



Exploring multidimensionality and mediation in the roles of lexical knowledge in reading comprehension for spanish-speaking language minority learners



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ABSTRACT

The present study explored whether lexical skills implicated in vocabulary growth for Spanish-speaking Language Minority (LM) learners—morphological awareness and cognate knowledge—represent distinct dimensions of lexical knowledge, and whether these dimensions have direct and/or indirect effects via general vocabulary knowledge on reading comprehension. Using confirmatory factor analyses with a sample of 249 Spanish-speaking LM students in grades 6, 7, and 8, we found that general vocabulary knowledge, morphological awareness and cognate knowledge were highly correlated, but separable dimensions of lexical knowledge. Unexpectedly, the latent correlation between cognate knowledge and morphological awareness was weaker than that between each skill and general vocabulary knowledge. Structural equation models indicated that the effects of these lexical skills on reading comprehension were fully mediated by English general vocabulary knowledge.

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1. Introduction

Adolescent learners face complex and abstract curricular challenges that require increasingly sophisticated literacy skills (Biancarosa & Snow, 2006). Specifically, these students must have the ability to read and understand a variety of text genres across the content areas. A major component of successful reading across these literacy tasks is academic language, that is, the “specialized language, both oral and written, of academic settings that facilitate communication and thinking about disciplinary content” (Nagy & Townsend, 2012, p 92). The more advanced linguistic demands of academic language are particularly difficult for students who come to school speaking a language other than English—a population referred to as language minority (LM) learners. LM learners comprise a broad population of students that include students currently identified as English language learners (ELLs), students who are proficient in two languages, and students who were exposed to another language at home and have become English-dominant (August & Shanahan, 2006). Unlike other terms (e.g., ELL, English-as-a-second-language learner, or Dual Language Learner), this term also includes students who are served in a complete range of instructional settings, including bilingual education, ESL classes, and mainstream English-

only settings. These students tend to have less exposure to academic English at home (Short & Fitzsimmons, 2007; Snow et al., 1998) and are at greater risk of having lower levels of academic language proficiency and in turn more difficulty comprehending grade-level text (August & Shanahan, 2006; Goldenberg & Coleman, 2010; Short & Fitzsimmons, 2007). In particular, native Spanish speakers make up the largest and fastest growing segment of the LM population (Kinder, 2002) and may be at particularly elevated risk for reading difficulties beyond that of other LM learners (e.g., Mancilla-Martinez & Lesaux, 2011).

While definitions of academic language vary, a central and undisputable component of academic language that influences reading in the middle school grades is academic vocabulary (Coxhead, 2000; Snow, 2010; Snow & Kim, 2006). In particular, Spanish-speaking LM students on average have smaller and more shallow English vocabularies than their monolingual English-speaking peers (Tabors, Pérez, & López, 2003; Uccelli & Paez, 2007), and these meaningful differences in general vocabulary knowledge between groups remain discrepant over time, with LM students continuing to fall below national norms in vocabulary (Mancilla-Martinez & Lesaux, 2011).

Researchers interested in why some students acquire large vocabularies while others struggle have focused on two cognitive skills theoretically implicated in vocabulary growth. The first is *morphological awareness*, student's metalinguistic understanding of how complex words are composed of combinations of smaller units of meaning—i.e., prefixes, roots, and suffixes (e.g., Carlisle, 2000; 2010; Nagy, Berninger, & Abbott, 2006). The second is *cognate knowledge*, students' knowledge

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of word meanings for words in two or more languages that are derived from the same root and that therefore share similar meaning, spelling, and pronunciation across two languages (e.g., Carlo et al., 2004; Lubliner & Hiebert, 2011). In defining cognate knowledge it is useful to distinguish it from a related bilingual skill, cognate awareness. Cognate knowledge, is a student's understanding and access to the meaning of a cognate pair across languages. By contrast, cognate awareness, a metalinguistic skill that contributes to this knowledge, is a student's ability to define what a cognate is and identify cognate pairs as a function of this metalinguistic understanding (Garcia & Nagy, 1993).

There is disagreement in the literature regarding the dimensionality of lexical knowledge as it involves these constructs. Some researchers have argued that morphological awareness is part and parcel of general vocabulary knowledge (Tannenbaum, Torgesen, & Wagner, 2006; Wagner, Muse, & Tannenbaum, 2007), whereas other studies specifically looking at LM learners find that morphological knowledge and vocabulary knowledge represent two distinct, though strongly related, constructs (Kieffer & Lesaux, 2012c). Few studies have explored morphological awareness and cognate knowledge simultaneously in the same model of lexical knowledge, limiting an examination of their separability from each other and from general vocabulary knowledge. Existing studies that include these two theorized dimensions of vocabulary knowledge find high correlations between these two knowledge sets (Hancin-Bhatt & Nagy, 1994), but scant research has explicitly investigated whether they are distinct dimensions.

Thus, the present study will investigate whether these lexical constructs represent distinct dimensions from one another and whether they represent unique dimensions from general vocabulary knowledge. Furthermore, a central question in the present analysis is the extent to which these two constructs play direct or indirect roles in English reading comprehension, a determinant of academic success for adolescents in general and a documented challenge for LM students in particular (August & Shanahan, 2006; Goldenberg & Coleman, 2010; Short & Fitzsimmons, 2007).

1.1. Dimensions of lexical knowledge for Spanish speaking language minority learners

Both morphological awareness and cognate knowledge are thought to support the acquisition of new words, but the mechanisms by which they do so are theorized to be distinct. Morphological awareness is considered a form of generative word knowledge, in that knowledge of the meanings of word parts and the metalinguistic ability to extract semantic information from word parts supports the learning of new words that include those word parts (Anglin, 1993). There is good reason to focus on morphological awareness in the middle school grades, as the academic words that students are exposed to in text are increasingly morphologically complex (Flanigan et al., 2011; White, Power, & White, 1989). On average 60% to 80% of the words students will encounter in grade-level texts will be morphologically complex (Anglin, 1993; Nagy & Anderson, 1984).

Cognate knowledge has been characterized as a combination of language specific word knowledge and a generative cross-linguistic capacity, whereby students leverage word knowledge in the first language to determine the meaning of words in the second language (Ramirez, Chen, Geva, & Kiefer, 2010). Cognate knowledge is a particularly relevant skill for native Spanish-speaking students, because the majority of academic vocabulary words are derived from Latinate roots (Nagy & Townsend, 2012) that also appear in many Spanish words. Many of the academic vocabulary words in English correspond to high frequency words in Spanish (e.g., *encounter/encontrar*), providing an opportunity for native Spanish speakers to leverage their knowledge of more basic Spanish words to understand words typical of a more mature English language user (Lubliner & Hiebert, 2011; Nash, 1997). A particularly important aspect of cognate knowledge is a student's degree of biliteracy (i.e., literacy development in both the first and second language).

Indeed, a student's ability to recognize whether a word is a cognate requires that they adequately know the meaning and form of the word in Spanish to bolster their recognition of the word in English (Jimenez, Garcia, & Pearson, 1996). As such, cognate knowledge is an outcome of this metalinguistic knowledge. Both morphological awareness and cognate knowledge contribute to students' understanding of the meaning and function of academic words, which is central to their comprehension of complex texts.

As will be noted in the subsequent paragraphs, research on these two constructs, as potentially high yield indicators of vocabulary growth, has treated each as distinct; however, there is much about their skillsets that is drawn from a core knowledge set. A principal feature of a cognate pair is the common root, with cognate recognition requiring an acknowledgment of the shared root, a morphological insight. These two aspects of word knowledge, thus, seem related, with many roots being bound morphemes (requiring at least one prefix or suffix to create a word) and many cognates thus being multimorphemic. An example of how these dimensions may interact dynamically is provided by a study by Hancin-Bhatt and Nagy (1994) in which Spanish-English bilinguals were better able to identify word stems in suffixed words that contained cognates than suffixed words that did not contain a cognate (e.g., *rapidly* versus *rarely*). One way in which the connection between these two dimensions has been discussed from a practical perspective is that knowledge of cognates could serve as a means by which students can learn the rules of English derivational morphology; if they recognize a cognate, then they can come to understand what a root is (Dressler, Carlo, Snow, August, & White, 2011). However, to determine the dimensionality of these two skills, an empirical study to establish them as distinct dimensions is warranted.

Research exploring morphological awareness as a distinct dimension of lexical knowledge among native English speakers has produced divergent findings. A study conducted by Wagner et al. (2007) with fourth graders found that morphological knowledge and general vocabulary knowledge tapped a single underlying dimension of lexical knowledge. Similarly, Spencer (2012) did not find a multidimensional structure for vocabulary knowledge for grade 8 students when exploring morphological knowledge and vocabulary measures (i.e., vocabulary knowledge, vocabulary usage, and relational knowledge) together. By contrast, other studies of adolescents do provide evidence of multidimensionality. A study by Carlisle and Katz (2006) using exploratory factor analysis with fourth and sixth graders' comprehension of derived words, revealed two factors that accounted for 72% of the variance in students' ability to read derived words—one factor representing knowledge of morphemes and the other representing exposure to word families. Particularly relevant to the present study of adolescent vocabulary knowledge is that Carlisle and Katz also found that students in sixth grade performed better on average than the participating fourth graders on reading derived words, providing some evidence that morphological awareness is a developmental skillset, with its unique contribution to vocabulary knowledge likely increasing as a function of its frequency of use, and relevance for curricular tasks over time.

A study with middle-school learners that included LM students in their sample found that morphological awareness was a separable dimension of lexical knowledge. Kieffer and Lesaux (2012c) found that students' vocabulary was composed of three unique factors: breadth, contextual sensitivity (i.e., students' ability to use context clues to derive the meaning of rare words), and morphological awareness. These dimensions, while highly correlated (i.e., latent correlations > .71), were all distinct dimensions of lexical knowledge. Furthermore, this multidimensional structure held for both the monolingual English speakers and LM learners. Beyond the study conducted by Kieffer and Lesaux (2012c) there is a lack of research that specifically explores the dimensionality of lexical knowledge for LM learners.

In the present study we were also interested in understanding the dimensionality of cognate knowledge for Spanish-speaking LM learners. Specifically, as it relates to the dimensionality of cognate knowledge and

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