

The Influence of Vocabulary on Reading Comprehension in Dual Language Learners of English and Arabic

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ABSTRACT

The connection between language and reading is well established in monolingual children but not well understood in dual language learners (DLLs) who learn Arabic, a Semitic language characterized by diglossia, a sociolinguistic phenomenon in which two varieties of the same language coexist, serving distinct functions and mutually exclusive purposes. This study examines the relationship between language (vocabulary) and reading comprehension in English-Arabic DLLs. Results indicate that vocabulary predicts reading comprehension both within and across languages of DLLs.

Recommendations for practicing teachers of DLLs are underscored.

Keywords: Language; vocabulary; reading comprehension; English-Arabic Dual Language learners

INTRODUCTION

The acquisition of language in early childhood constitutes the basis for learning and a robust foundation for reading success. While important for monolingual children, language is crucial for promoting positive academic outcomes in dual language learners (DLLs) who learn two or more languages simultaneously. Therefore, understanding how DLLs' first and second languages relate has the potential to shed light on DLLs' future reading development.

Such an understanding becomes paramount when considering: (1) the rapidly changing linguistic and cultural landscape in the United States schools, with a substantial increase in the

number of DLLs; and (2) the need to address the academic and social needs of all DLLs, beyond the Spanish-English DLLs. To date, the majority of research and policy in the US has been driven by the largest population (79%) of DLLs who speak Spanish as their primary language, while almost 21% of DLLs remain understudied. As teachers and educators, we must learn about all the students we serve and teach so that we are better equipped to prepare them for future social and academic success. This study focuses on a subset of DLLs in the US who learn English as their first language, and Arabic as their second language.

A fuller examination of the language and reading link in DLLs is important on the grounds that many DLLs, including English-Arabic DLLs, read below expectations for their age and developmental level (Cambell, Hombo, & Mazzeo, 1999). According to the National Assessment of Educational Progress (NAEP, 2009), the majority (over 70%) of DLLs score consistently below basic reading level in fourth and eighth grade. Moreover, data from the National Center for Education Statistics (US Department of Education, 2007) on the Early Longitudinal Study, Class of 1998-1999 (ECLS-K) show that DLLs are overrepresented in the learning disabilities category in proportion to the number of DLLs in the US. This suggests that teachers are more likely to label DLLs as struggling academically in later grades and are less likely to identify weaknesses in these children's oral language in the early years of formal schooling. This presumed weakness in reading is tied directly to the pronounced achievement gaps with cascading effects that persist into middle school and beyond, thus contributing to the significant dropout rates of DLLs in the high school period.

In the next section, I provide a brief review of the literature on the link between language (vocabulary) and reading comprehension within and across languages of DLLs, followed by an

overview of Arabic. I then present the theoretical framework upon which the current study is built.

Vocabulary-Reading Link within L1 and/or L2

Although the specific mechanisms for DLLs' poor reading outcomes are not fully understood, research suggests that a significant amount of the variance in reading ability may be attributed to language skills, particularly vocabulary (Farran, Bingham, & Matthews, 2012; Nagy 2005; Proctor, Carlo, August, & Snow, 2006). A relatively consistent positive relationship between DLLs' second language (L2) vocabulary and L2 reading comprehension has been reported. For example, Carlisle, Beeman, Davis, and Spharim (1999) showed that the size of L2 vocabulary predicted L2 reading comprehension in Spanish-English DLLs who were identified as struggling readers in first, second, and third grade.

In a study that addressed vocabulary development, Proctor et al. (2006) found that vocabulary skills were associated with reading outcomes within each language in Spanish-English DLLs both concurrently and longitudinally, and that this relationship remained significant after other components of language were taken into account.

In another study of 1,531 Spanish- English DLLs, Miller et al. (2006) found that Spanish vocabulary predicted Spanish word reading and Spanish reading comprehension, and that English vocabulary predicted English word reading and English reading comprehension. Similar findings have been reported in more recent studies in English (Nagy & Townsend, 2012), Spanish (Kieffer & Lesaux, 2012), Chinese (Li, McBride-Chang, Wong, & Shu, 2012), and Arabic (Farran et al., 2012).

Vocabulary-Reading Link across L1 and L2

The importance of vocabulary transcends a single language, however, as vocabulary has been found to transfer across languages in DLLs children (Genesee, Paradis, & Crago, 2004). DLLs seem to rely on their existing knowledge from one language when acquiring their other language, with the possibility of a two-way transfer of certain skills across languages (Durgunoglu, 2002).

Numerous studies have established the connection between language and reading in DLLs. Proctor et al. (2006) found that oral vocabulary measures in Spanish predicted reading comprehension in English, after the effect of English vocabulary was taken into account. Likewise, Nagy, Garcia, Durgunoglu, & Hancin-Bhatt (1993) found that children who performed better on a vocabulary test in their L1 also had that knowledge of the same concept in L2 and were efficient at identifying cognates (words with similar meaning and form in L1 and L2). This suggests that children had a similar semantic basis for words in both L1 and L2 (Bedore, Pena, Garcia, & Cortez, 2005). As such, they likely used their vocabulary knowledge in one language to buttress the acquisition of vocabulary in the other language, indicating the potential of likely vocabulary knowledge transfer across languages.

When considering the extent to which language skills transfer across languages in DLLs, the research evidence supports the premise that certain language components such as vocabulary tend to transfer more easily across languages compared to other language components, namely morphology and syntax, which appear to be less amenable to cross-language transfer (Durgunoglu, 2002; Saiegh-Haddad & Geva, 2008). Furthermore, Durgunoglu (2002) posits that the degree of cross-linguistic transfer is tied to how similar the specific languages of DLLs are (e.g., alphabetic versus non-alphabetic). Currently, there is limited research on of the language-reading connection across languages in children who speak Arabic in the US, particularly in the context of second language learning.

Overview of Arabic

Arabic presents a classic case of diglossia (Ferguson, 1959), requiring beginning readers to use two varieties of the Arabic language: Modern Standard Arabic (MSA), known as fusha, acquired via formal education and used in formal speeches, media, and for various written purposes; and Spoken Arabic Vernacular (SAV), known as ammiya, used for informal ordinary conversation as the primary mode of communication at home. The two forms of Arabic are used for mutually exclusive sets of functions, such that when MSA/fusha is used, SAV/ammiya is rarely used, which results in a linguistic distance between the two (SAV and MSA) (Saiegh-Haddad, 2003) that negatively impacts language acquisition, including vocabulary.

In the present study, DLLs are exposed to two variants of Arabic, MSA/fusha (main form of Arabic used for reading and writing, also frequently, though not always, during instruction by teachers in the classroom) and SAV/ammiya (spoken form used in the classroom along with MSA/fusha). Together, these factors contribute to the complexity of learning to read in Arabic.

THEORETICAL FRAMEWORK

The main theoretical position that guides this study is termed the *Linguistic Interdependence Hypothesis* (Cummins, 1979), according to which L1 language and reading provides a robust foundation for L2 reading development. This hypothesis posits that fundamental similarities exist between L1 and L2 language and reading, rendering the skills in L1 and L2 interdependent. As such, when students become readers in one language, they possess funds of knowledge in that language that seem to be transferable to, and provide experience in reading, the other language (s). Using the *Linguistic Interdependence Hypothesis* in the context of the current study, and given the similarities between English and Arabic (both alphabetic languages), we would suspect

that vocabulary skills in one language would be associated with vocabulary and reading comprehension outcomes of the other language.

Research Questions

This paper focuses on school age children in the US who speak English as their L1 and Arabic as their L2. It emphasizes the contribution of vocabulary in reading comprehension outcomes in a group of DLLs in grades 4-5. This study sought to answer the following research questions:

1. Does vocabulary predict reading comprehension within L1 and L2?
2. Does vocabulary predict reading comprehension across L1 and L2?

METHODOLOGY

This study employs a quantitative method to examine the reading comprehension of DLLs in an elementary school that teaches Arabic as a second language. Using a hierarchical multiple regression analysis (Bryk & Raudenbush, 1992; Cohen & Cohen, 1983), the study aims at quantifying, based on theory, the degree to which a given variable (predictor) contributes to the variance in another variable (criterion) above and beyond previously entered predictor (s) as a means of statistical control. This control is achieved by computing the change in the adjusted R^2 at each step of the analysis and examining the change in variance in the criterion after each predictor is entered into the regression equation.

Instructional Context

The context for this study was a charter school in a major city in the Southeastern portion of the U.S. This school emphasizes teaching Arabic as a second language in the primary/elementary grades. The school's Arabic department consists of four Arabic teachers who focus on oral language in their instruction using (1) MSA/Fusha and (2) SAV/Ammiya, though writing and spelling are used occasionally. Teachers also introduce spelling and reading simple paragraphs or

stories using pictures to help children's comprehension of text. In the early grades, do not focus on reading and writing activities. In contrast, they tend to rely heavily on oral language. Children received in-class English instruction for most content areas and Arabic instruction for 40 minutes per day, four days per week.

Participants

The participants were 55 (26 males and 29 females) English-Arabic DLLs in fourth and fifth grades who had attended the school and received instruction in Arabic for three or more consecutive years. In terms of the sample's demographics, the children come from various socioeconomic and middle-high educational backgrounds, with the majority of parents possessing a bachelor's college degree or higher.

To participate in the study, the parents signed a consent form and the children signed an assent form. Inclusionary criteria consisted of the following: children had to have no history of developmental disorders or learning disabilities and were learning English as their primary (or one of their primary) language(s).

Instruments

This study used several instruments that assess children's language and reading skills. These include the Iowa Tests of Basic Skills (ITBS), which measures English vocabulary and reading comprehension; and an Arabic adaptation of the *Gates-MacGinitie Reading Test, Fourth Edition, Level 2* (GMRT; MacGinitie, MacGinitie, Maria, and Dryer 2000), which measures Arabic vocabulary and reading comprehension. Both English and Arabic assessments provide a multiple choice format as a means for examining vocabulary and comprehension skills. The instruments were administered to children in groups, with each assessment lasting approximately 50-55 minutes. A brief description of each instrument follows.

English instruments. *The Iowa Tests of Basic Skills* (ITBS), a norm referenced achievement test, was used to assess vocabulary and reading comprehension. This test was administered by the school staff the year before data was collected for this study. The Vocabulary subtest consists of the presentation of the target word embedded in a sentence or paragraph. The child was asked to select the word that has the same meaning as the target from a choice of four words.

The Reading Comprehension subtest required the child to read passages with varying topics and lengths and to draw inferences about what was read. Next, the child had to answer comprehension questions based on the passage by selecting the correct answer from an array of four choices.

Arabic instruments. An adaptation of the *Gates-MacGinitie Reading Test, 4th edition, Level 2* (GMRT; MacGinitie, MacGinitie, Maria, and Dryer, 2000) was used to assess children's Arabic vocabulary and reading comprehension. Level 2 of the GMRT was selected and adapted into Arabic because it parallels the instruction children received in school, which relies on pictures, sentences, and short paragraphs to guide the child as he read the words and text. The examiner provided the children with a response form with multiple-choice questions. Vocabulary was assessed using 64 vocabulary items. Each item included a picture with four word choices. The child circled the word that depicted the picture from a multiple-choice array.

Cloze tests were used to assess reading comprehension. Each cloze test consisted of 28 items. For each item, a sentence was presented with three pictorial stimuli. The child was asked to circle the picture that best represented the meaning of the sentence. A score of 0 was given for incorrect (e.g., did not mark the target word) or partially correct responses (e.g., marked two responses including the target word) and 1 for correct responses. Raw scores were computed based on correct responses on all subtests.

RESULTS

Descriptive statistics in Table 1 includes means, standard deviations, and range of scores for the language and reading tasks administered in this study. Although the majority of the variables were normally distributed, a positive skew on the Arabic vocabulary measure was observed and corrected by alternatively using standardized scores (z-scores) in the remaining analyses.

Table 1

Descriptive Statistics: Variable Mean and Standard Deviation Scores

Variable	Mean	SD	Range
Language Measures			
English Vocabulary	200	29.00	134-262
Arabic Vocabulary	0.00	1.76	-3.43-6.85
Reading Measures			
English Reading Comprehension	202.78	30.84	150-268
Arabic Reading Comprehension	10.73	3.16	3- 20

To examine the within-language relations between the independent variables (IVs) of chronological age and vocabulary and the dependent variable (DV) reading comprehension English and Arabic, we conducted two hierarchical multiple regressions, one focusing on each language. For the first regression, we examined associations among the IVs and reading comprehension in English (Table 2). For the second regression, we examined associations among the IVs and children's reading comprehension in Arabic (Table 3).

Table 2

Summary of Hierarchical Regression Analysis of English Vocabulary on English Reading Comprehension (N=55)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>BE</i>	<i>SE B</i>	β
Child Age	21.26	2.77	.73***	2.71	2.86	.09
English Vocabulary				.87	.10	.82***
<i>R</i>²		.53		.80		
<i>F</i> for change in <i>R</i>²		58.91		70.67		

* $p < .05$; ** $p < .01$; *** $p < .001$

As indicated in Table 2, child age was entered in step 1 and significantly related to English reading comprehension, $F(1, 53) = 58.91, p < .001$, contributing 53% of the variance in English reading comprehension. In step 2, English Vocabulary was added to the equation and significantly contributed 80% of the variance in English reading comprehension, $F(2, 52) = 103.51, p < .001$.

Table 3 shows a similar pattern of results. Child age was entered in step 1 and contributed ~ 6% of the variance in Arabic reading comprehension, $F(1, 53) = 4.98, p < .05$. In step 2, Arabic Vocabulary was added to the equation and significantly contributed 16% of the variance in Arabic reading comprehension, $F(2, 52) = 7.33, p < .01$.

Table 3

Summary of Hierarchical Regression Analysis of Arabic Vocabulary on Arabic Reading Comprehension (N=55)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Child Age	.83	.37	.24*	.51	.37	.15
Arabic Vocabulary				1.03	.34	.33**
<i>R</i> ²	.06			.16		
<i>F</i> for change in <i>R</i> ²	4.98			9.19		

* $p < .05$; ** $p < .01$; *** $p < .001$

The next sets of hierarchical regressions focused on examining whether vocabulary skills in one language contributed additional amount of the variance in reading comprehension in the other language, above and beyond vocabulary skills of the other language (Table 4). Thus, we examined the relations between the independent variables (IVs), child age, English vocabulary, and Arabic vocabulary, and the dependent variable (DV) English reading comprehension (Table 5). Child age was entered in step 1 and contributed ~ 53% of the variance in English reading comprehension, $F(1, 53) = 58.91, p < .001$. In step 2, English Vocabulary was added to the equation and significantly contributed 80% of the variance in English reading comprehension, $F(2, 52) = 103.51, p < .001$. Arabic vocabulary was entered last in step 3 and contributed ~2% additional amount of the variance in English reading comprehension, above and beyond English vocabulary, $F(3, 51) = 75.15, p < .001$

The second regression examined associations among the IVs, child age, Arabic vocabulary, and English vocabulary, and children's Arabic reading comprehension (Table 5).

Child age was entered in step 1 and contributed ~ 11% of the variance in Arabic reading comprehension, $F(1, 53) = 6.47, p < .05$. In step 2, Arabic Vocabulary was added to the equation and significantly contributed 19% of the variance in Arabic reading comprehension, $F(2, 52) = 6.25, p < .05$. English vocabulary was entered last in step 3 and did not contribute additional amount of the variance in Arabic reading comprehension, $F(3, 51) = 4.09, p > .05$.

Table 4

Summary of Hierarchical Regression Analysis of English Vocabulary and Arabic Vocabulary on English Reading Comprehension

Variable	Model 1			Model 2			Model 3		
	B	SE B	β	BE	SE B	β	BE	SE B	β
Child Age	21.26	2.77	.73***	2.71	2.86	.09	.97	2.89	.03
English Vocabulary				.87	.10	.82***	.89	.10	.84***
Arabic Vocabulary							3.85	1.82	.14*
R^2		.53			.80			.82	
F for change in R^2		58.91			70.67			4.50	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5

Summary of Hierarchical Regression Analysis of Arabic Vocabulary and English Vocabulary on Arabic Reading Comprehension (N=55)

Variable	Model 1			Model 2			Model 3		
	B	SE B	β	B	SE B	β	B	SE B	β
Child Age	1.05	.41	.33*	.71	.42	.22	.75	.66	.23

Arabic Vocabulary	.96	.41	.31*	.95	.41	.31*
English Vocabulary				.00	.02	.01
R^2	.11		.19		.19	
F for change in R^2	6.47		5.48		.00	

* $p < .05$; ** $p < .01$; *** $p < .001$

DISCUSSION

This study sought to examine the within and cross-linguistic relationships between vocabulary and reading comprehension in a group of English-Arabic DLLs. The findings of the study support the *Linguistic Interdependence Hypothesis* proposed by Cummins (1979), which posits that the language skills in L1 and L2 are interdependent, thus influencing each other and connecting to reading comprehension in DLLs.

The findings provide answers to the proposed research questions. First, vocabulary skills in each language predicted reading comprehension within the same language, after the effect of children's chronological age was taken into account. This attests to the paramount role language, especially vocabulary, plays in reading development, corroborating previous research (Authors, 2012; Proctor et al., 2006, Snow et al., 1998). This was evident in both L1 and L2 of children in this study who learned two languages that differed in terms of frequency of use (English being the societal language and the one most frequently used in instruction across content areas in school; and Arabic being used only in the context of Arabic classroom instruction) and form (diglossic Arabic versus non-diglossic English).

Interestingly, when examining the second research question, namely the cross-linguistic effect of vocabulary, Arabic vocabulary predicted English reading comprehension above and

beyond English vocabulary skills and children's chronological age. This pattern did not hold for English vocabulary, however. Specifically, English vocabulary did not contribute any additional variance in Arabic reading comprehension above and beyond Arabic vocabulary and children's chronological age. This differential influence of vocabulary skills across languages on reading comprehension outcomes could be attributed to the limited experience children had using each form of Arabic due to diglossia and the linguistic distance it creates between formal and informal Arabic, which likely resulted in less well-specified linguistic representations of Arabic that DLLs used in the classroom. Therefore, it seems highly unlikely that an additional language (English in this case) would have any sizeable effect on Arabic reading comprehension above and beyond Arabic vocabulary. In contrast, the linguistic representations for English were well specified and relatively stable, perhaps owing to English being the language used most often in school and society at large. These findings have pedagogical implications for teachers of DLLs, to which I turn next.

RECOMMENDATIONS FOR PRACTICE

The study findings suggest the need to provide a conducive context for promoting vocabulary to improve reading comprehension. I thus present the following recommendations for practice related to language and reading instruction with DLLs:

1. Teacher training and support to implement strategies that capitalize on children's use of their first (L1) and second language (L2) (Goldenberg, Hicks, & Lit, 2012). This can be achieved through frequent professional development opportunities that allow teachers to practice and refine their skills based on recent research evidence. Research shows that strength in home language (L1) predicts second language (L2) outcomes as

well as L1 and L2 literacy outcomes (August & Shanahan 2008; Durgunoglu & Goldenberg, 2012).

2. Ensure access to culturally relevant resources that facilitate infusing language input in children's L1 and L2, both of which are needed for academic success;
3. Connect classroom instruction to home language and literacy practices that aim at preserving DLLs' L1 and L2 development and maintenance. This can be achieved by suggesting that caregivers tell family and community stories to their children and encourage children to present their stories during *Show and Tell*. Communicate with caregivers regularly and provide them with suggestions to use language to promote reading. Finally, model writing stories that children dictate in English in the classroom and request that caregivers do the same at home by writing stories their children dictate and ask children to share their stories with teachers and classmates.
4. Place an intentional emphasis on language in the classroom and curriculum by
 - a. Identifying and implementing a high-quality language-rich bilingual reading programs in the school's neighborhood that teachers can recommend to parents who have young children
 - b. Planning, designating, and implementing opportunities each day for DLLs to use their L1 and L2 language; and
 - c. Explaining the benefits of using L1 and L2 to all children (DLLs and non-DLLs) and their families.
5. Promote frequent use of children's L1 and L2 in the classroom through singing and watching videos to bolster all students' knowledge and understanding of the intersection between

language and culture, which likely results in better command (including vocabulary) in both L1 and L2, ultimately leading to better reading outcomes (Gillanders, 2007).

6. Teach reading in both L1 and L2 and encourage students' participation by bringing books from home and checking out books from the schools' library to send home. Elicit help from community members and parents as needed. This sends a strong message to parents and families letting them know that teachers consider reading to children to be important, irrespective of the language used in books.

CONCLUSION

Language is the building block in reading development in DLLs. Teachers must use DLLs' funds of knowledge, particularly vocabulary in both first (L1) and second (L2) language to maximize students' reading success. As the findings suggest, vocabulary is foundational in L1 and L2 reading comprehension success and must thus be introduced and enhanced both within and across languages of DLLs.

ABOUT THE AUTHOR

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