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Contents lists available at ScienceDirect

Journal of Experimental Child Psychology

journal homepage: www.elsevier.com/locate/jecp



The nature of orthographic learning in self-teaching: Testing the extent of transfer



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ARTICLE INFO

Article history:

Received 9 December 2014

Revised 14 December 2015

Available online 27 January 2016

Keywords:

Orthographic learning

Self-teaching

Morphology

Orthography

Transfer

Phonological decoding

ABSTRACT

The current study was designed to test how orthographic learning, or the learning of the spelling patterns of words, happens within the self-teaching paradigm. One possibility is that orthographic learning occurs on a word-specific basis. Two other possibilities are that orthographic learning transfers specifically to the processing of novel words that are morphologically related or that it transfers to novel words that are orthographically similar, regardless of morphological relationship. In an orthographic learning paradigm, we asked children in Grades 3 and 5 to read nonwords embedded in short stories. In a between-participants design, some children read nonwords that were base forms, others read nonwords that were morphologically complex forms, and others read nonwords that were orthographically complex forms (e.g., *feap*, *feaper*, and *feaple*, respectively). Children completed an orthographic choice task with the same items as in the stories. To evaluate transfer of learning, children also completed orthographic choices for the two forms of the nonwords not seen in the stories. Results indicated that children's orthographic learning affected processing of novel items that appeared to be morphologically related as well as those that shared only orthographic structure (e.g., both *feaper* and *feaple*). Additional analyses showed that these effects were held across cases when children did and did not successfully decode the novel words in the learning experience, although successful decoding did lead to higher levels of orthographic learning and transfer. Together, the findings suggest that children's prior experiences affect their processing of novel words that share

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orthographic similarity, likely reflecting a role for orthographic analogies in the self-teaching process.

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Introduction

Many theories of reading development have been proposed to account for how children learn to read. The Self-Teaching Hypothesis (Share, 2008) is one such prominent theory, with a specific emphasis on orthographic learning. Orthographic learning is the process of acquiring orthographic representations, or the mental representations of the spelling patterns for specific words (Apel, 2011; Share, 2008). A key appealing feature of the Self-Teaching Hypothesis lies in its item-based nature. The Self-Teaching Hypothesis proposes that success in acquiring orthographic representations “will depend primarily on the frequency to which a child has been exposed to a particular word together with the nature and success of item identification” (Share, 1999, p. 96). This feature is appealing in its move away from strict stage-based theories and more flexible than phase-based theories of word reading development. And yet, this feature raises the question of children’s learning of complex words. Many words are morphologically complex or made up of multiple minimal units of meaning or morphemes (e.g., *mised* = *miss* + *ed*) (Chomsky & Halle, 1968). Some words often share regularities in letter patterns with other words such as spellings for rime units (e.g., *-ight*). The complexity of spelling in English leads us to ask whether the learning of one word transfers to the processing of new words that young readers subsequently encounter. Using the self-teaching paradigm, we evaluated three alternative hypotheses as to the effect of prior learning experiences on children’s processing of novel words. For the purpose of the current study, the processing of new words is defined as the ability to recognize the correct spelling of words measured using an orthographic choice task as in prior orthographic learning studies (Nation, Angells, & Castles, 2007; Share, 1999; Wang, Castles, Nickels, & Nation, 2011).

The first, and most extreme, hypothesis is that self-teaching occurs solely on a word-specific basis, such that orthographic learning of a particular word does not transfer at all to the subsequent processing of other newly encountered words (see, e.g., Share, 1999, 2004, 2011). For example, despite other forms of information that can be drawn from English words, the prior learning of a word such as *miss* would not transfer to support children’s processing of morphologically related words such as *mised* or orthographically similar words such as *missile*. This possibility “aligns well with instance-based theories of learning . . . which see the process of learning as highly dependent on ‘episodic’ encounters with specific stimuli” (Share, 2008, p. 40).

The hypothesis that self-teaching is entirely word specific, without transfer to processing of other words, is likely an extreme interpretation of item-by-item learning. Nevertheless, we give it due consideration given its prominence in prior theory and empirical investigations. The most stringent test to date comes from investigations of by-item correlations between children’s decoding accuracy and their orthographic learning (e.g., between children’s decoding of *yait* in a text and their accuracy in choosing the *yait* spelling in an orthographic choice task). Despite correlations in general between the two scores (e.g., Cunningham, 2006), item-level analyses reveal cases in which children accurately decode a word and yet choose its incorrect spelling in an orthographic choice task and vice versa (Nation et al., 2007). Thus, it seems unlikely that orthographic learning via self-teaching is entirely word specific; critically, these studies do not specifically test whether the knowledge gained through orthographic learning transfers to the processing of other word forms.

A second hypothesis is that prior learning experiences gained through self-teaching transfer to the processing of morphologically related words. Share (1995) described the possibility that the phonological recoding process is modified over time as follows: “The expanding print lexicon alerts the child to regularities beyond the level of simple one-to-one grapheme–phoneme correspondences, such as context-sensitive, positional, and morphemic constraints” (p. 156). Furthermore, Share (2008) provided a specific example, suggesting that the formation of an accurate orthographic representation

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