks.

with confirmation and explanation. Many items within each task utilized pictures to reduce memory demands on the children.

Standardized measures were administered

individually to each child at his or her child care center during one, approximately 25 minute session. Four doctoral students in clinical psychology, all with general training in de-

velopmental assessment and specific training on the measures used in this study, administered the standardized oral language measures and the WJ-LC. These assessors were familiar with the design of the study but were not aware of a child's assignment to condition. Phonological sensitivity tasks were administered in a separate session by trained research assistants who were not aware of the study's design. Each test record was scored twice, once by the person conducting the assessment and once by another assessor. Discrepancies were resolved by a third assessor.

**Audiotape coding.** To determine that the reading style engaged in by the readers during dialogic reading conformed to the program guidelines and was different than typical shared-reading, undergraduate research assistants coded 90 stories from the audiotapes made during the reading sessions. The coded tapes were selected quasi-randomly so that reading sessions across both waves of the study and from each of the centers were represented. The behavior codes described in Table 2 were scored as present or absent during 10-second intervals for the first 5 minutes of each reading session on the selected audiotapes. A second research assistant independently coded 20 (22%) of these reading sessions selected at random. Reliability was computed using the intraclass correlation coefficient based on a one-way analysis of variance model (Bartko, 1976). As shown in Table 2, reliability was moderate to high for each coded category of reader behavior (mean intraclass  $R = .91$ , using  $r$  to  $z$  transformations to compute the mean).

## RESULTS

### *Preliminary Analyses*

**Fidelity of intervention.** Analysis of the reading logs revealed that each of the small group reading sessions were conducted between 4 and 5 days a week for the 6 weeks of the intervention. Children attended an average of 18.47 ( $SD = 4.95$ ; range = 6 to 31) reading sessions. Mean number of sessions attended was similar for children in the dialogic reading group ( $M = 19.15$ ,  $SD = 5.26$ ) and the

typical reading group ( $M = 17.64$ ,  $SD = 4.50$ ),  $F(1, 61) = 1.43$ ,  $p = .24$ . Some children were absent frequently and did not receive all the scheduled reading sessions, however, analyses of intervention effects restricted to children who received at least 12 sessions of reading (i.e., 2 times per week) yielded results similar to those reported. Descriptive statistics for the proportion of intervals containing the six different reader behaviors are shown in Table 2 for the typical and dialogic reading groups. As expected, the dialogic reading sessions had more open-ended and wh-questions,  $F(1, 88) = 242.84$ ,  $p < .001$ , more contingent responses,  $F(1, 88) = 233.67$ ,  $p < .001$ , more labeling,  $F(1, 88) = 50.37$ ,  $p < .001$ , and less text reading,  $F(1, 88) = 110.09$ ,  $p < .001$ , than the typical reading sessions. There also were slightly more yes and no questions and pointing responses in dialogic reading sessions than typical reading sessions,  $F(1, 88) = 6.56$ ,  $p = .01$ , most likely due to the overall higher frequency of questions during dialogic reading.

**Sample characteristics.** The number of children in each group, children's chronological age, and group mean standard scores on the three standardized oral language measures at pretest and posttest are shown in Table 3. Visual inspection of histograms as well as examination of the distributional properties (e.g., skew) of the pretest and posttest measures did not reveal any notable departure from normality or restriction of range in these variables. Children's ages were correlated with scores on the PPVT-R (at pretest  $r = -.42$ ,  $p < .001$ , at posttest  $r = -.28$ ,  $p < .01$ ) and the EOWPVT-R (at pretest  $r = -.45$ ,  $p < .001$ , at posttest  $r = -.30$ ,  $p < .01$ ). Older children scored lower on these tests than the younger children. Raw pretest scores on the WJ-LC and the measures of phonological sensitivity for the children who completed posttesting are shown in Table 4. Age was correlated with raw scores on the WJ-LC (at pretest  $r = .65$ ,  $p < .001$ , at posttest  $r = .62$ ,  $p < .001$ ). Scores on the WJ-LC were correlated highly with EOWPVT-R scores (partial  $r = .59$ ,  $p < .001$  at pretest, partial  $r = .71$ ,  $p < .001$  at posttest, controlling for age), indicat-

**Table 2.***Definitions, Intraclass Correlation Coefficients, and Group Descriptive Statistics for Behaviors Coded from Reading Sessions*

Code	Definitions	Intra-class <i>R</i>	Proportion of Intervals with Code		Group Contrast <sup>a</sup>
			Dialogic <i>M (SD)</i>	Typical <i>M (SD)</i>	
Open ended and what questions	Nonspecific requests for information from book (e.g., "Tell me about this page.") or questions that can be answered with a specific label or description (e.g., "What is this?" "What color is the dragon?").	.99	.83 (0.17)	.05 (0.17)	D > T***
Yes/No questions and pointing requests	Expected answer is "yes" or "no" or nod of the head or request for child to point to something in the book (e.g., "Is this a duck?" "Show me the spider.")	.78	.10 (0.14)	.03 (0.08)	D > T**
Contingent responses	Responses with a feedback or teaching function for child that follow a child's verbalization, including simple contingent responses like praise or correction (e.g., "No, it's called a wagon.") or more complex contingent responses like repetition or expansion (e.g., child: "wagon," Adult: "A red wagon.").	.88	.83 (0.14)	.09 (0.19)	D > T***
Labeling	Labeling of objects, events, or attributes in the book (e.g., "This is called a tuba and it's gold").	.64	.28 (0.18)	.04 (0.11)	D > T***
Reading	Straight reading of text not requiring a response.	.98	.60 (0.23)	.96 (0.08)	D < T***
Other verbalization	Nonreading-related talk including directives (e.g., "Sit down.") or attention prompts (e.g., "Look at this page.").	.72	.48 (0.24)	.44 (0.35)	D = T

<sup>a</sup>Group contrast for frequency of reading code significance based on *F* (1, 88). D = Dialogic Reading Group; T = Typical Reading Group. \*\**p* < .01; \*\*\**p* < .001.



**Table 3.**

*Descriptive Statistics for Children's Age and Standard Scores on Standardized Pretest and Posttest Measures of Language*

Variable	Intervention Group			ANOVA <sup>a</sup>
	No-Treatment <i>M (SD)</i>	Typical Reading <i>M (SD)</i>	Dialogic Reading <i>M (SD)</i>	
<i>n</i>	32	29	34	
% Girls	43.8	41.4	52.9	
% African American	75.0	75.9	79.4	
Age (months)	46.28 (10.70)	45.69 (10.02)	43.14 (9.44)	
PPVT-R <sup>b</sup>				
Pretest	80.91 (17.22)	81.31 (18.65)	82.20 (17.58)	ns
Posttest	85.19 (14.01)	78.35 (15.07)	85.69 (17.28)	
EOWPVT-R <sup>b</sup>				
Pretest	86.19 (14.29)	84.93 (11.19)	86.77 (12.15)	Time**
Posttest	87.97 (15.11)	87.52 (14.29)	89.09 (10.57)	
ITPA-VE <sup>b</sup>				
Pretest	41.25 (10.52)	38.03 (8.63)	36.53 (8.43)	G × Time** D > C, T = D, T = C
Posttest	40.81 (10.95)	40.72 (9.50)	40.74 (8.27)	

<sup>a</sup>Summary of significant effects for repeated measures ANOVA and summary of results of planned comparisons following significant group by time interaction. Time = significant effect of time in ANOVA; G × Time = significant group × time interaction in ANOVA. D = Dialogic Reading Group; T = Typical Reading Group; C = No-Treatment Group.

<sup>b</sup>PPVT-R = *Peabody Picture Vocabulary Test-Revised*; EOWPVT-R = *Expressive One-Word Picture Vocabulary Test-Revised*; ITPA-VE = verbal expression subscale of *Illinois Tests of Psycholinguistic Abilities*. Standard scores for the PPVT-R and EOWPVT-R have a mean of 100 and a standard deviation of 15. Standard scores for the ITPA-VE have a mean of 36 and a standard deviation of 6.

<sup>c</sup> $p > .10$  for Time and Group × Time effect in ANOVA.

<sup>d</sup> $p < .01$ .

ing that expressive vocabulary contributed a large portion of the variance in scores on the WJ-LC. Age also was significantly correlated with the four phonological sensitivity measures at pretest ( $r = .24$ ,  $r = .31$ ,  $r = .23$ , and  $r = .44$  for rhyme oddity, alliteration oddity, blending, and elision respectively) and three of the four phonological sensitivity measures at posttest ( $r = .21$ ,  $r = .38$ , and  $r = .48$  for rhyme oddity, blending, and elision respectively; the  $r = .09$  for alliteration oddity was not significant).

At pretest, groups did not differ in age ( $p > .50$ ), on the three standardized language measures (all  $ps > .13$ ), on the WJ-LC ( $p > .58$ ), or on measures of phonological sensitivity (all  $ps > .35$ ). Girls and boys scored similarly on all measures at both pretest and posttest (all  $ps > .07$ ), and there were no statistically significant interactions involving sex of child in the

analyses of intervention effects (all  $ps > .42$ ). African American children scored statistically significantly lower than Caucasian children on the PPVT-R, EOWPVT-R, and ITPA-VE at both pretest and posttest (all  $ps < .04$ ); however, ethnicity did not enter into any statistically significant interactions with intervention effects (all  $ps > .11$ ). Children in the first wave of the study scored lower on the ITPA-VE at pretest ( $M = 36.12$ ,  $SD = 6.88$ ) than children in the second wave of the study ( $M = 41.43$ ,  $SD = 11.01$ ),  $F(1, 93) = 7.87$ ,  $p = .006$ , and children in the second wave of the study scored lower on the alliteration oddity measure at posttest ( $M = 3.16$ ,  $SD = 1.18$ ) than children in the first wave of the study ( $M = 4.00$ ,  $SD = 1.58$ ),  $F(1, 91) = 9.15$ ,  $p = .003$ . Study wave, however, did not enter into any statistically significant interactions with intervention effects. Child age (i.e., younger

**Table 4.**

*Descriptive Statistics for Children's Raw Scores on Measures of Listening Comprehension and Phonological Sensitivity*

Variable	Intervention Group			ANOVA <sup>a</sup>
	No-Treatment <i>M (SD)</i>	Typical Reading <i>M (SD)</i>	Dialogic Reading <i>M (SD)</i>	
WJ-LC <sup>b</sup>				
Pretest	6.82 (4.23)	4.69 (4.01)	4.62 (2.76)	Time**, G × Time* T > C, T = D, D = C
Posttest	7.29 (4.27)	6.97 (5.02)	6.31 (3.84)	
Rhyme Oddity <sup>c</sup>				
Pretest	4.07 (1.53)	4.67 (1.59)	4.18 (1.57)	ns
Posttest	3.90 (1.42)	4.70 (2.13)	3.85 (1.40)	
Alliteration Oddity <sup>c</sup>				
Pretest	3.90 (1.63)	3.41 (1.45)	3.50 (1.24)	G × Time* T > C, T = D, D = C
Posttest	2.28 (1.28)	4.11 (1.83)	3.53 (1.30)	
Blending <sup>c</sup>				
Pretest	0.90 (2.83)	1.00 (3.26)	1.53 (2.96)	Time*
Posttest	2.83 (5.27)	3.04 (6.53)	3.00 (6.03)	
Elision <sup>c</sup>				
Pretest	2.21 (2.73)	1.89 (3.39)	1.50 (2.70)	Time**
Posttest	3.55 (4.61)	4.07 (5.20)	2.14 (3.48)	

<sup>a</sup>Summary of significant effects for repeated measures ANOVA and summary of results of planned comparisons following significant group by time interaction. Time = significant effect of time in ANOVA; G × Time = significant group × time interaction in ANOVA; D = Dialogic Reading Group; T = Typical Reading Group; C = No-Treatment Group; WJ-LC = Listening Comprehension subtest of *Woodcock-Johnson Psychoeducational Tests*.

<sup>b</sup>For WJ-LC, *ns* = 16 no-treatment group, 15 typical reading group, 13 dialogic reading group.

<sup>c</sup>For phonological sensitivity tests, *ns* = 29 no-treatment group, 27 typical reading group, 32 dialogic reading group.

\**p* < .05; \*\**p* < .01; <sup>ns</sup>*p* > .10 for Time and Group × Time effect in ANOVA.

vs. older based on median split) also did not enter into an interaction with any treatment effect. Because sex, ethnicity, study wave, or age did not enter into any statistically significant interactions with intervention effects (*ps* > .08 for repeated measures), these variables were not considered in subsequent analyses.

### **Intervention Effects**

A 3 (no-treatment group vs. typical reading group vs. dialogic reading group) × 2 (pretest vs. posttest) repeated measures analysis of covariance (ANCOVA) was conducted on each of the outcome measures using children's ages at pretest and posttest as covariates. Preliminary omnibus multivariate tests of effects were not used prior to conducting the separate ANCOVAs because we hypothesized, on the basis of past research and the nature of the

intervention, that the dependent measures would respond differently to the intervention (Rosenthal & Rosnow, 1991). To examine the effects of the interventions, statistically significant group by time effects within the ANCOVAs were followed with a set of nonorthogonal planned comparisons. The two intervention groups combined were compared to the no-treatment group, and the two intervention groups were compared to each other. Finally, the separate intervention groups were each compared to the no-treatment group because a primary question was whether one intervention was more effective than the other. Preliminary analyses revealed that there were no interactions between the covariates and intervention group for the language measures (all *ps* > .37), the WJ-LC (*ps* > .81), or the phonological sensitivity measures (all *ps* >

.07). Thus, the covariates met the homogeneity of regression assumption of ANCOVA.

*Standardized language tests.* Descriptive statistics for pretest and posttest scores for the three oral language measures for each group are shown in Table 3. The ANCOVA on the EOWPVT-R revealed a statistically significant effect of time,  $F(1, 90) = 7.56, p = .007$ , but no group by time interaction,  $F(2, 90) = 0.13, p = .88$ . Children's scores on the EOWPVT-R increased over time but this increase was statistically equivalent across groups. There were no statistically significant effects on the PPVT-R ( $ps > .25$ ).

The ANCOVA on the ITPA-VE revealed a statistically significant group by time interaction,  $F(2, 90) = 4.76, p = .01$ , but no overall effect of time,  $F(1, 90) = 0.02, p = .90$ . Planned comparisons revealed that changes in ITPA-VE scores were greater for the combined intervention groups than the no-treatment group,  $F(1, 90) = 6.61, p = .01$ , and did not differ between the typical reading and dialogic reading groups,  $F(1, 90) = 2.53, p = .11$ . There was a trend, however, for the dialogic reading group to experience more growth. The average change in ITPA-VE standard scores for children in the dialogic reading group was 4.97 ( $SD = 6.63$ ), compared to 2.69 ( $SD = 8.83$ ) for children in the typical reading group and  $-0.44$  ( $SD = 7.26$ ) for children in the no-treatment group. Changes in ITPA-VE scores differed between the dialogic reading group and no-treatment group,  $F(1, 90) = 9.49, p = .003$ ; changes in ITPA-VE scores did not differ between the typical reading group and the no-treatment group,  $F(1, 90) = 1.90, p = .17$ . In terms of developmental age scores, children in the dialogic reading group experienced 5.4 months more development in descriptive language use during the intervention than children in the no-treatment group, and children in the typical reading group experienced 2.5 months more development in this area than children in the no-treatment group.

*Listening comprehension.* Descriptive statistics for raw pretest and posttest scores for the listening comprehension measure for each group are shown in Table 4. The ANCOVA

for the WJ-LC using age and EOWPVT-R scores as covariates revealed an effect of time,  $F(1, 39) = 18.51, p < .001$ , and a group by time interaction,  $F(1, 39) = 3.39, p = .04$ . Planned comparisons indicated that changes in WJ-LC scores across time were greater for the combined intervention groups than the no-treatment group,  $F(1, 39) = 4.67, p = .04$ , and did not differ significantly between the typical reading and dialogic reading groups,  $F(1, 39) = 1.90, p = .18$ . Changes in WJ-LC scores were greater for the typical reading group than the no-treatment group,  $F(1, 39) = 6.76, p = .01$ , however, no differences were found for changes in WJ-LC scores between the dialogic reading group and the no-treatment group,  $F(1, 39) = 1.21, p = .28$ .

*Phonological sensitivity.* Descriptive statistics for raw pretest and posttest scores for the four phonological sensitivity measures for each group are shown in Table 4.<sup>1</sup> There were no effects on the rhyme oddity task ( $ps > .09$ ). The ANCOVA for the alliteration oddity task revealed a group by time interaction,  $F(2, 84) = 3.45, p = .04$ , but no effect of time ( $p = .80$ ). The group by time interaction for alliteration remained statistically significant,  $F(2, 82) = 3.81, p = .03$ , even when both oral language skills and age were used as covariates. Planned comparisons indicated that increases in alliteration scores across time were greater for the combined intervention groups than the no-treatment group,  $F(1, 84) = 5.57, p = .02$ , and did not differ significantly between the typical reading and dialogic reading groups,  $F(1, 84) = 1.28, p = .20$ . Changes in alliteration scores were greater for the typical reading group than the no-treatment group,  $F(1, 39) = 6.86, p = .01$ ; however, there was no difference in changes in alliteration scores between the dialogic reading group and the no-treatment group,  $F(1, 39) = 2.10, p = .15$ . ANCOVAs also revealed an

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<sup>1</sup> All children did not complete phonological sensitivity tasks at both pretest and posttest, thus analyses of phonological sensitivity were conducted on 88 children who completed both testing sessions ( $ns = 29$  no-treatment group, 27 typical reading group, 32 dialogic reading group). Analyses of standardized oral language measures and WJ-LC, however, were similar when conducted with or without the 7 children who did not complete pre and post phonological sensitivity tasks.

effect of time on the blending task,  $F(1, 84) = 5.78, p = .02$ , and the elision task,  $F(1, 84) = 12.69, p = .001$ , but no group by time interactions ( $ps > .33$ ). Children's scores on the blending and elision tasks increased over time but this increase was equivalent across groups.

## DISCUSSION

The results of this study demonstrate that both dialogic reading and typical shared-reading small group interventions can have positive effects on the emergent literacy skills of at-risk preschool children from low-income backgrounds. These positive effects were obtained with only a limited amount of intervention beyond the standard preschool curriculum. On average, children in the intervention groups received between 3 and 5 hours of additional exposure to shared-reading activities as a result of this study (i.e., 19 sessions at 10–15 minutes per session). Results also indicated that the effects of both shared-reading interventions were more similar than different with this population of children. Results favoring dialogic reading were found on the measure of descriptive use of language, whereas results favoring typical shared-reading were found on the measures of listening comprehension and alliteration detection. Effect sizes, calculated from group mean pretest to posttest difference scores, were .77 and .51 for dialogic and typical reading, respectively, for the ITPA-VE, .51 and .77 for dialogic and typical reading respectively for the WJ-LC, and .36 and .70 for dialogic and typical reading, respectively, for the alliteration task. Most of these effect sizes are in the medium to large range as defined by Cohen (1977).

The results of this study also add important data to the theoretical and empirical controversy concerning the role of shared-reading activities in the development of oral language and other emergent literacy skills. Despite widespread acceptance that shared-reading influences language and literacy skills, this effect has not previously been demonstrated unambiguously (Bus et al., 1995; Dunning, Mason, & Stewart, 1994; Lonigan, 1994; Scar-

borough & Dobrich, 1994). The majority of evidence in support of a positive effect of shared-reading on children's literacy skills has come from correlational studies that are subject to strong alternative interpretations (Lonigan, 1994; Whitehurst & Lonigan, 1998). This study as well as several previous studies (Arnold et al., 1994; Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold et al., 1994; Whitehurst et al., 1988) demonstrate that dialogic reading can increase children's oral language skills. This study is one of the first experimental studies to demonstrate that typical shared-reading also can promote the development of emergent literacy skills in preschool children.

Overall, these findings are in keeping with a growing body of research indicating shared-reading can facilitate oral language development in children (Cornell, Sénéchal, & Broda, 1988; Elley, 1989; Jenkins, Stein, & Wysocki, 1984; Sénéchal, LeFevre, Hudson, & Lawson, 1996; Sénéchal, LeFevre, Thomas, & Daley, 1998; Sénéchal, Thomas, & Monker, 1995). Sénéchal et al. (1998) found that storybook exposure, measured indirectly by title and author recognition checklists completed by parents, was strongly and uniquely associated with both kindergarten and first grade children's vocabulary skills, listening comprehension, and performance on alliteration and rhyme detection tasks. The present study adds to this research by indicating at least part of this association is causal.

Children in the two intervention groups in this study experienced more growth in listening comprehension skills than children in the no-treatment group. Similarly, Meyer, Wardrop, Stahl, and Linn (1994) found that a higher frequency of shared-reading by kindergarten teachers was associated with higher levels of listening comprehension. Interestingly, the effects on the listening comprehension measure in this study were relatively larger in the typical shared-reading group than they were in the dialogic reading group. The larger effects in the typical shared-reading group may be due to structural differences between the two interventions. In small group typical shared-reading, children have to sit quietly,

listen, and pay attention to the reader, whereas in small group dialogic reading, children need to attend mostly when it is their turn to contribute to the interaction. Although listening comprehension itself is an important emergent literacy skill, this result suggests that typical shared-reading may be a beneficial precursor to a more interactive form of shared-reading, like dialogic reading, for children with limited prior exposure to literacy activities. The behaviors developed during typical shared-reading (e.g., attending, listening) may provide a foundation for group reading that will allow a greater focus on the interactions.

Despite these positive effects on children's oral language, oral language skills are only one component of the constellation of emergent literacy skills that are associated with children's acquisition of reading. As highlighted by Whitehurst and Lonigan (1998), emergent literacy skills can be grouped into two broad components: skills that are associated with text decoding, and skills associated with text comprehension. Although oral language, in particular vocabulary, is likely to facilitate the acquisition of decoding skills, it is more likely to have a sizable effect later in the reading acquisition process when children are beginning to read more complex text for meaning and pleasure than in the initial stage of learning to decode (e.g., Snow, Barnes, Chandler, Hemphill, & Goodman, 1991; Whitehurst, 1996). The results of the present study suggest that shared-reading may have a small but reliable effect on preschool children's phonological sensitivity, a critically important skill for decoding. Caution interpreting this finding is warranted, however, because the effect was found on only one of four measures of phonological sensitivity, and the overall performance of children in all groups was at or near chance levels. Other studies do not support a direct link between shared-reading and growth in phonological sensitivity (e.g., Lonigan, Dyer, & Anthony, 1996; Raz & Bryant, 1990; Whitehurst, 1996). Moreover, Lonigan et al. (1998) found that scores on blending and elision tasks like those used in the present study were more associated with text decoding and letter knowledge than scores on

an alliteration task, and there were no intervention effects on these measures in the present study.

Overall, these findings have implications for preschool-based education and the development of children's individual education plans. The less rigorous procedures for typical shared-reading in small groups, which place fewer additional demands on teachers than the dialogic reading program, may provide a means to increase teacher compliance with intervention above that found in some previous studies of dialogic reading (Lonigan & Whitehurst, 1998; Whitehurst, Arnold et al., 1994). Thus typical shared-reading may be a practical and effective intervention for larger numbers of children at risk for educational disabilities due to conditions associated with poverty. The present results suggest that the specific form of shared-reading employed should depend on the skills to be targeted in children. Center-based group interventions during the late preschool period, however, may not be sufficient to completely close the gap between the oral language deficits of at-risk children from low-income families and the skills demonstrated by children who are more economically advantaged. These interventions also are unlikely to be potent enough to overcome substantial delays in oral language associated with more severe developmental disabilities. Nevertheless, these interventions may be particularly useful as adjuncts to more potent targeted individual interventions as a means of promoting practice and generalization of the skills developed with individual interventions. Additionally, it is possible that within inclusive settings, using mixed groups of children that include children without language delay may provide additional modeling opportunities for children with language delay.

The results of this study also suggest a number of additional avenues of inquiry. As noted, it is possible that group reading interactions may not be sufficient to produce broad improvements in children's oral language skills, even if the groups are small and the type of interaction is optimized. This may be particularly true for older preschool children.

The negative correlations between children's ages and standardized test scores in this study suggest that the effects of disadvantaged environments are cumulative, a pattern typical of other educational outcomes (Stanovich, 1986). There is evidence that some language skills are more impacted by home-based shared-reading (Lonigan & Whitehurst, 1998). Study of group versus individual center-based shared-reading intervention is required to localize the source of this difference. Dialogic reading targets expressive language skills through the use of probing, practice, teaching, feedback, and repetition that is keyed to a child's current abilities. The group format of dialogic reading may derail this scaffolding process and cause interactions (e.g., level of questions, type of feedback) to occur outside a child's zone of proximal development (Vygotsky, 1978). Additionally, each child in group-based dialogic reading receives less opportunity for practice and feedback. Alternatively, it is possible that home-based intervention produces more generalized changes in parent-child verbal interaction that promotes the development of language skills beyond the shared-reading context. Other studies have suggested that the home environment is more strongly related to children's language skills, whereas the classroom environment is more strongly related to children's achievement and overall cognitive abilities (Bryant, Burchinal, Lau, & Sparling, 1994).

The results of this study concern only the short-term outcomes of relatively brief interventions. Additional study is required to determine the long-term impact of the intervention and the impact of similar interventions conducted for more extended periods of time. Given the association between the skills children learn prior to formal schooling and their success in school, interventions for children at risk for educational disabilities will likely need to be of longer duration and multifaceted. Although shared-reading interventions can impact positively children's oral language skills, other aspects of emergent literacy like print knowledge and phonological sensitivity likely need to be targeted directly. Information concerning the short- and long-term outcomes

of such multifaceted preschool emergent literacy interventions is needed. Currently, the changes that can be made in the emergent literacy skills of at-risk children from low-income backgrounds are relatively small, but so too is our understanding of processes involved in the development of these skills. Returning to the Bronfenbrenner (1977) quote at the beginning of this paper, literacy is too important to a child's life-long prospects for us to not investigate these processes further, having achieved so little change—and so little understanding—thus far.

## REFERENCES

- Adams, M.J. (1990). *Learning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Alexander, K.L., & Entwisle, D.R. (1988). Achievement in the first 2 years of school: Patterns and processes. *Monographs of the Society for Research in Child Development*, 53 (2, serial No. 218).
- Anderson, A.B. & Stokes, S.J. (1984). Social and institutional influences on the development and practice of literacy. In H. Goelman, A. Oberg, & F. Smith (Eds.), *Awakening to literacy*. Exeter, NH: Heinemann.
- Arnold, D. H., Lonigan, C. J., Whitehurst, G. J., & Epstein, J. N. (1994). Accelerating language development through picture book reading: Replication and extension to a videotape training format. *Journal of Educational Psychology*, 86, 235–243.
- Bartko, J. J. (1976). On the various intraclass correlation reliability coefficients. *Psychological Bulletin*, 83, 762–765.
- Baydar, N., Brooks-Gunn, J., & Furstenberg, F. F. (1993). Early warning signs of functional illiteracy: Predictors in childhood and adolescence. *Child Development*, 64, 815–829.
- Bowey, J. A. (1995). Socioeconomic status differences in preschool phonological sensitivity and first-grade reading achievement. *Journal of Educational Psychology*, 87, 476–487.
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 513–531.
- Bryant, D. M., Burchinal, M., Lau, L. B., & Sparling, J. J. (1994). Family and classroom correlates of Head Start children's developmental outcomes. *Early Childhood Research Quarterly*, 9, 289–304.
- Bryant, P. E., MacLean, M., Bradley, L. L., &

- Crossland, J. (1990). Rhyme and alliteration, phoneme detection, and learning to read. *Developmental Psychology*, 26, 429–438.
- Burgess, S. R., & Lonigan, C. J. (1998). Bidirectional relations of phonological sensitivity and pre-reading abilities: Evidence from a preschool sample. *Journal of Experimental Child Psychology*, 70, 117–141.
- Bush, B. (1990). Parenting's best-kept secret: Reading to your children. *Reader's Digest*, 137, 67–70.
- Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65, 1–21.
- Butler, S. R., Marsh, H. W., Sheppard, M. J., & Sheppard, J. L. (1985). Seven-year longitudinal study of the early prediction of reading achievement. *Journal of Educational Psychology*, 77, 349–361.
- Carnegie Foundation for the Advancement of Teaching (1991). *Ready to learn: A mandate for the nation*. New York: Author.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (rev ed). New York: Academic Press.
- Commission on Reading, National Academy of Education (1985). *Becoming a nation of readers*. Washington, DC: National Institute of Education.
- Crain-Thoreson, C. & Dale, P. S. (1992). Do early talkers become early readers? Linguistic precocity, preschool language, and emergent literacy. *Developmental Psychology*, 28, 421–429.
- Cornell, E. H., Sénéchal, M., & Broda, L. S. (1988). Recall of picture books by 3-year-old children: Testing and repetition effects in joint reading activities. *Journal of Educational Psychology*, 77, 349–361.
- Dubow, E.F. & Ippolito, M.F. (1994). Effects of poverty and quality of the home environment on changes in the academic and behavioral adjustment of elementary school-age children. *Journal of Clinical Child Psychology*, 23, 401–412.
- Dunn, L. M. & Dunn, L. M. (1981). *Peabody Picture Vocabulary Test—Revised*. Circle Pines, NM: American Guidance Service.
- Dunning, D. B., Mason, J. M., & Stewart, J. P. (1994). Reading to preschoolers: A response to Scarborough and Dobrich (1994) and recommendations for future research. *Developmental Review*, 14, 324–339.
- Elley, W. B. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly*, 24, 175–187.
- Feitelson, D. & Goldstein, Z. (1986) Patterns of book ownership and reading to young children in Israeli school-oriented and nonschool-oriented families. *Reading Teacher*, 39, 924–930.
- Gardner, M. F. (1990). *Expressive One-Word Picture Vocabulary Test—Revised*. Novato, CA: Academic Therapy.
- Hart, B., & Risley, T. R. (1992). American parenting of language-learning children: Persisting differences in family-child interactions observed in natural home environments. *Developmental Psychology*, 28, 1096–1105.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experiences of young American Children*. Baltimore, MD: Brookes.
- Heath, S. B. (1982) What no bedtime story means: Narrative skills at home and school. *Language in Society*, 11, 49–76.
- Jenkins, J. R., Stein, M. L., & Wysocki, K. (1984). Learning vocabulary through reading. *American Educational Research Journal*, 21, 767–787.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, 80, 437–447.
- Juel, C., Griffith, P. L., & Gough, P. B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. *Journal of Educational Psychology*, 78, 243–255.
- Kirk, S.A., McCarthy, J.J., & Kirk, W.D. (1968). *Illinois Test of Psycholinguistic Abilities*. Urbana, IL: University of Illinois Press.
- Lentz, F.E. (1988). Effective reading interventions in the regular classroom. In J. L. Graden, J.E. Zins, & M.J. Curtis (Eds.), *Alternating educational delivery systems: Enhancing instructional options for all students*. Washington DC: National Association of School Psychologists.
- Lonigan, C. J. (1994). Reading to preschoolers exposed: Is the emperor really naked? *Developmental Review*, 14, 303–323.
- Lonigan, C. J., Burgess, S. R., Anthony, J. L., & Barker, T. A. (1998). Development of phonological sensitivity in two- to five-year-old children. *Journal of Educational Psychology*, 90, 294–311.
- Lonigan, C. J., Dyer, S. M., & Anthony, J. L. (1996, April). *The influence of the home literacy environment on the development of literacy skills in children from diverse racial and economic backgrounds*. Paper presented at the Annual Convention of the American Educational Research Association. New York, NY.

- Lonigan, C. J., & Whitehurst, G. J. (1998). Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly*, 17, 265–292.
- MacLean, M., Bryant, P., & Bradley, L. (1987). Rhymes, nursery rhymes, and reading in early childhood. *Merrill-Palmer Quarterly*, 33, 255–282.
- Mason, J. M. (1992). Reading stories to preliterate children: A proposed connection to reading. In P. B. Gough, L. C. Ehri, and R. Treiman (Eds.), *Reading acquisition*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- McCormick, C. E., & Mason, J. M. (1986). Intervention procedures for increasing preschool children's interest in and knowledge about reading. In W. H. Teale, & E. Sulzby (Eds.), *Emergent literacy: Writing and reading* (pp. 90–115). Norwood, NJ: Ablex.
- Meyer, L. A., Wardrop, J. L., Stahl, S. A., & Linn, R. L. (1994). Effects of reading storybooks aloud to children. *Journal of Educational Research*, 88, 69–85.
- Moon, B. C., & Wells, C. G. (1979). The influence of home on learning to read. *Journal of Research in Reading*, 2, 53–62.
- Raz, I. S., & Bryant, P. (1990). Social background, phonological awareness, and children's reading. *British Journal of Developmental Psychology*, 8, 209–225.
- Rosenthal, R. & Rosnow, R. L. (1991). *Essentials of behavioral research: Methods and data analysis* (2nd ed.). New York: McGraw-Hill.
- Scarborough, H. H. & Dobrich, W. (1994). On the efficacy of reading to preschoolers. *Developmental Review*, 14, 245–302.
- Sénéchal, M., LeFevre, J., Hudson, E., & Lawson, E. P. (1996). Knowledge of storybooks as a predictor of young children's vocabulary. *Journal of Educational Psychology*, 88, 520–536.
- Sénéchal, M., LeFevre, J., Thomas, E., & Daley, K. E. (1998). Differential effects of home literacy experiences on the development of oral and written language. *Reading Research Quarterly*, 13, 96–116.
- Sénéchal, M., Thomas, E., & Monker, J. (1995). Individual differences in 4-year-old children's acquisition of vocabulary during storybook reading. *Journal of Educational Psychology*, 87, 218–229.
- Share, D. L., Jorm, A. F., MacLean, R., & Mathews, R. (1984). Sources of individual differences in reading acquisition. *Journal of Educational Psychology*, 76, 1309–1324.
- Smith, S. S. & Dixon, R. G. (1995). Literacy concepts of low- and middle-class four-year-olds entering preschool. *Journal of Educational Research*, 88, 243–253.
- Snow, C. E., Barnes, W. S., Chandler, J., Hemphill, L., & Goodman, I. F. (1991). *Unfulfilled expectations: Home and school influences on literacy*. Cambridge: Harvard University Press.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21, 360–407.
- Stevenson, J., & Fredman, G. (1990). The social environmental correlates of reading ability. *Journal of Child Psychology and Psychiatry*, 5, 681–698.
- Stevenson, H. W. & Newman, R. S. (1986). Long-term prediction of achievement and attitudes in mathematics and reading. *Child Development*, 57, 646–659.
- Teale, W. H. (1986). Home background and young children's literacy development. In W.H. Teale and E. Sulzby (Eds.), *Emergent literacy: Writing and reading*. Norwood, NJ: Ablex.
- Tramontana, M. G., Hooper, S., & Selzer, S. C. (1988). Research on preschool prediction of later academic achievement: A review. *Developmental Review*, 8, 89–146.
- Valdez-Menchaca, M. C. & Whitehurst, G. J. (1992). Accelerating language development through picture book reading: a systematic extension to Mexican day care. *Developmental Psychology*, 28, 1106–1114.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1994). Development of reading-related phonological processing abilities: New evidence of bidirectional causality from a latent variable longitudinal study. *Developmental Psychology*, 30, 73–87.
- Wells, G. (1985). *Language development in the preschool years*. New York: Cambridge University Press.
- White, K. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin*, 91, 461–481.
- Whitehurst, G. J. (1996, April). *A structural equation model of the role of home literacy environment in the development of emergent literacy skills in children from low-income backgrounds*. Paper presented at the Annual Convention of the American Educational Research Association. New York, NY.
- Whitehurst, G. J. (1997). Language processes in context: Language learning in children reared in poverty. In L.B. Adamson & M.A. Ronski



- (Eds.), *Research on communication and language disorders: Contribution to theories of language development* (pp. 233–266). Baltimore, MD: Brookes.
- Whitehurst, G. J., Arnold, D. S., Epstein, J. N., Angell, A. L., Smith, M., & Fischel, J. E. (1994). A picture book reading intervention in day care and home for children from low-income families. *Developmental Psychology, 30*, 542–555.
- Whitehurst, G. J., Arnold, D. S., & Lonigan, C. J. (1990). *Dialogic reading: The hear-say method—A video workshop*. Stony Brook, NY: Acorn Films.
- Whitehurst, G. J., Epstein, J. N., Angell, A. C., Payne, A. C., Crone, D. A. & Fischel, J. E. (1994). Outcomes of an emergent literacy intervention in Head Start. *Journal of Educational Psychology, 86*, 542–555.
- Whitehurst, G. J., Falco, F., Lonigan, C. J., Fischel, J. E., DeBaryshe, B. D., Valdez-Menchaca, M. C., & Caulfield, M. (1988). Accelerating language development through picture-book reading. *Developmental Psychology, 24*, 552–558.
- Whitehurst, G. J. & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development, 69*, 848–872.
- Woodcock, R. W. & Johnson, M. B. (1977). *Woodcock-Johnson Psycho-Educational Battery*. Allen, TX: DLM Teacher Resources.
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