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# Phonemes matter: The role of phoneme-level awareness in emergent Chinese readers

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### ABSTRACT

The importance of phonological awareness for learning to read may depend on the linguistic properties of a language. This study provides a careful examination of this language-specific theory by exploring the role of phoneme-level awareness in Mandarin Chinese, a language with an orthography that, at its surface, appears to require little phoneme-level insight. A sample of 71 monolingual Mandarin-speaking children completed a phonological elision task and a measure of single-character reading. In this sample, 4- and 5-year-old preschoolers were unable to complete phoneme-level deletions, whereas 6- to 8-year-old first graders were able to complete initial, final, and medial phoneme-level deletions. In this older group, performance on phoneme deletions was significantly related to reading ability even after controlling for syllable- and onset/rime-level awareness, vocabulary, and Pinyin knowledge. We believe that these results reopen the question of the role of phonological awareness in reading in Chinese and, more generally, the nature of the mechanisms underlying this relationship.

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### Introduction

During the past decade, phonological awareness has become a mainstream concept. Not only has this skill been instantiated in policy and practice (National Reading Panel, 2000; Snow, Burns, & Griffin, 1998), but the concept also has entered children's homes (e.g., Hooked on Phonics, Leap Frog, Sesame Street), parents' vocabularies, and schooling agendas. This popularity is merited because

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phonological skills have been found to be exceptionally important for predicting reading ability (e.g., Adams, 1990; Torgesen, Wagner, & Rashotte, 1994; Wagner & Torgesen, 1987). In fact, phonological awareness is argued to be the single strongest predictor of reading ability in English-speaking children, explaining more than 50% of individual differences in later reading ability even after controlling for age, IQ, and vocabulary (e.g., Lonigan, Burgess, & Anthony, 2000). However, there is still not consensus as to *how* phonological awareness is related to reading (e.g., Anthony & Lonigan, 2004; Ziegler & Goswami, 2005). The predominant explanation for the relationship between phonological awareness and reading has centered on the interface between spoken and written language (e.g., Katz & Frost, 1992; Perfetti, Liu, & Tan, 2005; Seymour, 2006; Ziegler & Goswami, 2005). To date, there has been strong cross-linguistic support for this explanation (e.g., Goswami, 2008). However, we argue that a few fundamental assumptions in this approach have yet to be tested, assumptions centering on the role of phonological awareness (and phoneme-level awareness in particular) across languages.

### *How phonological awareness is related to reading: A language-specific approach*

The strong version of the language-specific hypothesis argues that the spoken and written properties of a language and the relationship between these two domains determine *which* linguistic level (i.e., phoneme, onset/rime, or syllable) is *the* level at which phonological awareness is necessary to learn to read in a given language (e.g., Katz & Frost, 1992). A recent theory by Ziegler and Goswami (2005), the theory of psycholinguistic grain size, operationalizes how the particular properties of a language may constrain the ways in which phonological awareness is related to reading. Specifically, this theory proposes three dimensions of a linguistic system that influence which skills predict reading ability in a language (Ziegler & Goswami, 2005). The first is the linguistic grain size (or *granularity*) at which phonology is mapped to orthography in a particular language (i.e., syllable, onset/rime, phoneme). The second is the *consistency* of this mapping. The third is the *availability* of this linguistic level in spoken language. The theory provides testable claims that, for the most part, have found strong support in the reading literature.

There is strong evidence, for instance, that the linguistic level at which the sounds and graphemes of a language are related is an important factor in reading acquisition. For languages where the mapping between sounds and symbols occurs at the level of the phoneme, such as Italian (e.g., D'Angiulli, Siegel, & Serra, 2001), Turkish (e.g., Durgunoglu & Oney, 1999), and English (e.g., Wagner, Torgesen, & Rashotte, 1994), phoneme-level awareness has been found to be strongly predictive of differences in reading ability. In contrast, for languages where the mapping does not occur at the level of the phoneme, phoneme-level awareness has appeared to be less important in reading acquisition (e.g., Goetzy, Urbain, Morais, & Kolinsky, 2005; Huang & Hanley, 1997; Read, Zhang, Nie, & Ding, 1986).

The *consistency* of the sound–symbol mappings in a language has also proved to be influential. In languages with a highly regular or transparent sound–symbol system, such as Italian and Spanish, phoneme-level awareness develops earlier and is related to reading ability for a shorter period of time than in less transparent languages, such as French and English (e.g., Goswami, Gombert, & de Barrera, 1998). Lastly, there is strong evidence that languages differ in whether their spoken features serve to highlight (or obscure) phonological features important for reading. In a cross-linguistic comparison of English and 12 other European languages, Seymour, Aro, and Erskine (2003) found that children who learned languages with simple syllable structures (no consonant clusters) such as Finnish were faster and more accurate at reading a list of simple nonwords than were children who learned languages with complex syllable structures such as English. Based on this, they proposed that complex syllable structures may obscure phoneme-level information. Other researchers have argued exactly the opposite, namely, that the spoken language processing demands of complex syllable structures heighten phoneme-level awareness (Caravolas & Bruck, 1993; Durgunoglu & Oney, 1999). Regardless of one's perspective, there is evidence that the structure of the spoken language affects children's developing awareness of the sounds within their language and that there is an interaction between the *availability* of this information and the *consistency and granularity* of the language that influences children's reading development.

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