■ Shared Book Reading Intervention for Children with Language Impairment: Using Parents-as-aides in Language Intervention

■ Intervention en lecture de livres partagée pour les enfants ayant un trouble du langage : utiliser les parents comme aides-éducateurs lors d'intervention en langage

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Abstract

The aim of this research was to investigate the efficacy of a shared book reading intervention administered by parents of preschool children with language impairment. Thirty-six preschool children with language impairment were randomly assigned to experimental and control groups. The experimental group received direct group intervention sessions for the children and parent training on how to conduct shared book reading at home. The shared reading intervention had two objectives: (a) promoting children's print concepts and (b) enhancing their oral language development. Videotapes of shared book reading were collected at pre-test and post-test and were coded to yield measures of parents' intervention strategies, the ratio of parent-to-child utterances, and children's oral language. The results indicated that parents in the experimental group used significantly more print concepts than the control group. The ratio of parent-to-child utterances significantly differentiated the experimental and control groups in Cohort 2, but not Cohort 1. No intervention effects were found for use of parents' shared book reading strategies or children's mean length of utterance, vocabulary diversity, or responses. The data suggest that a brief shared book reading intervention for children with specific language impairment impacted on parent's use of print concepts but had no effects on children's outcomes. Implications include suggestions for augmenting the dosage of intervention by providing parents with more focused training.

Abrégé

Le but de cette recherche était d'examiner l'efficacité d'une intervention en lecture de livres partagée faite par les parents d'enfants d'âge préscolaire ayant des troubles du langage. Trente-six enfants ayant des troubles du langage d'âge préscolaire ont été assignés au hasard à un groupe expérimental et à un groupe témoin. L'intervention consistait en des séances d'intervention directe en groupe pour les enfants et en une formation pour les parents sur la façon d'effectuer la lecture de livres partagée à la maison. Cette intervention en lecture de livres partagée avait deux objectifs : a) promouvoir le matériel imprimé auprès des enfants et b) améliorer leur développement du langage parlé. Des vidéos de lecture de livres partagée ont été prises avant et après l'intervention et ont été codées afin de mesurer les stratégies d'intervention des parents, le rapport des énoncés parent-enfant et le langage oral des enfants. Ces résultats ont indiqué que les parents dans le groupe expérimental utilisaient de façon plus importante le matériel imprimé que ceux du groupe témoin. Le rapport des énoncés parent-enfant a démontré une importante différence entre le groupe expérimental et le groupe témoin de la cohorte 2, mais non de la cohorte 1. Aucun progrès n'a été constaté pour l'utilisation par les parents des stratégies de lecture de livres partagée ou pour la longueur moyenne d'énoncé, de la diversité du vocabulaire ou des réponses des enfants. Les données indiquent qu'une brève intervention en lecture de livres partagée pour les enfants ayant des troubles spécifiques du langage a influencé l'utilisation du matériel imprimé par les parents, mais n'a eu aucune répercussion sur les progrès des enfants. Les conclusions suggèrent une augmentation du nombre d'interventions en offrant davantage de formations destinées aux parents.

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The purpose of the current study was to examine the effects of a shared book reading intervention by parents of preschoolers with language impairment that was used to supplement direct intervention by speech-language pathologists. Specifically, parents of 4- and 5-year-old children with language impairment were taught how to read books to their children to promote the development of print concepts and oral language skills as an adjunct to an eight-week intervention program. Shared book reading was selected because it is a commonly-occurring routine and children with language impairment have been found to produce more complex oral language in shared reading than in play (Davie & Kemp, 2002). In addition, books offer opportunities for parents to focus on print concepts, which is an important aspect of emergent literacy development (e.g., McGinty & Justice, 2009) and an area of difficulty for children with language impairment (Schuele, 2004).

Several studies have indicated that parents of children with language impairment may not engage in a style of book reading that is consistent with children's conversational engagement (e.g., Huebner & Meltzoff, 2005; Rabidoux & MacDonald, 2000; Schneider & Hecht, 1995). Many parents simply read the text to their children or use books as a context for direct teaching, thereby limiting conversational opportunities and responsive language feedback (Rabidoux & MacDonald, 2000; Schneider & Hecht, 1995; Schodorf & Edwards, 1983). Other researchers have suggested that children with language impairment may have low orientation to literacy and may be less inclined to participate in book reading compared to their typically developing peers (Kaderavek & Justice, 2005; Schneider & Hecht, 1995). Although there are many opportunities for parents to highlight the function of print during storybook reading, it appears that they rarely do so (Justice & Ezell, 2000). To summarize, many parents of children with language impairment lack knowledge on how to use shared reading to promote the development of emergent literacy and oral language skills. Speech-language pathologists are well placed to fulfill a critical role in providing parents with this information.

In the current study, parents were used as aides to extend the intensity of direct group intervention to the home environment. There are few studies that investigate the efficacy of using parents-as-aides despite the widespread practice of asking parents to conduct homework in clinical practice (Watts Pappas & McLeod, 2009). In interventions that utilize parents-as-aides, children typically receive direct intervention from a speech-language pathologist while the parents play a supportive role that may include observing the therapy session, receiving general advice on how to facilitate language in the home, and obtaining specific instructions to complete homework. This model of service delivery differs from home programs or parent training programs where parents are the primary change agents and the clinician does not work with the child. Only one study has previously examined dialogic book reading for children with language delays using a parents-as-aides model. Whitehurst, Arnold, Epstein, Angell, and Fischel (1994) found that a combined parent-teacher model effected greater changes in children's expressive vocabulary development than the teacher-implemented intervention alone. Two additional studies employed survey methods to investigate parents' perceptions of their roles in speech-language interventions that utilized parents-as-aides models. A survey of 40 families of preschoolers (3 to 5 years) who were receiving therapy for speech production at the Mayo Clinic revealed that approximately 48% of the parents did not know what the goals of intervention were for their children (Stoeckel & Strand, 2007). Thirty-one per cent of these parents reported that they had not been asked to conduct homework. The authors concluded that homework was limited, even though parents were asked to complete assignments at home following each therapy session. Glogowska, Campbell, Peters, and Roulstone (2002) reported that many parents anticipated that the clinician would provide direct intervention to their preschool-aged children and did not expect that they would play a role in the intervention program. Moreover, parents reported that they were not given sufficient information about intervention activities to help their children at home. The findings from these two studies point out the urgent need for studies that systematically investigate parents' roles as aides in language intervention programs.

The value of shared reading as an intervention context resides in the capacity of adults to create episodes of joint attention, elicit communication and conversation, and provide children with models of adult language input that are linked directly to a shared topic (e.g., a picture, an event in the book, print on the page). Recent studies have employed shared book reading as a context for teaching children about print concepts (Justice & Ezell, 2000; Justice, Weber, Ezell, & Bakeman, 2002). In these studies, parents learn to make explicit references to the written form of language to develop their children's knowledge of the appearance of print, its location on the page and its purpose in communicating information. This knowledge ultimately supports the development of letter knowledge and phonological awareness, which are precursors to decoding print (Whitehurst & Lonigan, 1998). Previous reports of print referencing interventions by parents and student clinicians during storybook reading have indicated that adults can learn to increase their use of verbal print references after a brief intervention (Justice & Ezell, 2000; Justice et al., 2002). These studies also indicate that typically developing children make gains in responses that include print references as well as on measures of print and sound recognition. In a study targeting children with language disorders, Lovelace and Stewart (2007) reported that children's knowledge of print concepts improved significantly when a speech-language pathologist used explicit print referencing during shared book reading. To date, no studies have been completed with parents of

children with language impairment. Therefore, it is not clear whether parents of these children can also learn to facilitate knowledge of print concepts during shared reading. This is an important line of inquiry because parents may find it challenging to engage in the dual task of facilitating both language and print awareness during shared reading.

Shared reading has also been used extensively to promote children's oral language development. Although there are several versions of shared book reading for language intervention (Crowe, Norris, & Hoffman, 2004; Whitehurst et al., 1988; Yoder, Spruytenburg, Edwards, & Davies, 1995), they share three common elements. First, the adult asks the child questions about book content. Second, the child answers the questions. Third, the adult provides feedback, typically in the form of an imitation, expansion, comment, or follow-up question. Shared book reading interventions with typically developing children or children at risk (e.g., from low income households) have been used successfully to facilitate receptive and expressive vocabulary development (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Whitehurst et al., 1994), morphosyntax (Huebner, 2000; Whitehurst et al., 1988), and conversational participation. However, the results for children with language impairment have been more variable. Whitehurst et al. (1994) applied shared book reading intervention with families from low income households whose children showed, on average, 10-month delays in language development. The authors reported that teacher and parent administration of book procedures was inconsistent, with some adults completing few shared book reading sessions. The children showed significant improvement in expressive vocabulary but did not demonstrate gains in receptive vocabulary or morphosyntax. Dale et al. (1996) reported that following a 6-8 week program, parents of preschool children with language impairment increased their use of what/who questions, open-ended questions, imitations, and expansions relative to controls. In turn, children increased their rate of verbal responses to questions, number of different words and mean length of utterance (MLU), but did not show measureable gains on standardized measures of vocabulary and language. In a follow-up study, Crain-Thoreson and Dale (1999) offered an eight-week shared book reading intervention to parents of 3- to 5-year-olds with mild to moderate language impairment. No intervention effects were found for parents' use of shared book reading strategies or for children's language abilities relative to a control group. The authors concluded that the intervention may have been too brief for children with language impairment to demonstrate gains. Similarly, other studies with smaller sample sizes and participants with variable etiologies have documented outcomes for children's communication (e.g., number of different words, MLU, responses to questions, conversational participation) (Bradshaw, Hoffman, & Norris, 1998; Crowe et al., 2004; Yoder et al., 1995). Therefore, outcomes are variable, suggesting the need for additional studies investigating the clinical usefulness of this strategy for children with language impairment.

The current study contributes to our knowledge about the efficacy of parents-as-aides by examining parents' use of shared book reading to promote two complementary objectives, print concepts and oral language. The current study differs from previous studies of shared reading in several important ways. First, speech-language pathologists provided eight direct intervention sessions to small groups of children with language impairment, which parents observed. During the sessions, the speech-language pathologists used different books each week to model print concepts and ask questions about book content that were embedded in the text. Second, parents received specific training on the use of shared reading at home to facilitate oral language and print concepts. Parents were expected to read the same books at home, focusing on the same goals. Third, parents were asked to complete homework forms regarding the frequency, duration, and outcomes of their shared reading homework.

The first question of this study examined whether parents in the experimental group used more print references as compared to the control group. Consistent with the intervention objectives, it was predicted that parents in the experimental group would increase their use of these utterances at post-test. These predictions were based on previous studies which have found that teaching adults to focus on print references during book reading is effective in increasing adults' use of such strategies (e.g., Justice & Ezell, 2000). The second question examined whether parents and children in the experimental group engaged in more balanced turn-taking during shared story book reading compared to parents and children in the control group. The intervention taught parents to increase their children's conversational participation in book reading through the use of questions and prompts to elicit children's talk. Therefore, it was predicted that the experimental group would have a more balanced turn ratio than the control group following intervention. The third question examined whether parents in the experimental group used more shared book reading strategies at post-test (e.g., Wh-questions, expansions, imitations, prompts, comments) as compared to the control group. It was predicted that parents in the experimental group would use significantly more of these strategies, based on the similar results of previous parent-training studies using dialogic book reading with children who have language impairment (e.g., Crain-Thoreson & Dale, 1999). The fourth question examined whether children in the experimental group (a) responded more often during shared book reading (answered parents' questions and used print concepts following parent's use of print concepts), (b) used a higher mean length of utterance in morphemes, and (c) used a more diverse vocabulary as measured by the Type Token Ratio compared to the control group. Based on the results of previous research (Dale et al., 1996), it was predicted that children in the experimental group would provide more responses, use a higher MLU, and a more diverse vocabulary following intervention.

Methods

Participants

Thirty-six preschool-aged children with language impairment and their parents participated in this study. Three additional children were recruited but were excluded from this study: one child did not meet the criteria for language disorders and two children completed the pre-test but not the post-test book reading session. The average age of the remaining children was approximately 53 months and the majority was enrolled in half-day junior kindergarten programs at the time of the study. The families were recruited from active caseloads or waiting lists for language intervention offered by preschool services in metropolitan Toronto (n = 33) and Halifax (n = 3). The children were recruited in two cohorts in the same calendar year (2007) reflecting the project's capacity for intervention programs. There were 22 children in Cohort 1 and 14 in Cohort 2. Preliminary analyses were conducted on the two cohorts to determine if they varied in terms of chronological age, language level, cognitive level, and proportion of bilingual children. The only pre-test measure on which the two groups differed was chronological age: the children in Cohort 2 were significantly younger than those in Cohort 1, t (34) = 2.11, p = .042. On average, the Cohort 1 children were 54.2 months of age and the Cohort 2 children were 51.6 months of age. Cohort 1 children were recruited in the Winter term of their junior kindergarten year, whereas Cohort 2 children were recruited in the Fall term. Thus, cohort was entered as a factor for all group analyses to determine if age impacted on the results. All 36 children had nonverbal cognitive abilities within normal limits (i.e., greater than 80), as measured by the Columbia Mental Maturity Scale (CMMS) (Burgemeister, Hollander Blum, & Lorge, 1972), and a language disorder as defined by a score one standard deviation below the mean on the core subtests of the Clinical Evaluation of Language Fundamentals – Preschool 2 (CELF-P2) (Wiig, Secord, & Semel, 2004). A similar criterion has been used in previous studies to identify children with specific language impairment (e.g., Deevy & Leonard, 2004; Goffman, 2004; Rice, Redmond, & Hoffman, 2006; Riches, Tomasello, & Conti-Ramsden, 2005). In addition, two other measures were used to describe further the language abilities of the children. The Structured Photographic Expressive Language Test – Preschool 2 (Dawson et al., 2005) was administered to assess morphosyntactic skills. Participants earned an average standard score of 65.3 (SD = 11.6) on this test. In addition, based on language samples taken at pre-test, all children had a mean length of utterance in morphemes (MLU) that was at least one standard deviation below the mean for their age (Miller, 1981), average MLU = 2.61 (SD = .56). None of the children had sensory disabilities, oral motor problems, frank neurological problems, or socio-emotional difficulties as determined informally by the referring speech-language pathologist. Eighteen children came from homes where another language was spoken at least 25% of the time. In these cases, the diagnosis of language disorder was also based on parental concern and parental report of a concomitant delay in the child's first language acquisition. The length of time these children had been speaking English to communicate with others averaged 23.3 months, with a range of 10 to 38 months. The home languages included: Cantonese (2), Hungarian (1), Mandarin (1), Portuguese (3), Russian (2), Sinhala (1), Spanish (4), Tamil (2) and Twi (1).

The children were randomly assigned to experimental and control groups (ns = 19 and 16, respectively) with stratification for geographical location (children received intervention in one of five local service sites). This was necessary because parents could not be expected to travel over 50 kilometres or more to the different sites within metropolitan Toronto. Once six children were recruited within a geographical location, the primary investigator, who was blind to pre-test assessment results, used a random numbers table to assign them to experimental and control groups. Families were notified of their group assignment by a phone call from the project coordinator and a follow-up letter with program dates/locations. Control families were advised that their children's intervention programs would take place in approximately 10-12 weeks, following the post-test. None of the children in the control group received speech and language services during the control phase.

The characteristics of the children in each group are displayed in Table 1. A research assistant screened the children's hearing using typanometry and an otoacoustic emissions test. If children failed the screening test or did not participate in the screening procedures, they were referred to a physician and an audiologist for follow-up and further testing. The hearing abilities of 35 children were within normal limits; one child in the experimental group was diagnosed with a moderate sensorineural hearing loss and fitted with hearing aids. All data were analyzed both with and without this child's data and there were no differences in any of the results. Therefore this child was included in all the analyses reported. Approximately half of the children (9 in the experimental group and 9 in the control group) were exposed to a non-English language in the home. According to parent report, the dominant language was English for all but one child in the experimental group (dominant in Tamil) and all but one child in the control group (dominant in Spanish). Table 2 summarizes the demographic characteristics of the families in terms of the parents' age and education. There were no significant differences between the experimental and control groups on any of the child or family characteristics reported in Tables 1 and 2. The two groups also did not differ in terms of the percentage of time the children heard and/or spoke a non-English language, number of months the child has been speaking English, or the ages at which the children first spoke English to communicate.

Table 1
Children's Demographic Characteristics

Child Characteristic	Experimental Group (n=19)	Control Group (n=17)
Sex		
# Males	10	12
# Females	9	5
Age (in months)		
Mean (SD)	53.4 (3.6)	53.0 (4.3)
Min-Max	48-60	46-61
CMMS Standard Score		
Mean (SD)	99.4 (12.1)	98.7 (9.1)
Min-Max	82-124	83-115
CELF-P Core Language Standard Score		
Mean (SD)	73.8 (8.2)	76.5 (7.7)
Min-Max	55-84	57-84
SPELT – P2 Standard Score		
Mean (SD)	65.8 (12.5)	64.8 (11.0)
Min-Max	42-87	47-86
Mean Length of Utterance		
Mean (SD)	2.65 (0.56)	2.57 (0.58)
Min-Max	1.57-3.63	1.08-3.40
% Time Child Speaks a non-English Language		
Mean (SD)	22.1 (13.5)	21.5 (17.6)
Min-Max	0-50	0-50
Age (in mos.) Child Started Speaking English		
Mean (SD)	27.8 (11.2)	32.8 (7.6)
Min-Max	12-48	23-48
# Months Child Has Been Speaking English		
Mean (SD)	25.0 (11.0)	20.1 (8.3)
Min-Max	10-38	7-32
School program		
# in Child Care	4	2
# in Child Care & Junior Kindergarten	6	6
# in Junior Kindergarten	9	8
# No program	0	1

Note: CMMS = Columbia Mental Maturity Scales; CELF-P2 = Clinical Evaluation of Language Fundamentals – Preschool 2; SPELT-P2 = Structured Preschool Expressive Language Test – Preschool 2; Junior Kindergarten is a half day program offered to 4-year-olds in the province of Ontario. Children in child care and combined child care/junior Kindergarten are in full day programs.

Design and Procedures

The study design was a pre-test/post-test control group design with a delayed treatment control group. Within each cohort, the children were randomly assigned to immediate treatment (experimental) or delayed treatment (control) groups, with stratification for geographical area (to permit families to receive intervention close to home). Children in both groups were assessed at pre-test and post-test by research assistants who were blind to the group assignment of the children. Testing occurred immediately before and after the experimental program. While the children in the experimental group participated in the 9-week intervention program, the children in the control group did not receive services. The control group participated in the same program following the post-test. The current study focuses on measures of parent-child shared reading and was part of a larger research project focusing on children's emergent literacy skills.

Pre-test

CELF-P2 results were obtained from the referring clinician prior to the pre-test. At pre-test, each parent-child dyad was videotaped during 15 minutes of shared book reading. The books were Little Yellow Dog Gets a Shock (Simon, 2003), Don't Forget to Come Home (Harris, 1978),

Table 2
Parents' Demographic Characteristics

Parent/Family Characteristic	Experimental Group (n = 19)	Control Group (n = 18)
Mother's Age (Years)		
Mean (SD)	34.9 (6.0)	33.9 (4.8)
Range	28-45	27-43
Father's Age (Years)*	38.5 (5.3)	36.3 (3.4)
Mean (SD)	30-49	31-41
Range		
Mother's Education		
# High school	9	5
# College/some university	7	5
# University degree	3	7
Father's Education*	8	3
# High school	6	6
# College/some university	4	6
# University degree		

* Age and education data were missing for one father in the experimental group and two fathers in the control group (single parent families).

and How to Catch a Star (Jeffers, 2004). These books were selected because (a) they modeled complete narrative sequences (e.g., beginning, middle, end, with a problem and resolution) and (b) they displayed print in various ways (e.g., in balloons, embedded within the pictures, in different font sizes and shapes). These books were only used in the test sessions. Parents were encouraged to read with their children as they normally would at home. Upon completion of the videotaped book reading, parents completed a short questionnaire on the representativeness of the interaction. Next, a research assistant administered the Columbia Mental Maturity Scale (CMMS) (Burgemeister et al., 1972) and the Structured Photographic Expressive Language Test – Preschool 2 (SPELT-P2) (Dawson et al., 2005). Finally, parents completed a questionnaire about the child's family and developmental history.

Post-test

Time 2 tests were completed within two weeks after completion of the experimental program. The post-test consisted of a 15-minute sample of parent-child shared book reading using the same books that were read during the pre-test.

Representativeness of Videotaped Interactions. Parents completed an informal questionnaire that asked them to rate the representativeness of each videotaped interaction using a 5-point scale (1 = very typical; 3 = typical; 5= not typical). At pre-test, all parents rated their amount of talk and rate of speech as typical (mean rating = 3.0 and 3.0, respectively). In addition, the parents determined that their comfort level was typical of unobserved interaction (mean rating = 3.2). Similar ratings were obtained at

post-test (amount of talk, 3.0; rate, 3.1; and comfort level, 3.4). Parents rated the children's level of interest/attention, amount of talk, and comfort as typical at both test times (mean rating = 3.5, 3.2, and 3.1 at pre-test and 3.2, 3.0, and 3.4 at post-test). A Wilcoxon signed ranks test revealed no significant differences between the pre-test/post-test rankings for any of the items. Overall, these ratings indicated that parents believed the videotaped interactions were similar to unobserved shared book reading interactions at home.

Intervention Program

The emergent literacy intervention program was 9 weeks long and consisted of one introductory parent session and eight 60-minute group sessions for the children, followed by 15 minutes of parent training after each session. Sessions were conducted weekly on the same day of the week. The group sessions included two or three children and were led by five speech-language pathologists, assisted by five volunteers who videotaped the group sessions and supervised the children's play during the 15-minute parent training sessions. The speech-language pathologists received a full day of training, an intervention manual, eight session manuals, and all session materials (e.g., books, story boards, phonological awareness games, cut-out figures, homework kits) that were created by the project staff. The principal components of the emergent literacy program were adapted from Kaderavek and Justice (2004) and included: (1) A 5-minute alphabet activity, in which the children identified letter names from key words (e.g., initial letter of child's name) and sang the alphabet song. (2) A 20-minute storybook reading activity, during which

Table 3
Parents' Home Practice Reports of Shared Book Reading

Variable	Experimental Group (n = 19)
# Sessions Attended (out of 8)	
Mean (SD)	7.1 (1.6)
Min-Max	2 - 8
# Homework Forms Completed (out of 7) [1]	
Mean (SD)	5.4 (2.0)
Min-Max	0 - 7
# Times Parent Read Book (per week)[2]	
Mean (SD)	4.0 (1.7)
Min-Max	0 - 7
Total Minutes of Shared Reading (per week)[3]	
Mean (SD)	63.9 (32.7)
Min-Max	11 - 125
# Times Child Answered Story Questions (per week) [2]	
Mean (SD)	3.3 (1.9)
Min-Max	0 - 7

[1] Parents were not expected to return homework records following the final session. [2] One parent did not return any homework records; data based on 18 parents. [3] Three parents did not report the number of minutes of book reading; data are based on homework reports of 16 parents.

the clinician read the story and asked literal and inferential questions that were embedded within the book (van Kleeck, Vander Woude, & Hammett, 2006). (3) A 20-minute post-story activity, during which the children reenacted the story plot using cut-outs of characters, various props, and/or role plays. (4) A 15-minute phonological awareness activity (15 minutes) that focused on initial sound identification and/or sound matching in games, such as fishing, sorting, etc. Throughout the 60-minute therapy session, the clinicians used focused stimulation techniques (Fey, 1986) to reply to the children's responses and spontaneous utterances.

Parent training was conducted during the first 60-minute intervention session and the last 15 minutes of each small group session. During the initial 60-minute parent training session, the clinician taught parents how to (a) use print concepts, (b) read the story and ask questions that were embedded into the text, (c) conduct a phonological awareness activity, and (d) complete homework sheets. This study focuses on the shared reading homework because the project collected pre-test and post-test videotapes of parent-child shared book reading only. Each session was accompanied by four print concept questions and 12-18 story questions embedded into the text that were labeled as easy or hard. For example, in the first intervention session, clinicians modeled the following skills before they read the book: (a) show me front of the book, (b) show me name/title of book, (c) what do you think title/name says?, (d) stating and pointing to the names of author and illustrator. Appendix A lists the print concepts that were taught in

each session. In addition, the clinicians asked the children questions that were written into the text and modeled how to respond to the children using imitations, expansions, comments, and further questions to encourage conversation. Parents were instructed to ask the easy questions in the first reading of the story and the harder questions in subsequent readings, once their children had mastered the easy questions. Easy questions asked for information that was readily available on the page (e.g., What is the boy doing?) and hard questions asked for inferences and predictions (e.g., What do you think the boy will do next?). Parents received the storybook at the end of the session and returned it the following week. They also received a parent manual that provided written reminders of the points stressed in the training session. During the 8 weeks of small group intervention, parents observed the sessions and met the clinician at the end of each session for 15 minutes while the children were supervised by a volunteer. During these 15-minute parent sessions, the clinician assigned the storybook from the session (with questions embedded in the text). Finally, each parent-child dyad received one individual consultation (approximately 15 minutes long) within the first four sessions of the program, during which the clinician provided feedback on the parent's use of book reading strategies. For a complete description of the program storybooks and goals, see Appendix A.

Treatment Fidelity

Before the implementation of treatment, the speech-language pathologists providing intervention participated in a full day training session to become familiar with the intervention protocol. Videotapes of four sessions for each experimental group (for a total of 28 sessions or 50%) were selected at random to provide estimates of treatment fidelity. Adherence to the intervention protocol was assessed via a checklist adapted from Robertson and Ellis Weismer (1999) with a maximum score of 20. A mean fidelity score of 18.6 (SD = 1.7) was obtained across sessions (range 14 - 20) indicating that the clinicians adhered closely to the intervention protocol.

The fidelity of treatment was also examined in terms of the parents' and children's attendance at group sessions and the parents' completion of activities at home (e.g., reading the books that were provided weekly). The parents' homework report form is in Appendix B and the data are displayed in Table 3. The average number of group sessions attended by the parents and children in the experimental

group was 7.1/8 sessions (range = 2 - 8 sessions). The child who attended only 2 sessions did not complete any homework. Therefore, this participant was omitted from the descriptive reports of homework completed. The remaining 18 parents returned an average of 5.7 homework sheets (range = 1 - 7). These parents reported reading the books 4.2 times per week (range = 1 - 7) for a total of 64 minutes per week (range = 11 - 125). Finally, parents reported that their children correctly answered 3.5 story questions per week (range = 0 - 7) and retold the story 2.7 times per week (range = 0 - 7). These fidelity data indicate that there was considerable variability in the extent to which parents engaged in shared book reading practices at home. There were no significant differences between the monolingual English-speaking children and the dual language learners on any of these measures derived from reports of homework, ts(2,34) = -.74 - -1.58, ps = .123 - .820.

Coding and Outcome Measures

A research assistant who was blind to group assignment transcribed all utterances spoken by the parents and children during the 10-minute book reading videotapes using the Systematic Analysis of Language Transcripts (SALT) (Miller & Chapman, 2002). Ten percent of the videotapes were randomly selected and transcribed independently by a second research assistant for reliability purposes. Interrater reliability was conducted at the utterance boundary level and at the word level. Reliability was calculated using the following formula: number of agreements / (the number agreements + disagreements) x 100 (Sackett, 1978) and yielded 93.8% for parents' utterance boundaries (n = 1101), 97.0% for children's utterance boundaries (n = 463), 96.4% for parents' words (n = 4114), and 90.1% for children's words (n = 1005).

SALT automatically provided the data for the MLU in morphemes and the type token ratio (TTR), a measure of vocabulary diversity. The transcripts were coded to identify utterances containing: (a) print concepts (i.e., references to print or book handling), (b) Wh-questions, (c) comments related to the content of the story, (d) choice questions, (e) parental prompts to elicit responses (e.g. "The dog is on the___"), (f) parents' imitations of child utterances, (g) parents' expansions of child utterances and (h) children's responses to parent questions and print references. Utterances that were not identified in one of the above categories were coded as 'other'. Each utterance received only one code. The complete coding system with examples is included in Appendix C. Transcripts were coded independently by the first author and a research assistant, both of whom were blind to the group assignment of the families. Each individual coded 50% of the transcripts. In addition, 20% of transcripts were randomly selected and re-coded for reliability purposes. Reliability for each code yielded 89.0% for print concepts (n = 100), 98.2% for Wh-questions (n = 273), 95.4% for comments (n = 709), 90.9% for choice questions (n = 11), 100.0% for prompts (n = 20), 93.3% for imitations (n = 45), 84.3% for expansions (n = 102) and 96.5% for child responses (n = 287).

Four outcome measures were derived from the coded book reading transcripts and were calculated for both pre-test and post-test transcripts. The first measure, Print Concepts, was the number of parents' utterances that referred to print or book handling. The Turn-Taking Ratio assessed how balanced parent and child turns were throughout the book interaction and was calculated by dividing the number of parent utterances by the number of child utterances. Shared Book Reading Strategies represented parents' use of strategies to make book reading interactive and was computed by summing the number of Wh-questions, comments, choice questions, prompts, imitations and expansions. Finally, children's responses represented how often children responded to parents' questions and print concepts.

Results

The summary data for these variables are displayed in Table 4. First, the data were examined to determine if the child's home language (i.e., monolingual English, bilingual) influenced the results. There were no significant effects attributable to home language for any of the variables we examined, ts(2,34) = .128 – 2.08, ps = .306 - .750, and therefore the data were collapsed for further analysis. For each of the outcome measures, the values were submitted to a mixed analysis of variance, with Time (pre- and post-test) as the within-participants factor and Research Group (intervention; control) and Cohort (1, 2) as the two between-participants factors. Cohort was entered as a within-participants factor because the two cohorts of children differed significantly in age. The outcome measures included the frequency of print concepts, the ratio of parent-to-child utterances, the frequency of shared book reading strategies, and children's outcome measures (i.e., answers, MLU, number of different words). The two-tailed p value for all analyses was set at 0.05.

Analysis of Shared Book Reading Outcome Measures

The first question asked whether parents in the experimental group differed from the control group in terms of their frequency of print concepts. A mixed model analysis of variance (ANOVA) was conducted on the total number of print concepts used by parents. As previously discussed, print concepts included utterances that described the properties of the book (e.g., cover, title, author, illustrator) or location of print (e.g., "We start reading from the front of the book."). This analysis revealed a significant time by research group interaction, $F(1,32) = 8.93$, $p = .01$, $\eta^2 = .22$, with parents in the experimental group using a greater frequency of print concepts at post-test as compared to the control group. The effect size is considered medium by the standards of behavioural research (Cohen, 1988). The parents in the experimental group increased their use of print concepts from 3.7 at pre-test to 6.8 at post-test. In contrast, during the same time period, the number of print concepts by parents in the control group decreased from 6.6 to 2.9. None of the main effects for time, research group, or cohort were statistically significant.

The second question examined whether the ratio

Table 4
Means and Standard Deviations for Parent and Child Shared Book Reading Measures

Measures		Experimental (n = 19) Mean (SD)	Control (n = 17) Mean (SD)	p values (one-tailed) Time x Group	Time x Group x Cohort
# Parent Print Concepts	Pre	3.74 (4.5)	6.59 (7.1)	.005*	.738
	Post	6.79 (8.8)	2.88 (2.7)		
Ratio of Parent to Child Utterances	Pre	2.26 (1.3)	3.52 (2.4)	.639	.032*
	Post	2.34 (2.0)	3.60 (2.3)		
# Parent Book Reading Strategies	Pre	51.58 (29.0)	52.59 (27.8)	.476	.515
	Post	41.16 (22.6)	50.29 (29.6)		
# Child Answers	Pre	14.05 (9.0)	16.53 (16.2)	.185	.924
	Post	18.74 (16.2)	14.00 (9.5)		
Child Mean Length of Utterance	Pre	2.85 (1.0)	2.39 (0.7)	.335	.588
	Post	2.76 (1.0)	2.59 (0.9)		
Child # Different Words	Pre	59.95 (31.6)	49.47 (26.6)	.684	.901
	Post	61.84 (37.9)	45.53 (30.4)		

* $p < .05$

of parent-to-child utterances became more balanced in the experimental group in comparison to the control group. A ratio close to 1.0 indicates an equal number of parent and child utterances, while a ratio greater than 1.0 indicates that parents are contributing more utterances to the conversation than the children. The mixed-model ANOVA revealed a significant time by research group by cohort interaction, $F(1,32) = 5.03$, $p = .03$, $\eta^2 = .14$, with the parent-to-child utterance ratio approaching a value of one (i.e., more balanced turn-taking) in the Cohort 2 experimental group as compared to the Cohort 2 control group. The effect size for this result is medium (Cohen, 1988). The parents in the Cohort 2 experimental group decreased their parent-to-child utterance ratio from 2.6 at pre-test to 1.9 at post-test. In contrast, during the same time period, the parent-to-child utterance ratio for the control group increased from 3.9 at pre-test to 4.9 at post-test. There was also a significant main effect of research group, $F(1,32) = 5.25$, $p = .03$, $\eta^2 = .14$, with the experimental group having a lower parent-to-child utterance ratio overall (M = 2.3) in comparison to the control group (M = 3.7), regardless of time or cohort. This effect size was also medium. No other interactions or main effects were found to be statistically significant.

The third question investigated whether the intervention increased parents' overall use of shared book reading strategies in comparison to the control group. These strategies (i.e., Wh-questions, choice questions, prompts, imitations, expansions, comments) aimed to increase children's conversational involvement in the book reading activity and were expected to increase during the intervention program. As can be seen in Table 4, the

parents in the experimental group displayed a decrease in the use of shared book reading strategies from pre-test to post-test, while the control group remained relatively stable. On average, parents in the experimental group used 41 strategies in 10 minutes in comparison to 50 strategies for the control group. There was no significant difference attributable to the intervention, $F(1,32) = 0.52$, $p = .48$, $\eta^2 = .02$. Furthermore, none of the main effects or other interactions was found to be significant.

The fourth question compared the children in the experimental and control group for their answers to parents' questions, MLU, and number of different words. None of the analyses revealed significant group differences on these three measures, $F(1,32) = 0.80, 0.96,$ and $.17, ps = .38, .34,$ and $.68, \eta^2 = .02, .03,$ and $.01,$ for answers, MLU, and number of different words, respectively. Moreover, none of the main effects or interactions for these three outcome measures was statistically significant (see Table 4).

Discussion

In summary, the results revealed two modest but positive benefits of the shared book reading intervention for parents and children with specific language impairment. First, parents in the experimental group used significantly more print concepts following intervention in comparison to controls. The effect size for this finding was medium. A post hoc examination of the individual data revealed that 11 of the 19 parents in the experimental group increased their use of print concepts from pre-test to post-test. In comparison, only two parents in the control group did so, with the remaining parents decreasing their use of these utterances over time. The decrease observed in the control

group suggests that parents may be unlikely to continue their use of print concepts without reinforcement. These utterances referred to physical properties of the book (e.g., Hold the book this way.), references to print (e.g., This is where we start to read.), and authorship (e.g., This book was written by Robert Munsch.). During the intervention, the speech-language pathologist modeled print concepts at the beginning of every shared reading session. The finding that parents in the experimental group used more print concepts at post-test is consistent with the results of two previous studies indicating that parents can learn to increase their use of references to print following a brief video training program (Justice & Ezell, 2000; Justice et al., 2002). This is encouraging because children with language impairment often demonstrate delays in the acquisition of early literacy skills, including print concepts (e.g., Boudreau & Hedberg, 1999; Schuele, 2004). Given the frequent occurrence of shared book reading in parent-child interactions, increasing the focus on print concepts may be an important means of boosting the early literacy skills of children with language impairment.

The second positive finding was that parent-child interaction became more balanced for dyads in the Cohort 2 experimental group. This finding is consistent with one of the objectives of shared reading intervention, which is to promote conversational exchanges between parents and children on the topic of the book. The data indicate that the ratio of parent-to-child utterances dropped from 2.6 to 1.9 in the experimental group, while it rose in the control group. Thus, Cohort 2 shared reading interactions in the experimental group were characterized by one child utterance for approximately every two utterances of the parent. The medium effect size was supported by the data. Six of the seven dyads in the Cohort 2 experimental group decreased their ratio of parent-to-child turns from pre-test to post-test in comparison with only two in the Cohort 2 control group. It is not clear why this effect was found for Cohort 2 dyads and not for the dyads in Cohort 1. One explanation may be that the clinicians were more experienced with the experimental procedures and may have taught parents more clearly in the second cohort. This explanation is not supported by the fidelity data; nonetheless clinicians may have been able to support parents in Cohort 2 in ways not captured by the fidelity measure.

The lack of findings for parents' use of shared book reading strategies is surprising, given that several other studies have reported significant increases in parental strategies following training with younger, typically-developing children (Arnold et al., 1994; Crain-Thoreson & Dale, 1999; Dale et al., 1996; Whitehurst & Lonigan, 1998). However, two previous studies have reported variability in terms of how parents apply shared book reading strategies. Whitehurst et al. (1994) used parent training as an adjunct to small group book reading (administered concurrently by educators) and reported considerable variability in parents' administration of shared reading procedures with children who, on average, had language delays of 10 months. Huebner

and Meltzoff (2005) concluded that mothers of 2- and 3-year-old children from low socioeconomic backgrounds showed non-significant gains in shared reading strategies and used a low frequency of these strategies overall. In the latter study, parents used an average of 18.9 strategies in 5 minutes (i.e., Wh-questions, labels, imitations, expansions), which is comparable to the rate used by the parents in our experimental group (i.e., 41 strategies in 10 minutes at the post-test). The lack of intervention effect observed in the current study may be due to the variability observed in the parents' reports of homework completion. Parents were asked to read to their children at least five times per week. An investigation of the individual homework data indicated that 13 of the children in the experimental group experienced fewer than five shared reading sessions at home per week. It is possible that parents were less committed to homework because they perceived that the speech-language pathologist was the primary person responsible for the intervention. For example, Glogowska et al. (2002) reported that parents whose children received direct intervention from a speech-language pathologist did not perceive the importance of home practice, nor did they expect to be involved. Unfortunately, parent perceptions of the current intervention were not collected and it is not possible to confirm why their homework completion rates were so variable. A second explanation may be that parents were asked to complete two different homework activities in this study, namely shared book reading and a phonological awareness activity. It is possible that this request gave parents mixed messages about which feature of the homework was important. Finally, the parent training in the current study was brief, consisting of one training session prior to the program, one individual consultation, and weekly debriefing sessions at the end of each group session. Augmenting this training by providing several individual consultations and including videotaping as a tool for reflective learning may have resulted in more focused learning experiences for the parents. Previous studies providing more intensive support using videotaping, coaching, and feedback have achieved notable success, albeit with younger children (e.g., Girolametto, Pearce, & Weitzman, 1997). Future studies may need to consider how to integrate videotaped feedback and mentoring in the home environment to help parents incorporate shared book reading strategies into their everyday interactions.

The goal of any shared book reading intervention is to increase children's oral language skills. In the current study, no differences were found between the children in the experimental and control groups for frequency of responses or for measures of oral language, including MLU and the number of different words. Previous investigations using children with language disorders and randomized control groups have reported conflicting results for shared reading intervention for this population. For example, Dale et al. (1996) reported that following a 6-8 week program, children increased their rate of verbal responses, number of different words, and MLU. However, Crain-Thoreson and Dale (1999) reported no differences in any language

measures relative to a control group following an 8-week intervention. Thus, one possibility is that intervention durations of 8 weeks, such as that employed in the current study, may not be intensive enough to demonstrate consistent gains for children with language impairment, a point that is underscored by a systematic review of intervention lengths and outcomes (Law, Garrett, & Nye, 2003). Moreover, as the parent fidelity data indicate, the homework was variably administered across the children and consequently, an adequate dosage of the intervention may not have been achieved by a sufficient number in the experimental group (Warren, Fey, & Yoder, 2007). Although typically developing children and children at risk demonstrate sizable language gains in this same time period (Arnold et al., 1994; Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1994), future interventions with children who have language impairment may need to be much more intensive in terms of duration and daily dosage to make a difference.

Although not a planned question of the current study, 18 children (nine in the experimental group and nine in the control group) spoke a different language in the home. Parents reported that the majority of their children were dominant in English at the time of the study and the two groups did not differ in terms of the percentage of time the children spoke English, the age at which they started speaking English, or the length of time they had been speaking English to communicate with others. We conducted preliminary analyses of homework reports and outcomes to ascertain whether language (i.e., monolingual English, dual language learners) had an impact on these variables. There were no significant differences between these two groups for any intake characteristics, homework reports, or parent-child outcome variables. Thus, in the current study, dual language learning did not systematically impact on the results. Moreover, parents from dual language backgrounds were able to participate in the planned intervention to a similar extent as monolingual English parents. It is important to note that parents who did not speak English well enough to conduct the home practice were not eligible to participate in this study and received regular services from the participating agencies.

Limitations and Future Directions

There are a number of limitations and suggestions for future research that arise from this study. The first limitation is that the results of this study (i.e., parent's use of print concepts, balance of parent-to-child utterances) cannot be attributed solely to the parent training. Because parents observed all sessions, these results may be due to the combination of speech-language pathologist direct intervention with the children as well as the parent-implemented book reading. A second limitation is that the sample of children with language impairment recruited for this study was small. Consequently, there may have been insufficient power in our analyses to detect small effects. A third limitation of this study is that the sample of parents and children was heterogeneous, consistent with the diversity that is typically found on the caseload of clinicians working in large urban settings. Although the majority of the children were English dominant, there was variability in terms of the languages spoken in the home and the length of exposure to English. Our study sought to recruit families who had at least one family member with sufficient English language skills to conduct the homework in English. However, some of the parents may not have been fully comfortable conducting shared book reading sessions in English. Unfortunately, this study did not have sufficient resources to provide home programming in all of the different languages spoken by the parents to their children. Other studies using this intervention for different language groups have focused on one language group, in addition to English, making the provision of resources easier (e.g., Tsybina & Eriks-Brophy, in press). Thus, it is possible that a single intervention may not be sufficient to address the diversity and heterogeneity observed in the children with language impairment who were recruited for this study. A fourth limitation was that the parent training component of the intervention program was brief and the study did not obtain direct measures of the homework (e.g., audiotapes or videotapes of homework activities). The frequency and duration of shared book reading practice was obtained only through parent report. Future interventions relying on parent involvement to extend the intervention may need to provide more rigorous training and fidelity checks at home (e.g., audiotaping or videotaping) to ensure that parents are applying the share book reading strategies appropriately and consistently.

Overall, the results of this study suggest that an intervention that combined direct treatment with parent-implemented book reading intervention yielded significant findings for print concepts and ratio of parent-to-child talk. However, this combined intervention approach had no effects on the oral language of children with language impairment. The findings suggest that clinicians may need to extend the duration of intervention and boost the amount of training, coaching, and support they provide parents so that they can more effectively fulfill their roles in extending intervention into the home setting.

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Appendix A

Session Number Book Title/Author	Number of Embedded Book Questions/Examples[1]	Print Concepts[2]
1. *Jason's Bus Ride* Harriet Ziefert (1987)	18 questions Easy: What does Jason see? Hard: Where do you think he's going?	Goals for Sessions 1 - 3: (a) Show front of the book. (b) Show name/title of book (c) What do you think title/name says? (d) State the author and illustrator's names.
2. *When the TV Broke* Harriet Ziefert (1989)	14 questions Easy: What happened? Hard: What would you do if your TV broke?	
3. *Stitches* Harriet Ziefert (1990)	18 questions Easy: What did the doctor do? Hard: How did John feel?	
4. *Harry the Dirty Dog* Gene Zion (1956)	22 questions Easy: Where does Harry go? Hard: How does he feel?	Goals for Sessions 4 - 6 (e) Which way do I read (directionality – lt to rt)? (f) Do I read this page or this page first (directionality – lt to rt)? (g) There are four lines on this page. Which way do I read first? (directionality – top to bottom). (h) Which one do I read last (directionality – top to bottom)?
5. *Shut the Gate* Sonia Devons & Shoo Rayner (1990)	18 questions Easy: What does John have in his hand? Hard: What's John going to do?	
6. *Mortimer* Robert Munsch (1983)	12 questions Easy: What does Mortimer do? Hard: What is going to happen next?	
7. *Mmm Cookies!* Robert Munsch (2000)	17 questions Easy: What did Sam make? Hard: What will he do with his clay cookie?	Goals for Sessions 7 - 8: (h) Show me where (character) is talking? (i) Where does it say (read text)? (j) Where do I begin to read? (k) Show me one letter on this page; show me the first letter on this page; show me a capital letter.
8. *Moira's Birthday Party* Robert Munsch (1987)	16 questions Easy: What does Moira order? Hard: Why does the man think she's crazy?	

[1] Pairs of questions (easy and hard) were inserted into the corresponding page of the book and appeared following the story text. The full set of embedded questions is available from the corresponding author.

[2] Print concepts were modeled by the clinician at the start of each group book reading session and were adapted from Justice & Ezell (2002).

Appendix B

Parent Homework Record Form

CHILD'S NAME: _____

Date: _____

Check (x) which activity or activities you and your child engaged in today:

   Storybook reading   Time (minutes) _____

During the storybook reading activity, my child (check all that apply):

   Retold the story (number of times _____)

    Answered questions about the story (number of times _____)

Appendix C

Book Interaction Coding System

1. Print Concepts [BH] – Utterances that focused on references to print and book handling.

        Examples: P The title of the story is "Don't Forget to Come Back" [BH].
                             P Look we read from the top to the bottom [BH].

2. Wh-questions [WH] – Questions that begins with what, where, when, why, how or who.

        Examples: P Okay so what happened to the house [WH]?
                             P Where is her mommy going [WH]?

3. Choice Question [CH] – Question which allows for only a finite choice of responses.

        Examples: P Do you think she wants an apple or a banana [CH]?
                             P Is Katie eating pizza or milk [CH]?

4. Prompt [PR] – Adult asks the child to speak or leaves a pause for the child to fill in the gap.

        Examples: P The cat is sitting on the [PR]~
                             P That's a [PR]~

5. Imitation [IM] – Utterance which repeats the child's previous utterance, while adding no new vocabulary/grammatical information (may be a reduced imitation).

        Examples: C That's a crayon.   P A crayon [IM].

6. Expansion [EX] – Statement within one turn of the child's previous utterance which contains at least one word from the child's previous utterance.

        Examples: C Another penguin.   P A baby penguin [EX].
                           C Mouse.   P A little mouse [EX].

7. Comments [CM] – Statements and commands, including paraphrasing the story, giving information related to the story, and providing the labels of objects, actions, or characters.

        Examples: P She was hiding in the closet [CM].
                             P Sarah is the babysitter's name [CM].

8. Answer [AN] – Utterances that correctly answer a question. Non-verbal answers are also included in this category.

        Examples: P What happened?   C It broke [AN].
                             P Where's the dog?   C {Points to the chair} [AN].