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Emergent literacy in print and electronic contexts: The influence of book type, narration source, and attention

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ABSTRACT

Young children learn from traditional print books, but there has been no direct comparison of their learning from print books and tablet e-books while controlling for narration source. The current project used a between-subjects design and examined how 4-year-olds ($N = 100$) learned words and story content from a print book read aloud by a live adult, a print book narrated by an audio device, an e-book read aloud by a live adult, and an e-book narrated by an audio device. Attention to the book and prior experience with tablet e-books were also measured and included in analyses. When controlling for vocabulary, the overall pattern of results revealed that children learned more words from the e-book and from the audio narrator, but story comprehension did not differ as a function of condition. Attention predicted learning, but only in some print book contexts, and significant effects of prior experience did not emerge.

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Introduction

Preschoolers are interacting with digital technology more than they have ever before, and e-book reading is on the rise. Simply put, the context in which children read is changing. In 2011 4% of 0- to

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8-year-olds had read an e-book on a tablet or smartphone, whereas in 2017 28% of children in this age group had read an e-book on one of these devices (Common Sense Media, 2017). Interestingly, the increase in e-book reading has complemented, rather than replaced, print book reading (Kucirkova & Littleton, 2016). Recent work has revealed that e-books, like print books, have the potential to foster emergent literacy skills (Bus, Takacs, & Kegel, 2015; Lauricella, Barr, & Calvert, 2014; Strouse & Ganea, 2017a). However, there is a paucity of research with respect to how supplemental e-book features influence learning and engagement. Given the variety of e-book types (e.g., computer storybooks, tablet e-books, smartphone apps) and accompanying features (e.g., audio narration, games, music, hotspots, text highlighting), researchers have acknowledged the difficulty in disentangling how these variables affect children's learning and urge for more well-controlled studies (Bus et al., 2015). This was the primary goal of the current project. Within the framework of sociocultural theory, we examined how preschoolers learned words and story content from print books and tablet e-books, isolating the role of audio narration from other e-book features.

Sociocultural theory and literacy development

Vygotsky's sociocultural theory offers support as to why early shared reading experiences are positively associated with vocabulary development and reading comprehension (Bus, van IJzendoorn, & Pellegrini, 1995; van Kleeck, 2008). Children learn through interactions with experts (skilled peers or adults), and experts use techniques and tools appropriate for children's current cognitive level (Vygotsky, 1978). In shared book reading, the book itself and the expert's reading techniques foster children's literacy development (Dickinson & Smith, 1994), and as children become more sophisticated readers, experts adjust techniques and offer different tools (more challenging books) to support learning (Zeece, 2010).

Empirical work guided by sociocultural theory has examined how techniques and tools transmit knowledge during book reading, with most work examining how scaffolding style supports literacy development (e.g., Haden, Reese, & Fivush, 1996). Techniques such as questioning (Sénéchal, 1997), reading a story multiple times (McLeod & McDade, 2011), and providing commentary (Ard & Beverly, 2004) foster emergent literacy skills better than standard reading practices. A smaller body of work has examined the book itself and features of the book as scaffolding tools. Vygotsky (1978) recognized the importance of tools, such as books, to transmit cultural knowledge (see also Lauricella et al., 2014). Research examining the print book as a tool has revealed that books with manipulative features ("pop-ups") (Tare, Chiong, Ganea, & DeLoache, 2010) and less realistic images (line drawings) (Simcock & DeLoache, 2006) result in poorer learning in young children. Thus, the expert's job is to scaffold the reading process and select developmentally appropriate scaffolding tools to support learning (Zeece, 2010).

Today, experts must scaffold children's competence with digital devices, new tools used to transmit knowledge (Rosenshine & Meister, 1992; Yelland & Masters, 2007). Specifically, e-books and features of the e-book (e.g., audio narration, text highlighting) serve as scaffolding tools, whereas the behaviors and comments made by the adult reader comprise scaffolding as a technique. As e-books become more prevalent (Bus et al., 2015), empirical research will advance best practices for how they ought to be studied, constructed, and used (Barr & Linebarger, 2017).

E-books and audio narration as scaffolding tools

Because shared print book reading is a formative activity, researchers, parents, and educators are interested in exploring whether the benefits extend to e-books. E-books have the potential to transmit knowledge but are different from print books in two ways. First, e-books are presented on screens and lack tangible pages. Indeed, this is one reason why parents of young children are wary of replacing print books with e-books during reading (Kucirkova & Littleton, 2016). Second, many e-books come equipped with additional features, including audio narration, dictionaries, games, and text highlighting. Audio narration, in particular, warrants further investigation because children can independently listen to the story; there is no need for a live reader. The research that has explored how these differences may affect learning is discussed below.

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