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Short vowels are believed to impact the reading accuracy of all types of readers in Arabic. Inconsistent findings were reported in previous research on the effect of short vowels on reading accuracy. The purpose of the present study was to investigate the effect of short vowels on reading accuracy in low- and high-skilled Jordanian Arabic readers.

Participants were 48 typically developing 9th grade, native Jordanian Arabic speaking students (14-15 years old). They were classified into low- versus high-skilled readers based on teachers' rating and reading a 100 vowelized word list. All participants read in four conditions. Results demonstrated that both types of readers did not benefit equally from the presence of short vowels on words in text and on isolated words. While high-skilled readers benefitted from the presence of short vowels on isolated words and in text, low-skilled readers most interestingly had exceptionally poor performance reading vowelized lists and benefitted from the presence of short vowels on context the most. Moreover, vowelizing word endings significantly influenced the reading accuracy of both types of readers.

This finding has important implications for assessment of reading proficiency in Arabic students. Reading assessment should not include unvowelized word lists because the multiple number of correct answers artificially inflates reading proficiency. Assessment of unvowelized words should only occur in texts where discourse and sentential context can determine the correct word reading. Future studies should attempt

to determine the most effective way to transition Arabic students from reading vowelized texts to unvowelized texts which are predominant in books, newspapers, and other sources of print.

THE EFFECT OF SHORT VOWELS ON ARABIC READING ACCURACY

by

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Approved by

_____
Committee Chair

To my wife, mother, and daughter

APPROVAL PAGE

This dissertation has been approved by the following committee of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

STATEMENT OF THE PROBLEM

Short vowels have an important role in reading accuracy and fluency in Arabic. Most studies that have examined the effect of short vowels used vowelized, partially vowelized (last vowel imposed on the word), and unvowelized words in single words, sentences, and passages (Abu Rabia, 1996, 1997a, b, c, 1998, 2001, 2012, Abu-Rabia & Siegel, 1995). The studies have found that vowelized words significantly aid in the reading accuracy compared to unvowelized words across grade levels and even in high skilled adult readers (Abu Rabia, 1996, 1997a, b, c, 1998, 2001, 2012; Abu Rabia & Siegel, 1995). These findings led to the conclusion that vowels are essential for reading Arabic regardless of the age or the skill level of the reader (Abu-Rabia, 1997b, 1999, 2001, 2002, 2012).

There are some limitations to these studies. First, there is some question about whether all short vowels would contribute equally to reading accuracy. Vowelizing word endings would not seem to be the only essential requirement for reading accuracy whereas vowelizing certain letters within words would change the meanings of words. Second, there is some question whether all types of readers would benefit equally from vowelizing words and whether they are all dependent on vowels for reading accuracy regardless of their age and reading level. Third, different interpretations of words were possible in several of the sentence stimuli. Finally, most of the studies were conducted on

one Arabic speaking population (i.e., Israeli Arabs) which calls for the need to conduct similar studies on other Arabic speaking populations to arrive at a better understanding of the role of vowels in reading Arabic.

The purpose of the present study was to investigate the effect of short vowels on reading accuracy in low- and high-skilled Jordanian Arabic readers. Passages were presented containing (a) unvowelized words, (b) vowelized words (c) single vowelized words, and (d) single unvowelized words. Pertinent research questions will be presented after the literature review.

CHAPTER II

REVIEW OF THE LITERATURE

The review will begin with an introduction of the nature of Arabic language and factors that might affect reading accuracy in Arabic. This will be followed by a review of the studies that consider the influence of short vowels on reading accuracy.

Nature of Arabic Language

Arabic is a Semitic language that forms the primary language of more than 200 million people in the Arab countries and even in some non-Arab countries. It is also a non-primary language in some other non-Arab countries (Kaye, 2009). The Arabic alphabet is comprised of 28 letters with one to one letter sound association. In modern standard Arabic (MSA), three of the 28 letters represent long vowels. The three long vowels are represented by letters and always appear in words (Abu-Rabia, 1996). The first is the letter ا *alef* and represents the long vowel /ae/ as in the word عاش (lived) /ʕae ʃ/ which is the middle letter in the word. The second is the letter و *wow* and represents the long vowel /u:/ as in the word جوع (hunger) /ʤu:ʕ/. The third is the letter ي *ya* and represents the long vowel /i:/ as in the word ريح (wind) /ri:ħ/.

These three long vowels have three short counterparts, which are represented by strokes that denote those vowels. The short counterpart for the long vowel /ae/ is the short vowel /a/ which is represented by the diacritic above the letter as in the letter قَ /qa/. The short counterpart for the long vowel /u:/ is /u/ and is represented by the diacritic above

the letter نُ /nu/. The short counterpart for the long vowel /i:/ is /i/ and is represented by the diacritic below the letter as in the letter فِ /fi/. The /a, u, i/ are called Fat-ha, Dammah, and Kasrah respectively. It is worth noting that each of these short vowels can have only one position on the letter and only one pronunciation e.g., the short vowel /i/ can only be placed below the letter.

Furthermore, the number of syllables in MSA is limited to five syllables, which are CV, CVC, CVCC, CVV, and CVVC (Al-Ani, 1970). The last two have long vowels are represented by letters in the Arabic writing system and this limits the number of syllable structures with short vowels to three. Since short vowels are limited and occur in a limited number of syllables, this makes them predictable in a sense (Funder, 2008).

Short vowels are only found in children's books, in the holy Quran, and in poetry (Abu-Rabia & Taha, 2006; Azzam, 1993; Ibrahim, 2013). Literary books, magazines, and newspapers do not use short vowels on words. Arabic writing usually does not include short vowels. Even young school-age children do not use short vowels in classroom writing or for their homework assignments. When children start learning to read, they are taught to read with the diacritics marked on word; they include short vowels, Shaddah, Hamza (gemination) and Sukon (stop), among others (Azzam, 1989). When a text is vowelized, all the short vowels and diacritics are on words. Words are supplied with full diacritics until 4th grade at which time they are gradually reduced (Abu-Rabia & Siegel, 2003; Ibrahim, 2013). Words that are vowelized might look like sentence a., and words that are unvowelized might look like sentence b.

a. ذَهَبَ الرَّجُلُ إِلى بَيْتِهِ

His house to the man went

b. ذهب الرجل إلى بيته

Although short vowels are important for teaching young school children to read, short vowels are considered external elements to the structure of the word. Skilled Arabic readers are allowed to replace short vowels with a Sukon on word endings when reading vowelized and unvowelized texts (Azzam, 1993). Nonetheless, vowelizing the pronoun ت *ta* attached to verb endings is important to disambiguate gender and person, i.e., masculine/feminine first/second speaker.

Isolated Words, Short Vowels, Shaddah, Hamza, and Sukon

Short vowels in Arabic are important for disambiguating homographs when reading isolated words (Schiff, 2012). When a single word is presented vowelized, the activation of the correct pronunciation should be automatic since all the grammatical and morphological features are presented in the short vowels and the Shaddah and Sukon. For example, the word **جمل** /dʒml/, when presented without short vowels might have a number of possible readings, but when presented vowelized as in **جَمَلْ** /dʒa.mal/ *camel*, **جُمَلْ** /dʒu.mal/ *sentences*, **جَمَّلْ** /dʒam.mal/ *to make beautiful*, the short vowels would remove any ambiguities regarding the accurate reading of the word. Though the Sukon is placed on the last letter of all the possible readings of the word **جمل** /dʒml/, such readings with the Sukon are generally considered accurate.

The Shaddah and Hamza are variably used on words when they are not vowelized. The Shaddah marks a doubling of the letter when the letter is geminated and occurs within syllable boundaries as a consonant sequence (Dyson & Amayreh, 2000), such as the Shaddah on the letter ‘ر’ which is doubled in the word **جَرَّبَ** /dʒar.ra.ba/ *he tried*. The lengthening marked by the Shaddah is usually on the last letter in the word, such as the letter ‘ر’ which is lengthened as in the word **سارّ** /saerr/ *pleasant*. The Hmaza indicates a glottal stop, as on the letter alef أ. The Hamza is not frequently used in Arabic text unless it marks a change in meaning as in سأل *asked* and سال *flow*.

The short vowels /a/ and /u/ can only be placed above the Hamza and Shaddah and the short vowel /i/ can only be placed below them, for example the letter *alef* with the Hamza and the short vowel /a/ on top of it would look like this أَ and the letter *b* with the Shaddah and the short vowel /u/ which is placed on top of the Shaddah would look like this بُّ. The Shaddah would limit the number of homographs if present as can be seen in the previous example of the word **جمل**.

A Sukon marks the absence of a short vowel and is not marked in unvowelized text. When the Sukon is used in vowelized words it looks like on the letter l لْ. An example using the Sukon where it might change the possible reading of the word as in the word **حَمَلَ** *carried*. The use of the Sukon on the middle letter of the word marks the absence of a short vowel and thus changes the word to **حَمْل** *pregnancy*. When a verb ends with a consonant letter, the Sukon must be used at the end of the verb when it expresses the imperative (Makkūdī & Rājiḥī, 1993).

Context and Short Vowels

In Arabic, most verbs and nouns are built on root morphemes with 2-4 consonants. In a few cases, roots may have 5 consonants. The root usually represents the basic lexical concept. For example, the root *rkb (ركب)*, which means *to ride,* contains three consonants. Adding affixes or inflections to roots creates different grammatical functions of a word. The noun, *rider,* is created by adding the long vowel /ae/ and the short vowel /i/ to the root *rkb* make *raekib (*راكِب). The short vowels /a/ and /i/ and /a/ can also be affixed to each consonant in the root *rkb* respectively to form the past verb *rakiba* رَكِبَ *he rode*/*mounted* (Funder, 2008; Abu-Rabia, 2007; Azzam, 1989).

When skilled Arabic readers come across an unvowelized word like *rkb* ركب , they would access the word meaning through the visual route assigning the lexical basic meaning to the word and would also assign the correct vowels or pronunciation to the word based on the context to overcome the homograph phenomenon which is not the case in single word reading. For example in the unvowelized sentence in 1a:

1a. ركب المسافر السيّارة

The car the passenger to ride

Since the word is unvowelized, a skilled Arabic reader would access the word meaning of the unvowelized word *rkb* ركب*,* which is *to ride* through the visual route. The context should enable the reader to assign the correct short vowels on the word to specify its grammatical function and specific reading which should look like this:رَكِبَ *rode*. The previous example shows that when there is enough context to disambiguate the word,

skilled readers are not expected to have difficulties reading unvowelized words accurately. When the context is not enough, a word would be open for a number of possible readings as in 1b:

1b. كتب الولد

to write/books the boy

The lack of enough context opens the word ktb كتب which conveys the meaning of *writing* to more than one possible reading even for the skilled reader, so the word ktb would be read as either *kataba* كَتَبَ *wrote* or *kutubu* كُتُبُ *books*.

The Role of Short Vowels on Reading Accuracy

The role of short vowels on reading accuracy has been studied by varying the presence of short vowels in texts. Texts can be vowelized, partially vowelized, and completely unvowelized. Context may facilitate reading accuracy when words are presented in passages rather than in lists. The review of studies will be organized according to the following five questions/issues: (a) at what age/grade students are able to accurately read unvowelized texts, (b) differences in skilled vs. unskilled readers, (c) context effects on reading accuracy, (d) whether vowel position (e.g., end vs. other position) affects readability, and (e) whether all diacritics should be viewed as short vowels.

Age

Some studies found that Arabic speaking readers will still need short vowels for reading accuracy regardless of age (Abu-Rabia 1996, 1997a, b, & c, 1998, 2001, 2007,

and 2012). Azzam (1993) children were still learning to read with short vowels until 6th grade. Other studies found that Arabic speaking children (4th/8th grade) and adults do not need short vowels to read texts accurately (Ibrahim, 2013; Saiegh-haddad, 2011; Seraye, 2004). These inconsistent findings may be caused by differences in the scoring criteria used to judge reading accuracy. To determine whether short vowels are needed to read words accurately, scoring should focus only on errors that result from not having short vowels present or misreading them as other vowels. In some studies, however, other errors were counted, such as the misreading of the letters (Abu Rabia, 1996, 1997a) and the deletion and inappropriate addition of long vowels (Seraye, 2004). In the studies by Saiegh-Haddad (2011) and Ibrahim (2013), the scoring criteria were not clearly specified. In the current study, vowel errors were scored by the examiner and were judged by a trained judge and only errors attributed to vowel errors were counted.

Reader Skill Level

The studies by Abu Rabia and others have also considered the effect of short vowels on the reading accuracy of different skilled readers. Some studies compared average-skilled readers to low-skilled readers (Abu-Rabia, 1997a, b, c, 1998), others looked at high-skilled readers (Abu-Rabia, 1996, 2001, 2012), and some compared average-skilled readers to students with dyslexia (Abu-Rabia, 2007; Saiegh-Haddad, 2011). The studies by Abu-Rabia found that all students benefitted from the presence of short vowels regardless of skill level, but low-skilled readers benefitted the least. In contrast, Saiegh-Haddad (2011) found that only 1st grade children with dyslexia benefitted from the presence of short vowels, 2nd to 4th grade children with dyslexia and

average-skilled readers did not benefit from short vowels. A recent study by Ibrahim (2013) also found that short vowels did not help average-skilled 8th grade readers.

The discrepancies in the previous studies might be attributed to the inconsistent criteria used in classifying readers according to skill level. For example participants were classified using teachers' reports in (Abu-Rabia & Siegel, 1995; Azzam, 1993; Ibrahim, 2013), reading score (Abu-Rabia, 1996, 1997a, b, c, 1998), and self-reports Abu-Rabia (2001, 2012). A different classification criterion was utilized in Seraye (2004). He used the same reading passage with different vowelization conditions to classify participants as high-skilled readers. Any participant who achieved ≥ 90 percent accuracy in this reading task was included in the study; none of the participants was excluded. Even though his subjects made errors in reading, it is not clear what criteria were used to judge the errors used for classifying participants.

Contrary to previous studies and to avoid subjective judgments and discrepancy, the current study asked teachers to select children who were high- and low-skilled readers. Then a list of vowelized words was used to confirm the teachers' classification of the participants into low- versus high-skilled readers. All of the participants read the same list of words. Measures were used to ensure objective choice of words. A set score was used to classify participants into high- versus low-skilled readers.

Tasks

In addition to short vowels, context was also found to benefit reading accuracy. In the studies by Abu-Rabia, all groups made the most errors reading unvowelized lists of words. As before, average- and high-skilled readers benefitted the most from context in

both sentence-level reading (Abu-Rabia 1997a; Abu-Rabia & Siegel, 1995) and paragraph-level reading (Abu-Rabia, 1997b, 1998, 2001). In contrast to these findings, Saiegh-Haddad (2011) and Seraey (2004) found that the addition of short vowels on words in context did not add any benefit to the reading accuracy of their native Arab readers.

One possible factor that might explain the inconsistent results across previous research might be that some words across studies had restricted interpretations, while others had more than one interpretation. For example Seraye (2004) used words that were high versus low frequency but they were not homographs whereas Abu-Rabia (1997a) used words that were homographs but context allowed for more than one interpretation, such as the word من, which could mean *from* or *who.* Another possible factor might be related to the texts used to represent different reading conditions. For example Seraye (2004) self-interpreted and constructed one text and presented it in different reading conditions whereas Abu-Rabia (1997b) used 4 narrative texts from the Arabic literature book and 4 newspaper articles and presented each text in a different reading condition. Saiegh-Haddad (2011) used one paragraph in her reading conditions and it is not clear how she chose the text.

The current study used two different passages. Two versions of each passage were created: vowelized and unvowelized. Arabic teachers were asked to evaluate the passages to ensure that there was only one interpretation for the target words.

Vowelizing Word Endings

While vowelizing word endings is important for reading accuracy in context for optimal reading accuracy (Abu-Rabia, 1996, 1997c, 1998, 2001, 2007, and 2012), vowelizing word endings is not important and does not contribute to reading accuracy Seraye (2004). Other researchers vowelized word endings in the tasks they used (Saiegh-haddad, 2011; Ibrahim, 2013).

The inconsistent findings among researchers can be attributed to the differences in how vowelized word endings were scored. In the studies by Abu-Rabia (e.g., 1996, 1997c, and 1998) vowelized word endings was considered in the scoring, whereas in the study by Seraye (2004), word endings were not vowelized and thus the scoring criteria did not consider them. It is not clear what scoring criteria Saiegh-Haddad (2011) and Ibrahim (2013) used.

In the current study two scorings were used for vowelized word endings. The use of two scorings made it possible for the current study to determine which reading error affected the results in previous research. The first criteria scored reading with a Sukon on any word ending as inaccurate in the two vowelized conditions and the unvowelized text. The second scoring criteria considered any reading of a word with a Sukon on word ending accurate in all conditions.

Should all Diacritics be Viewed as Short Vowels?

Most studies considered all diacritics as short vowels (Abu-Rabia 1996, 1997a, b, c, 1998, 2001, 2012; Abu-Rabia & Siegel 1995; Saigh-Hadda, 2011). Only Seraye (2004) did not treat all diacritics as vowels. In this study the /a, u, i/ were considered short

vowels and the Shaddah and Sukon were treated as different diacritics. Sukon was not used in the reading tasks. The current study did not consider all diacritics as short vowels. However, the vowelized conditions included all the diacritics because a vowelized text or word in Arabic usually has all the diacritics including the three short vowels.

Purpose of the Current Research

Previous studies have found some inconsistencies in the importance of short vowels for proficient reading of Arabic. These inconsistencies can be attributed to the different tasks used to assess reading (word lists vs. texts), different scoring criteria used, differences in reading skill level, and student age. The purpose of the current research was to investigate the influence of vowelization and task (word lists vs. texts) on reading accuracy in high- and low-skilled adolescent Jordanian Arabic speaking students. Specific research questions were:

1. Does reading skill level (high/low) influence reading accuracy of vowelized and unvowelized lists and texts?
2. Does vowelization affect reading accuracy in high and low-skilled readers?
3. Does the task (reading lists vs. text) affect reading accuracy in high- and low-skilled readers?
4. Does rescoring without the Sukon influence reading accuracy in high- and low-skilled readers across the four conditions (vowelized/unvowelized lists and texts)?

CHAPTER III

METHOD

Participants

Participants were 48 typically developing 9th grade, native Jordanian Arabic speaking students. The students were tested near the end of the second school semester. 9th grade students are typically 14-15 years old. Students were first classified by their teachers into low- and high-skilled readers. To confirm the teachers' classification, students were divided into high- (≥ 80%) and low-skilled (25-45%) groups based on their reading of a list of 100 vowelized words. There were 24 students in each group. Students needed to read at least 25% of the words accurately to be included in the study.

Procedures

Students were first asked to read a 100-item vowelized word list to confirm the teachers' classification of the students and to divide them into high- and low-skilled readers. Students then read a100-item vowelized word list, a 100-item unvowelized word list, a 100-word vowelized text and a 100-word unvowelized text. Students were instructed to read the words and texts to the best of their ability. The presentation of the lists and passages was counter-balanced. Several practice words were presented to ensure that students understood the task. Students were told to take their time reading. Students were audio-recorded for later scoring.

Measures

Word Lists

There were two 100 word lists, one fully vowelized and the other without vowels. In the unvowelized lists, there were no vowels on consonant word endings. All the words included the correct Shaddah (gemination marker that notes the doubling of the consonant or extra lengthening) and the Hamza.

Six Arabic literature teachers reviewed the words for correct vowelization. The lists of words were chosen from the 9th and 10th grades. Half of the words in each list were form the 9th grade and the other half from the 10th grade Arabic literature books used in Jordan. There were 50 high frequency and 50 low frequency words in each word list. Frequency was based on the Aralex online lexical database for modern standard Arabic (MSA) developed by Boudelaa & Marslen-Wilson (2010).

Texts

There were two 100 word texts judged to be at a 10th grade reading level. One of the texts was fully vowelized, the other unvowelized. As with the unvowelized word lists, the unvowelized texts contained no vowels on consonant word endings. All the words included the correct Shaddah (gemination marker that notes the doubling of the consonant or extra lengthening) and the Hamza.

In order to rule out familiarity with the texts by the students, the texts were selected and judged for grade equivalency by a group of 4 experienced Arabic literature-school teachers. The texts were further judged by six experienced Arabic literature-school teachers for vowelization, lexical ambiguity, and grade level. Word frequency was judged

using the Aralex online lexical database (Boudelaa & Marslen-Wilson, 2010). Finally, the tasks were pilot tested with nine 9th grade students to make sure that the instructions were clear and that word reading accuracy was between 25% and 80%.

Scoring and Reliability

To be scored as accurate, the entire word needed to be read correctly with all the short vowels in the vowelized word list and the vowelized and unvowelized texts. For the unvowelized word list reading condition, any reading with short vowels or a Sukon on word consonant ending in the unvowelized list was scored as accurate as long as the word was an actual Arabic word. All words had at least 2 possible readings. Some of the words had as many as 5 possible readings. This first scoring of the data is referred to as "Sukon scoring". The second scoring considered any reading with a Sukon on word endings in the vowelized list and text and in the unvowelized text as accurate. This scoring typically allowed for two possible correct readings. This modified scoring is referred to as "No Sukon scoring".

The score for each reading condition ranged from 0-100. Inaccurately produced words were further analyzed to determine the types of errors made (e.g., within word vowels, Sukon on word endings, creating nonwords). Intra and inter-rater reliability was calculated on the data for 12 students. The intra-rater reliability was 96%. The data was further scored and compared to ensure the consistency of scoring. An Arabic literature teacher was trained to conduct the inter-rater reliability check. The inter-rater reliability was 90%; disagreements were resolved through discussion.

Data Analysis

A 2 (group) x 2 (task-list/text) x 2 (vowelization) linear mixed-effects model (RELM) was used to address the research questions in the study. Statistical analysis software 9.3 (SAS) was used to analyze the data. Tukey post-hoc comparisons and correlated t-tests were used to further analyze the data.

CHAPTER IV

RESULTS

Table 1 provides the means and standard deviations for the two groups (high/low skilled readers) according to task (list/text), vowelization (vowelized or unvowelized), and scoring criteria (Sukon or No Sukon). Figure 1 shows the mixed model means and confidence intervals for the reading accuracy of each reading condition in low- and high-skilled readers. A 2 x 2 x 2 mixed linear-effects model found that the three-way interaction was significant ($F (1, 138) = 6.38$, $p = 0.013$). Figure 2 plots the data for the two groups. As can be seen in this figure, the high-skilled readers had higher scores than the low-skilled readers and the low-skilled readers had particularly difficulty reading the vowelized word list. Tukey post-hoc analyses indicated that all of the group comparisons were significant ($p < .001$). (See Appendix A for all statistics.)

The within group comparisons were generally similar. Both groups had the highest reading accuracy for the unvowelized word list. For the low skilled readers, all of the comparisons for the unvowelized word list were significant ($p < .001$). The difference between vowelized word list and the vowelized text was also significant ($p < .001$). For the high-skilled readers, reading accuracy was significantly poorer for the unvowelized text than the other three conditions ($p < .001$). Performance on the unvowelized word list was also significantly better than the vowelized text.

Table 1. Means and SDs for low- and high-skilled readers with Sukon and no Sukon

Task	High skilled	Low skilled
List		
Vowelized		
Sukon	85.04(6.7)	48.2(15.1)
No/ Sukon	86.8(6.3)	*62.2(11.3)
Unvowelized		
Sukon	90.2(5.2)	76(10.5)
No/Sukon	90.2(5.2)	76(10.5)
Text		
Vowelized		
Sukon	81.3(7.7)	59.1(10.98)
No/Sukon	88.3(5.4)	*70.4(8.4)
Unvowelized		
Sukon	64.3(7.1)	53.8(7.7)
No/Sukon	*83.1(4.5)	*75.2(7.3)

**Mean difference is statistically significant*

Figure 1. Model-based group means in low- and high-skilled readers in all conditions

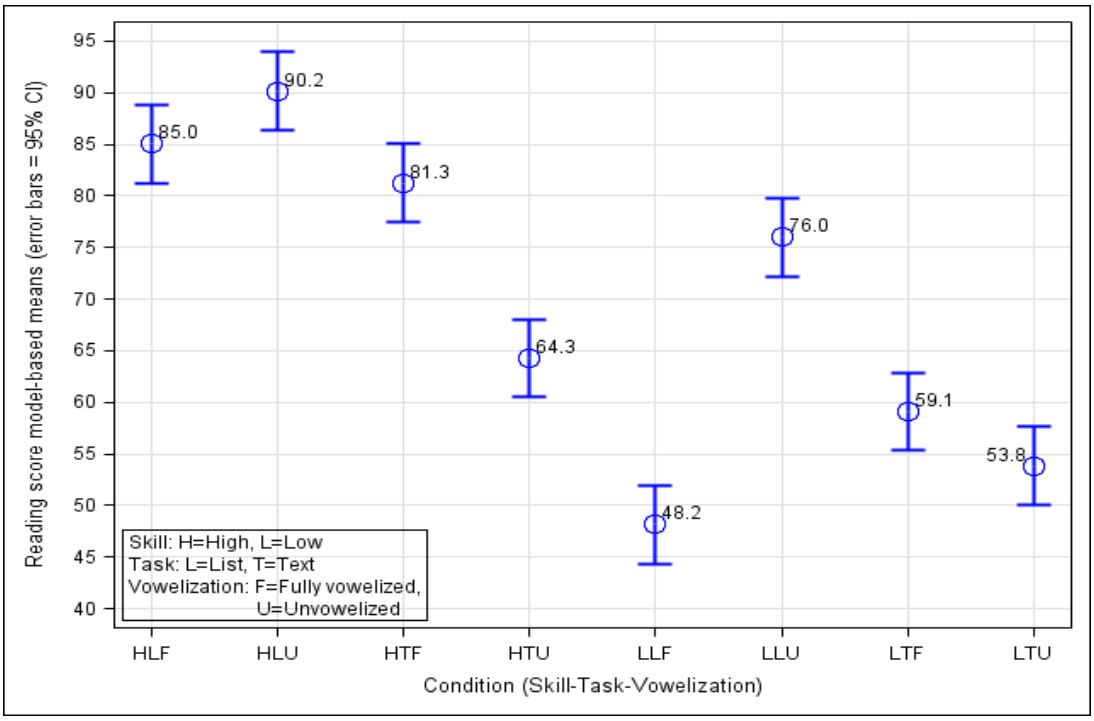


Figure 2. Reading accuracy patterns for low- and high-skilled readers

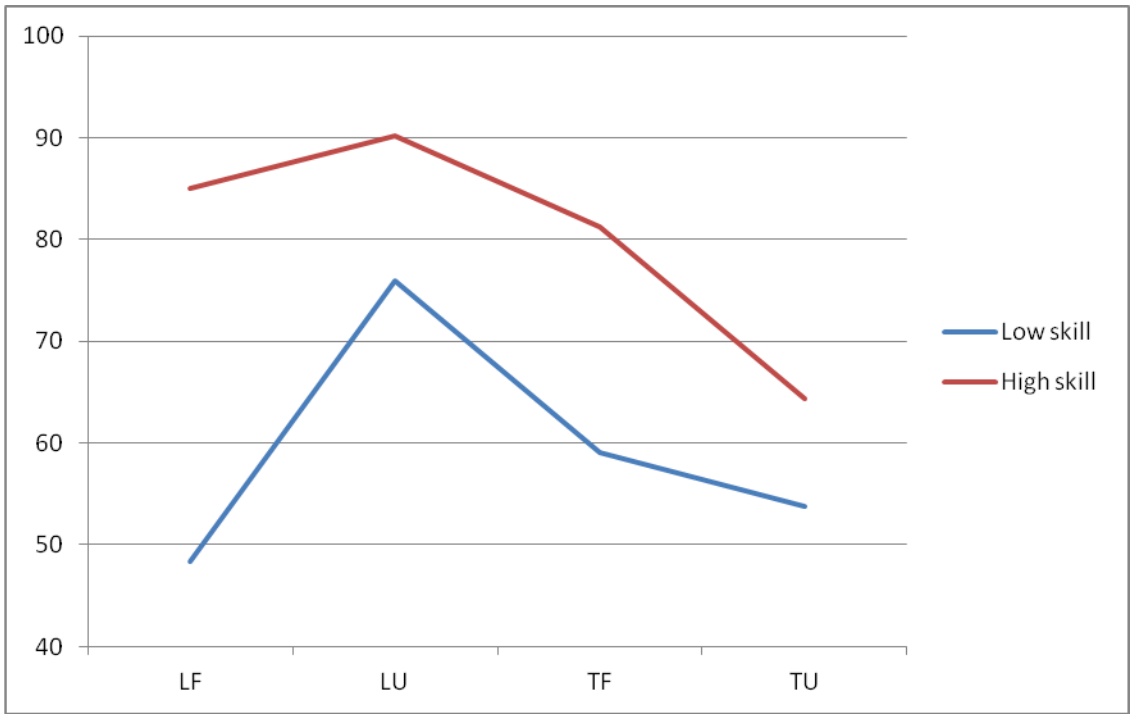


Figure 4 shows the pattern of performance across the various conditions for the modified scoring (No Sukon). These data are also presented in Table 1. In contrast to the original scoring, the 3-way interaction among group, vowelization, and task was not significant ($p > .05$). Correlated t-tests with Tukey corrections were used to compare the data for the two different scorings. A p value of .01 was set for the 8 comparisons. For the high-skilled readers, only the unvowelized text condition showed significant differences for the two different scorings. For the low-skilled group, the only condition that did not show a significant difference was the unvowelized word list.

Figure 3. Mean scores with the Sukon considered accurate for both types of readers

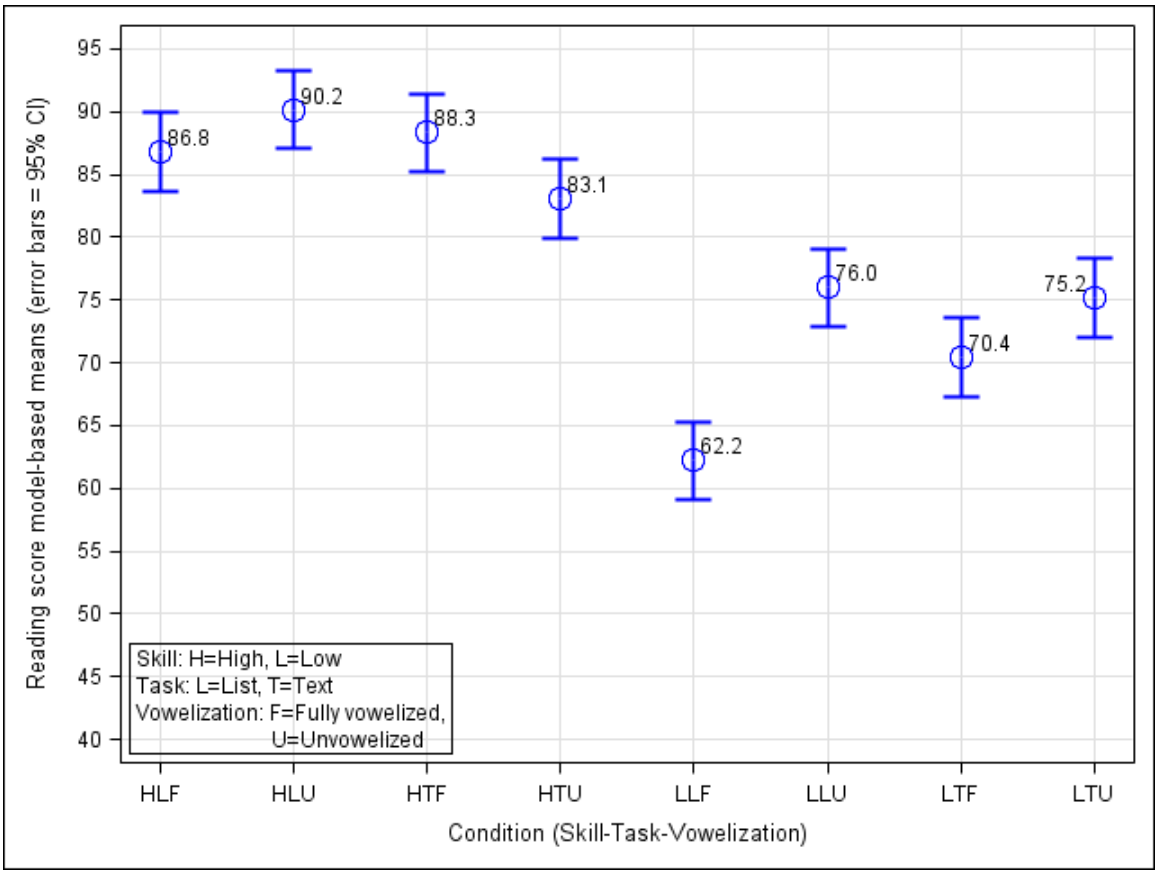
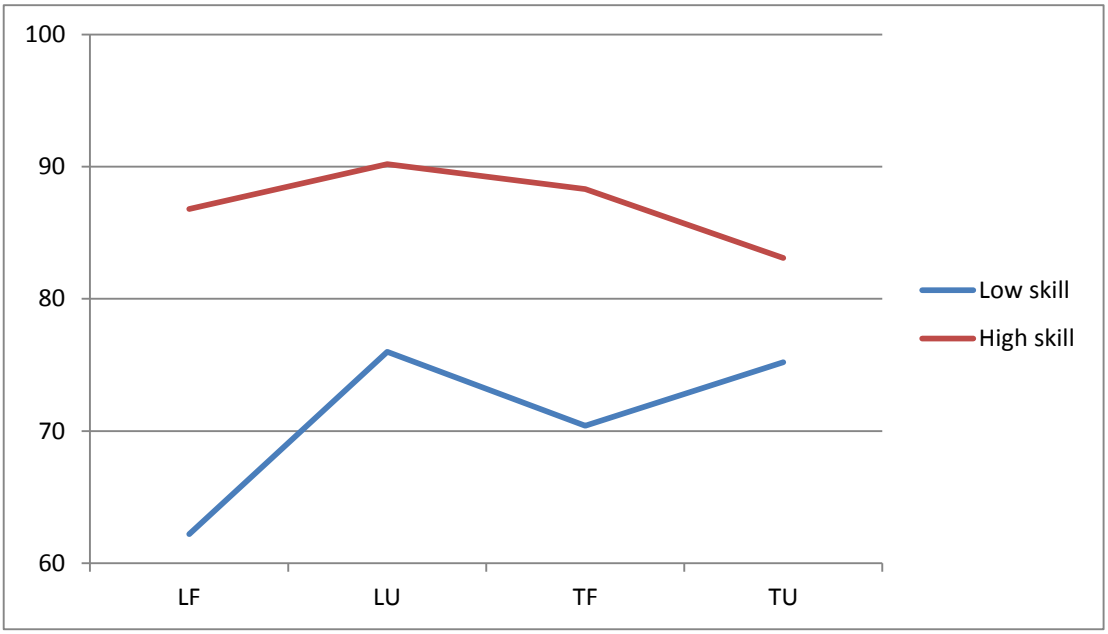


Figure 4. Reading accuracy patterns for low- and high-skilled readers



CHAPTER V

DISCUSSION

The purpose of the current research was to investigate the role of short vowels on reading accuracy in adolescent Jordanian Arabic speaking students. Four research questions were posed. The first one questioned whether reading skill level (high/low) influenced reading accuracy of vowelized and unvowelized lists and texts. The findings indicated that skill level influenced the reading accuracy of vowelized and unvowelized lists and texts. The high-skilled readers had significantly higher reading accuracy scores for all four conditions. These findings confirm that the categorization of students into high- and low-skilled groups was in fact appropriate.

The second research question considered the effect of vowelization on reading accuracy. The influence of vowelization was influenced by the number of possible correct readings and task. Reading accuracy was high for the unvowelized word list for both groups because there were up to 5 possible correct answers. Accuracy was low for the unvowelized text condition for both groups because the discourse and sentence context allows only one correct word reading. For the high-skilled readers, only the comparisons involving the unvowelized texts reached significance. In contrast, the low-skilled readers did particularly poorly reading the vowelized word lists (48%). Low-skilled readers showed a dramatic 30% increase in reading the unvowelized word lists (76%) because any of the possible word readings were considered accurate. High-skilled

readers showed no similar increase (a nonsignificant 5%) because they had no difficulty reading the vowelized word lists (85%).

Though the findings of the present study might seem to be in line with Abu-Rabia (1996, 1997a, b, c, 1998, 2012; Abu Rabia & Siegel, 1995) in that short vowels aid in the reading accuracy of both low- and high-skilled readers, these findings deviate sharply from previous studies. The present findings also contradict the findings of Saiegh-Haddad (2011) and Seraye (2004) who reported that reliance on short vowels is only important for reading isolated words. The aforementioned previous studies of Abu-Rabia always found that both low and high skilled readers read unvowelized lists of words with a floor effect with no significant differences between both groups, vowelized word lists read with lower accuracy than unvowelized and vowelized texts, and vowelized texts were read with higher accuracy than unvowelized texts. Abu-Rabia limited the scoring of unvowelized word lists to one possible answer. Moreover, Abu-Rabia and Siegel (1995) consider any accurate reading of an isolated word a wild guess.

The third research question addressed the influence of task. One would expect that reading accuracy of texts might be better than reading accuracy of isolated words because discourse and sentence context cues would aid reading. But not only was reading accuracy affected by the number of possible answers, it was also affected by vowelization and skill level. Young adolescent skilled readers showed a significant 15% difference between the vowelized and unvowelized text conditions. Perhaps by the end of High School, this difference would disappear. Low-skilled readers also had difficulty reading unvowelized texts, but they showed similar difficulty reading vowelized texts and

particularly difficulty reading vowelized word lists. Their apparent ability to read unvowelized word lists was an artifact of the lenient scoring of reading accuracy.

The fourth research question addressed scoring without the Sukon. This scoring, as with the unvowelized words lists, allowed more than one correct answer. As expected, the low-skilled benefitted the most from the more lax scoring, significantly improving their reading accuracy in all but the unvowelized word list, which already had lax scoring. Improvement was 21% for the unvowelized texts, 14% for the vowelized word list, and 11% for the vowelized text. The lax scoring improved the reading accuracy for the high-skilled readers for the unvowelized text, which showed the lowest reading accuracy in the original scoring (64%). The more liberal scoring improved performance to 83%, an increase of almost 20%. In previous studies by Abu-Rabia and others (e.g., Azzam, 1993; Saiegh-Haddad, 2011; Seraye, 2004), reading accuracy scores were higher than the original scoring with the Sukon. This suggests that these studies used the more liberal scoring without the Sukon to score reading accuracy.

Examples of the nature of reading errors in placing the Sukon on word ending in the unvowelized text in high-skilled readers are represented in a and examples of the nature of the reading errors with the Sukon on word ending in the unvowelized text in low-skilled readers are represented in b.

a. أحملكْ, صاحبْ, أجهلْ, ذكرهْ, جهلهْ, أتركْ, وافقهْ عملهْ, قبلتْ, الأميرْ, الأعرابْ, قبلتْ, فأخبروه, حرٌّ

b. رجلْ, صاحبْ, رأيتْ, أجهلْ, جهلهْ, أتركْ, قيلْ, عملهْ, قبلتْ, العربْ, يسقطْ, فأخبروهْ, حرٌّ, الأعرابْ

The present findings indicate that there are significant differences in the use of short vowels by high- and low-skilled readers. Low-skilled readers have significantly poorer knowledge of short vowels than high-skilled readers. This is most evident in the difficulty they had reading vowelized word lists where their accuracy was less than 50%.

Theoretical Implications

The reliance of high-skilled readers on short vowels in isolation and in context can be explained by the orthographic depth hypothesis (Frost et al., 1987). Because high-skilled readers encountered vowelized words in isolation and in context, they seemed to have realized that all the phonological and grammatical information is present within the words so they read the words without reliance on other resources, such as context. Unlike low-skilled readers who relied on short vowels and context for reading accuracy in vowelized text, the reliance on short vowels only might also reflect a parsimonious use of short-term memory resources by high-skilled readers allowing them enough short-term memory resources for comprehension (Perfetti, 1985).

The finding that only low-skilled readers read the vowelized text with higher accuracy than the vowelized word list might indicate that low-skilled readers relied on both short vowels and context to help their reading accuracy. This finding is consistent with (e.g., Perfetti, 1985; Stanovich, 1980) showing that low-skilled readers rely more on context than high-skilled readers. Low-skilled readers tend to use all available resources to decode print.

Low-skilled readers read the unvowelized word list with higher accuracy than the other three reading conditions and high-skilled readers read the unvowelized word list with higher accuracy than vowelized and unvowelized texts. When a word is unvowelized, it might have more than one possible reading and can still be counted as accurate. Unvowelization increased the number of possible readings of the words. This reflects the homograph phenomenon found in Arabic (Abu-Rabia, 1998; Haddad, 2011; Funder, 2008). Though Arabic is homographic, it only has three short vowels and the number of syllables with short vowels in Arabic is limited to three (Al-Ani, 1970). This makes these short vowels predictable in a sense (Funder, 2008). These two factors might provide a possible explanation why both types of readers read the unvowelized word list with higher accuracy than the other conditions.

In addition to the limited number of syllable structures in Arabic, syllable structure of the word can limit the possible readings of the short vowel in a syllable. For example, the second syllable in the two-syllable word *لسان/li.saen/ tongue,* which should be read with the long vowel /ae/, restricts the number of possible readings of the short vowel to /i/. This means there is only one possible reading of the word. In addition to syllable structure, syllable position within the word would also aid in the predictability of short vowels on words. Even though syllable structure and sequence within a word might limit the possible readings of the homograph to one possible reading in some cases, in others it might not.

The current findings on skilled readers reading the unvowelized word list are in line with the findings of Ibrahim (2013) on unvowelized word list reading accuracy. He

attributed the findings to the absence of context which causes an Arabic reader to use other linguistic resources present in the word to aid in the reading accuracy of the unvowelized words (i.e, vocabulary and morphological structure of the word). While this is true, the present findings may point to another direction which is vocabulary knowledge might have aided the high reading accuracy rate of unvowelized word lists in high-skilled readers and even in low-skilled readers supported by the fact that an unvowelized word opens the word to a number of possible readings. Having an adequate vocabulary is one of the requisites for reading accuracy (Torgesen & Hudson, 2006). This would explain why high-skilled readers read unvowelized word list with higher accuracy than low-skilled readers.

Educational Implications

The present findings have a number of educational implications. First, the present findings might impact the way reading proficiency is assessed in Arabic. Assessment of reading proficiency in Arabic should take into account the fact that even when short vowels are used in texts in lower grades, they are reduced like all other diacritics. Eventually, Arabic readers will encounter unvowelized texts in books, newspapers, and other forms of print. Assessment instruments should be designed to take this into account. Assessments might want to give emphasis to testing reading accuracy with short vowels on word ending from the very beginning of instruction in Arabic in the early grades. This might help inform instruction and might also help in delineating the areas of weaknesses that might be related to unvowelizing word ending if there are and whether they would

impact reading accuracy only or might even impact speed and comprehension depending on the type of reader.

Another educational implication concerns how short vowels are taught to young Arabic readers. Arabic literature teachers are likely to give variable emphasis to short vowels on words which would explain the tendency of Arabic readers to place a Sukon on word endings. Words in Arabic curricula are usually supplied with full diacritics until 4th grade at which time they are gradually reduced (Abu-Rabia & Siegel, 2003; Ibrahim, 2013). Given the importance of short vowels for reading accuracy, the transition to unvowelized text could still start in grade 4, but be more gradually phased out through Grade 6.

The use of unvowelized word lists as a task to measure reading accuracy needs to be reconsidered. Reading assessment should not include unvowelized word lists because the multiple number of correct answers artificially inflates reading proficiency. Assessment of unvowelized words should only occur in texts where discourse and sentential context can determine the correct word reading.

Limitations and Future Directions

The current study has a number of limitations. First, it was conducted on 9th grade students and did not include other age groups. Second, the current study used only one type of text. Third, the present study was limited to the investigation of the role of short vowels on the reading accuracy of low- and high-skilled readers. Future studies should investigate the role of short vowels on average Arabic readers as well. Fourth, the current study was conducted on students from two schools in Jordan. Moreover, the current study

was conducted on Arabic speaking students from one country i.e., Jordan. In addition, the number of the sample was limited. Finally, the size of the word lists and texts was limited to 100 words each.

The role of short vowels in reading accuracy in Arabic needs to be investigated in terms of its influence on reading speed. Since accuracy and speed are related to reading fluency, investigating the role of short vowels on reading speed is warranted. Future studies should also consider the role of short vowels in different populations (e.g., students with speech sound disorders and specific language impairment) as well as different age groups (elementary through late adolescence). Future studies might also undertake error analysis to look for the pattern of errors different types of readers make when reading unvowelized texts. Such studies might reveal the size of influence placing a Sukon on word ending in unvowelized text might have on the meaning of context. Future studies could also investigate the role of Sukon on reading accuracy in different types of readers to determine the prevalence of its use. From a pedagogical perspective, since a Sukon on word ending is the grammatical marker of a word and since it is rarely used even by high-skilled readers, future research might consider how much emphasis the importance of short vowels on word endings receives in formal grammar lessons throughout elementary school and beyond.

Summary and Conclusions

The purpose of the current research was to investigate the role of short vowels on reading accuracy in adolescent Jordanian Arabic speaking students. Four research questions were posed that considered the influence of reading skill level, vowelization,

and task on reading accuracy. As expected, high-skilled readers showed significantly higher reading accuracy than low-skilled readers in all of the conditions. The most interesting finding was the exceptionally poor performance of the low-skilled readers on the vowelized word list. Their relatively good performance on the unvowelized word list is an artifact of lax scoring that allowed up to 5 correct answers. This finding has important implications for assessment of reading proficiency in Arabic students. Reading assessment should not include unvowelized word lists because the multiple number of correct answers artificially inflates reading proficiency. Assessment of unvowelized words should only occur in texts where discourse and sentential context can determine the correct word reading. Future studies should attempt to determine the most effective way to transition Arabic students from reading vowelized texts to unvowelized texts which are predominant in books, newspapers, and other sources of print.

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APPENDIX A

DATA TABLES

Table A1. Group mean differences for low- and high-skilled readers

Task	High skilled	Low skilled	t-value	*p**
<u>Lists</u>				
Vowelized	85(6.7)	48.3(15.1)	13.64	<.0001
Unvowelized	90.2(5.2)	76(10.5)	5.24	<.0001
<u>Texts</u>				
Vowelized	81.3(7.7)	59.1(10.98)	8.18	<.0001
Unvowelized	64.3(7.09)	53.8(7.7)	3.87	.0041

**Standard error=2.7; p<.05*

Table A2. Within group comparisons for high-skilled readers

Task		t-value	*p**
List	Text		
Vowelized	Vowelized	1.74	.66
Vowelized	Unvowelized	9.5	<.0001
Unvowelized	Vowelized	4.08	.002
Unvowelized	Unvowelized	11.84	<.0001
List	List		
Vowelized	Unvowelized	-2.35	.28
Text	Text		
Vowelized	Unvowelized	7.76	<.0001

**Standard error = 2.2; p<.05*

Table A3. Within group comparisons for low-skilled readers

Task		t-value	*p**
List	Text		
Vowelized	Vowelized	-5.01	<.0001
Vowelized	Unvowelized	-2.59	.17
Unvowelized	Vowelized	7.72	<.0001
Unvowelized	Unvowelized	10.14	<.0001
List	List		
Vowelized	Unvowelized	-12.74	<.0001
Text	Text		
Vowelized	Unvowelized	2.42	.24

**Standard error= 2.2; p<.05*

Table A4 D. Group mean changes for scoring with Sukon and without Sukon for lists

Task	High skilled	t-value	*p**	Low Skilled	t-value	*p**
List						
Vowelized						
Sukon	85.04(6.7)			48.2(15.1)		
no/ Sukon	86.8(6.3)	-0.91	.99	*62.2(11.3)	-7.26	<.0001
Unvowelized						
Sukon	90.2(5.2)			76(10.5)		
no/Sukon	90.2(5.2)	0.00	1.00	76(10.5)	0.00	1.00

**Standard error= 1.93; p=.01*

Table A5. Group mean changes for scoring with Sukon and without Sukon for texts

Task	High skilled	t-value	*p**	Low Skilled	t-value	*p**
Text						
Vowelized						
Sukon	81.3(7.7)	-3.66	.0254	59.1(10.98)	-5.84	<.0001
no/ Sukon	88.3(5.4)			*70.4(8.4)		
Unvowelized						
Sukon	64.3(7.1)	-9.72	<.0001	53.8(7.7)	-11.05	<.0001
no/Sukon	*83.1(4.5)			*75.2(7.3)		

**Standard error= 1.93; p=.01*

APPENDIX B

WORD LISTS AND TEXTS

Vowelized Text 1

الحِيْلَةُ النَّاجِحَةُ

قِيلَ: إنَّ الرَّشِيْدَ خَرَجَ يَوْماً لِلصَّيْدِ وَمَعَهُ أَبُو نُواسٍ. ثُمَّ ذَهَبَ كُلٌّ إلى عَمَلِهِ, وبَقِيَ طاهي الطَّعامِ وَيُدْعى فَرَحاتٌ, أَقْبَلَ أَبُو نُواسٍ عَلى فَرَحاتٍ وَقالَ: أَطْعِمْني لِأَنَّني أَتَضَوَّرُ جُوْعاً, فَقالَ فَرَحاتٌ: لا أُطْعِمُ أَحَداً قَبْلَ الأَمِيْرِ.

فَذَهَبَ أَبُو نُواسٍ إلى بَعْضِ الأَعْرابِ وَقالَ:أَلا تَشْتَرُونَ مِنّي غُلاماً عَرَبِيّاً, فَقالُوا لهُ نَشْتَرِيهِ بِهَذِهِ النَّاقَةِ , فَقالَ أَبُو نُواسٍ: قَبِلْتُ, ثُمَّ ساروا حَيْثُ فَرَحاتٌ. فَتَقَدَّمَ العَرَبُ وَأَمْسَكُوهُ, فَصاحَ فَرَحاتٌ: أَنا حُرٌّ لا أُباعُ.

فَسَمِعَ الأَمِيْرُ الضَّجَّةَ وَسَأَلَ عَنِ الخَبَرِ, فَأَخْبَرُوهُ أَنَّ أَبا نُواسٍ باعَ فَرَحاتٍ لِبَعْضِ الأَعْرابِ, فَضَحِكَ حَتَّى كادَ يَسْقُطُ عَنْ جَوادِهِ, وقالَ لِلأَعْرابِ: اُتْرُكُوهُ وَخُذُوا ناقَتَكُم وَفَوْقَها أَلْفُ دِرْهَمٍ. فَقَبِلَ الأَعْرابُ, وَفُكَّ رِباطُ فَرَحاتٍ , وَأَبُو نُواسٍ يَضْحَكُ.

Unvowelized Text 1

الحيلة الناجحة

قيل: إنّ الرّشيد خرج يوما للصّيد ومعه أبو نواس. ثمّ ذهب كلّ إلى عمله, وبقي طاهي الطّعام ويدعى فرحات, أقبل أبو نواس على فرحات وقال: أطعمني لأنّني أتضوّر جوعا, فقال فرحات: لا أطعم أحدا قبل الأمير.

فذهب أبو نواس إلى بعض الأعراب وقال:ألا تشترون منّي غلاما عربيّا, فقالوا له نشتريه بهذه النّاقة, فقال أبو نواس: قبلت , ثمّ ساروا حيث فرحات. فتقدّم العرب وأمسكوه, فصاح فرحات: أنا حرّ لا أباع.

فسمع الأمير الضّجّة وسأل عن الخبر, فأخبروه أنّ أبا نواس باع فرحات لبعض الأعراب, فضحك حتّى كاد يسقط عن جواده, وقال للأعراب: اتركوه وخذوا ناقتكم وفوقها ألف درهم. فقبل الأعراب, وفكّ رباط فرحات, وأبو نواس يضحك.

Vowelized Text 2

وَافَقَ شَنٌّ طَبَقَةَ

كانَ شَنٌّ رَجُلاً مِنْ دُهاةِ العَرَب وعُقَلائِهِم , وَبَيْنَما هُوَ في بَعْضِ تَرْحالِهِ وَافَقَهُ رَجُلٌ إلى القَرْيَةِ الَّتي يَقْصِدُها, قالَ لَهُ شَنٌّ: أَتَحْمِلُني أَمْ أَحْمِلُكَ؟ فَقالَ الرَّجُلُ: يا جاهِلُ, نَحْنُ راكِبَانِ.

ثُمَّ دَخَلا القَرْيَةَ فَلَقِيَتْهُما جِنَازَةٌ, فَقالَ شَنٌّ: أَتَرى صاحِبَ هَذا النَّعْشِ حيّاً أَمْ مَيّتاً ؟ فَقالَ الرَّجُلُ: ما رَأَيْتُ أَجْهَلَ مِنْكَ. وَسارَ بِهِ الرَّجُلُ إلى بَيْتِهِ, وكانَ لِلرَّجُلِ ابْنَةٌ اسْمُها طَبَقَةُ, فَشَكا إلَيها جَهْلَهُ وَحَدَّثَها بِحَدِيثِهِ.

فَقالَتْ: أَمّا قَوْلُهُ أَتَحْمِلُني أَمْ أَحْمِلُكَ, فَأَرادَ أَتُحَدِّثُني أَمْ أُحَدِّثُكَ. وَأَمّا قَوْلُهُ في الجِنازَةِ فَأَرادَ: هَلْ تَرَكَ عَقِباً يَحْيا بِهِم ذِكْرُهُ؟ فَفَسَّرَ الرَّجُلُ لِشَنّ ما سَأَلَهُ عَنْهُ.

فَتَزَوَّجَها شَنٌّ, فَلَمّا رَأَوْها قالُوا : وَافَقَ شَنٌّ طَبَقَةَ.

Unvowelized Text 2

وافق شنّ طبقة

كان شنّ رجلا من دهاة العرب وعقلائهم, وبينما هو في بعض ترحاله وافقه رجل إلى القرية التي يقصدها, قال له شنّ: أتحملني أم أحملك ؟ فقال الرّجل: يا جاهل , نحن راكبان.

ثمّ دخلا القرية فلقيتهما جنازة, فقال شنّ: أترى صاحب هذا النّعش حيّا أم ميتا ؟ فقال الرّجل: ما رأيت أجهل منك. وسار به الرجل إلى بيته, وكان للرّجل ابنة اسمها طبقة, فشكا إليها جهله وحدّثها بحديثه.

فقالت :أمّا قوله أتحملني أم أحملك , فأراد أتحدّثني أم أحدّثك. وأمّا قوله في الجنازة فأراد: هل ترك عقبا يحيا بهم ذكره؟ ففسر الرّجل لشنّ ما سأله عنه.

فتزوّجها شنّ, فلمّا رأوها قالوا: وافق شنّ طبقة.

Vowelized Word List 1

داخِلَ	فُتِحَ	تُطَوِّرُ	مُذَكِّراتٍ	ناسٍ	شُعْلَةٌ
يُتِمُّ	الظُّروفَ	مَفْهومٌ	رَحيلَ	بَسَطَ	أَبْكِيَ
فَتْرَةَ	أَفْضَلَ	طَرَفَ	المؤَدِّيَةِ	الوِقايَةِ	عَزَلَها
مَجالَ	قَدِمَ	تَوزيعَ	التَّسامُحَ	نُمُوَّها	انْطَلِقوا
الحَرَكَةُ	الخَدَماتِ	النَّفْسُ	القُلوبَ	أُؤَكِّدُ	مُخْتَلِفانِ
رِجالٌ	تَدَخُّلُ	مَدْرَسَةٍ	نادِرَةً	الدَّهْرُ	لَعَلَّكُمُ
البَحْثَ	اتِّجاهَ	المَعْرِفَةُ	طَليعَةٌ	مَلامِحَها	جاوَزَتِ
ضِمْنَ	يَعْمَلُ	ثَقافَةً	يُشَكِّلونَ	اشْجِرافٌ	يَلْتَهِمُ
مَلايينَ	حُرِّيَّةٍ	الجَزيرَةِ	أَمْكَنَ	قُدْوَةٌ	وافِرَةِ
المَصادِرَ	تَوْفيرَ	رِحْلَةٌ	الأَوانُ	يَمْنَعُهُ	يُنْفِقُهُ
وَجْهِ	الإنسانيَّةِ	احْتِرامَ	اللَّومَ	تَخْتَلِطُ	تَبَدُّلاً
صورَةٍ	مُسْتَقْبَلُ	يُصْدِرُ	نافِذَةٍ	المُتَغَيِّرَةَ	يُوهِمُ
القَضاءِ	طَبيعَةَ	لَيْلَةَ	أُدْخِلَ	سَوادٌ	اشْتَبَكَ
مَرْكَزَ	العَدْلَ	مُكافَحَةَ	تَرْبِيَةِ	يَدُكُّ	أَخْسَرُ
بَلَغَ	سُلْطَةَ	جُمْلَةً	أَعَدَّ	فِضَّةٌ	خَيْراتِها
تَطْويرَ	الكامِلَ	زادَ	التُّرْبَةَ	أَطَلَّ	
يُريدُ	المَواقِفَ	تَدْريجِيًّا	واحَةٍ	المُشْرِقَةِ	

Unvowelized Word List 1

داخل	فتح	تطوّر	مذكّرات	ناس	شعلة
يتمّ	الظّروف	مفهوم	رحيل	بسط	أبكي
فترة	أفضل	طرف	المؤدّية	الوقاية	عزلها
مجال	قدم	توزيع	التّسامح	نموّها	انطلقوا
الحركة	الخدمات	النّفس	القلوب	أؤكّد	مختلفان
رجال	تدخّل	مدرسة	نادرة	الدّهر	لعلّكم
البحث	اتّجاه	المعرفة	طليعة	ملامحها	جاوزت
ضمن	يعمل	ثقافة	يشكّلون	انحراف	يلتهم
ملايين	حرّيّة	الجزيرة	أمكن	قدوة	وافرة
المصادر	توفير	رحلة	الأوان	يمنعه	ينفقه
وجه	الإنسانيّة	احترام	اللّوم	تختلط	تبدّلا
صورة	مستقبل	يصدر	نافذة	المتغيّرة	يوهم
القضاء	طبيعة	ليلة	أدخل	سواد	اشتبك
مركز	العدل	مكافحة	تربية	يدكّ	أخسر
بلّغ	سلطة	جملة	أعدّ	فضّة	خيراتها
تطوير	الكامل	زاد	التّربة	أطلّ	
يريد	المواقف	تدريجيّا	واحة	المشرقة	

Vowelized Word List 2

يَجِبُ	التَّعْليمُ	خِدْمَةَ	أَعْطى	اعْتِداءاتٌ	أَثْمَرَتِ
عَبْرَ	مَدى	وَرَدَ	مُبَكّراً	الذَّوقُ	عَدَسَةَ
المَدينَةَ	وَقَفَ	لَحْظَةَ	كَثافَةِ	الغُبارَ	اخْتِراقاتٍ
عِدَّةٌ	العِلْمُ	شارَكَ	العِنايَةَ	اسْتَولى	حُضوريَ
أُعْلِنَ	حَياةٍ	كُشِفَ	اسْتَمِعْ	تَليقُ	حاجَتَهُمُ
النَّظَرَ	وَقْعُ	مُتابَعَةٌ	لَوْنُ	الرّاسِخَةِ	تأْهيلُهُمِ
الواقِعَ	أَشْهُرٍ	لِمَنْ	المَنْشأ	حَبَّةَ	اسْتِئْذانٍ
العَمَلِيَّةِ	مَسيرَةَ	جَرى	العَطاءَ	قالَبٌ	المُجْرِمونَ
رِسالَةٌ	المَصْدَرَ	عادَةً	غَيَّرَتِ	حَديثِيْ	اسْتَعارَ
الطَّريقَ	الحالَ	القِيَمَ	المُلائِمَةِ	فُلْكِ	قاتِمٌ
القُوَّةُ	الزَّمَنَ	حِدَّةٍ	الرَّفيعَةِ	غِذاءً	يَنْهَمِرُ
الأَرْضَ	حَقيقَةَ	أَبْرَزَ	عُدْتَ	مَناحِيَ	تَمَنَّوا
لِتَحْقيقِ	السّاحَةَ	دَوْرُها	يَكُفُّ	ضَبابٌ	يَفوتُهُ
وَسَطَ	البِدايَةِ	وُلِدَ	الإبْداعُ	مَجيْدٍ	أُوتُوا
أَصْبَحَ	المَسْرَحَ	تَخْتَلِفُ	الأَرْواحُ	نَميزُ	مُتَجاوِرِينَ
اسْتِخدامَ	بَعْضها	تُحَدّدُ	يُصيبُ	طَلَعَ	
الحَديثَةِ	رُؤْيَةٍ	قُلْنا	يَتَمَسَّكُ	الهِمَمَ	

Unvowelized Word List 2

يجب	التّعليم	خدمة	أعطى	اعتداءات	أثمرت
عبر	مدى	ورد	مبكّرا	الذّوق	عدسة
المدينة	وقف	لحظة	كثافة	الغبار	اختراقات
عدّة	العلم	شارك	العناية	استولى	حضوري
أعلن	حياة	كشف	استمع	تليق	حاجتهم
النّظر	وقع	متابعة	لون	الرّاسخة	تأهيلهم
الواقع	أشهر	لمن	المنشأ	حبّة	استئذان
العمليّة	مسيرة	جرى	العطاء	قالب	المجرمون
رسالة	المصدر	عادة	غيّرت	حديثي	استعار
الطّريق	الحال	القيم	الملائمة	فلك	قاتم
القوّة	الزّمن	حدة	الرّفيعة	غذاء	ينهمر
الأرض	حقيقة	أبرز	عدت	مناحي	تمنّوا
لتحقيق	السّاحة	دورها	يكفّ	ضباب	يفوته
وسط	البداية	ولد	الإبداع	مجيد	أوتوا
أصبح	المسرح	تختلف	الأرواح	نميز	متجاورين
استخدام	بعضها	تحدّد	يصيب	طلع	
الحديثة	رؤية	قلنا	يتمسّك	الهمم	

APPENDIX C

RANDOMIZATION TABLE

No	Ability	Combination	No	Ability	Combination
H13	High	L2FV,L1FU,T2FV,T1FU	L1	Low	L1FV,L2FU,T1FV,T2FU
H4	High	L1FU,L2FV,T1FU,T2FV	L20	Low	T2FU,T1FV,L1FU,L2FV
H9	High	T1FV,T2FU,L1FV,L2FU	L10	Low	T1FU,T2FV,L1FV,L2FU
H23	High	T2FV,T1FU,L2FU,L1FV	L3	Low	L1FV,L2FU,T1FU,T2FV
H7	High	L2FV,L1FU,T1FU,T2FV	L18	Low	T2FU,T1FV,L1FV,L2FU
H22	High	T2FU,T1FV,L2FV,L1FU	L11	Low	T1FV,T2FU,L1FU,L2FV
H24	High	T2FU,T1FV,L2FU,L1FV	L13	Low	L2FV,L1FU,T2FV,T1FU
H6	High	L2FU,L1FV,T1FV,T2FU	L4	Low	L1FU,L2FV,T1FU,T2FV
H5	High	L2FV,L1FU,T1FV,T2FU	L17	Low	T2FV,T1FU,L1FV,L2FU
H16	High	L2FU,L1FV,T2FU,T1FV	L5	Low	L2FV,L1FU,T1FV,T2FU
H17	High	T2FV,T1FU,L1FV,L2FU	L22	Low	T2FU,T1FV,L2FV,L1FU
H10	High	T1FU,T2FV,L1FV,L2FU	L24	Low	T2FU,T1FV,L2FU,L1FV
H11	High	T1FV,T2FU,L1FU,L2FV	L7	Low	L2FV,L1FU,T1FU,T2FV
H21	High	T2FV,T1FU,L2FV,L1FU	L2	Low	L1FU,L2FV,T1FV,T2FU
H14	High	L2FU,L1FV,T2FV,T1FU	L9	Low	T1FV,T2FU,L1FV,L2FU
H3	High	L1FV,L2FU,T1FU,T2FV	L12	Low	T1FU,T2FV,L1FU,L2FV
H15	High	L2FV,L1FU,T2FU,T1FV	L16	Low	L2FU,L1FV,T2FU,T1FV
H8	High	L2FU,L1FV,T1FU,T2FV	L23	Low	T2FV,T1FU,L2FU,L1FV
H12	High	T1FU,T2FV,L1FU,L2FV	L6	Low	L2FU,L1FV,T1FV,T2FU
H1	High	L1FV,L2FU,T1FV,T2FU	L21	Low	T2FV,T1FU,L2FV,L1FU
H18	High	T2FU,T1FV,L1FV,L2FU	L15	Low	L2FV,L1FU,T2FU,T1FV
H20	High	T2FU,T1FV,L1FU,L2FV	L8	Low	L2FU,L1FV,T1FU,T2FV
H19	High	T2FV,T1FU,L1FU,L2FV	L14	Low	L2FU,L1FV,T2FV,T1FU