

**Critical Review:**  
**Does print referencing during shared storybook reading improve pre-literacy skills in preschoolers?**

Ashleigh Campbell  
M.Cl.Sc SLP Candidate

University of Western Ontario: School of Communication Sciences and Disorders

This critical review examines the evidence regarding the effects of print referencing during shared storybook reading on pre-literacy skills in preschool children. A literature search was completed and yielded the following types of articles: one randomized clinical trial, two randomized block designs and one single-subject multiple probe design. Overall, the results indicate that print referencing behaviors do enhance the pre-literacy skills of preschoolers. Clinical implications of this intervention are discussed.

***Introduction***

In our society, education is related to success and success in education is related to reading ability. With early literacy skills being found to serve as strong predictors of later reading ability (Ball & Blachman, 1991; Bryant et al., 1990; Menyuk et al., 1991; Stuart, 1995; Tunmer et al., 1998), the development of print knowledge has been linked with later reading ability as well. Print knowledge is an important domain of children's early literacy development and describes the emergent knowledge about the forms and functions of written language (Storch & Whitehurst, 2002; Whitehurst & Lonigan, 1998). Research has found that it is not simply the frequency with which children engage with print that matters most to their development of print knowledge, but the quality of these interactions (Roberts, Jurgens, & Burchinal, 2005; Skibbe et al., 2008). Using eye-gaze methodologies, it has been shown that in typical reading situations, preschool-age children look at print infrequently, corresponding to less than 5% of visual fixations (Evans & Saint-Aubin, 2005; Justice, Pullen & Pence, 2008). Also research states that adults do not typically use a print referencing technique when reading with children, but rather it needs to be taught (Justice, Kaderavek, Fan, Sofka & Hunt, 2009). The following paper will examine whether or not using print referencing behaviors during shared storybook reading improves pre-literacy skills in preschoolers.

***Objectives***

The objective of this paper is to critically evaluate the existing literature regarding the impact of print referencing on the pre-literacy skills of preschool children.

***Methods***

**Search Strategy**

Computerized databases, including SCOPUS, ERIC, and PubMed were searched using the following search

strategy: ((shared reading), (storybook reading) or (book reading)) AND ((print referencing) or (print focus)).

**Selection Criteria**

Studies selected for inclusion in this critical review paper were required to investigate the impact of print referencing skills on preschool children's pre-literacy skills. The studies were required to include English speaking children with no alternate diagnosis other than language impairment.

**Data Collection**

Results of the literature search yielded the following types of articles congruent with the aforementioned selection criteria: one randomized clinical trial (RCT), two randomized block designs which were called pretest-posttest control group research designs, and one single-subject multiple probe design.

***Results***

Justice and Ezell (2000), hypothesized that parents' use of print referencing strategies would stimulate the development of their children's word and print skills. The study was conducted with 28 Caucasian parents and their typically developing children (16 girls and 12 boys; aged 3;11-5;2). The families were recruited through flyers dispersed at local daycare centers, preschools, and public libraries. The children were required to pass an audiological screening, and have a minimum standard score of 85 on the Peabody Picture Vocabulary Test and the Expressive One-Word Picture Vocabulary Test-Revised.

The children were matched based on gender, maternal education (used as a broad measure of SES) and children's receptive vocabulary skills, and then randomly assigned to control or experimental groups making this a randomized block design. The Oxford Centre for Evidence-based Medicine Levels of Evidence categorizes this as level two evidence, with the gold standard being level one. Based on a series of paired-sample t-tests, there were no significant differences

between the two groups based on age, expressive and receptive vocabulary, or years enrolled in preschool. One child discontinued participation and at that time, her match in the control group was also discontinued.

A series of paired-samples t-tests found no significant differences between groups based on the five early literacy measures administered by the first author at pretest. The informal early literacy measures examined: Words in Print, Alphabet Knowledge, Print Recognition, Word Segmentation and Print Concepts.

Results from the analysis of parent-recorded videotapes over the four-week period found that 97% of the experimental sessions examined used at least 9 verbal print referencing behaviors. Print referencing in the control group occurred in only 3% of the sessions.

A repeated-measures analysis of variance (ANOVA) between the control and experimental groups was conducted. The results showed significant differences in the gain scores in favour of the experimental group for three of the five subtests: Words in Print, Print Concepts and Word Segmentation, but not Alphabet Knowledge or Print Recognition.

There were several limitations to this study. The first limitation was that participants all volunteered for the study through flyers at public places where educated people would attend, possibly creating a selection bias. Another limitation was that the language assessment only examined single word vocabulary knowledge, which is not a true measure of expressive and receptive language capabilities. Also the measure for Alphabet Knowledge appeared to ceiling for these particular children and therefore true gains in this domain could not be displayed in the analysis.

One more limitation of this study included the variability within the parent's print-referencing behaviors. These behaviors were taught briefly at the beginning of the study. Videotapes were examined for the amount of print referencing behaviors, but how the parents were incorporating these behaviors was not assessed.

Despite the limitations, the study also had several strengths. The study design was appropriate for the number of participants. Also, it was beneficial for the authors to take into account SES, as it has been shown to impact literacy development. Although, it is questionable whether maternal education alone is a valid measurement of SES. It may have been beneficial to determine household incomes along with maternal education. Another strength of this study was that they carefully controlled many extraneous factors between

groups in order to determine the effect of the variable being tested. Also, the overall procedural reliability was reported as 99.6% between 25% of all pre- and posttest assessment sessions even though the author assessing the children at pre- and posttest was not blinded.

Overall, the study demonstrates compelling evidence that participation with parents in shared storybook readings including a print focus will facilitate development in pre-literacy skills of typically developing preschoolers.

Justice and Ezell (2002) did a randomized block design to determine how participation in shared book reading sessions with a print focus compared to a picture focus influenced the print-awareness skills of preschool children from low-income households.

The 30 children (15 girls and 15 boys, ranging in age from 3;5 to 5;2) who met the eligibility criteria of being typically developing were age matched and then randomly assigned to an experimental or control group. The experimental group included print focus reading sessions and the control group included picture focused reading sessions. The authors report age matching due to the wide variation of ages and because early literacy development correlates highly with age. A series of paired-samples t-tests indicated that the two groups did not significantly differ based on chronological age, receptive vocabulary or print awareness (PA) composite scores, but the experimental group outperformed their control group peers on expressive vocabulary. This difference was accounted for in post hoc statistical analysis and determined it was due to three outlying scores.

Children were then split into 10 reading groups (five experimental and five control) of three to five children each. All groups participated in 24 reading sessions over an 8-week period. In each reading session, the adult posed a total of nine prompts (either print or picture focused) and children were called on to respond to at least one of the nine prompts. Eight books were read a total of three times each, with all groups having an identical sequence. The nine print focused prompts included three on print conventions, three on concept of word and three on alphabet knowledge.

Results of a doubly repeated measures multivariate analysis of variance (MANOVA) showed the print focused group had a greater increase in print-awareness performance over time compared to the picture focused group. The effect size observed with respect to this time-by-group interaction was .548. Then a series of univariate pairwise comparisons were conducted to examine change across each of the dependent variables

(the six print awareness measures: letter orientation and discrimination; print concepts; print recognition; words in print; alphabet knowledge; and literacy terms and a print-awareness composite score). Results indicated the children who participated in the print focused group demonstrated significantly greater gains in Print Recognition, Words in Print, Alphabet Knowledge and PA Composite, but not for Letter Orientation, Print Concepts and Literacy Terms.

There were several limitations to this study, two of which were stated within the article. One was that the reliability and validity of the early literacy measures cannot be assumed, although the measures did undergo pilot testing and modification prior to the study. The other limitation was the potential influence of children's language skills on the effects of intervention. Post hoc analysis found that the children in the experimental group demonstrated significantly better expressive vocabulary than the control group. Some additional limitations include the assessment of language was merely at the single word level and also that the authors did not discuss how participants were gathered.

Of note are the various strengths within this study. Inter rater reliability procedures were conducted at posttest to control for potential experimenter bias. The overall inter rater reliability score was 98.9%. Procedural fidelity was assessed as 98% and 97.9% for the administration of the pretest and posttest pre-literacy assessments and the implementation of intervention respectively. Another strength was that the teachers remained blinded throughout the study. Also, the length of each reading sessions was calculated and no statistical difference was found between groups. The authors also explained their reasoning for not acquiring level one evidence with a randomized clinical trial.

Considering the strengths and limitations, this study demonstrates suggestive evidence for the benefits of print referencing during shared storybook reading to facilitate a variety of pre-literacy skills.

Lovelace and Stewart (2007) examined the effect of using non-evocative and explicit print referencing cues during shared book reading on print concept knowledge in children with language impairment.

This single-subject multiple probe study design included five language impaired children (4 girls and 1 boy aged 4;0-5;0). All children were Caucasian and native English speakers who had normal corrected vision, hearing abilities within normal limits, and ability to attend to task for approximately 30 minutes when provided with some redirection. The presence of a language impairment as the primary disability, and an

individualized education plan containing semantic goals was also necessary for inclusion. These children were administered the Concepts of Print Assessment (CPA) and needed to score less than 35% accuracy.

In the baseline condition, IEP goals including relational words were focused on during language intervention sessions. Then children were read to for 10 minutes while the SLP made comments on pictures and text that demonstrated the concept targeted in that session. In the experimental condition, non-evocative strategies of commenting, tracking and pointing to examples of 20-print related concepts were conducted within the book reading portion of the language intervention sessions. After collecting the baseline data, two participants entered the experimental condition. Probes were administered to each participant every fourth session, and a new child was entered into the experimental condition once a child learned six print concepts more than was obtained during their final baseline probe. The first author executed all sessions.

The percentage correct performance on the CPA was calculated and graphed across subjects in order to compare within and across participants. Graphs were examined for: stability and levels of performance during baseline, sudden improvements in performance following experimental procedures, and the results on the generalization probe. The percentage of data that did not overlap was calculated as an additional measure of effectiveness. The performance on each of the 20 print concepts was aggregated and analyzed for trends in concept learning across participants.

After implementation of the experimental condition, performance on the CPA increased noticeably for every participant. Also the participants in the experimental condition the longest obtained the highest scores on the final intervention probe.

Some limitations stated by the authors included: the absences of the participants, as well as the test-retest reliability and validity of the CPA were not established. Inter rater reliability for CPA scoring and procedural reliability were both calculated as 97% for this study, which is a merit. Another merit of the study was the detailed testing completed for each child. The small number of participants allowed for this in-depth assessment.

As a level one study, this provides compelling evidence for non-evocative print referencing impacting print awareness skills in language-impaired preschoolers.

Justice et al., (2009) examined whether or not teachers' use of a print referencing style could increase the print

knowledge of at-risk children beyond what teachers' typical reading style could offer over an academic year. This print referencing style included: asking questions about print, commenting about print and tracking one's finger along the text while reading.

This randomized clinical trial, which is level one evidence, was conducted as part of a multi-cohort, multisite, longitudinal RCT. This study reported findings on the first cohort of teachers (n=23) and preschool-age children (n=142) in an intent-to-treat (ITT) analyses, which does not take into account fidelity, compliance or deviations in implementation. The participants that completed the study were 106 disadvantaged preschoolers (47 girls and 59 boys with a mean age of 4;4) in 23 classrooms designed to provide early education services to at risk children. The 23 teachers enrolled themselves and then consents were sent out to parents and from the returned consents three to nine children were randomly selected from each class. The 36 children that did not complete the study were statistically compared to the rest of the children in the study. Based on maternal education and language measures, no significant difference was evident.

Teachers were randomly assigned to either the print referencing condition (n=14), or an everyday-shared reading comparison condition (n=9). Both groups read specifically chosen books for print salient features, four times a week for 30 weeks. The teachers in the print referencing condition used a print referencing style embedding verbal and nonverbal references to at least two of the four print targets (print organization, print meaning, letters and words) and the comparison group used their normal reading style. All teachers videotaped the shared reading session once every two weeks for the 30-week period.

Three standardized criterion-referenced tools were used to measure the children's print knowledge outcomes: the Upper-Case Alphabet Knowledge and the Name-Writing Ability subtests of the Phonological Awareness Literacy Screening: PreK, and the Preschool Word and Print Awareness assessment, which examines children's knowledge of 14 concepts about print and words. A multivariate analysis of variance (MANOVA) found there were statistically significant group differences on the baseline measure of print knowledge. Follow up analysis of variance (ANOVA) revealed groups statistically differed only on alphabet knowledge in favor of the control group. Similar procedures were used to examine groups for the four baseline language measures (sentence structure, word structure, expressive vocabulary and composite score) and the multivariate test statistic was not significant.

A multivariate analysis of covariance (MANCOVA, statistically controlling for classroom instructional quality) found that the two groups had statistically different gain scores on the three early literacy measures. A follow-up univariate analysis showed that children in the print referencing classrooms had statistically higher gains scores on Print Concept Knowledge and Alphabet Knowledge, but not statistically significant gains in Name-Writing Ability. The three effect sizes were calculated as 0.50, 0.56 and 0.42 for Print Concept Knowledge, Alphabet Knowledge and Name-writing Ability respectively. These effect sizes represent medium effects meaning that the experimental group exhibited clinical gains in pre-literacy skills over the academic year.

A limitation of this study was that the authors never mentioned the reasoning for having a control group of 9 teachers and an experimental group of 14 teachers. Also little was known about the individual differences of the children with regards to their specific risk factors. A small number of children were concurrently receiving special education services, but there is no detail regarding this, which can impact the results. The authors also did not report the reliability or validity of the measurement tools. It was stated that based on Justice et al., 2003 the three measures had adequate psychometric properties, but interrater reliability was not calculated. Another limitation of the study could be the individual differences of the teachers within and between groups. The print referencing group was controlled using index cards to cue the teachers what to say and when within the shared reading, but there may have been differences during the remainder of the day. One final limitation was that the groups of children differed on baseline measures of alphabet knowledge, and there was no further mention of this in the study.

The article did provide detail regarding statistical analysis of group differences of those who dropped out of the study and those who completed the study to show that the children's data not used in later analysis due to missing data was unlikely to materially affect the results reported. The authors also calculated the amount of print referencing teachers in the control and experimental group executed. Over the three periods of analysis, the rate at which the experimental group referenced print statistically more differed from the control group twice. In the spring the groups did not statistically differ, but the effect size was 0.71, which is a large effect size. It is also a merit of the study to take into account classroom quality when doing the analysis.

Although this is level one evidence, this study only shows suggestive evidence for using print referencing

strategies to improve pre-literacy skills in preschoolers due to methodology and the results.

**Discussion**

While all four studies provided evidence on the effectiveness of print referencing on pre-literacy skills, caution may be necessary based on the limited range of authors executing the research. It is important to note that all measurement tools were not standardized and therefore it was difficult to compare the data within and between studies. All studies included within this critical review used the measurement tools repeatedly and did not report on test-retest reliability. The four studies all conclude that print referencing does facilitate growth in pre-literacy skills in preschoolers. Based on The Oxford Centre for Evidence-based Medicine Levels of Evidence, the study designs fall into level one and level two categories.

All studies were very controlled in the development and procedure of implementation. The procedural fidelity was measured as acceptable for each study. All studies except one measured language at the single word level, meaning that the validity of these measurements may not be a true representation of the language abilities of these children. In fact two studies had significant differences in groups prior to the implementation of the experiment. None of the studies assessed the longitudinal effects of print referencing.

Pre-literacy skills were determined using a variety of criterion-referenced measures, all having slightly different names and meanings. Although all studies showed an improvement in pre-literacy skills when print referencing was targeted, it is interesting to note that different skills improved in the various studies. The chart below depicts the various aspects in pre-literacy skills that showed significant improvements over the control group after print referencing behaviors.

Justice & Ezell (2000) Randomized Block Design, n=28, Parents using print referencing vs. normal reading behaviors in dyadic shared reading sessions	Justice & Ezell (2002) Randomized Block Design, n=30, Print vs. Picture focus within small shared reading groups in Head Start Centers	Lovelace & Stewart (2007) Single subject, multiple probe design, n=5, Using non-evocative explicit print referencing cues within language therapy	Justice et al. (2009) Randomized clinical trial, n=106, Teachers using typical reading style vs. print referencing style in classroom setting
-Words in print -Segments spoken words strings -Understands print concepts <b>NOT:</b> -Alphabet Knowledge -Print Recognition	-Print recognition -Words in Print -Alphabet Knowledge -PA Composite <b>NOT:</b> -Letter Orientation -Print Concepts -Literacy Terms	-Concepts of Print including Print and Book Concepts	-Print Concept Knowledge -Alphabet Knowledge <b>NOT:</b> -Name-Writing Ability

The chart demonstrates that some pre-literacy skills showed improvements in some research studies but not others. It appears that if you factor out numerous variables of pre-literacy skills, then using print referencing targets will impact at least one of them. Overall, each study concluded there were improvements in some pre-literacy skills after print referencing was targeted.

**Recommendations**

Further research would be beneficial to provide additional information on the effects of print referencing on pre-literacy skills. This research should focus on the following:

- 1) The effects that print referencing has on the pre-literacy skills of language impaired children. More studies need to include language-impaired individuals in order to provide more evidence of efficacy for this type of intervention with this population.
- 2) Whether evocative or non-evocative print referencing strategies are ideal.
- 3) The quantity of book repetitions and print referencing targets that is necessary to induce changes in pre-literacy skills.
- 4) The long term effects that print referencing has on pre-literacy skills and therefore literacy skills.

**Clinical Implications**

Many practitioners include shared book reading in their intervention sessions. Based on the evidence provided by the studies in this critical review, print referencing within these shared storybook interactions would be encouraged. The evidence is compelling enough that this small change may facilitate growth in the pre-literacy skills of these preschoolers. Unlike many other therapy approaches where a choice needs to be made regarding the best route for intervention, print referencing can be incorporated into the context of already occurring practices. It would also be recommended as a strategy to teach parents. Reading strategies used by adults are diverse and not necessarily instinctual, particularly among caregivers of children who are considered to be at risk for later academic and language difficulties (Justice & Ezell, 2000). Whether it be used in practice or suggested to parents, it is important to note that all experimental procedures required repetitive readings of the same books and the use of books with large, salient print.

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