Interactive Audio Pens, Home Literacy Activities and Emergent Literacy Skills

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Abstract
Interactive audio pens – pens that contain a built-in speaker and that can be used in combination with books that are made for this purpose – are new, commercially available technological developments that have found widespread dissemination. In the current paper, we studied the availability and use of these interactive audio pens and their associations with home literacy activities and children’s emergent literacy skills in a sample of 103 German preschool children. We found that the availability of interactive audio pens at home showed small positive relations to children’s verbal short-term memory. Home literacy activities were not correlated to the availability of interactive audio pens. Results are discussed against the background of current research in multimedia storybook reading.

Keywords: interactive audio pens, emergent literacy skills, multimedia storybooks, home literacy environment, verbal short-term memory

1 Introduction
It is widely acknowledged that the learning opportunities parents provide are pivotal for the development of their children’s emergent literacy skills – skills that have been shown

Zusammenhänge zwischen der Nutzung digitaler Lese- und Lernstifte mit der häuslichen Lernumwelt und schriftsprachlichen Vorläuferfähigkeiten

Zusammenfassung

Schlagwörter: Digitale Lese- und Lernstifte, schriftsprachliche Vorläuferfähigkeiten, elektronische Kinderbücher, häusliche Lernumwelt, verbales Kurzzeitgedächtnis
to be substantially related to later reading and spelling achievement. Searching the most prominent precursor skills, meta-analyses, such as the study by Scarborough (1998) or the National Early Literacy Panel (2008), have reported that skills directly tied to the process of reading itself, for example, letter-name and letter-sound knowledge, are very good predictors of later reading achievement. Beyond these print-specific skills, researchers have emphasized the role of phonological processing abilities, such as verbal short-term memory and phonological awareness, for later reading and spelling development (Melby-Lervåg/Lyster/Hulme 2012; Wagner/Torgesen 1987). Verbal short-term memory denotes the ability of temporal storage and manipulation of verbal information (Baddeley 1992; Wagner/Torgesen 1987). Phonological awareness refers to the ability to reflect upon, detect, and manipulate the sound structure of oral language, independent of its meaning (Anthony/Francis 2005; Pfost 2015). However, recent studies comparing the importance of different predictors of reading achievement across orthographies have called into question the assumption that phonological processing abilities across orthographies, which differ in their transparency, carry equal importance (e.g., Ziegler et al. 2010). For the German orthography, for example, training studies on phonological awareness seemed less effective in comparison to the effect sizes reported in international literature (Fischer/Pfost 2015; Wolf/Schroeders/Kriegbaum 2016). Taken together, preschool aged children develop skills that facilitate their later reading development. As our interest is not limited to the question of the identification of such skills, we further ask whether we can identify variables and family activities that relate to individual differences in emergent literacy skills.

1.1 Storybook Reading, Electronic Storybooks, and Interactive Audio Pens

Besides formal approaches that are used to teach children to read and print words, parents often engage in several informal literacy activities with their children, such as joint storybook reading or visiting the library with their child (Lehrl/Ebert/Rossbach 2013; Sénéchal et al. 1998). These informal literacy activities have shown to be closely related to children’s oral language and basic reading skills, including letter naming and phonological processing skills (Bus/van Ijzendoorn/Pellegrini 1995; Mol/Bus 2011). Parent’s formal literacy activities, like teaching children to print words, have been shown to be of minor importance to children’s oral language skills. However, substantial relations to children’s letter knowledge were found (Lehrl/Ebert/Rosbach 2013; Sénéchal et al. 1998).

Nowadays, in addition to the analogue storybook, an increasing number of electronic multimedia devices, including electronic storybooks and e-book apps, are available. Electronic storybooks combine elements of traditional storybooks – text and pictures – with multimedia elements, such as an oral reading of the narrative, games or sound effects (Bus/Takacs/Kegel 2015). In a population representative sample of 2- to 8-year-old children in Germany, Ehmig/Seelmann (2014) showed that 16% of families have already tried electronic picture- and storybook apps, and data by Rideout (2014) showed that within the United States even 30% of the children have engaged in electronic reading. Regarding the effects of electronic multimedia storybooks on children’s oral-language development and emergent literacy skills, a substantial number of experimental studies have provided convincing evidence for the beneficial effects of using such electronic multimedia storybooks (e.g., Chera/Wood 2003; Korat/Segal-Drori 2016; Takacs/Swart/Bus 2014). Such positive