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Enhancing Linguistic Performance:

Parents and Teachers as Book Reading Partners for Children with Language Delays

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In this study, we instructed parents and early childhood special education staff in Dialogic Reading, an interactive language facilitation technique. We compared the effects of this instruction on adult and child language during shared book reading and on children's vocabulary growth in three different treatment conditions. Thirty-two children with language delays were randomly assigned to one of three groups: (a) parent instruction with one-on-one shared book reading practice, (b) staff instruction with one-on-one shared book reading practice, (c) staff instruction without one-on-one shared book reading practice (control group). Children were given standardized tests of vocabulary and were videotaped during shared book reading before and after the 8-week intervention period. Parents and staff showed changes in their shared book reading style consistent with the instruction they had received. After adult instruction in Dialogic Reading, children in all three groups spoke more, made longer utterances, produced more different words, and participated more in shared book reading. The magnitude of change in the children's linguistic performance from pre- to posttest was positively correlated with the magnitude of change in adult behavior. There were no statistically significant changes in children's vocabulary test scores. We interpret these findings as consistent with a Vygotskian model in which children's linguistic performance can be enhanced by a supportive social context.

Shared book reading with parents and other adults seems to be an ideal context for children to practice and improve their language skills. A growing body of research has demonstrated that frequent and effective shared book reading is associated with many aspects of children's language growth as well as literacy, although the nature of the underlying causal relationships is still being debated (see Bus, van Ijzendoorn, & Pelligrini, 1995, and Scarborough & Dobrich, 1994, for reviews with differing perspectives). Longitudinal research has shown associations between frequency and quality of shared book reading and children's vocabulary growth and use of abstract language (Crain-Thoreson & Dale, 1992; Debaryshe, 1993; van Kleeck, Gillam, Hamilton, & McGrath, 1997). Experimental research has demonstrated that increasing the frequency of story reading at home and at school can enhance preschool- and primary school–age children's language comprehension and expressive language skills (Vivas, 1996). In a series of experimental studies, Whitehurst and colleagues have demonstrated that preschool children's vocabulary growth is enhanced when parents and teachers are taught to use an interactive book sharing style (Whitehurst et al., 1988; Whitehurst et al., 1994).

Why is shared book reading such an ideal context for the development of language skills? In a Vygotskian theoretical framework (Vygotsky, 1962, 1978), shared book reading offers both social and contextual support for the development of language. Through repeated readings and the use of familiar routines, adults use books to support children's learning of new concepts and their verbal participation (Ninio & Bruner, 1978; Yoder, Spruytenburg, Edwards, & Davies, 1995). During shared book reading, a skilled adult can monitor a child's understanding of the text by questioning and, if the child doesn't understand, can appeal to the illustrations or create bridges from the text to the child's experience as scaffolding to aid comprehension (Rogoff, 1990). Adult and child can jointly construct meaning for the story, thereby supporting the child's use of increasingly more sophisti-

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cated language structures and functions (Heath, 1982; Snow, 1991).

However, not all parents and teachers take advantage of the power of shared book reading as a context for children's language development. If they choose a book that is too difficult, or too easy, it may not effectively engage the child. If they simply read the text and require the child to listen and keep still, they may not provide opportunities for the joint construction of meaning (Heath, 1982). Indeed, research has demonstrated a great deal of variability—even within middle class samples—in the way parents approach shared book reading (van Kleeck et al., 1997; Whitehurst et al., 1988). To help adults more fully exploit the potential of shared book reading, Whitehurst and colleagues developed an instructional program called Dialogic Reading that uses shared book reading to provide a context for interactive dialogue between adult and child. Results from their studies demonstrated that parent instruction in Dialogic Reading facilitated preschool children's vocabulary development in a sample of middle-class families (Whitehurst et al., 1988). These effects were replicated in a staff-administered intervention with 2- to 3-year-old children in Mexican day care (Valdez-Menchaca & Whitehurst, 1992), and again in a parent- and staff-administered intervention with a low-income sample of 3- to 4-year-olds in the United States (Whitehurst et al., 1994).

Shared book reading also holds promise as a language intervention procedure for children with language delays. In fact, one of the first uses of the Dialogic Reading program was as part of a therapeutic intervention for children with specific expressive language delay (Whitehurst et al., 1991). In that study, the researchers found that a home-based intervention implemented by parents was effective in increasing the expressive language skills of 28-month-old children. Children without the intervention did, however, catch up with the intervention group by the age of 65 months, which may say more about the nature of specific expressive language delay than about the effectiveness of the intervention itself.

On both empirical and theoretical grounds, Dialogic Reading has great potential for children with language delay and other developmental disabilities. The intervention aims to increase the kinds of parent utterances that have empirically demonstrated facilitative effects on children's linguistic performance in clinical contexts. For example, Yoder and Davies (1990), in a study of children with disabilities, found that children's multiword utterances were more likely to follow topic-continuing questions from their parents than other utterances. In an intervention study targeting children with developmental disabilities, Yoder, Davies, Bishop, and Munson (1994) found that, when adults increased their topic-continuing *wh*-questions, children's participation in conversational interactions increased. Finally, in an intervention study with a sample of children with disabilities, increases in maternal semantic contingency produced gains in joint attentional focus in mother–child dyads (Girolametto, Verbey, & Tannock, 1994).

These kinds of conversational features are promoted by Dialogic Reading. Parents are instructed to follow the child's lead, use *wh*-questions and open-ended questions, follow children's responses with topic-continuing questions, and expand and recast children's utterances. The program is based on the assumption that parents can play an important role in supporting their children's language development, especially in contexts such as shared book reading where joint attentional focus may be easier to achieve than in many other contexts (Tomasello & Farrar, 1986). Parents usually provide more complex language as a model for children during book reading than in other contexts (Crain-Thoreson, Powell, & Dahlin, 1998; Hoff-Ginsberg, 1991; Snow et al., 1976), but this complex language may be especially beneficial for language development if children's participation in the conversation is encouraged, giving the parents more opportunities to provide expansions and topic-continuing replies.

In a previous study (Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996), we contrasted an intervention based on Dialogic Reading with a play-oriented language facilitation intervention for children with language delays. We found that parents were able to modify their language according to the goals of each program. The effects of each of the two interventions on children's language were modest but consistent with the goals of each of the interventions (e.g., positive effects for mean length of utterance [MLU] and conversational participation). The intervention based on shared book reading was superior in increasing the children's linguistic performance overall. A consistent finding in both groups was that parents showed a tendency not to give their children time to respond to the questions they asked, which perhaps limited the effectiveness of both interventions. One of our goals in designing the present study was to fine-tune the Dialogic Reading intervention to address the needs of children with language delays by specifically teaching adults to pause and give children time to respond.

A second goal of our study was to compare the relative effectiveness of a staff-administered intervention to a parent-administered intervention program. Providing cost-effective interventions for children with language delays is a major challenge in early childhood special education. Children need opportunities to converse with more sophisticated conversational partners, but these opportunities are often limited by the availability of staff in a preschool setting. Perhaps for this reason, parent-implemented interventions have become a topic of great

interest in the clinical literature (see Kaiser, 1993, for a review). In many ways, parents are the ideal language facilitators for their children. They are motivated to help their children, interact with them in many settings, and spend much more time with them than a clinician could. Several types of parent-implemented conversational facilitation programs have been evaluated, with generally positive results (Fey, Cleave, Long, & Hughes, 1993; Kaiser, 1993; Tannock, Girolametto, & Siegel, 1992; Yoder, Kaiser, & Alpert, 1991).

In only a few studies have parent-implemented and staff-implemented interventions been compared. Even fewer investigators have compared the use of the same intervention by parents and staff. Cooper and colleagues found that the effects of a parent-implemented intervention compared favorably to those of a staff-implemented intervention (Cooper, Moodley, & Reynell, 1979). More recently, Fey and colleagues contrasted a parent-based with a staff-based intervention, finding that each was effective in improving children's language skills but that the clinician-implemented intervention produced more consistent results (Fey et al., 1993). Whitehurst et al. (1994) compared the effectiveness of a school-based with a combined school- and home-based Dialogic Reading intervention for children in federally funded preschool programs. Children's language skills increased more in the combined program. Lonigan (1993) contrasted an exclusively home-based condition with an exclusively school-based and a combined condition and found that the home-based condition was more effective for enhancing growth in some child language measures than either exclusively the school-based or the combined condition. It is important to note that in these Dialogic Reading comparison studies, children in the home-based condition participated in one-on-one shared book reading, whereas in the staff-implemented condition children participated in small-group shared book reading. Thus, group size may be an important factor to consider in comparing the effectiveness of home-based and school-based interventions.

Although the efficacy of shared book reading in improving children's language skills has been convincingly demonstrated empirically, important theoretical questions remain regarding the mechanism through which shared book reading has its effects. Repeated exposure to interactive story reading is assumed to be necessary before changes can be observed in child language, but this assumption has yet to be tested. Interactive shared book reading may have an immediate effect on children's linguistic performance in that particular context. A change in parent style could enable children to participate more and to produce more sophisticated expressive language during shared book reading. Children's increased participation and use of more varied language forms might in turn enable parents to produce even more topic-continuing replies and expansions of children's utterances, potentially leading to growth in children's underlying linguistic competence through a "snowball effect."

Indeed, although measures of children's language such as MLU, participation, and lexical diversity are often used as developmental measures, they are also substantially influenced by contextual and situational factors (Cazden, 1970; Crain-Thoreson et al., 1998). The same linguistic knowledge base (competence) may lead to more elaborate performance by the child when adults employ a more facilitative style. In our research design, we wanted to disentangle the potential effects of adult instruction on children's linguistic performance during shared book reading from the potential effects of repeated practice with shared book reading on children's underlying linguistic competence. Therefore, we decided against using the type of control group that has been employed in many previous shared book reading intervention studies, in which neither child nor adult receives an intervention in the control condition. Rather, in our control condition the adult would receive training in Dialogic Reading during the intervention period, but the child would not receive one-on-one practice with these new shared book reading strategies. In this way, we could distinguish the immediate effects of changes in adult behavior on the child from the effects of repeated experience.

Individual differences in children's response to the adult instruction also might be influenced by factors inherent to the child. Evidence from observational and correlational studies of shared book reading has suggested that children learn different things from reading stories at different stages of development (e.g., Crain-Thoreson & Dale, 1992). For example, when children are just beginning to combine words (Brown's Stage I; Brown, 1973), they may derive primarily vocabulary gains from shared book reading (Ninio & Bruner, 1978), but as children begin to acquire inflectional morphology (Brown's Stage II; Brown, 1973), evidence suggests that story reading can fuel the growth of grammatical knowledge as well (Snow & Goldfield, 1983). In our previous intervention study (Dale et al., 1996), we found that lower functioning children were more likely to respond to the intervention with increased verbal engagement and vocabulary learning, whereas the higher functioning children were more likely to respond to the intervention with growth in grammatical competence. In the present study, we hoped to add to our knowledge of what children learn from shared book reading at different levels of language development.

In our study, we modified the Dialogic Reading training program to more specifically address the needs of children with language delays by teaching parents to pause and give their children time to respond. Using this modified version of Dialogic Reading, we compared the effectiveness of a parent-implemented intervention with two levels of staff-implemented intervention—one level in which children received repeated exposure to shared

book reading and one in which they did not (control condition). We measured effectiveness by changes in adult language during shared book reading that were consistent with the instruction they had received, increases in children's participation and linguistic sophistication during shared book reading, and increases in children's performance on structured vocabulary measures. Finally, we examined predictors of children's response to the Dialogic Reading intervention.

Method

Participants

Thirty-two children (22 boys and 10 girls) qualifying for early childhood special education services and enrolled in preschool programs in three school districts in the Pacific Northwest participated in the study. The goal of these publicly funded preschool programs was to provide early intervention for children with special needs. A letter was sent to parents of children enrolled in each of five different classrooms (three classes from one large district and one class each from two smaller districts) describing the study and requesting their participation. Children whose parents consented to participation were included in the study. Thirty-seven children began the study but five did not complete it (see explanations in a later section). The mean chronological age of the children who completed the study was 51.6 months, ranging from 39 to 66 months. All children had mild to moderate language delay, scoring at least 1 standard deviation below the normed mean on the Peabody Picture Vocabulary Test–Revised (PPVT-R; Dunn & Dunn, 1981). Parents of 10 of the children and seven staff members from the five different schools also participated in the study.

Procedure

After consent was obtained, parents filled out a demographic questionnaire. Each child completed the PPVT-R and the Expressive One-Word Vocabulary Test–Revised (EOWPVT-R; Gardner, 1990) at the beginning of the study. These measures were administered either by school personnel or by graduate student assistants trained in the administration of these measures. Based on the children's pretest PPVT-R scores, triads of children with similar receptive vocabulary scores were formed. Children within each triad were then randomly assigned to the Parent (n = 13), Staff/practice (n = 13), or Staff/control (n = 11) group. (This procedure was followed within each of the three school districts participating in the study, leading to initially unequal numbers of participants in each group.) Five children did not complete the study. Three families dropped out of the parent group, due in one case to illness and in the two other cases to a reported lack of time. Two children in the control group did not complete the study due in one case to illness and in the other case to lack of compliance by the child during posttest videotaping. Thus, final group sizes were Parent, n = 10, Staff/practice, n = 13, and Staff/control, n = 9. Table 1 provides information on the three groups of final participants for demographic variables and for the receptive and expressive language measures.

Each child was individually videotaped participating in shared book reading with a familiar adult at the start of the study and with the same adult at the end of the 8-week intervention period. Each videotaping session lasted approximately 10 minutes. Children in the parent group read with a parent. Children in the two staff groups read with a staff member from the school who was known to the children (e.g., teacher, librarian, teacher's aid, school nurse). At two of the schools, one

TABLE 1. Description of Treatment Groups

Measure	Parent[a]	Staff/Practice[b]	Staff/Control[c]
Age in months	49.9 (8.5)	53.8 (7.0)	51.1 (8.9)
PPVT-R scale score	62.7 (14.3)	55.2 (14.7)	59.7 (12.5)
EOWPVT-R scale score	70.8 (9.9)	71.7 (12.4)	70.0 (8.5)
MLU during pretest video	2.1 (0.6)	2.3 (0.5)	2.2 (1.2)
Maternal ed.	2.7 (1.2)	2.7 (0.9)	2.4 (1.1)

Note. Standard deviations are in parentheses. Maternal ed. = mother's education (1 = < high school; 2 = high school; 3 = some postsecondary; 4 = 4-year college degree; 5 = advanced degree); PPVT-R = Peabody Picture Vocabulary Test–Revised (Dunn & Dunn, 1981); EOWPVT-R = Expressive One-Word Picture Vocabulary Test–Revised (Gardner, 1990); MLU = mean length of utterance.

[a] n = 10. [b] n = 13. [c] n = 9.

staff member read to all the children in both the Staff/practice and the Staff/control groups. At three schools, two staff members each read to half the children from the Staff/practice and half the children from the Staff/control groups (randomly selected). The pretest videotaping was completed before instruction in Dialogic Reading, and the posttest videotaping took place at the end of the study, when all adults had received instruction in Dialogic Reading. Two books were chosen for the pre- and posttest videotaping. They were *Fortunately* by Remy Charlip (1993) and *When I Am Old With You* by Angela Johnson (1990). The books were chosen to be interesting and relevant for girls and boys of different backgrounds. *Fortunately* is a humorous, somewhat fantastic story with a young White boy as main character. *When I Am Old With You* is a more realistic story, focusing on the relationship between a young African-American girl and her grandfather. Both books were available during each videotaping, and adults were told to read either or both. Some adult–child dyads chose to read the same book at each videotaping, some read one book at the pretest and the other at posttest, and some read both books at each videotaping. The patterns of reading the same, different, or both books did not differ systematically across the treatment groups.

After the pretest videotaping was completed, the instruction phase of the project began. Parents and staff participated in two $1\,^1/_2$-hour instructional sessions 4 weeks apart that were based on the Dialogic Reading program and used segments from the Dialogic Reading videotape (Whitehurst et al., 1988). Parents and staff members met with the researchers as a group during the evening for each of the instructional sessions. At each instructional session, parents and staff members viewed a videotape describing effective book sharing strategies, saw a demonstration, had an opportunity to ask questions, and practiced in a role-playing exercise. At the first instructional session, eight major strategies were introduced and summarized on a handout for parents (see Figure 1). The strategies were drawn directly from the Dialogic Reading videotape, except for one added to specifically address the needs of children with language delay (i.e., "Slow down and give your child time to respond"). At the second instructional session, the original strategies were reviewed and two additional strategies were introduced, again summarized on a handout. Parents were given a choice of several children's books from which they could select two at each of the instructional sessions. The books used for videotaping were not given to families to take home.

Over the 8-week course of the study, children who had been assigned to the Parent group or the Staff /practice group engaged in one-on-one interaction with one of the trained adults at least four times per week. Parents and staff members were asked to keep logs of their shared reading and were called weekly in case they had questions. Although some parents read more than four times per week with their children, all parents in the Parent group reported using the Dialogic Reading strategies at least four times per week. Based on their logs, staff members conscientiously engaged in one-on-one shared book reading with the children in the Staff/practice group four times per week. Children in the Staff/control group did not participate individually in Dialogic Reading during the intervention period, although group story time was part of the preschool programs for all children in the study. The parents of all children in the two staff groups were invited to learn the Dialogic Reading strategies at the conclusion of the study.

First Instructional Session Strategies

1. Ask "what" questions.
   Adult: "What are those?"
2. Slow down and give the child time to respond.
3. Follow the child's answers with questions.
   Adult: "What are those?"
   Child: "shoes"
   Adult: "What's he doing with his shoes?"
4. Repeat what the child says.
   Child: "shoes"
   Adult: "yes, shoes"
5. Help the child as needed.
   Adult: "What are those?"
   Child: no response
   Adult: "Those are his shoes, aren't they?"
6. Praise and encourage the child.
   Adult: "What are those?"
   Child: "shoes"
   Adult: "Yes, shoes, great!"
7. Shadow the child's interests.
   Child: points to picture of a birthday cake.
   Adult: "What's that?"
8. Have fun!

Second Instructional Session Strategies

1. Ask open-ended questions.
   Adult: "What's happening?"
2. Expand what the child says.
   Child: "shoes on"
   Adult: "He's putting his shoes on."

FIGURE 1. Dialogic reading strategies with examples.

At the conclusion of the intervention period, the PPVT-R and EOWPVT-R were administered again to each child. Children were individually videotaped while reading with the same adult who had read with the child at the pretest videotaping. The books and procedure used were the same as at the first videotaping.

Videotape Coding

The pretest and posttest videotapes were transcribed using the Codes for the Human Analysis of Transcripts (CHAT), a standardized transcription format developed by the Child Language Data Exchange System (MacWhinney, 1995). In order to measure changes in children's language complexity during the videotaped book sharing, the Computerized Language Analysis Programs (CLAN; MacWhinney, 1995) were used to compute several of the dependent variables, including child mean length of utterance (MLU), number of different words spoken by the child, and total number of child and parent utterances during each videotaped book sharing session. A measure of the children's relative participation in each videotaped book sharing session was computed by dividing the number of child utterances by the sum of child and adult utterances, a value of .50 reflecting equal participation by the two individuals.

A coding system was developed for these interactions, similar in structure to the coding system reported in Dale et al. (1996). Coding conventions developed for adults' language were based on the types of utterances that had been either encouraged or discouraged by the Dialogic Reading instruction (see Table 2). The code "insufficient time for response" (ITR) was used if adults followed one utterance with another utterance within 2 seconds in the absence of a response by the child. The utterance codes were entered as dependent tiers in the CHAT system and tallied by the CLAN programs. Transcription and coding were performed by graduate and undergraduate students in psychology and in speech and hearing sciences. These raters were not aware of whether the videotapes represented pretest or posttest sessions.

Twelve transcripts from 12 different children were coded by an independent rater in order to compute interrater agreement. These transcripts were randomly chosen but approximately evenly distributed among pre- and posttest videotaping and among treatment groups. Percentage agreement was computed for each code and corrected for chance agreement using Cohen's Kappa (see Table 2). Overall agreement was 79% ($\kappa = .77$).

Results

Effect on Adult Book Reading

Our first research goal was to evaluate the effectiveness of the Dialogic Reading intervention in modifying parents' versus staff members' shared book reading style. We performed a series of 2 x 3 repeated-measures analyses of variance, with time (Pretest, Posttest) as a within-subjects factor and group membership (Parent, Staff/practice, Staff/control) as a between-subjects factor, using frequencies of each of the adult behavior codes in turn as a dependent measure. Although the mean overall frequency of adult speech did not change significantly from pre- to posttest videotaping, $F(1, 29) = 0.06$, $p = .80$, there were a number of significant changes in adult story reading style from pretest to posttest (see Table 3). Mean frequencies that increased from pre- to posttest videotaping were those for acknowledgments, $F(1, 29) = 15.76$, $p < .01$; expansions, $F(1, 29) = 14.67$, $p < .01$;

TABLE 2. Parent Language Coding Conventions

Code	% Agree	Cohen's Kappa
1. Verbatim or near-verbatim book reading (*discouraged*)	99	.99
2. Statement		
a. acknowledgment of child utterance (*encouraged*)	59	.54
b. information statements (*discouraged*)	88	.86
c. direct correction of form or meaning (*discouraged*)	100	1.00
d. model appropriate answer (*encouraged*)	73	.69
3. Question		
a. requiring a pointing response (*discouraged*)	71	.68
b. yes/no question (*discouraged*)	79	.77
c. question with "what" or "who" (*encouraged*)	86	.84
d. open-ended question (*encouraged*)	77	.74
4. Expansion of child utterance (*encouraged*)	69	.65
5. Praise or encouragement (*encouraged*)	75	.72
6. Providing insufficient time for child response (*discouraged*)	97	.95

open-ended questions, $F(1, 29) = 50.41$, $p < .01$; and who/what questions, $F(1, 29) = 26.83$, $p < .01$. Mean frequencies that decreased from pre- to posttest videotaping were those for verbatim reading, $F(1, 29) = 66.84$, $p < .01$; information statements, $F(1, 29) = 7.87$, $p < .01$; and insufficient time for response, $F(1, 29) = 6.21$, $p < .05$.

There were some statistically significant differences among the group means for frequencies of particular types of utterances, although the group means did not differ in overall frequency of adult speech, $F(2, 29) = 1.04$, $p = .37$. There was a statistically significant main effect of group membership for the frequencies of utterances coded as verbatim reading, $F(2, 29) = 8.50$, $p < .01$; information statements, $F(2, 29) = 4.10$, $p < .05$; yes/no questions, $F(2, 29) = 3.30$, $p < .05$; who/what questions, $F(2, 29) = 3.37$, $p < .05$; open-ended questions, $F(2, 29) = 3.63$, $p < .05$; and expansions, $F(2, 29) = 5.21$, $p < .01$. Two orthogonal comparisons (parents vs. the two staff groups and Staff/practice vs. Staff/control) were computed as follow-up tests for each of these statistically significant main effects. In only one case was there a statistically significant result (i.e., the parent group had a higher mean frequency of verbatim reading than the two staff groups, $F(1, 29) = 5.74$, $p < .05$). There were no statistically significant Group x Time interaction effects, indicating that the rate of change in adult language style from pretest to posttest was quite similar in all three groups.

Effect on Children's Language Use

Our second research goal was to compare the effectiveness of adult instruction in Dialogic Reading in each of the three intervention conditions in producing gains in children's participation and language elaboration during shared book reading. We performed a series of 2 × 3 repeated-measures analyses of variance, with time (Pre-

TABLE 3. Mean Frequencies of Adult Behaviors During Shared Book Reading

	Parent		Staff/practice		Staff/control		Statistical significance	
Code	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Time	Group
Utterances	84.0 (20.9)	89.3 (24.5)	96.5 (19.8)	97.0 (22.7)	100.6 (25.0)	97.0 (17.5)	*ns*	*ns*
Read	30.6 (9.8)	14.2 (4.4)	14.9 (11.1)	4.4 (5.8)	18.4 (12.8)	5.8 (6.1)	**	**
Ack	6.3 (3.8)	12.9 (4.3)	5.6 (5.2)	7.5 (5.7)	3.9 (3.3)	6.8 (5.4)	**	*ns*
Inf	14.0 (9.6)	10.4 (9.4)	25.9 (6.7)	18.5 (12.7)	25.8 (15.9)	18.8 (10.5)	*	*
Corr	0.3 (0.7)	0.6 (0.8)	0.5 (1.1)	0.2 (0.4)	0.3 (1.0)	0.0 (0.0)	*ns*	*ns*
Model	1.5 (1.4)	3.1 (1.9)	3.2 (2.5)	4.2 (3.8)	3.4 (3.0)	3.3 (2.1)	*ns*	*ns*
Point	1.5 (2.2)	1.2 (1.9)	3.2 (7.5)	1.4 (1.8)	5.6 (8.3)	1.6 (1.8)	*ns*	*ns*
Yes/No	4.3 (2.5)	5.8 (2.9)	9.6 (7.0)	6.4 (5.0)	8.3 (4.4)	10.4 (5.4)	*ns*	*
WhQ	3.4 (4.4)	9.2 (4.7)	8.0 (6.3)	16.2 (10.2)	5.9 (4.6)	15.9 (8.1)	**	*
OEQ	1.0 (1.9)	6.1 (4.6)	4.6 (3.7)	12.0 (6.3)	4.7 (6.7)	10.3 (5.1)	**	*
Exp	0.8 (1.3)	2.4 (1.8)	2.2 (1.7)	5.2 (3.5)	2.1 (2.6)	4.4 (2.1)	**	**
Praise	1.7 (2.5)	2.4 (1.9)	1.5 (2.7)	2.5 (2.8)	2.6 (3.3)	2.1 (1.9)	*ns*	*ns*
ITR	33.9 (14.0)	30.1 (17.2)	42.9 (15.2)	38.5 (22.8)	50.1 (21.4)	39.1 (18.5)	*	*ns*

Note. Standard deviations are in parentheses. Read = verbatim reading; Ack = acknowledgments; Inf = information statements; Corr = direct correction; Model = models appropriate response; Point = question asking for a pointing response; Yes/No = yes/no question; WhQ = who/what questions; OEQ = open-ended question; Exp = expansion; Praise = praise or encouragement; ITR = insufficient time for child response.

**$p < .01$. *$p < .05$. *ns* = not statistically significant.

test, Posttest) as a within-subjects factor and group membership (Parent, Staff/practice, Staff/control) as a between-subjects factor. In these analyses we in turn used number of child utterances, ratio of child participation, child MLU, and child lexical diversity as dependent measures. A number of statistically significant changes from pre- to posttest were observed in children's language (see Table 4). Children's MLU increased, $F(1, 29) = 15.81$, $p < .01$, from pretest to posttest. Furthermore, children's mean scores at posttest were higher for number of utterances, $F(1, 29) = 18.25$, $p < .01$; number of different words used, $F(1, 29) = 27.64$, $p < .01$; and ratio of participation, $F(1, 29) = 17.92$, $p < .01$. These changes were consistent across the intervention conditions (i.e., there were no statistically significant Group x Time interactions).

Effect on Children's Vocabulary Knowledge

Our third research goal was to examine the effectiveness of adult instruction in Dialogic Reading in increasing children's vocabulary knowledge as measured by standardized tests (PPVT-R, EOWPVT-R). We used these test scores (standard scores and raw scores) as dependent measures for a series of 2 × 3 repeated-measures analyses of variance with time (Pretest, Posttest) as a within-subjects factor and group membership (Parent, Staff/practice, Staff/control) as a between-subjects factor (see Table 4). These analyses revealed no statistically significant effects of group membership or of time.

We also calculated the standardized mean differences (SMD) between pretest and posttest scores for each measure (using the pretest standard deviation as the denominator) and included these in Table 4. The SMDs for the two vocabulary knowledge measures were small and showed little pattern. In contrast, the SMDs for all of the language measures derived from the videotaped sample were substantial and manifested a regular pattern of larger effects for the Parent and Staff/practice group than for the Staff/control group. It is possible that a study with a larger sample of children—and hence greater statistical power—would obtain statistically significant differences among the groups on these measures.

Individual Differences

Our final research goal was to examine the predictors of children's response to adult instruction in Dialogic Reading. First, we looked at individual differences in

TABLE 4. Means, Standard Deviations, and Effect Sizes for Measures of Children's Language

	Parent		Staff/practice		Staff/control		Statistical significance	
Measure	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Time	Group
MLU	2.10	2.67	2.31	3.03	2.18	2.70	**	*ns*
	(.59)	(.72)	(.53)	(.93)	(1.17)	(.97)		
SMD	.97		1.36		.44			
Utterances	29.1	44.1	27.3	44.5	23.7	35.3	**	*ns*
	(21.6)	(10.3)	(19.8)	(22.1)	(19.2)	(21.3)		
SMD	.69		.87		.60			
Diff Words	32.2	54.2	37.4	59.1	27.0	48.8	**	*ns*
	(22.8)	(13.0)	(25.0)	(23.2)	(26.4)	(38.7)		
SMD	.97		.87		.83			
Partic	.24	.34	.21	.31	.18	.26	**	*ns*
	(.13)	(.06)	(.12)	(.11)	(.12)	(.12)		
SMD	.77		.83		.67			
PPVT-R	62.7	64.1	55.2	61.2	59.7	62.0	*ns*	*ns*
	(14.3)	(16.5)	(14.7)	(21.8)	(12.5)	(16.2)		
SMD	.10		.41		.18			
EOWPVT-R	70.8	75.6	71.7	70.9	70.0	71.0	*ns*	*ns*
	(9.9)	(12.1)	(12.4)	(11.3)	(8.5)	(10.6)		
SMD	.48		−.07		.12			

Note. Standard deviations are in parentheses. The PPVT-R and EOWPVT-R are reported here as standard scores. Analyses with raw scores showed a similar pattern of results. MLU = mean length of utterance during shared book reading; Utterances = total number of child utterances during shared book reading; Diff Words = total number of different words used by the child during shared book reading; Partic = child utterances divided by the sum of adult and child utterances during shared book reading. *SMD* = standardized mean difference between pretest and posttest scores; PPVT-R = Peabody Picture Vocabulary Test–Revised (Dunn & Dunn, 1981); EOWPVT–R = Expressive One-Word Picture Vocabulary Test–Revised (Gardner, 1990).

**$p < .01$. *$p < .05$. *ns* = not statistically significant.

TABLE 5. Children's Vocabulary Level as a Predictor of Improvement in Performance

	Posttest sample measure			
Pretest measure	**MLU**	**Diff Words**	**Partic**	**Utterances**
EOWPVT-R	.47**	.52**	.30	.21
PPVT-R	.40*	.14	.00	−.21

Note. These analyses were computed as partial correlations, with children's pretest performances on each language sample measure partialed out. Pretest standard scores for the PPVT-R and the EOWPVT-R were used in these analyses. MLU = child's mean length of utterance during shared book reading; Utterances = total number of child utterances during shared book reading; Diff Words = total number of different words used by the child during shared book reading; Partic = child utterances divided by the sum of adult and child utterances during shared book reading; PPVT–R = Peabody Picture Vocabulary Test–Revised (Dunn & Dunn, 1981); EOWPVT–R = Expressive One-Word Picture Vocabulary Test–Revised (Gardner, 1990).

**$p < .01$. *$p < .05$; two-tailed tests of significance.

children's linguistic ability as a predictor of change. A series of partial correlation coefficients were computed between children's pretest standardized vocabulary scores (EOWPVT-R, PPVT-R) and their posttest linguistic behavior as observed in the videotaped shared book reading sessions, with variance due to pretest observed linguistic behavior in shared book reading removed (see Table 5). In essence, this approach correlates pretest standardized test scores with changes in children's performance during shared book reading. Moderate positive correlation coefficients were obtained between vocabulary pretest scores and scores representing gains in children's MLU and number of different words used.

Second, changes in adult behavior (staff and parents) from pre- to posttest videotaping were examined as potential correlates of observed change in children's language during shared book reading. These analyses were performed by calculating second-order partial correlation coefficients (i.e., the variance due to the pretest scores for each child measure and each adult measure was removed before calculating the correlation between adult and child posttest scores). One-tailed tests of significance were used, because we hypothesized that specific kinds of adult language would be facilitative (see Table 2). Moderate second-order partial correlation coefficients were obtained (see Table 6), demonstrating that greater changes in children's linguistic performance were associated with increased frequency of adult acknowledgments of children's utterances, decreased frequency of information statements, decreased frequency in use of who/what questions, and decreased frequency in insufficient time for response.

Discussion

Both parents and staff changed their shared book reading style in response to our Dialogic Reading intervention. All changes were consistent with the goals of the instructional program. Parents and staff became more responsive to children by slowing down, decreasing their verbatim reading and information statements, and increasing their questions and expansions of children's utterances. Although staff members may have used an interaction style that was slightly more consistent with the goals of the intervention, the amount of change from pre- to posttest videotaping did not differ among the groups. Thus, we can conclude that both parents and staff benefit in similar ways from the kind of instruction provided in this intervention.

The intervention did not have an effect on children's vocabulary growth as measured by standardized tests of receptive and expressive vocabulary. This result contrasts with the findings of Whitehurst et al. (1994) in which significant effects—especially in children's expressive vocabulary scores—were observed after Dialogic Reading interventions of 6 to 8 weeks. The lack of statistical significance in our analyses may well be due to low power because of the small sample size in our study. It is also possible that this intervention is not as powerful for vocabulary growth in children with language delay as it is for more typically developing children. A longer intervention period may be required for changes in standardized test scores to be observed. We believe that this intervention does show some promise of improving children's vocabulary skills over time and deserves further investigation with a larger sample and a longer intervention period.

In all three intervention conditions, children responded to the change in adult shared book reading style with more use of language during story time and with more elaborate expressive language. Extended one-on-one practice with this style of shared book reading was not necessary in order for children to exhibit gains in sophistication and quantity of expressive language during shared book reading. In the Staff/control group, children's expressive language showed gains from pre- to posttest that were comparable to the gains shown in the two experimental groups. The only treatment received by the children in the Staff/control group was the pre- to

TABLE 6. Adult Story Reading Behavior as a Predictor of Children's Linguistic Performance

Adult behavior frequency (posttest)	Posttest language sample measures (child)			
	MLU	Diff Words	Partic	Utterances
Verbatim reading	−.20	−.20	−.14	−.21
Acknowledgments	.22	.47**	.45**	.43**
Information	−.32*	−.28	−.45**	−.24
Who/what questions	−.54**	−.61**	−.53**	−.34**
Open-ended questions	.16	−.06	−.23	−.22
Expansions	.00	−.05	.06	.01
Praise	−.44**	.00	.17	.25*
ITR	−.29	−.32*	−.59**	−.35*

Note. These analyses were computed as second order partial correlations between adult and child language measures at posttest, with pretest values for each measure partialed out for adult and child. MLU = child's mean length of utterance during shared book reading; Utterances = total number of child utterances during shared book reading; Diff Words = total number of different words used by the child during shared book reading; Partic = child utterances divided by the sum of adult and child utterances during shared book reading. ITR = insufficient time (< 2 seconds) for child response between two consecutive parent utterances.

**$p < .01$. *$p < .05$; one-tailed tests of significance.

posttest change in adult shared book reading style associated with the adults' instruction in Dialogic Reading.

With children in all three groups showing similar language growth over the course of the 8-week intervention, one might argue that the observed changes in children's expressive language production were associated with maturation, effects of their early childhood preschool program, test–retest effects, or statistical regression rather than to changes in adult story reading style. Although such interpretations cannot be ruled out completely because of the lack of a no-treatment control group, three kinds of evidence suggest that the adult instruction in Dialogic Reading was at least partly responsible for the changes in children's expressive language. First, there were larger changes in child language during the story reading interaction than would be predicted from maturation alone. For example, over the 2 months of intervention, children's MLU in the book reading session increased an average of 7.7 months age equivalent. (This age equivalent score is based on Miller's [1981] norms, which are based on a small, homogeneous sample of children; however, Fenson et al. [1994] provide a similar estimate based on a much larger sample of children.) Second, if regression to the mean were a factor, we would expect to see a pattern of negative correlation coefficients between children's pretest language scores and children's gain scores. In fact, just the opposite pattern was observed (see Table 5). Finally, the positive relationships between the magnitude of adult behavior change and the magnitude of child language growth is a strong argument in favor of a role for Dialogic Reading instruction in the observed gains in children's linguistic performance during shared book reading.

Because of our detailed coding scheme of the pre- and posttest shared book reading, we were able to describe relationships between the kinds of linguistic support provided by adults and the linguistic performance exhibited by children during shared book reading. Children's participation in story time was enhanced when adults slowed down, decreased their verbatim reading, decreased their information statements, and increased their acknowledgments of children's utterances. The complexity of children's expressive language during story time was enhanced by an increase in adult acknowledgments and by a relatively lower level of adult use of who/what questions at posttest. These results are consistent with a view of shared book reading in which the adult fosters joint attentional focus by following the child's lead with topic-continuing utterances. The results concerning who/what questions are particularly interesting. The Dialogic Reading training promotes the use of who/what questions, and overall their frequency increased substantially (Table 3); however, there was a negative correlation between adults' use of who/what questions at posttest and measures of elaboration of children's language. These results suggest something of a U-shaped function in which adults use who/what questions to initially engage the child, then decrease their frequency (or at least not continue increasing their frequency), moving to open-ended questions to elicit more elaborate language from the child. An overuse of who/what questions may result in less sophisticated child language, because the answers to such questions are typically one-word answers.

Children's developmental level was a predictor of their response to the intervention, with the intervention showing more benefit to children who had higher vocab-

ulary scores at pretest. This pattern of results, however, contrasts with the findings of Dale et al. (1996) that the lower functioning children benefited more in vocabulary development and the higher functioning children benefited more in grammar development over the course of the intervention. The children in the present study had a lower MLU overall (M = 2.20) than those in Dale et al.'s (1996) study (M = 2.74). Thus, in terms of absolute developmental level, the higher functioning group in this study is comparable to the lower functioning children in Dale et al.'s study. It may be that there is a particular level of language development (from MLU 2.0 to 2.5) at which children derive the greatest benefits from the strategies taught in Dialogic Reading. This also is a promising avenue for future investigation.

In summary, in this study we have demonstrated a relatively simple method for eliciting more complex linguistic performance from children with language delays. After receiving instruction in Dialogic Reading strategies, parents and staff members were able to change their shared book reading style in a way consistent with the instruction. Indeed, the more adults improved their shared book reading style, the more children's linguistic performance during story time improved from pre- to posttest. This study provides a promising first step and suggests the need for a more rigorous longitudinal intervention study testing the effects of shared book reading as an intervention for language delay. Beside its obvious clinical importance, such a study would enhance our understanding of the mechanisms through which increases in children's linguistic performance can eventually lead to increases in their underlying language competence.♦

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