



The Role of Short Vowels in Reading Arabic: A Critical Literature Review

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Abstract

The purpose of the present review is to examine the studies that tested the role of short vowels in reading Arabic. Most of the studies are reviewed in this paper and two contradicted data are presented: data that support positive contribution of short vowels in reading Arabic, and the other data that reject the assumption that short vowels contribute to the quality of reading, and suggest that these short vowels do not add any positive contribution and maybe the opposite; short vowels hinder reading in Arabic orthography. The results are criticized indicating some methodological problems and suggestions for further studies are presented.

Keywords Short vowels · Arabic orthography · Reading and short vowels · Semitic languages

The goal of this paper is to review the literature of short vowels and reading in the Arabic orthography focusing on the influence of short vowels on reading accuracy, comprehension, levels of text understanding, and listening comprehension among regular, poor, dyslexic, skilled and adult readers. Further, a critique of the reviewed studies will be presented with suggestions for the need to overcome methodological obstacles as well as suggestions for further research.

The short vowelization issue characterizes the Semitic languages; Arabic and Hebrew. The absence of short vowels causes ambiguity in reading. The Arabic orthography is usually considered shallow if presented with full vowelization and deep if presented without short vowelization. Short vowels add phonology to the Orthographic Units in words, which may help readers to accurately pronounce Arabic words, especially beginners and poor readers struggling in their early stages of reading (Abu-Rabia and Taha 2006).

Interestingly, even adult readers showed better reading results when they tackled vowelized scripts and words for accuracy and comprehension (Abu-Rabia 1998a, 2001, 2012; Abu-Rabia and Abu-Rahmoun 2012; Al-Shdifat 2014; Al-Samawi 2014). Numerous studies have shown that short vowelization positively contributed to all reading conditions (Abu-Rabia and Taha 2006; Abu-Rabia 1998a, 2001).

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However, the short vowelization issue is still debatable and some studies revealed different results, namely that short vowelization does not contribute positively to reading (Ibrahim 2013; Seraye 2004, 2015; Taha 2016; Khatteb-Abu Leil 2011).

Reading Acquisition

Reading is a complicated process. It is very different from the acquisition of speaking that we acquire naturally from an early age. Reading is a cognitively demanding process with the involvement of other environmental conditions, which all together build up a systematic learning process in all kinds of orthographic systems (Perfetti and Rieben 1991; Adams 1990).

Shimron (1999) distinguishes between two processes in reading: the perceptive and linguist, where letters represent codes of phonology and later the meaning of these representations.

However, other scholars assume that both processes occur simultaneously (Abu-Rabia 1995; Bentin 1992). The fluency of word recognition depends on the speed of connection of certain Orthographic Units to their specific phonology, semantics, morphology and syntax (Seraye 2004). This process is cognitively demanding, namely it demands most of the readers' cognitive attention, which alternatively hinders higher orders of reading comprehension processes (Persson 1994). Thus mastering automatic word recognition skills is highly required in order to become a skilled reader at all levels (Abu-Rabia and Siegel 2002; Shimron 2006; Yovanoff et al. 2005).

Obviously, in this case, word decoding/identification does not guarantee reading comprehension of sentences and texts (Abu-Rabia 1995; Perfetti and Rieben 1991). Reading comprehension involves additional variables such as syntax and word knowledge (Gough et al. 1996; Shimron 1999). This is in addition to the cultural relationship of the reader to the input of the text (Abu-Rabia 1995, 1996), attitude of the reader, and the reader's interest in text input (Abu-Rabia and Feuerverger 1996; Abu-Rabia 1995, 1998a, b).

The above is relevant to all languages but not to learning Arabic. Ayari (1996) and Abu-Rabia argue that the short vowels are also considered grammatical functions in sentences and readers must pronounce correctly these short vowels on ends of words even when there is script without short vowels, reading for extracting meaning from print and thinking about the grammatical function of the word in order to read it correctly. This split of attention causes serious difficulty through the reading process of sentences and texts (Abu-Rabia 2012).

This is in addition to the fact that Arabic is a homographic language; although many words are similarly written they are pronounced differently and carry different meanings (Abu-Rabia 2012). Abu-Rabia and Saliba (2008) suggested that the unique complexity of the Arabic morphology causes a different process of Arabic morphological lexicon arrangement.

Abu-Rabia (1997a, 1998a, 2001) tested the role of short vowelization in reading: eight studies were conducted testing the role of short vowels on Arabic reading accuracy and comprehension among different Arabic reading populations. All the results indicated the importance of short vowels as significant contributors to reading accuracy and comprehension. Abu-Rabia and Taha (2006) tested the spelling ability of 1st grade to 9th grade Arab readers. The results indicated that phonology has a significant effect in the process of the Arabic orthographic acquisition. The spelling errors of the phonological type were similar

across all ages and grades. Namely, the phonological stage in reading exists at all levels of spelling acquisition and all grades. Phonology highlights the importance of short vowelization in the problem of spelling development.

Although there is ample evidence that short vowelization enhances reading in general among all types of populations, still there are studies that indicate different results, suggesting that short vowels do not contribute to reading and maybe hinder reading fluency (Ibrahim 2013; Taha 2016). Likewise, Ibrahim (2013) tested the effect of short vowels on reading accuracy in Arabic among 8th grade students. The results indicated the non-vowelized words were read more accurately and fluently than the vowelized words. Ibrahim (2013) explained his results in that his participants used a whole word recognition process to access the lexicon, namely direct lexical access.

Likewise, Seraye (2004, 2015) and Khatteb-Abu Leil (2011) tested the contribution of short vowels to reading accuracy, comprehension and fluency. Their results indicated a non-significant effect for short vowels in all reading conditions (Taha 2016).

What Hinders Reading Acquisition in Arabic?

There are some obstacles that face the beginners of reading Arabic which may not be in other languages: Diglossia, homographic words, morphological and phonological complexity and short vowelization of words as a function of their grammatical functions in sentences.

Diglossia

Namely there is the spoken Arabic and the literary Arabic with a huge gap between them. The spoken Arabic is the local dialect of the daily language, while the literary Arabic is the standard written Arabic of books, the Koran and literature. The relevancy here of this issue is related to the reading acquisition of children in 1st grade who have to read and write a language that is different from their spoken language (Lyovin 1997). It is almost like learning a new language (Abu-Rabia 2001).

Homographs

The orthography of Arabic is highly homographic if words, sentences and texts are presented without short vowels. Words share the same Orthographic Units, however they carry different meanings if vowelized or put in a sentence. Usually, after 4th grade, Arab readers are supposed to read Arabic texts presented to them without short vowels which is a hard mission. It is similar to reading consonants and guessing vowels (for a thorough review see Abu-Rabia and Siegel 2002; Abu-Rabia 2012).

Phonological and Morphological Complexity

The Arabic orthography is unique and complex in morphology and phonology in spelling rules and short vowelization—putting short vowels above, under and inside word letters. This is in addition to the diglossia that children face when they start their 1st grade (Abu-Rabia and Saliba 2008).

Scholars have just begun to scratch the surface of this area, short vowelization effects on reading. This lag was caused due to the serious lack of academics in this area around the globe who mastered the Arabic language; most scholars concentrated on studying the Latin orthography. Usually scholars did not focus on different orthographies and their effect on reading processes, namely cross-cultural studies (Abu-Rabia and Siegel 1995; De Francis 1989; Sampson 1994).

The most important question raised was how huge is the gap between the orthography of a certain language from its representative spoken language. Further, how does this characteristic affect word identification (Hung and Tzeng 1981).

The Arabic orthography resembles the Hebrew and Persian orthographies, where short vowels are not presented as letters in words, but rather as separate diacritics that contribute phonology to Orthographic Units. Short vowels are usually added to words and texts for readers in their early stages of reading acquisition, and added in poetry and the holy Koran (Mahmoud 1979; Baluch 1992; Shimron 1993).

The study of short vowelization and its effect on reading is still controversial. Some scholars argue that short vowels in the Arabic orthography are beneficial for all texts and all reading conditions among all reader types (Abu-Rabia 1996, 1997a, b, 1998a, b, 2001, 2007).

Other scholars argue exactly the opposite; the short vowels do not help readers to improve their reading level in all kinds of reading conditions and among all types of readers (Seraye 2004; Ibrahim 2013; Abedelhadi et al. 2011). Abu-Rabia (1998a) and Shimron (1999, 2006) argue that words in a Semitic language carry phonological and morphological information that helps readers in processing these words.

The role of short vowels in Arabic is very important in reading homographs (Abu-Rabia 1997a, 1998a). When homographs are shortly vowelized, they help readers reach a high level in reading accuracy. The other way of reading these homographs accurately is putting them in sentence context (Abu-Rabia and Siegel 1995). This makes the Arabic orthography a writing system that relies on sentence context due to the absence of short vowels presented in words and sentence context (Abu-Rabia 2012).

The Influence of Short Vowels on Reading Arabic

The Arabic writing system connects letters and it is based on 25 consonants and 6 vowels: three long and three short ones. The study of Badry (1982) indicated that the Arabic characteristics of the Arabic three-letter root morphology helps readers and writers to read and write new words. This model helps readers to read and understand Arabic texts. However, Shimron and Sivan (1994) argue that in order to read words without diacritics (short vowels) a reader must divide words to morphemes. Thus phonology (short vowels) joins morphology and both help readers to identify words and understand texts (Abu-Rabia 1995; Shimron and Sivan 1994).

Arabic and Hebrew are Semitic languages and both share the same morphological system. What is relevant to Arabic is also relevant to Hebrew (Frost et al. 1987; Koriat 1984; Shlonsky 1997). This statement of Hebrew linguists led the rest of the Hebrew linguists to believe that whatever results they find in the Hebrew language are automatically applied to Arabic. Later, in results drawn from studies that tested Arabic reading processes, it became questionable and almost controversial.

Abu-Rabia and Saliba (2008) argue that despite the resemblance of the two morphologies, the difference between them is clear; the Arabic morphology is condensed and complex significantly more than the Hebrew morphology which demands a different process of lexical development and arrangement (Boudalla 2016; Abu-Rabia and Awwad (Shalhoub) 2004).

The Contribution of Short Vowels to the Quality of Reading

Abu-Rabia (1995, 1996, 1997a, 1999) has tested the effect of short vowels on reading and reading comprehension. In eight successive studies he investigated how short vowelization affect reading accuracy and reading comprehension combined with additional factors like sentence context, type of readers, poor and skilled children in their early reading stages, text type (informative, poetic and Koranic) and reading condition: word identification and reading comprehension (Abu-Rabia 2001).

The studies of Abu-Rabia (1995, 1996) tested the effect of short vowels on the reading accuracy of highly skilled Arabic readers. These studies intended to test the effect of short vowels and sentence context on reading accuracy among skilled Arabic readers, ages 17–18 years old.

Furthermore, Stanovich's (1980, p. 634) theory, Interactive Compensatory, was tested here for its relevancy to the Arabic orthography when highly skilled readers read words and sentences with and without short vowelization. The results indicated that short vowels and sentence context contributed separately to reduce students' reading errors. Further, the combination of the sentence context and short vowelization reading condition variables in one reading condition reduced even more reading errors. The worst reading condition was when students read words without short vowels.

In an attempt to support his hypothesis from the previous study (Abu-Rabia 1996) stated that "reading in Arabic orthography of highly skilled readers does not fit any of the reading models derived for Latin orthography, this since none of the existing models considered short vowels or/and sentence context in the Arabic orthography" (Abu-Rabia 1997a: p. 639).

Furthermore, Abu-Rabia tested if the above-mentioned results are relevant to poor Arabic readers. His results indicated that short vowels and sentence context do help both populations, poor as well as skilled readers (Abu-Rabia 1995, 1996, 1997a, b, 1998a, 1999).

In addition, Abu-Rabia (1997a) found that short vowels helped skilled readers significantly more than poor readers. Abu-Hamour et al. (2013) that short vowels improved poor as well as skilled reader in 5th grade replicated such results.

The results of Abu-Rabia (1997a) and Abu-Hamour et al. (2013) regarding the benefit from vowelized words and texts is ascribed to the uniqueness of the Arabic orthography and its rich and complex morpho-phonemic units; namely that phonological patterns and condensed morphological units all demand highly visual-morphophonemic processing. The skilled readers obviously build up their morpho-phonemic lexicon much faster than the poor readers, a fact which enables them to use this lexical knowledge in reading. Poor readers are not equipped with such lexical knowledge (Abu-Rabia 1997a; Ibrahim 2013).

The conclusion of Abu-Rabia's studies: "There is a serious need to understand the reading process of the Arabic orthography as a function of a parallel-interactive-dynamic (PID) process of word identification and sentence context, with special focus on the sentence context as a key to initial lexical access among skilled and poor readers"

(Abu-Rabia 1997a). Consistently, Abu-Rabia (1998a) tested the role of short vowelization and sentence context among 11th grade native Arabic poor and skilled readers. Students were asked to read texts in different writing styles: poetry, narrative, newspaper articles, and Koranic verses. In this study a new reading condition was added—false short vowelization condition. The results indicated that false short vowelization hindered reading accuracy of the participants in the false vowelization condition; namely the participants could not recognize or/and ignore the false short vowelization of words and sentences (Abu-Rabia 1998a).

Furthermore, Abu-Rabia (1999) added a new variable to his short vowelization studies: reading comprehension among 2nd grade and 6th grade native Arabic students. The results indicated that both groups benefitted significantly more when texts were short vowelized. Abu-Rabia (1999) explained that words with short vowelization, namely with phonology add more information to the coding saving process in working memory while reading and processing texts for reading comprehension purposes. This phonological addition enhances the working memory of readers and alternatively their understanding of texts becomes significantly higher (Abu-Rabia 1999: p. 100).

In order to generalize the results of short vowelization in reading comprehension, for all ages, Abu-Rabia (1995, 1996, 1997a, b, 1998a, 1999) tested reading accuracy and comprehension in Arabic and Hebrew as a second language of university Arab students. Students had to read fully vowelized Arabic texts and others without short vowels. The same reading conditions were presented to them in Hebrew as a second language. The results indicated that short vowels contributed significantly to accuracy and understanding in all reading conditions in Arabic and Hebrew.

Consistently, Abu-Rabia (2001) tested Arabic adult readers (ages 22–30) in Arabic and Hebrew as a second language. The most important results in both languages were: short vowels raised the level of reading accuracy in isolated words and in reading aloud short stories; short vowels raised the level of reading comprehension of stories in Arabic and Hebrew.

In addition, Abu-Rabia and Taha (2006) tested the spelling development of native Arab speakers, from 1st grade to 9th grade. They found that the phonological errors were the most common type of error through all grades. Namely, the phonological period in the development of Arabic spelling is a continuous stage that accompanies spellers at least until 9th grade in this particular study. This result supports the short vowels' role in reading since these short vowels contribute phonology to the Arabic Orthographic Units (Abu-Rabia and Taha 2006).

Furthermore, Abu-Rabia (2007) in a developmental study investigated the effect of phonological and morphological factors on the reading of 3rd grade to 12th grade Arabic phonology including mastering short vowelization and morphological knowledge and the way these factors predict reading through all grades. The results indicated the important role of both variables across all ages (Abu-Hamour et al. 2013). The importance of the morphological factors is ascribed to the absence of short vowelization reading condition; readers must rely on visual orthographic characteristics of the Arabic morphology in order to decode words. Usually Arabic readers have to cope with texts with almost no short vowels when they read in the 5th grade.

Likewise, Abu-Rabia and Saliba (2008) have investigated the effect of phonological patterns and morphological verb roots on reading among regular and dyslexic readers. The results indicated that there is a lexicon development of verb roots through the years among the regular Arabic readers. Roots and phonological patterns did not help dyslexic Arabic readers to improve their reading skills. This is to say that the lexical dual model is relevant

in this case to explain the results; dyslexic, poor and beginning readers rely on whole word recognition and regular readers use sub-lexical entries to read words.

In conclusion, the above-mentioned studies indicate the importance of short vowels in reading Arabic among nearly all types of readers.

Short Vowels Do Not Contribute to the Quality of Reading

Although there is ample evidence indicating the positive contribution of short vowels to reading Arabic, there is other data showing that short vowels do not contribute to reading in Arabic orthography (Seraye 2004; Khatteb-Abu Leil 2011).

Seraye (2004) tested the influence of short vowels on the reading of adult native readers of Arabic. The reason for such results, in his opinion, is that adult Arabic readers have been exposed to texts and their orthographic lexicon is already well built, which enables them to use a whole language approach in reading.

Likewise, Seraye tested the effect of vowels reading among 4th grade Arabic readers. He conducted four reading conditions: (a) reading sentences with *Shadda*: it marks a doubling of the letter when the letter is geminated and occurs within syllable boundaries as a consonant sequence (Dyson and Amayreh 2000); (b) reading sentences with short vowels and *Shadda*, (c) reading sentences with short vowels without *Shadda*; (d) and reading short vowels which did not affect the reading, reading comprehension and the fluency of these 4th grade native Arabic readers. According to Seraye, the most influential variable on the quality of reading is the frequency of words. He argues that only frequency of words accelerates reading quality in Arabic orthography.

Consistent with the above results, Ibrahim (2013) tested the effect of short vowels on the reading of 8th grade native Arabic speakers. The participants had to read isolated words and pseudowords with and without short vowels. The results indicated that short vowels hindered the quality of reading: students read accurately and fluently words without short vowels compared to the short vowelized reading condition (Abdelhadi et al. 2011).

Likewise, Almadi (2007) tested the effect of short vowels among three groups: dyslexic, chronological age-matched, and reading age-matched groups, in reading aloud and silent comprehension of texts. The results indicated that short vowelized texts did not contribute to the participants' reading comprehension in any of the reading conditions; short vowelized versus non-short vowelized, and reading aloud and/or silent reading among the three different groups.

Furthermore, in a recent study by Taha (2016), he tested the effect of short vowelization on reading fluency and accuracy of 146 2nd and 4th grade poor Arabic readers. The results indicated that these poor readers read fluently and accurately under the non-short vowelized reading conditions. Taha (2016) interpreted his results to say that an overloaded visual reading condition hinders even the reading quality of poor readers.

Where is the Problem?

In this specific area of research, the role of short vowels in reading Arabic, the different results obtained from studies that intended to test the same independent variables; accuracy, comprehension and fluency among different reading groups; beginners, teenagers,

adults, skilled, poor and dyslexic readers, seem to be ascribed to the following methodological problems:

1. Researchers used different measures, different administration procedures and scoring rules. Scoring rules were often absent in study description. For unvowelized words and non-words reading, multiple legal pronunciations are possible, so scoring rules must be determined. Many of the studies did not include the items on tasks or description of the items.
2. Researchers defined skilled and poor reading using different measures and different cutoff points. In many cases, the method is not clearly explained.
3. There were no longitudinal studies, which make it difficult to draw conclusions about the course of short vowels and Arabic reading development.
4. Nearly none of the lists of words used in these studies represented what they meant to represent a certain age, grade or reading level. The researchers, regardless of frequency consideration, constructed most lists of words since there is no Arabic frequency dictionary. So all lists are random based on the researcher and his/her students' best knowledge. This caused some results to be totally unreasonable and hard to explain; for example, the study of Taha (2016) and Ibrahim (2013) and Avin (1995): short vowels did not help regular and poor readers to improve their reading. How could 2nd grade children unfamiliar with Arabic read words without short vowels? This is not natural and at this age and level of reading, children are struggling in the phonological stage of reading development. Thus, these Arabic measures are not reliable and not valid. These unreliable and invalid tools will certainly equip us with unreliable data.
5. The pseudoword reading lists are also constructed randomly as mentioned with no clear description of the criteria of list construction, pronunciation and scoring, not even how to decide which is linguistically right or not.
6. Thus, using different uncontrolled measures does lead to different unexplained results and ultimately invalid and unreliable results. This is to say that when we confront Arabic teachers with these results they are shocked to hear. Their repeated answer to the results of short vowels that they do not affect reading in lower grades is "...of course they knew these words before."

Suggestions for Further Studies and Practical Implications

1. Researchers should work on longitudinal studies; such a research design may better examine the development of the course of reading development.
2. Researchers have ignored different writing styles in Arabic, narrative, newspaper article, poetic, informative, philosophic and Koranic. Different writing styles are characterized with levels of difficulty. Koranic writings are more difficult than newspaper articles or informative texts. Further, poetic and philosophical texts are harder to cope with compared to narrative texts. Thus, it is important to test short vowelization effect on reading and reading comprehension of these writing styles.
3. It is highly important to test, in addition to longitudinal studies, the effects of question level and short vowelization. Is there an interaction between short vowels and question type?
4. In order to reduce the visual load in reading words, it is suggested here to partially add short-vowels to Arabic words. Namely only where it is highly necessary to post short

vowels on letters. Words which there is only one-way to read them, its suggested to leave them without short vowels. I think that the visual-load attracted the attention of researchers however, it is not enough. Using longitudinal studies with short vowelization reading condition is highly important, especially starting with minimal short vowelization. This with full consultation with Arabic linguists to guarantee correct and legal grapho-phonemic writing should provide more accurate results.

Compliance with Ethical Standards

Conflict of interest The author declares that he has no conflict of interest.

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