

# Quality of Adult Book Reading Affects Children's Emergent Literacy

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The authors assessed the relative benefits of 3 styles of adult book reading for preschoolers' emergent literacy. A describer style focused on describing pictures during the reading, a comprehender style focused on story meaning, and a performance-oriented style introduced the book and discussed story meaning on completion. Forty-eight 4-year-olds were randomly assigned to receive 1 of the 3 reading styles over a 6-week period. Pretests and posttests measured children's receptive vocabulary, print, and story comprehension skills. A describer style of reading resulted in the greatest overall benefits for children's vocabulary and print skills, but a performance-oriented style was also beneficial when children's initial skill levels were taken into account. Future book-reading interventions should be tailored to children's initial skill levels.

By the time children enter formal schooling, they have already developed a diverse range of literacy skills. An *emergent* approach to literacy recognizes that much more is involved in literate behavior than simply decoding letters and words (Beals, DeTemple, & Dickinson, 1994; Reese, 1995; Teale & Sulzby, 1986). Emergent literacy encompasses children's oral language skills, story comprehension, and print concepts, as well as the prototypical letter recognition skills (e.g., Mason & Allen, 1986). Conceptually, semantic skills are necessary components of reading for meaning (Gough, Ehri, & Treiman, 1992). Empirically, the semantic skills of receptive vocabulary and story comprehension at school entry are strongly predictive of later literacy (e.g., Snow, Tabors, Nicholson, & Kurland, 1994; Wells, 1985). Stanovich (1986) maintained that vocabulary knowledge in particular is causally related to children's reading comprehension abilities.

Some young children are especially motivated to become literate. These children seek out literacy experiences, alone and with others, and sometimes become early readers (e.g., Durkin, 1966). The conventions of literacy are culturally specific, however, and learning them requires at least to some degree the assistance of more expert individuals. Rogoff (1990), building upon Vygotsky's

(1978) sociocultural theory, proposed that cognitive development occurs through an apprenticeship process in which the expert gradually transfers responsibility to the novice as the novice becomes more competent. In this model of transfer and internalization, the novice is not just a passive recipient but an active agent in deciding which skills to take on and an active interpreter in the way these skills build on previous knowledge. Research supports the notion that one way in which children become literate is through their language interactions with adults, especially through talk that is removed from the immediate time and place (e.g., "decontextualized" speech; Beals et al., 1994; Reese, 1995).

Only by examining interactive events between adults and children in more detail have researchers begun to understand the dynamics of the association between social interaction and literacy development. We continue this approach in the study reported here, but we focus specifically on the potential benefits of children's interactions with an adult reader during book reading. Shared book reading is appropriate for examining the effects of social interactions on emergent literacy because it requires cooperation as well as the generation of conversation between reader and child. Within the book-reading context, children are exposed to narratives, vocabulary, syntax, story structure, and basic print concepts (Clay, 1979; Ferreiro & Teberosky, 1982; Sulzby, 1985).

Most research on the possible effects of shared book reading on children's literacy has centered on the frequency with which children are read to during early childhood. Although researchers disagree about the magnitude of this effect on children's later literacy, they do agree that a relation exists between the frequency of being read to and children's later receptive vocabulary, verbal precocity, and knowledge of print (Crain-Thoreson & Dale, 1992; DeBaryshe, 1993; Wells, 1985; for reviews, see Bus, van IJzen-doorn, & Pellegrini, 1995; Scarborough & Dobrich, 1994). In their review of the potential effects of shared book reading, however, Scarborough and Dobrich highlighted the need for more research on the effects of the quality rather than quantity of book reading experienced in early childhood.

Notably, a research program conducted by Whitehurst and colleagues has experimentally demonstrated an effect of one particular book-reading style, dialogic reading, on preschool children's

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language and literacy development. In a dialogic style of reading, adults increase their rates of open-ended questions and elicit children's responding during book reading. Dialogic reading benefits 2- to 4-year-old children's expressive and receptive vocabulary, as well as their writing and print skills (Whitehurst, Arnold, et al., 1994; Whitehurst, Epstein, et al., 1994; Whitehurst et al., 1988).

Dialogic reading is just one way of reading to preschoolers, and its benefits appear to be primarily for children's language skills. Other styles of reading may be more beneficial for other aspects of literacy skill, such as story comprehension. A second body of research has now demonstrated a considerable amount of variability in adults' naturally occurring book-reading styles with preschoolers (e.g., Heath, 1983; McNaughton, 1995; Ninio, 1980). In particular, Heath (1982) identified variability in three potentially important types of utterances for children's story skills: *what-questions* (what has happened in the story), *reason explanations* (why it happened), and *affective commentary* (evaluative judgments). What-questions may benefit story comprehension as it is often tested, in the form of story memory; reason explanations may facilitate a deeper understanding of the story; and affective commentary may promote the aesthetic appreciation of stories that is usually not emphasized in the curriculum until the later years of schooling. Pellegrini, Brody, and Sigel (1985) characterized what-questions as lower demand, and reason explanations and affective commentary as higher demand utterances. The latter two utterance types require that the child go beyond the immediate context of the text to understand why an event happened or to evaluate what that event might mean for the character or the reader. Sigel (1982) argued that higher demand strategies comprise a greater degree of cognitive "distancing" from the immediate environment and thus aid children's abstract thinking. In this study, we are primarily concerned with the effect that adult book-reading styles of different demand levels have on children's emergent literacy.

Haden, Reese, and Fivush (1996) examined the demand level of middle-class North American mothers' styles during book reading with their children age 3 to 5 years. Though the study was exploratory, Haden et al. noted consistency in maternal reading styles across time. In a lower demand *describer* style, mothers focused on describing and labeling pictures. In a higher demand *comprehender* style, mothers focused more on story meaning and making inferences and predictions about story events. Importantly, these maternal styles of reading were linked to children's later literacy. Children of mothers using a comprehender style had higher vocabulary and story comprehension levels 2½ years later compared with children of mothers using a describer style. Dickinson and Smith (1994) also found individual variation in reading style among preschool teachers. In particular, a high demand *performance-oriented* style, in which teachers read the story uninterrupted and confined discussion to before and after the story reading, was supportive of receptive vocabulary growth in contrast to other more interrupting styles. Thus, naturally occurring styles of book reading are related to different skills in the development of children's literacy.

Together, the reports of experimental and naturally occurring variations in book reading suggest that there may be a number of styles that benefit children's developing literacy skills. These styles vary on two critical dimensions: the demand level and the placement of the commentary during reading. Although Whitehurst, Epstein, et al.'s (1994) dialogic reading style incorporates

aspects of several styles, it is most similar to Haden et al.'s (1996) naturally occurring describer style. Both work primarily at the lower demand what-question level and frequently interrupt the text. Yet the results for these two styles are mixed. Whitehurst, Arnold, et al. (1994) and Whitehurst, Epstein, et al. (1994) found positive results of dialogic reading for children's vocabulary and print, but Haden et al. found that children of mothers using a describer style had lower language and story comprehension skills compared with children of mothers using a comprehender style. Notably, the dialogic reading studies have mainly been conducted with low-income and younger samples, whereas Haden et al.'s sample consisted of middle-class children from 3½ years to nearly 6 years of age.

The two other distinct styles to emerge from the literature are the comprehender and performance-oriented styles. Both are higher demand styles than either dialogic or describer reading with their focus on affective commentary and reason explanations. These two styles differ slightly in content: The performance-oriented style incorporates more affective commentary, whereas the comprehender style uses more reason explanations. The critical difference between the two styles, however, may be in the placement of comments. The comprehender style is more interrupting to the storyline, whereas the performance-oriented style restricts commentary to the beginning and ending of the story. Both of these styles are associated with benefits to children's receptive vocabulary skills compared with other styles, but only in correlational research (Dickinson & Smith, 1994; Haden et al., 1996). The comprehender style is additionally associated with advances in story comprehension (Haden et al., 1996).

In the present experiment, we manipulated the describer (low-demand and interrupting), comprehender (high-demand and interrupting), and performance-oriented (high-demand and noninterrupting) styles in their effects on emergent literacy because they represent the main styles of book reading found to date in naturally occurring interactions between adults and children. We did not include a low-demand, noninterrupting style in the design because such a style has not emerged in the research on naturally occurring book reading. Our primary goal was to assess experimentally the relative benefits of these naturally occurring reading styles. In the process, we hoped to resolve some of the discrepant findings between past experimental and correlational research.

Experimenters read to 4-year-old New Zealand children in one of the three styles over a period of 6 weeks. New Zealand children start formal schooling on the day that they turn 5 years old (thus the composition of "new entrants" classes is constantly changing during the school year as new 5-year-olds enter and older children are moved up). We targeted 4-year-olds because literacy intervention may be particularly crucial just before formal schooling. Although some previous experimental studies of book reading have used nonreading control groups, we instead used multiple styles to serve as reading control groups for the other styles. Therefore, our results address the relative benefits of the styles, not the effect of book reading per se.

Our predictions for the effects of the different reading styles were dependent on (a) the initial skill level of the child and (b) the emergent literacy skill measured. Our focus on the importance of children's initial skill level again draws on Vygotsky (1978) and subsequent expansions of Vygotsky's theory (e.g., Rogoff, 1990; Wood, Bruner, & Ross, 1976). For teaching interactions to be

effective, they must be targeted to children's level of potential development. Teaching strategies that are not demanding enough or too demanding fail to stay within children's "zone of proximal development," or the gap between his or her unassisted and assisted abilities. Some studies addressing the possibility of such interactions suggest that children with lower initial skill levels may benefit more from less demanding book-reading styles (Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Pellegrini et al., 1985). Other studies have found no interactions between reading condition and children's initial skill levels on vocabulary acquisition, but the adult reading styles in these studies varied primarily in the degree of participation on the part of the child, not in content or demand level (Senechal, 1997; Senechal & Cornell, 1993; Senechal, Thomas, & Monker, 1995). In this experiment, we kept participation constant and instead tested for effects of the demand level of the reading style. We predicted that children of higher initial skill levels would advance more with higher demand styles, and less-skilled children would advance more with lower demand styles. Because the practice of interrupting the text is primarily used with younger children (e.g., Heath, 1983), we also hypothesized that the more interrupting styles—describer and comprehender—might be more effective with children of lower skill levels. Therefore, we predicted an interaction between children's initial developmental level and the style of book reading. On a continuum, the describer style was predicted to be most effective with less-skilled children, the performance-oriented style with the most-skilled children, and the comprehender style somewhere in between.

Our predictions were also specific to the particular literacy skill in question. For receptive vocabulary and print skills, the only experimental evidence supports the benefit of a describer type of style (dialogic reading; e.g., Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Epstein, et al., 1994), but it is important to extend these effects in comparison with other styles of book reading. For story comprehension, past research instead supports the benefit of a comprehender style (e.g., Haden et al., 1996).

## Method

### Participants

Through letters to parents, we recruited fifty (24 girls, 26 boys) 4-year-old children from three state-run preschools in Dunedin, New Zealand, to participate in the study. Children's ages at the start of the study ranged from 4 years 0 months to 4 years 10 months ( $M = 4$  years 5 months). The children represented a broad range of initial language levels, with Peabody Picture Vocabulary Test—Revised (PPVT-R Form L; Dunn & Dunn, 1981) standard scores spanning from 65 to 131 ( $M = 102$ ). The sample was 92% Pakeha (New Zealanders of European descent) and 8% Maori (indigenous New Zealanders). English was the primary language in all the families' homes. Families' socioeconomic status (SES) was assessed through a combined index of maternal education and paternal occupation (the latter derived from Elley & Irving, 1976).<sup>1</sup> The sample was predominantly working class, with 60% of the children's fathers working in a technical, sales, or trade occupation. Ten percent of children's mothers held a university degree.

### Materials

In all, 36 books were used in the study and were selected as representative of storybooks widely available to New Zealand preschoolers. All of

the books were narratives and comprised a mix of recent (e.g., *My Cat Maisie*; Allen, 1990) and older books (e.g., *Outside Over There*; Sendak, 1981). Narrative rather than expository books were chosen because the two book types are associated with different adult reading styles (Pellegrini, Perlmutter, Galda, & Brody, 1990) and because primarily narrative books have been used in past intervention research (e.g., Whitehurst, Epstein, et al., 1994).

### Procedure

The study consisted of three phases: pretest, intervention, and posttest. After obtaining informed consent from the parents, one of three trained female researchers visited children in their own homes for pretest and posttest, with a different researcher at each test. At each assessment, we measured children's receptive vocabulary, print skills, and story comprehension.<sup>2</sup> Posttest researchers and coders were unaware of children's reading style assignment and pretest performance.

**Pretest and posttest assessment.** Pretesting took place over a period 2 weeks before the intervention, and posttesting 2 weeks after the intervention was completed. Testing took place in a quiet room in children's homes in the following order:

1. **Vocabulary.** Receptive vocabulary was measured with the PPVT-R (Form L at pretest and Form M at posttest). Split-half reliability for Form L with 4-year-olds is .70 and for Form M is .74, with a retest reliability of .78. The test was administered in the standard format, with the following substitutions: *jug* for *pitcher* and *tap* for *faucet*, because New Zealand English does not include the words *pitcher* and *faucet*. Children's language age was used as the final score.

2. **Print.** We assessed children's environmental print knowledge, letter recognition, and concepts of print. We devised our own environmental print measure to be suitable for a New Zealand sample. For letter recognition, we used the letter identification part of the reading portion of the Wide Range Achievement Test—Revised (WRAT-R; Jastak & Jastak, 1978). The WRAT-R is a popular screening test for reading ability; retest reliability on the entire reading test with 7- to 10-year-olds is .94–.96. To assess print concepts, we used the 10 items of Clay's (1979) Concepts About Print (CAP) test that measure letter and story concepts. We did not use the decoding items from the CAP because the majority of New Zealand children do not start passing them until at least 5½ years of age. Children's final print score was a sum of their performance on the following three subtests.

- a. **Environmental print.** Testers presented children with 14 color logos on laminated 4" × 6" cards. The logos were ones that New Zealand children frequently encounter in their everyday lives (e.g., for McDonald's restaurant, Coca-Cola, and Weet-bix cereal). For each logo, the tester asked the child, "What does this one say?" A correct response consisted of the child saying the words or letters exactly as written, with the exception that we allowed "Coke" as correct for "Coca-Cola." Each correct response yielded 1 point.

- b. **Letter and word identification.** The letter identification part of the reading portion of the WRAT-R was administered with the individual

<sup>1</sup> Paternal occupation was rated on a 6-point scale devised for a New Zealand population by Elley and Irving (1976), with 1 = *professional occupations* and 6 = *unskilled labor*. Maternal education was also rated on a 6-point scale, with 1 = *graduate education past a B.A.* and 6 = *some high school education but no degree*. Families' scores on the two scales were summed to provide an SES index, with 2 being the highest possible SES and 12 being the lowest.

<sup>2</sup> Children's storytelling skill was also assessed in the same session, with one storytelling measure before and one after the test of story comprehension. These measures are not included in the present study.

letters printed in boldface type on separate 4" × 6" cards. If children identified correctly 10 of the 12 letters, we then asked them to identify each of the first 10 words from the WRAT-R. Children received 1 point for each letter and word correctly identified, for a possible total of 22 points.

c. *Print concepts.* We administered the 10 items from the CAP in the standard manner. Children received 1 point for each item answered correctly.

3. *Story comprehension.* We adapted a story comprehension test from Beals and DeTemple (1993), with testers reading an unfamiliar storybook to children and asking comprehension questions at predetermined points during the story (*The Snowy Day* [Keats, 1962] at pretest and *Peter's Chair* [Keats, 1967] at posttest). Questions focused on plot information, inferences, and general knowledge about the world critical to the understanding of the story. This task was audiotaped and later transcribed for scoring. Children received 1 point for each question answered correctly out of 11 questions at pretest and 12 questions at posttest. Two coders independently coded 25% of the transcripts at each test. Reliability between the two coders was  $\kappa = .86$  at pretest and  $\kappa = .93$  at posttest. One coder scored the remaining transcripts. A tape-recorder malfunction for 1 child in the performance-oriented group eliminated her pretest story comprehension data; for analyses, we entered the performance-oriented group mean for the missing score.

*Intervention phase.* After pretesting, children were matched on their PPVT-R scores and gender and then randomly assigned to one of the three reading styles. Then each child was individually read 32 books out of 36 by the same reader in a quiet room in the preschool over the next 6 weeks. Reading sessions occurred two to three times each week for each child with 2 to 3 books read in each session. The intervention was administered by four readers, two of whom had also served as pretesters. Readers were unaware of the main hypotheses of the study. Reading styles were distributed evenly across the readers and the three preschools. Reader 1 read to 2 children in the describer style, 4 children in the comprehender style, and 4 children in the performance-oriented style in Preschool A and to 5 children in the describer style, 5 children in the comprehender style, and 3 children in the performance-oriented style in Preschool B. Reader 2 read to 6 children in the describer style, 4 children in the comprehender style, and 5 children in the performance-oriented style in Preschool C. Reader 3 read to 2 children in the describer style, 2 children in the comprehender style, and 3 children in the performance-oriented style in Preschool C; Reader 4 read to 2 children in the describer style, 1 child in the comprehender style, and 2 children in the performance-oriented style in Preschool C. One child in the performance-oriented group (read to by Reader 4) did not attend preschool often enough to complete the 6-week reading phase. Another child (read to by Reader 1) was randomly dropped from the describer group to avoid the statistical problems associated with covariance analyses with unequal cell sizes (Tabachnick & Fidell, 1989). The characteristics of the resulting sample of 48 children by reading condition are summarized in Table 1.

Previous book-reading interventions have sometimes used rather flexible guidelines for readers to follow when administering the intervention. We

ensured stylistic fidelity and avoided the problem of experimenter bias in administering the intervention by instead adhering to strict reading protocols. For each of the three styles, five prepared questions and five prepared comments were included in the reading of each book. The particular utterance types for each style were drawn from past research on naturally occurring book reading. In the describer style, the reader made five comments and asked five questions throughout the story focusing on labels and descriptions of the pictures. In the comprehender style, the five questions and five comments interspersed through the story focused on predictions and inferences about the storyline as well as inferences about characters' emotions. In the performance-oriented style, the reader introduced the story with five comments and then requested five inferences and evaluatives at the end of the story reading. Table 2 presents examples of the three styles. In all styles, readers responded to children's comments with an affirmation but no further discussion and to all children's questions by turning the question back to the child (e.g., the child asks, "Why is the mouse under the house?" and the reader responds, "I don't know. Why do you think the mouse is under the house?"). Readers worked from a typed protocol for each book that listed the exact comments and their placement during reading. Unobtrusive stickers with comment numbers were placed in the books at the appropriate point in the text. Readers had a separate sheet of paper for each book containing the numbered comments that they read from during the session. All readings were audiotaped. Stylistic fidelity was conducted on 96 readings, one each from the first 10 and last 10 books read for the 48 children. These readings were transcribed and then checked against protocols by a research assistant who had not participated in either reading or testing. Adherence to the exact wording of prescribed comments was  $\kappa = .99$ . Basically, in 1 of the 96 readings checked, one reader forgot to ask one child a single question. All comments except the omitted one were made at the correct point in the text.

## Results

### Preliminary Analyses

Preliminary analyses of variance showed no preexisting differences in the sample by reading style assignment on the three pretest skills (see Table 3). We checked all variables for normality and found that the posttest vocabulary score was mildly positively skewed. We conducted a logarithmic transformation of that variable and reran all of the following analyses. The pattern of significant results was the same using transformed scores, so we retained results using the original scores in all findings presented here. Analyses of covariance by SES (high or low, based on a median split) and reading style with pretest scores as covariates indicated no effects of SES, either as a main effect or in interaction with reading style, on the three posttest skills. Thus, children in the three reading-style groups were nicely matched at pretest on all skills, and they did not respond differently to the intervention on the basis of their SES. As will become apparent, however, the children differed at posttest as a function of reading-style condition. It is to the posttest differences that we now turn.

### Plan of Analysis

The main question of interest in this study was how reading style would influence emergent literacy skills. In support of the notion that the components of emergent literacy are distinct but interrelated (Reese, 1995; Snow & Dickinson, 1991), the three skills we targeted were moderately intercorrelated at pretest. The pretest PPVT-R was correlated at .41 ( $p < .01$ ) with pretest print skills and .57 ( $p < .01$ ) with pretest comprehension skills. Pretest

Table 1  
Gender Distribution, Mean Age, and Initial Vocabulary by  
Reading-Style Condition

| Condition               | Boys/girls | Age in months |           | PPVT-R<br>standard score |           |
|-------------------------|------------|---------------|-----------|--------------------------|-----------|
|                         |            | <i>M</i>      | <i>SD</i> | <i>M</i>                 | <i>SD</i> |
| Describer               | 7/9        | 53.06         | 3.17      | 104.81                   | 15.08     |
| Comprehender            | 9/7        | 53.12         | 2.96      | 102.00                   | 15.14     |
| Performance<br>oriented | 9/7        | 54.18         | 2.71      | 100.56                   | 13.88     |

Note. PPVT-R = Peabody Picture Vocabulary Test—Revised.

Table 2  
*Examples of the Three Book-Reading Styles During Hemi's Pet (De Hamel, 1985)*

| Style                | Commentary   |
|----------------------|--|
| Describer            | <p>There is Rata. (p. 2)</p> <p>What is that girl doing? (p. 3)</p> <p>How many windows are there on the building? (p. 6)</p> <p>Hemi and Rata are in the bathroom. (p. 8)</p> <p>What are Mum and Dad having for breakfast? (p. 10)</p> <p>Look at all the animals. (p. 12)</p> <p>What is the budgie looking at in its cage? (p. 14)</p> <p>The cat has got green eyes. (p. 16)</p> <p>The cat got a prize too. (p. 22)</p> <p>Where is the red ribbon? (p. 23)</p>  |
| Comprehender         | <p>Why doesn't Rata go to school every day? (p. 1)</p> <p>Hemi wishes he had a pet to take. (p. 3)</p> <p>Why do you think Hemi smiled? (p. 6)</p> <p>Why is Hemi making Rata look pretty? (p. 7)</p> <p>Hemi is taking Rata to school as his pet. (p. 10)</p> <p>The children have different pets. (p. 12)</p> <p>Do all pets have four legs? (p. 13)</p> <p>Some of the pets have fur, some have four legs and some have a tail, but not all of them. (p. 20)</p> <p>No one else had a pet like Rata so Hemi and Rata won a prize. (p. 21)</p> <p>Do you think Hemi liked having Rata for a pet? (p. 23)</p> |
| Performance oriented | <p>(Before reading)</p> <p>This story is about a boy named Hemi and his little sister, Rata. One day there is a pet show at school. But Hemi doesn't have anything to take! His little sister wants to know what a pet is. Let's see what special pet Hemi decides to take to school.</p> <p>(After reading)</p> <p>Who was Hemi's pet?</p> <p>Why did Hemi take Rata to school as his pet?</p> <p>What sort of pets did the other children take to school?</p> <p>Do you think Rata made a good pet?</p> <p>What was your favorite pet in the story?</p>  |

print and comprehension were correlated at .47 ( $p < .01$ ). Therefore, it was important to control for all pretest skills in estimating the effects of reading style on each posttest skill. We also hypothesized possible interactions between children's initial levels on the pretest skills and the effect of reading style. Evaluation of posttest

differences can therefore only be made with consideration to pretest scores and Style  $\times$  Pretest interactions. Posttest scores adjusted for these variables are shown in Table 3. As a result of the adjustment, in some cases, children's scores appeared to have decreased over the course of the intervention.

Table 3  
*Pretest and Adjusted Posttest Means and Standard Errors by Literacy Skill and Reading-Style Condition*

| Test phase and measure | Reading style |           |              |           |                      |           |
|------------------------|---------------|-----------|--------------|-----------|----------------------|-----------|
|                        | Describer     |           | Comprehender |           | Performance oriented |           |
|                        | <i>M</i>      | <i>SE</i> | <i>M</i>     | <i>SE</i> | <i>M</i>             | <i>SE</i> |
| Pretest                |               |           |              |           |                      |           |
| PPVT-R                 | 57.62         | 12.71     | 55.56        | 10.78     | 55.12                | 10.91     |
| Print                  | 15.25         | 6.16      | 15.06        | 6.94      | 16.00                | 6.32      |
| Comprehension          | 3.26          | 2.10      | 4.69         | 2.09      | 4.07                 | 1.57      |
| Posttest               |               |           |              |           |                      |           |
| PPVT-R                 | 83.00         | 9.10      | 42.69        | 8.19      | 40.99                | 7.85      |
| Print                  | 25.67         | 3.82      | 8.14         | 3.44      | 17.82                | 3.29      |
| Comprehension          | 5.25          | 2.79      | 3.65         | 2.51      | 9.54                 | 2.40      |

*Note.* Posttest means are adjusted for pretest and reading style by pretest interaction scores. PPVT-R = Peabody Picture Vocabulary Test—Revised.

Table 4  
*Predicting Children's Emergent Literacy Skills*

| Variable                     | Posttest PPVT-R |              | Posttest print |              | Posttest comprehension |              |
|------------------------------|-----------------|--------------|----------------|--------------|------------------------|--------------|
|                              | $\beta$         | $\Delta R^2$ | $\beta$        | $\Delta R^2$ | $\beta$                | $\Delta R^2$ |
| Pretest PPVT-R               | 0.44            | .09**        | 0.05           | .00          | 0.03                   | .00          |
| Pretest print                | 0.02            | .00          | 0.82           | .25***       | 0.38                   | .07*         |
| Pretest comprehension        | 0.50            | .08**        | 0.19           | .01          | 0.32                   | .03          |
| Reading style                | -0.89           |              | -1.07          |              | -0.85                  |              |
|                              | -1.00           | .06*         | 0.07           | .03*         | 1.16                   | .03          |
| Style $\times$ PPVT-R        | 0.56            |              | 0.71           |              | 1.30                   |              |
|                              | 1.70            | .06*         | 0.45           | .02          | -1.41                  | .04          |
| Style $\times$ Print         | 0.62            |              | 0.26           |              | 0.12                   |              |
|                              | -0.38           | .03          | 0.13           | .01          | 0.29                   | .01          |
| Style $\times$ Comprehension | -0.24           |              | -0.08          |              | -0.57                  |              |
|                              | -0.42           | .02          | -0.62          | .03*         | -0.03                  | .02          |

Note. Beta weights were derived on entry after all other terms. PPVT-R = Peabody Picture Vocabulary Test—Revised.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

To address the presence of interaction effects in analyses, we used a dummy variable regression procedure that allows a test of Group  $\times$  Covariate interactions in which multiple pretests are entered as covariates, both alone and in interaction with the grouping variable (Judd, McClelland, & Smith, 1996). This regression procedure answers questions of whether the relation between a measured variable and the dependent variable is constant across levels of the independent variable, allowing us to test our prediction that children with higher initial skills would benefit more from the higher demand performance-oriented style, whereas children with lower initial levels would benefit more from the lower demand descriptor style. This regression procedure thus tests for three types of effects on each posttest score: group effects, covariate effects, and Group  $\times$  Covariate interactions. Our three pretest scores served as the covariates. Essentially, the interaction terms in the analysis address slope differences between groups in the regression of each posttest on each pretest score; they examine the question of whether group effects on each posttest are dependent on children's initial levels on any of the pretest scores. In predicting each posttest variable, our full model consisted of the three pretest scores as covariates, dummy variables for the reading-style effect (one pair per model), and dummy variables for each Reading Style  $\times$  Pretest interaction (three pairs per model). First, a pair of dummy variables for the group effect was created through a series of binary contrasts; second, the interaction terms were created by multiplying these grouping variables with each pretest variable. All dummy variables were tested in pairs. The resulting case-to-variable ratio of 6.9 per model is above the minimum ratio of 5:1 suggested by Tabachnick and Fidell (1989).<sup>3</sup> Using a forced-entry procedure, we tested the unique predictive power for each posttest of each of the seven terms after the other six terms had been entered. Beta weights upon entry and unique increases in explanatory power for each term are displayed in Table 4. Significant group and interaction effects were followed up by pairwise comparisons with a corrected alpha set at  $p < .025$ . We discuss the unique predictors for each posttest skill in turn.

### *Predicting Children's Vocabulary Skills*

The full model of predictors resulted in an adjusted  $R^2$  of .70,  $p < .001$ . Of the three pretest skills, children's initial vocabulary and story comprehension both contributed uniquely to their posttest vocabulary. Reading style was also a unique predictor of children's posttest vocabulary. Follow-up tests showed that although the comprehender style did not differ significantly from either the descriptor or performance-oriented styles, children in the descriptor condition showed significantly greater vocabulary gains than did children in the performance-oriented condition,  $\Delta R^2 = .10$ ,  $F(1, 24) = 11.93$ ,  $p < .01$  (see Table 3 for an illustration of this main effect). This main effect of reading style must be interpreted in the context of a significant interaction between reading style and initial vocabulary levels. Follow-up tests revealed that although the comprehender style did not differ significantly from either the descriptor or performance-oriented style in interaction with children's initial vocabulary skills, children with higher initial vocabulary skills made greater vocabulary advances with a performance-oriented rather than descriptor style,  $\Delta R^2 = .11$ ,  $F(1, 24) = 13.72$ ,  $p < .01$ . Table 5 contains this slope difference as a function of children's initial skills. Therefore, reading style had an effect on children's vocabulary levels, with descriptor children making the overall greatest gains in comparison with performance-oriented children. The effect of reading style was dependent, however, on children's initial vocabulary skills. Children with higher initial vocabulary skills gained most from the performance-oriented style, whereas children with lower initial vocabulary skills gained most from a descriptor style of reading.

<sup>3</sup> Moreover, J. Miller (personal communication, November 18, 1997) maintained that this ratio is not so critical when doing hypothesis testing, as we are, because the  $F$  test automatically takes into account sample size. The ratio is primarily a concern when developing predictive models, in which case there is the possibility of fitting error in estimating regression coefficients.

Table 5  
*Slopes of Posttest Performance as a Function of  
 Reading Style and Pretest Skill*

| Style                | Posttest PPVT-R on<br>pretest PPVT-R | Posttest print on<br>pretest comprehension |
|----------------------|--------------------------------------|--|
| Describer            | -0.10                                | 2.13                                       |
| Comprehender         | 0.61                                 | 0.51                                       |
| Performance oriented | 0.90                                 | -0.63                                      |

Note. PPVT-R = Peabody Picture Vocabulary Test—Revised.

### *Predicting Children's Print Skills*

The full model for predicting children's composite print scores resulted in an adjusted  $R^2$  of .84,  $p < .001$ . Variables that contributed uniquely to print posttest skills were pretest print, reading style, and reading style as a function of initial comprehension. Follow-up tests of the reading style effect showed that although the performance-oriented style did not differ significantly from either the describer or comprehender style, children in the describer condition made significantly greater gains than children in the comprehender condition,  $\Delta R^2 = .03$ ,  $F(1, 24) = 5.84$ ,  $p < .025$  (see Table 3 for an illustration of this main effect). This main effect of reading style must be interpreted in light of the significant interaction between reading style and children's initial comprehension skills. Follow-up tests of the slopes as a function of children's initial comprehension showed that although the comprehender style did not differ significantly from either the describer or performance-oriented styles in interaction with children's initial comprehension skills, children in the describer condition gained more in their print skills when they had higher initial comprehension levels in comparison with children in the performance-oriented condition,  $\Delta R^2 = .04$ ,  $F(1, 24) = 8.03$ ,  $p < .01$  (see Table 5 for slope differences). Thus, although children who were read to in a describer style showed the greatest overall gains in print skills, this effect was especially pronounced with children of higher initial comprehension skills, whereas children with lower initial comprehension skills gained most from a performance-oriented style.

### *Predicting Children's Story Comprehension*

The full model for predicting children's story comprehension resulted in an adjusted  $R^2$  of .37,  $p < .01$ . Children's initial print skills contributed uniquely to later story comprehension, but there was no unique effect of reading style on story comprehension, either alone or in interaction with pretest skills.

## Discussion

This study is the first to experimentally compare the relative effects of several adult book-reading styles on a range of children's emergent literacy skills. A main finding was that a describer style of book reading with children does appear to provide overall benefits for their receptive vocabulary and print skills in comparison with the two other reading styles. These main effects of reading style were in line with our predictions for these skills and are in keeping with past experimental research demonstrating the

benefits of a similar dialogic style of reading (e.g., Whitehurst, Epstein, et al., 1994). The present findings extend previous work, however, in several important ways. First, the only previous research using dialogic reading with 4-year-olds also included an add-on phonics program (Whitehurst, Epstein, et al., 1994). Our results clarify that their effects were most likely not due solely to this additional training. Second, past experimental research with this age group has been in comparison with nonreading control groups; the obtained results could have been due to the increased quantity of reading children received as well as the quality of reading. Our results provide evidence of the relative benefits of different reading styles and suggest that these effects were due to differences in the quality of book reading. The present results could be strengthened by including a larger sample size and extended to additionally demonstrate effects of book-reading quantity through the inclusion of a nonreading control group. Moreover, our prediction that a comprehender style would benefit children's story comprehension was not supported in the present study. Psychometric work on story comprehension tests for this age group may be needed before drawing any conclusions about the absence of reading-style effects on this skill.

Another main finding, however, was that these overall benefits for a describer style of reading must be considered in the context of significant interactions between reading style and children's preexisting skill levels. Specifically, children with higher initial vocabulary benefited most in their vocabulary development from a performance-oriented style, whereas a describer style was most beneficial for print skills when children had higher initial story comprehension levels.

These interaction findings are important for empirical, theoretical, and practical reasons. Empirically, these interaction findings suggest reasons for discrepancies between findings in past research, which at times has indicated the benefits of all three reading styles for children's receptive vocabulary. Notably, studies that found benefits of higher demand styles were conducted either with older preschoolers (Dickinson & Smith, 1994) or with children of above-average vocabulary skills (Haden et al., 1996). Research supporting the benefits of a lower demand reading style has been conducted either with very young preschoolers or with children performing significantly below average for their age (e.g., Valdez-Menchaca & Whitehurst, 1992). Therefore, a lower demand describer type of style may be most appropriate for advancing vocabulary development with younger children or those with lesser abilities, whereas a higher demand but uninterrupted performance-oriented style may work best with older or more advanced children. Robbins and Ehri (1994), for instance, found that 6-year-olds with high word knowledge made greater vocabulary gains than did children with low initial word knowledge from simply hearing unfamiliar words repeated during book reading. Robbins and Ehri concluded that the high-knowledge children made better use of contextual information in the text to acquire new words. Thus, an incidental vocabulary teaching technique may work best when children already have high receptive vocabularies.

Theoretically, these interaction findings have relevance for Vygotskian theories of cognitive development by emphasizing that what children bring to the interaction is vital for their subsequent learning. The interaction findings for children's vocabulary fit especially well with the idea of structuring teaching within the

zone of proximal development: Children with higher initial levels benefited more from higher demand reading styles.

We must exercise caution, however, in interpreting our findings of the effects of these book-reading styles on children's print skills. The overall benefits we found for the describer style are in line with experimental research (e.g., Whitehurst, Epstein, et al., 1994) but not with correlational research (Beals et al., 1994; Haden et al., 1996). Moreover, the obtained interaction results did not fit with our predictions that children with higher initial levels would benefit more from demanding book-reading styles. For print skills, children with higher initial comprehension benefited more from the less demanding describer style. In these children who are already processing plot information well, the interrupting nature of the describer style may provide an opportunity to observe physical features of the book and of print. For children with lower initial comprehension, the uninterrupted performance-oriented style may distract children less from noticing these physical features. The present results should be replicated and extended before we can draw any firm conclusions as to the mechanism of the effect. The results do indicate, however, that the benefits of a particular reading style, even after children's developmental level is taken into account, may be highly specific to the literacy outcome studied. Print and semantic aspects of literacy may have different developmental precursors and trajectories (Reese, 1995; Snow & Dickinson, 1991).

Even given the limitations of these findings for children's print skills, the present results suggest that the relation between adult reading style and changes in children's emergent literacy may be a causal one. Previous correlational studies left open the possibility that other influences, such as family background or preschool classroom variables, accounted for the obtained relations. The strength of the effects we obtained is in keeping with that of other successful book-reading interventions. For instance, the present intervention uniquely explained 17% of the resulting variance in children's vocabulary scores (total explained variance of our effects involving reading style on the PPVT-R). Whitehurst, Epstein, et al. (1994) acknowledged that the unique variance in children's language accounted for by their own and other successful book-reading interventions is still significantly less than the 12.5%–18% variance in child language accounted for by home literacy activities. Children's literacy skills are multiply determined, and it is noteworthy to uniquely explain even 17% of vocabulary knowledge from a 6-week intervention in which all children were read the same books, with variations only in extra-textual commentary. Moreover, even small differences in skills such as receptive vocabulary upon school entry tend to magnify into larger discrepancies between poor and good readers over the years, probably because receptive vocabulary enables reading, which in turn further enhances vocabulary development (Stanovich, 1986). The differential effects of the present reading styles are likely to be even greater in their naturally occurring settings of home and school where children are exposed to the different styles across many more readings over an extended period of time. Mothers appear to be stable in the reading style they use with their preschoolers over an 18-month period (Haden et al., 1996). A full treatment of this issue would compare the benefits of similar or contrasting book-reading styles across home and preschool on children's literacy skills. As Heath (1983) argued, it is the match

between home and school experiences that may be critical for later success in school.

Given that children's vocabulary and print skills before school entry are extremely good predictors of their later reading success (e.g., Snow et al., 1994; Wells, 1985), these findings also have potential practical importance. Our results suggest that reading interventions need to be carefully tailored to children's individual skill levels in different areas. Specifically, if vocabulary skill is to be fostered, children with low initial skills would benefit most from a describer style of reading. If print skills are to be enhanced, children with low comprehension skills may instead benefit most from a performance-oriented approach.

Our results do not address issues concerning the quantity of book reading children receive during the preschool years, but they do begin to answer questions regarding the quality of book reading children receive before schooling. Now that the relative benefits of some naturally occurring book-reading styles have been experimentally demonstrated, the next step is to expand the comparative study of book-reading quality. In particular, a dialogic reading style has been demonstrated to be beneficial for younger preschoolers and for older preschoolers of low developmental levels (e.g., Whitehurst et al., 1988; Whitehurst, Epstein, et al., 1994), but it has not yet been compared directly with other styles of book reading. Our describer style is similar but not identical to dialogic reading, which encourages a great deal more child participation over repeated readings. The performance-oriented style in the present study poses an attractive complement to dialogic reading for its ease of implementation in a preschool setting, especially for interventions with older and more advanced preschoolers. A direct experimental comparison of performance-oriented and dialogic reading with preschoolers of different ages and developmental levels would determine their relative benefits for various skills.

The present results are only a first step in comparing effects of different adult book-reading styles on children's emergent literacy. We maintain that it is unlikely that future research will ever uncover one "best" style of reading to children. Rather, different styles of book reading benefit different skills for children of different levels. Continuing to map out these effects of shared book-reading quality is imperative for designing effective book-reading interventions with preschoolers.

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