

Effects of Dialogic Reading on the Language Development of 4- and 5-Year-Old Children

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This practice-based research synthesis focuses on the characteristics of dialogic reading that help to develop and enhance the emergent literacy and language development of children 4 and 5 years of age (a “sister synthesis” for children ages 2 and 3 has been completed and can be retrieved from http://www.evidencebasedpractices.org/bridges/bridges_vol2_no1.pdf). Dialogic reading is an interactive style of adult-child shared picture book reading. Eleven randomized experimental or quasi-experimental studies were reviewed to discern whether there is sufficient evidence to recommend this practice to parents and practitioners. After close examination of how implementation of the intervention generated positive outcomes, there is evidence to support the use of dialogic reading as a practice for facilitating early language development with children ages 4 and 5.

Purpose

The purpose of this practice-based research synthesis is to determine whether there is evidence to support the practice of *dialogic reading* with children ages 4 and 5 as a way to facilitate early language development. Dialogic reading is an early childhood intervention based on the theory that carefully scaffolded adult/child interactions in the context of picture book reading encourage young children’s language development (Zevenbergen & Whitehurst, 2003). Shared reading experiences provide children with many of the skills necessary for school readiness such as vocabulary, sound structure, knowledge of the meaning of printed letters or words, and knowledge of the structure of stories and language (Whitehurst et al., 1988, 1994; Zevenbergen & Whitehurst, 2003).

This practice-based research synthesis was conducted as an activity of the Research and Training Center on Early Childhood Development. A practice-based research synthesis differs from more traditional approaches to integration of research findings by its explicit focus on the characteristics, features, and elements of environmental variables (Babbie, 1995; Bronfenbrenner, 1992) that are associated with behavioral or developmental differences.

Background

Experts in early childhood development emphasize shared book reading as one way parents can support their children’s learning and readiness for school (Boyer, 1991;

Ready, Edley, & Snow, 2002; Snow, Burns, & Griffin, 1998). For example, shared book reading is gaining attention as a context for language development (Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996); both correlational and experimental research have provided converging evidence for the potential role of joint book reading as a powerful technique for facilitating oral language development (Crain-Thoreson & Dale, 1999; Snow et al., 1998). Specifically, shared reading includes the implementation of a variety of characteristics that may facilitate vocabulary acquisition (Ninio & Bruner, 1978; Sénéchal, LeFevre, Hudson, & Lawson, 1996; Snow & Goldfield, 1983; Teale & Sulzby, 1986; Zevenbergen & Whitehurst, 2003).

Studies conducted by a number of researchers have directly addressed the issue of whether variations in adult reading behaviors affect children’s language development (van Kleeck, Stahl, & Bauer, 2003; Watson, 2003). The intervention that is the focus of this practice-based research synthesis is called dialogic reading. It is one shared reading method used to promote expressive language

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development in 4- and 5-year-old children. According to the developers of this practice, “the implication is that changes in parental behavior that are not particularly difficult to obtain could have substantial positive effects on children’s language development” (Whitehurst et al., 1988, p. 557).

Dialogic reading with young children, first described by Whitehurst, Falco, Lonigan, et al. (1988), is based on three principles of implementation: (1) *provocative techniques* are used to encourage the child to take an active role during story time, (2) *feedback* is encouraged in the form of modeling, corrections, and praise, and (3) *progressive change* in adult standards for the child are encouraged so that the parent or teacher is constantly encouraging the child to do just a bit more than he or she normally would (Arnold & Whitehurst, 1994). During typical joint or shared book reading interactions, an adult reads while a child listens; however, in dialogic reading, the child is taught gradually to become the storyteller (Whitehurst et al., 1988; Zevenbergen & Whitehurst, 2003).

Dialogic reading has been shown to produce effects on the expressive language skills of children from middle-to-upper income families (Arnold & Whitehurst, 1994; Whitehurst et al., 1988) and children from lower-income families with additional at-risk factors (Huebner, 2000a, 2000b; Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992), as well as children who are typically developing (Huebner, 2000a; Whitehurst et al., 1988), and those with language delays (Crain-Thoreson & Dale, 1999; Dale et al., 1996; Lonigan, Anthony, Bloomfield, Dyer, & Samwel, 1999; Valdez-Menchaca & Whitehurst, 1992).

When learning to implement dialogic reading, adults are trained how to increase standards for a child’s verbalizations over time, following the theory of a *zone of proximal development* (Rogoff, 1990; Vygotsky, 1978; Wood, Bruner, & Ross, 1976). Dialogic reading is based on the premise that language development may be accelerated if the boundaries of the proximal zone are pushed further than they might be spontaneously (Arnold & Whitehurst, 1994) and if the boundaries are based on children’s levels of potential development (Reese & Cox, 1999). In a Vygotskian theoretical framework (Vygotsky, 1962), shared book reading offers both social and contextual support for the development of language (Crain-Thoreson & Dale, 1999). As a child masters a new task or skill, an adult “allows the child greater independence and can then move on toward a greater level of complexity” (Sybesma, 2001, p. 30).

Description of the Practice

Two interrelated practices have been developed: one for reading with children 2 to 3 years of age and the other for reading with children 4 to 5 years of age (Zevenbergen & Whitehurst, 2003). Across both age groups, “the child is

encouraged to become the teller of the story over time; the adult’s role is to prompt the child with questions, expand the child’s verbalizations, and praise the child’s efforts to tell the story and label objects within the book” (Zevenbergen & Whitehurst, 2003, p. 178) and allow the child sufficient time to respond (Dale et al., 1996). Dialogic reading is a sequential intervention where one characteristic builds on the mastery of preceding characteristics.

Dialogic reading. Eight characteristics of dialogic reading designed for implementation with 2- and 3-year-old children have been identified: (1) asking “what” questions, (2) following the child’s answers with questions, (3) repeating what the child says, (4) helping the child as needed (if necessary, answer the question posed to the child and have him or her repeat the adult verbalizations), (5) praising and encouraging, (6) following the child’s interests, (7) slowing down and allowing the child time to respond (Crain-Thoreson & Dale, 1999), and (8) allowing all reading sessions to be fun (Whitehurst et al., 1988). After a child has demonstrated mastery of this part of the implementation process, three additional characteristics of the practice are introduced: (1) asking open-ended questions, (2) expanding what the child says, and (3) emphasizing fun in order to encourage continued interest in reading (Whitehurst et al., 1988).

The implementation sequence for 4- and 5-year-old children is an extended version of the preceding practice. Changes target more advanced skills that are related to emerging literacy. Specifically, when using dialogic reading with children ages 4 and 5, adults are taught the preceding skills in addition to characteristics of the practice that are focused on (1) asking a child specific types of questions, (2) evaluating his or her responses, (3) expanding on those responses, and (4) having the child repeat the expanded phrases (Whitehurst et al., 1994; Zevenbergen & Whitehurst, 2003).

Search Strategy

Search Terms

Identification of relevant studies was accomplished using dialogic reading, joint book reading, interactive book reading or interactive reading, shared book reading, shared book experience, picture book reading, and lap reading as search terms. The search was delimited by adding preschool or kindergarten children as a Boolean condition. *Sources*

Primary databases searched for relevant studies included Psychological Abstracts online (PsycINFO), Educational Resources Information Center (ERIC) database, Social Sciences Citation Index (SSCI), MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Library and Academic Search Elite. An online search via the Google search engine

was also conducted. A secondary search was made of an EndNotes bibliographic information database maintained by the Puckett Institute.

Archival and hand searches of relevant professional journals augmented the computer-assisted search for relevant research on dialogic reading. Repeated sweeps of various electronic databases using established and newly identified search terms and the examination of the reference sections of identified publications were made until no further studies were located.

Selection Criteria
Studies were included in this research synthesis if they met all of the following criteria: (1) the practice of dialogic reading was the focus of investigation; (2) the dialogic reading practices designed for 2- and 3-year-old children (11 contingent skills described on p. 6) and/or the extended practices created for 4- and 5-year-old children (four characteristics described on p. 6) were incorporated during the implementation of the practice; (3) children involved in the study were between 48 and 72 months of age (chronological) at the time of baseline assessment (or this sample was embedded in the study population); and (4) observation, description, or measurement of language development was included as part of the study.

Exclusion criteria. Studies that were focused on children younger than 4 years of age or older than 5 years of age were not included in this synthesis (unless these samples were embedded within populations) due to the nature of the intervention. A sister synthesis has been completed for studies conducted on dialogic reading with younger children (see Cutspec, 2004) and researchers have called for studies with children older than age 5 (Zevenbergen & Whitehurst, 2003).

It was necessary to exclude five studies that appeared to have met all of the inclusion criteria during the initial phase of the search process (Sabbatini, 2001; Sénéchal & Cornell, 1993; Sybesma, 2001; Whitehurst, Fischel, Caulfield, DeBaryshe, & Valdez-Menchaca, 1989; Whitehurst et al., 1991). Close inspection of these studies revealed two reasons for exclusion: (1) although they included some of the characteristics of dialogic reading (or similar shared reading behaviors) to encourage language development in children, the implementation of the intervention was modified to a significant degree to meet the focus and design of the studies (specifically, a modified dialogic-reading component was used as part of a much broader intervention designed to encourage expressive language) and/or (2) the age range of the participants was not specified in sufficient detail as to allow for isolation of children ages 4 and 5.

Search Results

A total of eleven studies that included 902 participants met the selection criteria and were included in this

research synthesis. In Table 1, selected characteristics of the study participants are presented. In Tables 2 and 3, research designs used in the studies, intervention variables, outcome measures, and measurements of variation in the intervention are listed.

Participants

The 902 children who participated in the studies ranged in age from 30-72 months at baseline assessment and approximately 51% of these children were male (three studies did not report gender totals). A majority (83%) of child participants was identified as having or was considered at risk for language delays.

In addition to the child participants, 247 parents, 6 teachers, and 17 daycare personnel, librarians, researchers, and a college student were identified as participants (please note that not all studies reported the number of parents, teachers, and staff who participated; see Table 1 for a breakdown of these numbers). Sociodemographic information collected as part of the studies indicated that a majority of the participating families were low-income. Four of the studies included middle and/or upper-income families and two studies did not report this information.

Research Designs

All of the studies included in the synthesis used randomized experimental or quasi-experimental designs. Table 2 includes a breakdown of the group conditions included in each study.

Practices

Adult readers. A total of 247 adult readers were trained to use the dialogic-reading program (two studies did not report parent totals and five studies did not include parents as participants). In the home setting, parents were asked to read to their child at least once per day for 5-15 minutes (depending on the study), using the skills they had learned during the training sessions. In the daycare setting, teachers or staff members were asked to read to small groups (3 to 8 children) or individual children for approximately 10-15 minutes, a minimum of 2 times per week, using the skills they had learned. The length of the intervention ranged from 4-30 weeks, with a mean of 11 weeks (this average is skewed by two studies that were implemented for 30 weeks).

Dialogic-reading intervention. Children in the experimental groups across eleven studies participated in the intervention with parents, teachers, and/or researchers. In two of the eleven studies, the intervention occurred in the home. In the remaining nine studies, five interventions occurred in both home and daycare settings, three interventions occurred in daycare settings alone, and one study randomly assigned participants to home *or* daycare conditions.

Treatment fidelity. Some form of adult-reading treat-

ment fidelity information was reported in ten of the eleven studies included in this synthesis (see Table 3). In some of the studies, the authors simply indicated that adult readers completed logs of dialogic-reading activities. In other studies included in this synthesis, adult readers were required to tape record some or all of the reading sessions to ensure compliance with intervention protocols. In two studies, reading sessions were audiotaped and in one study they were videotaped. The most compelling form of treatment fidelity occurred in studies in which an independent observer coded these audiotapes to establish adherence to the intervention condition.

Outcomes

All children were assessed for language-development outcomes, using standardized instruments (see Table 3). Pretest and posttest measurement included assessments of receptive and expressive language. Most of the studies included in this synthesis also incorporated measures of verbal engagement, vocabulary, story comprehension, and demographics.

Synthesis Findings

Table 4 summarizes the findings related to language development that were reported across studies. In addition, this table includes information regarding alternative explanations and threats to validity for each of the studies included in this synthesis.

Results

Language development. Across all of the studies, the children who participated in the experimental conditions experienced positive gains in language development, particularly expressive language development. Specifically, the mean length of spoken phrases increased and children in dialogic-reading groups demonstrated greater expressive vocabulary scores. All follow-up assessments indicated maintenance of the gains identified during the studies.

Further, there was evidence to indicate a positive change in parent-child reading style when the parents involved complied with the characteristics of the intervention. Specifically, one of the strongest findings from these studies was that the extent to which parents complied with intervention at home was related to children's scores on language development (Zevenbergen & Whitehurst, 2003).

Length of intervention. The practice was generally effective in as little as 4 weeks, and effect sizes increased as duration of interventions increased. However, the studies extending for the longest period of time (Whitehurst et al., 1994, 1999) generated findings indicating that the effects of the intervention did not generalize to longitudinal gains.

Two large-scale, longitudinal studies of the use of dialogic reading over 30 weeks of a Head Start program showed large effects on emergent literacy skills that were maintained through the end of kindergarten. However, these gains did not translate into differences in reading scores for the same children at the end of first and second grade (Zevenbergen & Whitehurst, 2003). While the gains did not extend into early elementary school, "children who participated in the intervention obtained higher scores on tests of language abilities, knowledge of letters and sounds, and writing" (Zevenbergen & Whitehurst, 2003, p. 190).

Home vs. daycare. It is important to distinguish the gains achieved according to the context of the intervention. Children in home-plus-daycare conditions demonstrated the greatest gains, followed by children in home conditions, and finally, children in daycare conditions. Further, the findings suggest that one-to-one reading conditions led to more positive outcomes than small-group reading sessions, especially with children who had or were at risk for language delays.

Rival Explanations

Any interpretation of the positive outcomes that have been obtained is limited by the general absence of a control group in some of the studies, participant self-selection, the limited ways in which the examination of fidelity of parent implementation was measured (despite the advantages of contingent-responsive conversation during dialogic book reading, parents may differ in implementation styles of this practice), the findings of the fidelity measures (e.g., variability in teacher compliance with the intervention), issues associated with cross-cultural application of the practice (Chow & McBride-Chang, 2003), and the fact that researchers did not separate the effects of dialogic reading from increased frequency of reading and children's familiarity with the books used during posttesting.

Additionally, there was no attempt to measure or pull out the individual characteristics that led to positive outcomes. Some of the studies reviewed were focused on practice characteristics designed for 2- and 3-year-old children, others were focused on practice characteristics for 4- and 5-year-old children, and some used a combination of both (see Table 2). However, despite threats to the generalizability of this practice, synthesis findings support the effectiveness of this intervention if the identified characteristics are incorporated and children are 5 years of age or younger.

Conclusion

The link between early shared reading and acquisition of literacy skills, coupled with the observed differences in patterns of literacy exposure in the lives of children from

lower and higher SES groups, “suggests that shared reading may provide one means of intervention to improve the early literacy skills of at-risk children from lower income families” (Lonigan et al., 1999, p. 307). Based on this synthesis and the one written about this intervention as it applies to 2- and 3-year-olds (Cutspec, 2004), dialogic reading has had a significant effect on preschool and kindergarten children’s expressive language, mean length of utterance, writing, linguistic awareness, and print concepts (Whitehurst et al., 1994, 1988, 1999; Zevenbergen & Whitehurst, 2003).

The behavioral change in parents that occurred while sharing book-reading time with children, coupled with the expressive language gains demonstrated by the children who participated in the studies, indicates that dialogic reading is an effective early childhood intervention. The studies included in this synthesis clearly indicated that most parents are quite capable of encouraging and teaching language skills to their toddlers when they are provided with strategies and tools that are likely to produce positive outcomes (Scher, 1998). The characteristics of dialogic reading are straightforward and easy to demonstrate and understand (Huebner, 2000b).

Implications for Practice

Findings reported in this synthesis have a number of implications for practice. First, it is important to recognize that dialogic reading works best when the intervention is monitored to make sure it has been tailored to meet the baseline reading levels of individual children. While both typically developing children and children with or at risk for language delays can benefit from this intervention, the studies included in this synthesis demonstrate how these two groups benefit in different ways, and achieve different gains. Additionally, it is important to emphasize that gains are made in the development of language skills, not reading achievement.

Second, while this intervention has evidential support for use with children ages 2 through 5, there is no literature to support implementing dialogic reading with children older than 5 years of age. Researchers have called for studies to investigate the effectiveness of dialogic reading with children in elementary school (Zevenbergen & Whitehurst, 2003); however, at the time of this synthesis, no results have been published.

Informing practice. How can this synthesis be used to inform practice? Armed with knowledge about dialogic reading and its influence on language development, parents and practitioners can maximize shared reading experiences. To assist adult readers in implementing this practice, A *Bottomlines* (Vol. 4, No. 3) report that describes the major findings from this practice-based research synthesis in nontechnical, user-friendly language has been developed. The *Bottomlines* summarizes what

we know about dialogic reading with 4- and 5-year-old children specifically for parents and practitioners. Also included is a lively vignette illustrating what the practice looks like for a child in preschool or kindergarten and his or her parents and caretakers.

Both the *Bridges* and *Bottomlines* reports are being used to produce practice guides that take a user step-by-step through the process of developing and implementing dialogic reading interventions. These guides will be available to readers in electronic version at our Web site www.researchtopractice.info.

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Table 1
Characteristics of the Study Participants

Study	Sample Size	Child Age (Months)	Child Gender			Adult Participants			Child Diagnosis (Language Development)
			Male	Female	SES	Parents	Teachers	Staff*	
Branscum (1998)	20	NR	9	11	Lower-upper	NI	NI	5	NR
Chow & McBride-Chang (2003)	86	56-69	NR	NR	Lower-middle	86	NI	NI	Typically developing
Crain-Thoreson & Dale (1999)	32	39-66	22	10	Lower	10	NI	7	Mild to moderate language delays
Dale et al. (1996)	33	36-72	24	9	NR	33	NI	NI	Mild to moderate language delays
Hargrave & Senechal (2000)	36	30-64	15	21	Lower	27	6	NI	Moderate to severe language delays
Lonigan, Anthony, & Bloomfield et al. (1999)	95	25-64	44	51	Lower	NI	NR	NR	Mild to moderate language delays
Lonigan & Whitehurst (1998)	91	33-60	42	49	Lower	91	NR	NR	Mild to moderate language delays
Reese & Cox (1999)	48	48-58	26	24	Lower-middle	NI	NI	4	Typically developing
Sabbatini (2001)	14	34-46	7	7	NR	NI	NI	1	Typically developing
Whitehurst, Epstein, Angell et al. (1994)	167	NR	NR	NR	Lower	NR	NR	NR	Mild to moderate delays
Whitehurst, Zevenbergen, Crone et al. (1999)	280	NR	NR	NR	Lower	NR	NR	NR	Mild to moderate delays
Totals or Ranges	902	30-72	189	182	Lower-upper	NI	NI	NI	Typically developing to severe delays

* = May be preschool or school staff members or trained researchers
 NR = Not reported (but included as part of the study)
 NI = Not included as part of the study
 SES = Socioeconomic status

Table 2
Research Design, Length of Intervention, and Treatment Condition for Adult Readers

Study	Research Design	Length of Intervention (Weeks)	Characteristics of Dialogic Reading Included in Implementation of Practice
Branscum (1998)	Quasi-randomized experimental design (traditional reading vs. dialogic reading-compound stimuli vs. expressive reading-visual stimuli vs. receptive reading-auditory stimuli)	8	<i>What</i> questions Follow-up questions Repetition Helping when necessary Praising and encouraging Following child's interests Creating a "fun" atmosphere Asking open-ended questions Expanding on responses
Chow & McBride-Chang (2003)	Randomized experimental design (dialogic reading vs. typical reading vs. control)	8	Prompting the child to say something about the storybook Evaluating the child's response Expanding the child's responses by rephrasing and adding information Repeating the prompt to ensure the child has learned from the expansion
Crain-Thoreson & Dale (1999)	Randomized experimental design (dialogic reading/home vs. dialogic reading/daycare vs. control)	8	<i>What</i> questions Follow-up questions Repetition Helping when necessary Praising and encouraging Following child's interests Slow down to give child adequate time to respond Creating a "fun" atmosphere Asking open-ended questions Expanding on responses
Dale et al. (1996)	Randomized quasi-experimental design (dialogic reading vs. conversational program)	6-8	<i>What</i> questions Follow-up questions Repetition Helping when necessary Praising and encouraging Following child's interests Creating a "fun" atmosphere Asking open-ended questions Expanding on responses
Hargrave & Senechal (2000)	Randomized experimental design (regular reading vs. dialogic reading)	4	<i>What</i> questions Follow-up questions Repetition Helping when necessary Praising and encouraging Following child's interests Creating a "fun" atmosphere Asking open-ended questions Expanding on responses
Lonigan, Anthony, & Bloomfield et al. (1999)	Randomized experimental design (dialogic reading vs. shared reading vs. control)	6	<i>What</i> questions Follow-up questions Repetition Helping when necessary Praising and encouraging Following child's interests Creating a "fun" atmosphere Asking open-ended questions Expanding on responses

Table 2, continued

Study	Research Design	Length of Intervention (Weeks)	Characteristics of Dialogic Reading Included in Implementation of Practice
Lonigan & Whitehurst (1998)	Randomized experimental design (dialogic reading/school vs. dialogic reading/home vs. dialogic reading/school plus home vs. control)	6	<p><i>What</i> questions</p> <p>Follow-up questions</p> <p>Repetition</p> <p>Helping when necessary</p> <p>Praising and encouraging</p> <p>Following child's interests</p> <p>Creating a "fun" atmosphere</p> <p>Asking open-ended questions</p> <p>Expanding on responses</p>
Reese & Cox (1999)	Randomized experimental design (describer style vs. comprehender style vs. performance style)	6	<p>Adult reader made five comments focusing on labels and descriptions of the pictures in the book.</p> <p>Adult readers asked five questions focusing on labels and descriptions of the pictures in the book.</p> <p>Adult readers responded to child's comments with affirmation, but not further discussion.</p> <p>Adult reader responded to child's questions by turning the question back to the child to invite additional comments.</p>
Sabbatini (2001)	Randomized experimental design (dialogic reading vs. play activities)	6	<p>Providing completion prompts</p> <p>Providing recall prompts</p> <p>Providing open-ended prompts</p> <p>Asking <i>what</i> questions</p> <p>Providing distancing prompts</p>
Whitehurst, Epstein, Angell et al. (1994)	Randomized experimental design (DR intervention vs. Head Start curriculum)	30	<p>Providing completion prompts</p> <p>Providing recall prompts</p> <p>Providing open-ended prompts</p> <p>Asking <i>what</i> questions</p> <p>Providing distancing prompts</p> <p>Prompting the child to say something about the storybook</p> <p>Evaluating the child's response</p> <p>Expanding the child's responses by rephrasing and adding information</p> <p>Repeating the prompt to ensure the child has learned from the expansion</p>
Whitehurst, Zevenbergen, Crone et al. (1999)	Randomized experimental design (DR intervention vs. Head Start curriculum; 37 classes, not individual children were randomly assigned to two conditions)	30	<p>Providing completion prompts</p> <p>Providing recall prompts</p> <p>Providing open-ended prompts</p> <p>Asking <i>what</i> questions</p> <p>Providing distancing prompts</p> <p>Prompting the child to say something about the storybook</p> <p>Evaluating the child's response</p> <p>Expanding the child's responses by rephrasing and adding information</p> <p>Repeating the prompt to ensure the child has learned from the expansion</p>

Table 3
Interventions, Outcome Measures, and Treatment Fidelity

Study	Independent/Intervention Variables	Treatment Location	Outcome Measures	Treatment Fidelity
Branscum (1998)	Group reading sessions (n = 5 participants) administered by trained reader 3 times per week for 12 minutes	School	EOWPVT-R ROWPVT MLU	NR
Chow & McBride-Chang (2003)	Individual, picture book dialogic reading sessions administered by parent 2 times per week for 15 minutes	Home	PPVT-III PPCLS RCPM HK-WISC Demographic questionnaire	Parents contacted by phone fortnightly to remind them to read and to address any problems encountered with dialogic reading (DR). Follow-up questionnaire completed by DR group parents to check for treatment fidelity
Crain-Thoreson & Dale (1999)	Individual, picture book dialogic-reading session administered by a parent or school staff member (teacher, librarian, teacher's aide, school nurse) at least 4 times per week for 10 minutes	Home or daycare	MLU PPVT-R EOWPVT-R	Adult readers completed logs of DR activities. Pretest and posttest reading sessions were video taped and coded for compliance.
Dale et al. (1996)	Individual, picture book dialogic-reading session administered by a parent for at least 5 minutes Individual CLPP sessions administered by a parent for an unspecified number of times per week for at least 10 minutes	Home	MLU Measure of verbal engagement Measure of total engagement MSCA GCI PLAS	Adult readers completed logs of DR activities. Adults were asked to tape-record random reading sessions; however, due to poor recording quality and failure to date tapes, data were not analyzed.
Hargrave & Senechal (2000)	Teachers: Picture book DR sessions administered by a teacher 5 times per week to groups of 8 children for a minimum of 10 minutes Parents: Individual picture book DR sessions administered by a parent at least 5 times per week for 10 minutes	Home and daycare	PPVT-R EOWPVT-R BV	Teachers: Two observations of all teachers were made prior to and during intervention. All teachers were required to complete reading logs (indicating books read to participants). Parents: Post-intervention measure designed to determine which books were read and child's' level of enjoyment with sessions. Experimenter periodically visited daycare centers to answer questions; experimenter visited DR daycare center at closing time during week one to answer questions.
Lonigan, Anthony, & Bloomfield et al. (1999)	Small group (n = unspecified), dialogic-reading sessions administered by trained undergraduate volunteers daily for 10-15 minutes	Home and daycare	PPVT-R EOWPVT-R ITPA-VE WJ-LC Measures of phonological sensitivity (4)	Volunteer readers completed a log of DR activities. Reading sessions were tape-recorded and coded for presence or absence of program behaviors.
Lonigan & Whitehurst (1998)	Small group (no greater than 5 children), picture book dialogic-reading session administered by a teacher for 10 minutes per group per day, 5 times per week Individual, picture book dialogic-reading session administered by a parent on a voluntary basis	Home and daycare	MLU PPVT-R EOWPVT-R ITPA-VE Measure of verbal production	Parents and teachers were asked to complete a log of DR activities. Weekly visits to daycare centers took place to collect teacher logs, check compliance, and provide guidance.

Table 3, continued

Study	Independent/Intervention Variables	Treatment Location	Outcome Measures	Treatment Fidelity
Reese & Cox (1999)	Individual reading sessions administered by a trained reader 2 to 3 times per week for an unspecified number of minutes	Daycare	PPVT-R CAP WRAT-R Story comprehension test Measure of environmental print knowledge	All reading sessions 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 checked against protocols.
Sabbatini (2001)	Group reading sessions (n = 3 or 4) administered by a investigator 2 times per week for 20 minutes	Daycare	PLS-3 TERA-2	NR
Whitehurst, Epstein, Angell et al. (1994)	Group reading sessions (n = 4) administered by a teacher 3 to 5 times per week for 10 minutes Individual reading sessions administered by parent 3 to 5 times per week for 10 minutes	Home and daycare	PPVT-R One Word ITPA DSC (18 subscales) Stony Brook Family Reading Survey Quick Test	Teachers and aides were asked to record daily to whom they read. Investigators visited classrooms once every 2 weeks to check compliance and to answer questions. Investigators met with parent trainers every 4 to 6 weeks to discuss project and answer questions. Teachers and aides were videotaped (one session). Videotapes were coded for major categories of teacher behavior that are relevant to DR and were compared across intervention and control conditions. Follow-up survey was sent to caregivers and parents; survey included questions focused on compliance with study protocol.
Whitehurst, Zevenbergen, Crone et al. (1999)	Group reading sessions (n = 4) administered by a teacher 3 to 5 times per week for 10 minutes Individual reading sessions administered by parent 3 to 5 times per week for 10 minutes	Home and daycare	PPVT-R One Word DSC (18 subscales) Stanford Achievement Test-Eighth Edition Woodcock Reading Mastery Tests Revised	Teachers and aides were asked to record daily to whom they read. Investigators visited classrooms once every 2 weeks to check compliance and to answer questions. Investigators met with parent trainers every 4 to 6 weeks to discuss project and answer questions. Teachers and aides were videotaped (one session). Videotapes were coded for major categories of teacher behavior that are relevant to DR and were compared across intervention and control conditions. Follow-up survey was sent to caregivers and parents; survey included questions focused on compliance with study protocol.

BV = Book vocabulary
 CAP = Concepts about print
 DR = Dialogic Reading
 DSC = Developing Skills Checklist
 EOWPVT-R = Expressive One-Word Picture Vocabulary Test—Revised
 HK-WISC = Hong Kong Wechsler Intelligence Scale for Children’s Vocabulary
 ITPA-VE = Illinois Test of Psycholinguistic Abilities—Verbal Expression
 MLU = Mean length of utterance
 MSCA GCI = McCarthy Scales of Children’s Abilities GCI
 NR = Not reported
 PLAS = Preschool Language Assessment Inventory
 PLS-3 = Preschool Language Scale —3
 One Word = Expressive One-Word Picture Vocabulary Test
 PVT-R = Peabody Picture Vocabulary Test—Revised
 PPVT-III = Peabody Picture Vocabulary Test—Third edition
 PPCLS = Preschool and Primary Chinese Literary Scale
 RCPM = Raven’s Colored Progressive Matrices

Table 3, continued

ROWPVT = Receptive One Word Picture Vocabulary Test

TERA-2 = Test of Early Reading Ability —2

WRAT-R = Wide Range Achievement Test—Revised

WJ-LC = Woodcock-Johnson Psychoeducational Battery—Listening Comprehension Subtest

Table 4
Relationship Between Practice and Outcomes, Major Synthesis Findings, and Threats to Validity

Study	Primary Findings (Language Development)	Rival Explanations/ Major Threats to Validity
Branscum (1998)	<p>Observable differences were found across all experimental conditions. DR group showed the most uniform increases across the language measures. Both receptive and expressive language-age scores were positively affected by DR instruction.</p> <p>DR group did not show any negative effects.</p> <p>Findings support the use of operant principles in language acquisition.</p>	<p>Small sample size</p> <p>Study did not directly measure the children’s comprehension of the storybook materials.</p> <p>Same books were not used across all reading conditions, therefore, language skills scores could have been affected by the types of materials used.</p>
Chow & McBride-Chang (2003)	<p>Significant main group effect for performance on both measures, with children in DR group benefiting significantly from the intervention.</p> <p>Findings suggest a causal relationship between home literacy activities and children’s language and literacy acquisitions.</p> <p>Early literacy-related activities in the home have strong and direct effects on both children’s literacy growth and language development in Chinese.</p>	<p>Translation of PPVT-III into Cantonese was not normed for the study population.</p> <p>Small sample size may explain why some group differences were not statistically significant.</p> <p>Because random sampling was applied, there was no specific control used during grouping; gender ration and pretest scores were not balanced across groups.</p>
Crain-Thoreson & Dale (1999)	<p>Children in DR group used a greater number of different words than did the conversation program group.</p> <p>Adult readers 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.</p> <p>The more the adult readers adopted the dialogic style of reading, the more the children’s linguistic performance improved from pretest to posttest.</p>	<p>Study did not include a no-treatment control group.</p> <p>Small sample size may have led to low power in the statistical significance of analyses.</p> <p>Children in all 3 groups showed similar language growth; therefore, one might argue that the observed changes in expressive language production were associated with maturation, effects of their early childhood preschool program, test-retest effects, or statistical regression rather than DR.</p>
Dale et al. (1996)	<p>Changes occurred more in play episode than in book reading.</p> <p>Parents with greater behavioral change were likely to have children with greater behavioral or language change.</p> <p>Lower functioning children responded to DR with increased verbal engagement and vocabulary learning; higher functioning children used input as a source for gaining in MLU and grammar.</p>	<p>Design called for an interval of 6-8 weeks, but some were as long as 10-11 weeks.</p> <p>Fidelity could not be established to the degree anticipated.</p>
Hargrave & Senechal (2000)	<p>Results suggest effects of DR were produced in a shorter intervention period than previous research.</p> <p>Results indicated large effect size for expressive vocabulary scores in DR condition.</p> <p>Study extends previous findings by demonstrating that DR can be implemented in larger groups (8:1).</p>	<p>DR training video used in the study was developed to train DR practices in 2- & 3-year-olds; the version developed for 4- & 5-year-olds was not used (due to language delays of participants).</p> <p>Due to time limitations, DR parts 1 & 2 (based on scaffolded skills for 2- & 3-year-olds) were implemented simultaneously.</p> <p>Attendance and duration of reading sessions across two conditions differed significantly, therefore, benefits of DR may be attributable to higher attendance and longer duration of DR reading sessions (compared to standard reading condition).</p>
Lonigan, Anthony, & Bloomfield et al. (1999)	<p>Results favoring DR were found on the measure of expressive language, whereas results favoring typical shared reading were found on measures of listening comprehension and alliteration detection.</p> <p>Results suggest that group reading interactions may not be sufficient to produce broad improvements in children’s oral language skills.</p>	<p>Claims of increases in phonological sensitivity should be interpreted with caution because the effect was found on only one of our measures regarding this variable and the overall performance of children in all groups was at or near chance levels.</p> <p>Results of this study include only the short-term outcomes of relatively brief interventions.</p>

Table 4, continued

Study	Primary Findings (Language Development)	Rival Explanations/ Major Threats to Validity
Lonigan & Whitehurst (1998)	<p>Children in center-based conditions experienced more growth in vocabulary; children in home-only group experienced more growth in descriptive language.</p> <p>Children in home-plus-daycare DR group had higher expressive vocabulary scores than control children.</p> <p>Center-based produces smaller effects than home-based.</p>	<p>Substantial variability in teacher compliance with DR intervention schedule.</p> <p>Only 60% of parents returned reading logs.</p> <p>Centers did not continue intervention characteristics beyond study.</p>
Reese & Cox (1999)	<p>Findings suggest a causal relationship between reading style and changes in children’s language development. Describer style (represented by DR and similar to DR) appears to provide overall benefits for their receptive vocabulary and print skills in comparison with the two other reading styles (comprehender style and performance style).</p> <p>Children with higher initial vocabulary benefited most in their vocabulary development from a performance-oriented style, whereas a describer style (similar to DR) was more beneficial for print skills when children had higher initial comprehension levels.</p>	<p>No non-reading control group was included.</p> <p>Small sample size</p> <p>Overall benefits for the describer style (similar to DR) are in line with experimental research but not with correlational research.</p> <p>Describer style (DR) is similar, but not identical to DR, and claims made about DR must be explained with difference in mind.</p>
Sabbatini (2001)	<p>Findings indicated no significant differences between DR and play groups; however, findings also indicated significant differences between pretest and posttest measures of the experimental group.</p>	<p>Findings may have been impacted by small sample size (N = 14) and the attrition of 3 of the original total (final total: N = 11).</p> <p>Experimenter-implemented study</p> <p>Parents and teachers were not included in implementation of the practice—other studies have indicated the strongest casual relationship between DR and language development occurred when teachers and parents were actively involved in implementing the practice.</p> <p>Even though the duration of reading sessions was longer compared to other studies (20 minutes vs. 10-15 minutes), the practice was only implemented 2 days per week compared to up to 5 times per week.</p> <p>Instruments used in pretesting and posttesting were different than those used across other studies. Also, early reading abilities of participants were measured instead of language skills.</p>
Whitehurst, Epstein, Angell et al. (1994)	<p>The more parents read dialogically to their children at home, the more gains in the children’s language abilities are achieved. Findings regarding language development were mediated by the degree to which parents were involved in the at-home component of the intervention, with large effects for children with involved parents and minimal effects for those with uninvolved parents.</p>	<p>Failure to find a significant intervention effect on language measures may suggest that 4- and 5-year-olds from lower SES families may need one-on-one DR interactions in order to make expected gains in their language development. Group reading interventions may not be as effective in preschool and may not offer transferable skills as a child enters first grade.</p>
Whitehurst, Zevenbergen, Crone et al. (1999)	<p>An intervention that includes both DR and a classroom-based sound and letter awareness program fostered the growth of literacy skills of 4-year-olds enrolled in Head Start.</p> <p>Findings indicate that the emergent literacy skills of children from low-income, at-risk backgrounds can be enhanced by modest additions to the typical Head Start curriculum (e.g., DR).</p> <p>Effects of intervention did not generalize to reading and language scores at the end of first or second grade.</p>	<p>Failure to find a significant intervention effect on language measures may suggest that 4- and 5-year-olds from lower SES families may need one-on-one DR interactions in order to make expected gains in their language development. Group reading interventions may not be as effective in preschool and may not offer transferable skills as a child enters first grade.</p>

DR = Dialogic reading
 MLU = Mean length of utterance
 PPVT-III = Peabody Picture Vocabulary Test—Third edition