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Do children with specific language impairment and autism spectrum disorders benefit from the presence of orthography when learning new spoken words?



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ABSTRACT

This experiment investigated whether children with specific language impairment (SLI), children with autism spectrum disorders (ASD), and typically developing children benefit from the incidental presence of orthography when learning new oral vocabulary items. Children with SLI, children with ASD, and typically developing children ($n = 27$ per group) between 8 and 13 years of age were matched in triplets for age and nonverbal reasoning. Participants were taught 12 mappings between novel phonological strings and referents; half of these mappings were trained with orthography present and half were trained with orthography absent. Groups did not differ on the ability to learn new oral vocabulary, although there was some indication that children with ASD were slower than controls to identify newly learned items. During training, the ASD, SLI, and typically developing groups benefited from orthography to the same extent. In supplementary analyses, children with SLI were matched in pairs to an additional control group of younger typically developing children for nonword reading. Compared with younger controls, children with SLI showed equivalent oral vocabulary acquisition and benefit from orthography during training. Our findings are consistent with

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current theoretical accounts of how lexical entries are acquired and replicate previous studies that have shown orthographic facilitation for vocabulary acquisition in typically developing children and children with ASD. We demonstrate this effect in SLI for the first time. The study provides evidence that the presence of orthographic cues can support oral vocabulary acquisition, motivating intervention approaches (as well as standard classroom teaching) that emphasize the orthographic form.

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Introduction

Building rich oral and sight vocabulary knowledge is a lifelong endeavor; vocabulary, a relatively unconstrained skill, continues to develop throughout adulthood (Paris, 2005). Learning oral vocabulary presents challenges for many children, including those with specific language impairment (SLI) and autism spectrum disorders (ASD) (McGregor et al., 2012). Mounting evidence indicates that children learn new oral vocabulary items more readily when they are taught with the printed form (orthography) available (e.g., Ehri & Rosenthal, 2007; Ricketts, Bishop, & Nation, 2009). An experiment was conducted to investigate whether emphasizing orthography would be an effective strategy for teaching new words to children with SLI and ASD, with potential therapeutic implications.

The role of reading in vocabulary acquisition

The simple view of reading (Gough & Tunmer, 1986; Tunmer & Chapman, 2012) emphasizes the importance of oral language (e.g., vocabulary) in reading comprehension; both word recognition and oral language comprehension are seen as necessary prerequisites to reading comprehension. Equally, once rudimentary reading skills are in place, the reading process provides opportunities for children to learn new words, with incidental learning from written materials making a considerable contribution to vocabulary growth during childhood and adolescence (e.g., Nagy, Herman, & Anderson, 1985). Importantly, vocabulary acquisition is an incremental process rather than an all-or-none process, and texts provide readers with information that enables them to refine partial representations of known words as well as establish new lexical representations (Schwanenflugel, Stahl, & McFalls, 1997; Steele, Willoughby, & Mills, 2013).

There is growing interest in investigating an additional way in which reading may affect vocabulary acquisition. Following early work conducted by Ehri and Wilce (1979) and Reitsma (1983), two studies demonstrated that typically developing children are more likely to learn new oral vocabulary items if they are trained in the presence of an orthographic representation (Ricketts et al., 2009; Rosenthal & Ehri, 2008). In Rosenthal and Ehri's (2008) study, 7-year-olds ($n = 20$) and 10-year-olds ($n = 32$) were exposed to the pronunciations and meanings of low-frequency nouns. In Ricketts and colleagues' (2009) work, 58 children aged 8 or 9 years were taught 12 new mappings between referents and non-words. In both studies, a repeated measures design was used to manipulate the presence of orthography such that half of the items were taught with orthography present and half were taught with orthography absent. Furthermore, the presence of orthography was incidental; children were not made aware of the orthographic form or directed to use it. Across studies, typically developing children showed a learning advantage for phonology–semantic mappings that had been trained with orthography in comparison with those that had been trained in isolation (for recent replications, see Jubenville, Sénéchal, & Malette, 2014; Lucas & Norbury, 2013; Mengoni, Nash, & Hulme, 2013). Furthermore, this orthographic facilitation effect appeared to be greater for more advanced readers, that is, those children with greater orthographic knowledge.

In terms of a specific mechanism, orthographic facilitation for oral vocabulary acquisition has been interpreted as follows (e.g., Ehri, 2014; Ricketts et al., 2009; Rosenthal & Ehri, 2008); because

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