



The effect of alphabet eBooks and paper books on preschoolers' behavior: An analysis over repeated readings



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ABSTRACT

Preschoolers' behavior was examined over repeated sessions when interacting with one of two types of alphabet books – traditional alphabet books in paper format or interactive alphabet books in an eBook format – to determine the extent to which each type of book elicited behavior relating to alphabet knowledge. Data are reported from 63 3 and 4-year-old children who were assessed on letter knowledge and phonemic awareness. They were randomly assigned to conditions in which they used either paper books representing a variety of text and illustration styles, or eBooks representing a variety of audio and interactive features. Orientation to the books and letter-related behaviors in independent reading were coded in 16 sessions occurring over 8 weeks, and summarized across 2-week blocks. Children in the eBook condition spent more time oriented to the books. However, they generally engaged in less letter-related behavior (saying letter names, saying object names). In half of the observations they activated object hotspots. Moreover, their overall letter-related behavior declined over sessions. Implications for parents, educators and publishers are discussed.

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1. Introduction

The use of alphabet books is common in both home and school settings. For example, [Levy, Gong, Hessels, Evans, and Jared \(2006\)](#) found that parents of 474 children ages 4–7 years reported reading alphabet books to their children two to three times a month, and that children looked at these books on their own almost equally as often. Parents' goals for providing and reading these books to their children include developing their alphabet knowledge ([Nowak & Evans, 2013](#)). However, research on the ways in which children interact with alphabet books and potentially learn from them is scarce. In the last few years alphabet books in a digital format, which include interactive features and audio providing letter names and sounds and interactive features, have appeared but have been subject to even less research scrutiny.

The purpose of the present research was to examine how young children interact independently with traditional alphabet books in paper format and alphabet eBooks presented on tablets during repeated encounters with them in an attempt to understand how children might learn or fail to learn from these books. In particular it

examined whether these different types of alphabet books evoked different behaviors and different trajectories of behavior over time. Such information would be valuable for determining how children's book activities should be scaffolded by adults and for the design of alphabet books to foster alphabetic learning.

To provide a context for this research, the introduction briefly discusses the importance of alphabet knowledge followed by the findings from the few extant studies of children's learning from and engagement with alphabet books.

1.1. The importance of alphabet knowledge

Children develop certain pre-reading skills, knowledge, and attitudes before being able to read or write which lay the groundwork for literacy acquisition. This “emergent literacy” includes alphabet knowledge, phonological awareness, and print motivation and awareness ([Whitehurst & Lonigan, 1998](#)), all deemed important in launching children on the pathway to reading.

Alphabet knowledge is a unitary construct defined by the [National Institute for Literacy \(2009\)](#) as “knowing the names and sounds of printed letters” (p. 14). Mastery of the names and sounds of letters is a consistent predictor of academic success in reading and spelling ([Adams, 1990](#); [Foulin, 2005](#); [Hammill, 2004](#); [Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004](#)).

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Because alphabet knowledge is important in reading acquisition, the Headstart Outcomes Framework (*Administration for Children and Families, 2015*) specified that 4–5-year-olds should be able to name at least half the letters of the alphabet and say the sounds of many letters that they recognize. Similarly, the National Association for the Education of Young Children specified the development of the ability to associate letters and sounds as a goal to be reached for preschoolers (*NAEYC, 1998*).

Phonological awareness, and more specifically phonemic awareness, is the conscious awareness of phonemes in spoken words and entails the ability to isolate individual phonemes and blend them into syllables and words. Its importance has been emphasized (*National Reading Panel, 2000; Snow & Burns, 1998*), given a breadth of research showing it also to be a strong predictor of subsequent reading skill as reviewed by *Melby-Lervåg, Lyster and Hulme (2012)*.

These domains of knowledge—letter names, letter sounds, and phonemic awareness—are strong predictors across studies and across alphabetic languages (*Caravolas et al., 2012*) and appear to develop in a reciprocal fashion. First, many alphabet letters in English adhere to the acrophonic principle by containing the sound that the letter makes within the letter name. This letter name structure affects the ease with which children acquire knowledge of letter sounds (*Evans, Bell, Shaw, Moretti, & Page, 2006; Justice, Pence, Bowles, & Wiggins, 2006; McBride-Chang, 1999; Piasta & Wagner, 2010; Share, 2004; Treiman, Tincoff, & Richmond-Welty, 1996*), with letter names containing their sound being learned more readily. Second, the ability to associate a letter name with a letter sound is affected by phonemic awareness, in that these associations are more easily acquired by children with higher levels of phonemic awareness (e.g., *Castles, Coltheart, Wilson, Valpied, & Wedgwood, 2009; Kim, Petscher, Foorman & Zhou, 2010; Piasta & Wagner, 2010*). However, with even limited phonemic awareness, *Levin, Patel, Margalit and Barad (2002)* noted in a study with Hebrew-speaking participants that children “can see the connection between letters and sounds when the word includes a letter-name sequence” (p. 293) (examples of this in English being the name of N in *enter*, A in *ape*, B in *beat*, R in *car*) preparing them for further learning. Similarly, *Roberts (2003)* found that training preschoolers in letter names helped them to learn words spelled phonetically with those same letters. Third, ability on phonemic awareness tasks is facilitated by letter knowledge. For example, *Burgess and Lonigan (1998)* found letter knowledge at age 5 uniquely predicted scores on phonemic awareness tasks a year later. Through a training study, *Castles, Wilson and Coltheart (2011)* concluded that preschoolers draw on their knowledge of letters to perform phonological awareness tasks. Most recently, *Lerner and Lonigan (2016)* demonstrated through analyses of growth curves the bidirectional relation between letter knowledge and phonemic skill during the preschool years.

1.2. Alphabet books

Despite the importance of instruction in alphabet knowledge, *Pelatti, Piasta, Justice, and O’Connell (2014)* found that in 81 early childhood classrooms, an average of just 2.77 min a day was devoted to alphabet knowledge. Informal teaching of alphabetic knowledge, however, frequently occurs through the provision and use of alphabet books in homes, classrooms and libraries.

Alphabet books present upper and lowercase letters in a large font together with corresponding illustration(s) to show the sound of the letter and provide a mnemonic for their recall. *The National Association for the Education of Young Children (1998)* noted that “alphabet books and alphabet puzzles in which children can see and compare letters may be a key to efficient and easy learning” (p. 10).

The value of alphabet books was suggested by two early small *n* observational studies of parents and young children by *Smolkin and Yaden (1992)* and *Yaden, Smolkin, and MacGillivray (1993)*. These showed that both parents and children made more comments and questions about letters when reading alphabet books together than when reading storybooks, and that children first associate the letters with the illustrations rather than the printed labels of those illustrations. This preference for illustrations was confirmed by *Evans, Saint-Aubin and Landry (2009)* who tracked the eye movements of 20 5-year-olds while the children read an alphabet book page by page on a computer screen. Even though each page had a large uppercase letter and simply illustrated object with label, and children knew an average of 13 letter names, they rarely fixated the letters, fixated the illustrations more quickly than the letters, and fixated them longer. However, with increasing alphabet knowledge children fixated the letters faster and for longer durations.

Stadler and McEvoy (2003) and *Bus and Van Ijzendoorn (1988)* confirmed that when reading alphabet books compared to storybooks to their children, parents are more likely to emphasize aspects of phonological awareness, letter-sound connections, and print concepts. *Davis, Evans, and Reynolds (2010)* observed 5-year-olds and their parents reading an alphabet book, each page having text of the format “letter is for object” (e.g., “Aa is for apple”). The children frequently attempted to read the text, and the parents frequently provided direction and corrective feedback by drawing children’s attention to and commenting on the letters and letter sounds. In addition, children with better developed phonemic awareness and letter knowledge made fewer errors in completing the phrase with the label of the corresponding object.

These observational studies support the notion that alphabet books and adult extra-textual comments around the text may help children move towards higher levels of emergent literacy. A small number of intervention studies in which children listened to alphabet books have addressed the role of alphabet books themselves more directly. *Greenwald and Kulig (1995)* randomly assigned 5-year-old children to daily teacher-read alphabet or storybook conditions for 17 days. Teachers in both conditions talked about unfamiliar words and encouraged the children to read along. They found that the children who listened to their teacher read alphabet books gained more letter name knowledge than children who listened to storybooks. *Murray, Stahl, and Ivey (1996)* compared 4–5-year-olds whose prekindergarten classes were randomly assigned to listening to conventional alphabet books, storybooks, or letter name books (i.e., letters and pictures presented without printed labels) for three weeks. Children in all groups gained in letter knowledge, but greater gains in phonemic awareness occurred with the alphabet books. The authors noted that the teacher pointed to the letters but that they “did not witness any direct or indirect instruction in phoneme awareness during the alphabet readings” (p. 315).

Most recently, *Both-de Vries and Bus (2014)* read one of two versions of an alphabet book four times with no extra-textual comments to 4 and 5-year-olds while tracking their eye movements. Each letter was pointed to as it was read. Gains in letter knowledge pooled across the alphabet book groups were greater than in a control group receiving regular classroom activities. Replicating *Evans et al. (2009)*, they also found that children’s attention was primarily on the illustrations and that letter knowledge affected their attention to letters.

Chiong and DeLoache (2013) studied whether added features of flaps, tabs, and textures for children to manipulate and touch would affect gains in alphabet knowledge. Children ages 30–36 months were twice read either a paper book with these features, a non-manipulative version of the same book, or a different simple alphabet book. At each of two readings, four letters established at pretest to be unknown by the children were pointed to and labelled

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