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Story-related discourse by parent–child dyads: A comparison of typically developing children and children with language impairments

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ABSTRACT

The engagement of two groups of parents and preschoolers while sharing a wordless picture book and an interactive e-book are described, specifically comparing children with typically developing language (TD) versus children with language impairments (LI). Parent–child dyads were video recorded in a laboratory (TD group, $n = 10$) or at a clinical site (LI group, $n = 10$) while sharing a wordless picture book (WL condition) and an e-book (EB condition). Our assessment focused on the areas of (1) child persistence and (2) child verbal engagement (length of turns, verbal responses to parental prompts, gestural responses). The LI group spent more time with the WL book than the TD group, which was unexpected due to prior reports of poor engagement with print books by LI children; therefore we speculate that children with LI engage with books to the extent that the language demands of the book and the interaction are adapted to the child's linguistic capabilities. The LI and TD groups showed similar levels of nonverbal engagement with the EB. Parents in the EB condition behaved differently: parents of TD children coordinated their talk with their child's actions and perceptions; parents of LI children increased the number of questions and demands for responses markedly, whereas their children reduced the proportion of verbal responses significantly in comparison with the WL condition. Further research is required to develop guidelines for effective sharing of e-books with children with LI.

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1. Introduction

A recent research brief published by Common Sense Media found 75% of families in the United States own some type of "smart" electronic device for reading, including a sizeable number of (40%) tablets [1]. Even before reading tablets were introduced to the market, research on CD-ROM books for preschoolers revealed that e-books represent a highly engaging medium for adults and children alike. Roskos and colleagues list "self-direction, interaction, emotion, choice and a sense of competence" [2, p. 48] as prime defining features of engagement. An additional quality of engagement frequently highlighted is *persistence*, meaning the ability to sustain attention over time [3] or stay on task [4]. When observing parents and children sharing different media, Moody et al. [3] found that children were more engaged (i.e., persisted for longer) with the e-storybook but were more verbally engaged (i.e., used more communicative initiations in the form of labeling) in the traditional book condition. Chiong, Ree, Takeuchi, and Erickson [5] operationalized book engagement with regard to children's direct attention and touch, finding the majority of children equally engaged with print and e-books, notwithstanding a large minority that was more engaged by e-books. A recent experimental study with pre-kindergarteners ($N = 94$) conducted by Willoughby, Evans, and Nowak [6] compared alphabet-books in print and electronic format used in read-alouds by researchers who provided no scaffolding. Children were more engaged verbally during readings of print books, showing spontaneous letter naming and object labeling more frequently; furthermore, in the print book condition a predictive relationship was found between time spent oriented towards the books and letter-name knowledge and phonological awareness at post-test, when taking children's pre-test performance into account.

Although the generally engaging potential of e-books seems indisputable, findings regarding their capacity to simultaneously stimulate *verbal* engagement by children are rather pessimistic. If e-books reduce verbal engagement during shared reading, this

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might be a particular problem for children with a known risk for later reading difficulties, such as children with a developmental phonological disorder or language impairment (LI). This potential problem could be further exacerbated by the risk of co-occurring attention deficit among children with reading and language disorders [7]. Concerns are frequently raised about the distracting nature of interactive features such as games and hotspots [8–10]. The apparently distracting nature of these features may explain reports of impaired story recall by children exposed to e-books [11]. This is a particularly plausible explanation in the case of younger children whose attention systems are still developing [12].

In contrast to this concern that e-books might be especially distracting for young children, it has been suggested that this medium might have some particular benefits for the population of children with LI. At least some children with LI do not respond well to traditional reading media (cf. [13]); for these children e-books could represent a useful alternative. Many e-books effectively represent a crossover between book and toy, featuring playful elements that invite physical manipulation and thus active engagement by the child reader. If these features enhance sustained attention during shared reading, e-books might increase exposure to beneficial language input for children with LI. Given how little is factually known about the ways in which adult–child dyads interact around various types of e-books, we deem it important that more descriptive information about this is accrued.

An observational study with two groups of parent–child dyads was conducted, where children in one group had a diagnosis of language impairment (LI), and age-matched children in the comparison group had typically developing (TD) language. Our main objectives were to describe book sharing exchanges in terms of children's general engagement (defined as persistence, or time attending to the shared reading task) and verbal (defined as amount of talk and pragmatic function of talk) and nonverbal (defined as gestural responses to parent initiations including deictic gestures preformed on the book's pages or screens) engagement. We compared these variables during adult–child sharing of a wordless picture book and an interactive e-book, comparing across the two groups of children. We hypothesized that between group differences in general and verbal engagement would be less pronounced in the e-book condition than in the wordless picture book condition, given the multimedia features of the e-book that were specially designed to attract child attention and to encourage parent–child dialogue that would also serve to maintain child attention to the shared reading exchange.

2. Method and materials

2.1. Participants

Ten English-speaking parent–child dyads were recruited from local daycare settings as part of the TD group. Thirteen children with a diagnosis of language impairment and their parents were recruited from a pool of parents attending a 6-week intervention on dialogic reading and language stimulation conducted by a speech–language-pathologist at a clinical site in the English-language health care sector. Children in the LI group met admissibility criteria to receive language therapy at this site by exhibiting a primary language impairment in the absence of a cognitive impairment or other disability that would indicate secondary rather than primary language impairment. Three children who attended this intervention were excluded from the present study because parents read to their child in another language (2 cases) or the child was an identical twin whose sibling also participated in the study (one case). The demographic and language characteristics of the final sample are described in Table 1 with additional details provided in the Appendix.

2.2. Materials

All dyads looked at three researcher-selected stories in turn, with the order of book titles held constant across dyads within groups. Because the second book was different for the TD and LI groups, only data for the first and third books will be described here. The first book shared was *Good Night, Gorilla* [15], a wordless picture book (average words per page: $M = 2.7$). A wordless picture book was included in the assessment protocol because this type of book slows down the book sharing process and potentially opens up space for the child as an active storyteller thus providing opportunity for more engagement; furthermore, and of particular importance for this study, this kind of book presents a good 'door opener' for the children with LI who do not enjoy the conventional format of 'being read to', especially when the text is linguistically demanding. The third book shared was *Caillou: What's that funny noise?* [16] an interactive e-book designed to facilitate parent–child dialogue, presented as an e-book (EB) for the iPad (average words per screen: $M = 38.5$; hotspots per screen $M = 3.14$, range = 1 to 7). This book is part of the iRead With series, designed specifically to encourage an interactive reading style between parent and child by the addition of a prompt bar that suggests story- and text-relevant questions and comments to the adult reader (e.g., What do you see here? What makes the shadows on the bed? What did Caillou do to make himself feel less afraid?). For this study, background music and a recording-feature were deactivated, level was set to 1 and "read and talk" mode was activated, meaning the adult was expected to read the text to the child.

2.3. Procedures

A standard two-visit research protocol was conducted with all dyads in both groups. In the first meeting, the parent viewed the content of the books; an overview of key e-book features was provided. Subsequently the parent completed three questionnaires concerning their child's developmental history, literacy activities in the home, and the family's use of digital media; meanwhile the child was administered a test of receptive vocabulary (PPVT-III or PPVT-IV, [17,18]). During the second visit, we video recorded the parent and child sharing the books. The dyad was recorded in the laboratory (TD group) or the clinical site (LI group) using two standard digital cameras installed to supply close-up front and back views. Parent and child sat side-by-side on the same model small couch at both sites. The parent was asked to read the books like they normally would when sharing books with their child at home.

2.4. Transcription and coding

Video clips containing front and back views were synchronized using AVS4YOU video editing software. Book sharing sessions were transcribed by four research assistants trained in the use of the CHAT transcription-system [19], noting parent and child utterances, along with a predefined set of meaningful gestures when used. Intonation and turn taking were prioritized in deciding on utterance boundaries. A range of five pages from each book was selected to serve as the basis for all further analyses; these sections were part of the narrative that led up to the climax of the story, excluding the first two pages of each book. An equal number of video extracts from both groups, amounting to 20% of the overall transcripts, were randomly selected and transcribed independently by a research assistant trained in the use of CHAT. Transcription reliability was calculated at the utterance and word boundary, using the formula by Sackett [20]: number of agreements/(number of agreements + disagreements) ×100 (cf. [21,22]). For parent and child together, this yielded 96.24%

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