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Vowelizing English Consonant Clusters with Arabic Vowel Points (Harakaat): Does it Help Arab Learners to Improve Their Pronunciation?

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Abstract:

The study was carried out to investigate the effect of using Arabic vowel points (harakaat) on one-syllable English words of three consonant clusters in initial and final positions. Four lists words were developed: two with harakaat in initial and final positions and two without harakaat. It was hypothesized that the use of these harakaat would result in better pronunciation of these words by Arab students. The t-test (T(39) =2.807, P<0.01) showed significant differences between the mean of words with harakaat and the mean of words without harakaat, favoring writing words with harakaat. All subjects benefited from these harakaat in different degrees. The t-test for a supportive hypothesis related to initial position was significant beyond level p<05 (T(39) =3.029) suggesting that writing English words with Arabic harakaat leads to better pronunciation of these clusters in initial position. The t-test for another supportive hypothesis related to final position, however, showed no significant difference between writing consonant clusters in final position with Arabic harakaat and writing them without harakaat (T(39)=1.964). Results have implications to contrastive phonetics and language teaching in general.

***Key words**: vowelization, consonant clusters, Arabic harakaat, contrastive Phonetics, teaching Arab students.*

Introduction

Borrowing between languages is an old issue that might go back to time as early as the split of the first human family, where new dialects and accents emerged into varieties of the original language. Later, such varieties became independent languages but with words and phrases shared between all these varieties. As each variety was developed into an independent language, they continue to borrow from each other new words and phrases, and even graphs to represent these words in the writing system of the borrowing language (Hoofer, 2005). Furthermore, borrowing went beyond words, phrases and graphs to special symbols known as diacritical marks. Although these diacritical marks are rarely used nowadays (perhaps used more in teaching poetry), their existence in a SL constitutes an evidence that they were borrowed to improve SL pronunciation. For example, the words *naïve* (with the umlaut), *résumé* (with the acute accent), *piña* (with the tilde), and *pâté* (with the circumflex) are English words that were borrowed from other European languages along with their diacritical marks. The question is whether using diacritics

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from another language on words from a target language, say; English, would lead to improving the pronunciation of these words by learners of this target language or not. The present study is an attempt to answer this question empirically.

Statement of the research problem

Arabic and English are two different systems for communication, if we define language as a system for communication. The dissimilarity between the two languages goes back to their origin and their nature. It is believed that the former is a Semitic, while the second is believed "to descend from the language of a tribe of nomads roaming the plains of eastern Europe and western Asia" (Gascoigne, par. 7). While Arabic is written from right to left, English is written from left to right, and Arabic has sounds that are not found in other languages, including English, such as ض. At the same time, Arabic lacks some of the English phonemes, such as /p/, /v/ and so on. Both Arabic and English are stressed-timed rhythm languages (Barkat-Defradas, Hamdi, Ferragne & Pellegrino, 2004). A stress-timed rhythm means that stressed syllable "will intend to occur at relatively regular interval" (Roach, 2009, p. 107). However, Arabic retains the unreduced vowel (Kenworthy, 1987). Orthographically, vowels in English are written within the word, regardless of whether they are long or short. In Arabic, only long vowels are written within the word. Short vowels are compensated with vowel points or diacritics called *harakaat* (singular: *harakah*), which are put over or under the preceding consonant. Morphologically, Arabic is one of the highly inflected systems, but English is among the weakly inflected languages.

Concerning syllable structure, Arabic has no counterpart of English phonotactics of consonant clusters. Arabic syllable may start with a consonant or a vowel and also end with a consonant or a vowel. In standard Arabic, the onset of any syllable, however, should only have one consonant, while the coda may have up to two consonants only, as in كَلْبْ *kalb* (English: dog), for example. In English, the onset may have up to three consonants, while the coda can have up to four consonants (Roach, 2009; Collins, & Inger, 2003). This may explain the difficulty which Arab students, in particular, and Arabic speakers, in general, have in pronouncing English consonant clusters. They tend to insert a vowel (usually a schwa) between the consonants, dividing the single syllable into two syllables (Celce-Murcia, Brinton & Goodwin, 1996).

These differences between Arabic and English have their effects in teaching English to speakers of Arabic language, where the effect of L1 on L2 is seriously observed, especially in pronunciation. The two languages also have different phonotactic rules such as those for consonant clusters, long vowels, /r/ and other aspects. Such differences result in negative transfer in some cases and avoidance of target language structures, rules or aspects in other cases. Consonant cluster differences have resulted in a phonetic phenomenon called vowel intrusion (Hall, 2003) or epenthesis (Celce-Murcia, Brinton & Goodwin, 1996). Such intrusion results indirectly in the increment of the number of syllables. For example, the word *spread* /spred/ is

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one syllable, but with the intrusion of the schwa in the cluster /spr/, the word becomes a disyllabic word (i.e., /səp.ˈred/. This phenomenon reflects the difficulty that Arab students face and at the same time their persistent endeavor to cure such difficulty, even on the account of accurate pronunciation. On the other hand, those involved in teaching English have also tried continually to adopt, and sometimes to invent, techniques that could help their students overcome these problems. One of these techniques is the use of L1 (Arabic) phonotactics in teaching English pronunciation, where they compare or relate English syllable structure and phoneme arrangement to Arabic patterns.

As mentioned earlier, short vowels in Arabic are replaced with vowel points or diacritics called *harakaa*t, which indicate the directions of vowel production from close to open and from spread to rounded vowels. There are three main *harakaat* in Arabic: *'fat-hah'*, '*dhammah*' and '*kasrah'*. *'fat-hah'*, is a flat line put over the preceding consonant to replace the short vowel /ʌ/ as in the word *'gum*' /gʌm/; the vowel /ʌ/ is replaced by /g̅/. '*Dhammah*' takes the shape of coma put over the preceding consonant to indicate the movement of that consonant, as in the case of the word 'not' /nɒt/, where *dhammah* is put over the /ˀn/ to replace the vowel /ɒ/. *Kasrah* is another flat line put under the preceding consonant to replace the short vowel /e/ as in 'red' /*red*/ where /r̲/ is written with that diacritic. When the consonant is followed by another consonant or it is the final phoneme, a diacritic called '*sokoon*' that takes the shape of a small circle is used over that consonant. For example, the word *card* كاردْ would have the 'º' put over the /d/ to indicate that it is not followed by a vowel.

Beside their role in directing the consonant movement, Arabic diacritics are used to distinguish grammatical categories and make morphological changes in these categories. For example, the word '*kataba*' is written as '**كَتَبَ**'. Without these diacritics, it might be read as *'kataba'* '**كَتَبَ**' (English: wrote), ' *kuteba*' '**كُتِبَ**' (English: was written) or *kutub*' '**كُتُبْ**' (English: books). The first two are verbs (past simple and past passive respectively) while the last is a plural noun. The diacritics over and under the letters determine the pronunciation and the category of the word. In modern Arabic, however, these diacritics are not written except in special texts, such as Qura'nic and poetry verses to control the consonant pronunciation. Though some language mistakes may happen, Arab laymen can figure out the pronunciation of the word from the context spontaneously.

It is thought that putting Arabic diacritics over and under English words that contain consonant clusters in both initial and final positions may result in improving Arab students' pronunciation of these words. If so, a suggestion might be made to adopt these diacritics to the English alphabetic system when teaching English vocabulary to Arab students. This could be a stage in Arab students' acquisition of English until they master the correct pronunciation of such clusters and their tongues become familiar with the English consonant clusters. Thus, *the present study is*

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an attempt to use Arabic vowel points (harakaat) to facilitate the correct pronunciation of English consonant clusters at initial and final positions.

Research question

The present study intends to answer the following question:

> Do Arabic vowel points (henceforth *harakaat*) over and under English letters improve Arab students' pronunciation of English consonant clusters in initial and final positions?

Research hypotheses

H0: There will be no significant difference at level $p<0.05$ between Arab students' pronunciation of English words with consonant clusters in *initial and final* positions vowelized *with* Arabic *harakaat* and their pronunciation of matching English words with consonant clusters in *initial and final* positions *without* Arabic *harakaat*.

H1: Arab students' pronunciation of English words with consonant clusters in *initial and final* positions *with* Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *initial and final* positions *without* Arabic *harakaat*. Two subsidiary hypotheses are derived from this major hypothesis as follows:

H1a: Arab students' pronunciation of English words with consonant clusters in *initial* position *with* Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *initial* positions *without* Arabic *harakaat*.

H1b: Arab students' pronunciation of English words with consonant clusters in *final* position *with* Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *final* positions *without* Arabic *harakaat.*

Research significance

The present study is a loop in a long chain of attempts to make Arab students pronounce English words correctly or, at least, very close to the pronunciation of English native speakers. The study is audacious in its theme as it tackles a topic that has not -to the knowledge of the researcher- been tackled before, which makes it a pioneer study in this regard. English consonant clusters have proven to be very difficult aspect, if not the most, which Arab speakers face in their pronunciation of English (Avery & Ehrlich, 1992; Mourtaga, 2006; Al-Saidat, 2010; Na'ama, 2011). The study findings will provide language teaching methodologists with a theoretical basis on which they can base their suggestions for improving the quality of teaching and learning English vocabulary through L1 phonotactics and L1specific rule. Besides, the study could form the first step in producing English alphabet with Arabic vowel points which may help Arab students learn vowel pronunciation and perform better in pronouncing English words of simple syllable structure (CVC) as well as words of more complex structures. In addition, the study will add to the literature in Arabic-English contrastive phonetics and English language teaching to

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Arab students. The results may inspire computer software developers to develop a special computer keyword program that accommodates Arabic harakaat over English letters.

Research limitations

The study is limited to single-syllable English words of 3 consonant clusters in the initial and final positions. It is also limited to Arab students learning English as a second or foreign language. Any generalization of the results should consider these two limitations. It is beyond the scope of the study to tackle the detailed description and the articulation of English and Arabic phonemes or the rules of syllable structures in both languages. The British English phonemic transcription provided in the electronic version of Cambridge Advanced Learner's Dictionary (3rd edition) was used in this study, except in some words where the American transcription was adopted (i.e., where /r/ was needed as 'rhotic accent'. (See: Tables 1- 4).

Terms definitions

Consonant Cluster: Although, as Sukkari (2012) indicates, there is no consensus, among English linguists whether consonant clusters should be limited within syllables, in this paper, consonant clusters are limited to any sequence of adjacent consonants, especially those occurring initially or finally in the same syllable (Crystal, 2008, p 81).

Vowel: "Phonetically, they are sounds articulated without a complete closure in the mouth or a degree of narrowing which would produce audible friction; the air escapes evenly over the centre of the tongue" (Crystal, 2008, p. 517).

Diacritic (*harakah*): A "mark placed over, under, or through a letter in some languages to show that the letter should be pronounced differently from the same letter without a mark" (Longman Dictionary, 2003, p. 430).

Vowel Intrusion: The insertion of a vowel (usually a schwa) when pronouncing a consonant cluster in the initial or final position of a syllable.

Minimal Pair: Minimal pair is "two words in a language which differ from each other by only one distinctive sound (one phoneme) and which also differ in meaning" (Richards et al, 1985, p. 178). They are use to test phonemic distinctions in language (Yule, 2006).

Transcription: The act of changing "a piece of writing into the alphabet of another language" (Longman Dictionary, 2003, p. 1766).

Phonetic Transcription: The use of "phonetic symbols for various sounds including symbols to show in detail how a particular sound is pronounced. It is used to show finer points of pronunciation. (Richards et al, 1985, p. 195) in the present study, it is the use of Arabic phonemic symbols with *harakaat* (vowel diacritics) to show the closest pronunciation of a word to its original pronunciation in English.

Previous Studies

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One of the problems in conducting the current study was the grave deficiency of previous studies on the current topic, i.e., Arabic harakaat over English letters. Although there were many studies on Arab students' pronunciation of English sounds that go back to the second half of the last century, their authors have not tackled the use of Arabic harakaat in any form for improving Arab students' pronunciation of English words. They were mostly done on three areas: difficulties which Arab speakers face in pronouncing English consonant clusters, their exertion to cure these problems through L1 transfer, and the effect of vowel points –or in Abu Rabia's terminology: 'vowelization' (1998)- on reading or pronouncing Arabic scripts.

Avery & Ehrlich (1992), for example, investigated the most difficult consonants for Arabic speakers to pronounce and reported that the most noticeable problem in that regard was the pronunciation of the consonant clusters and individual consonants: /θ/, /ð/, /ʧ/, /ŋ/, /ʤ/, /r/. Barros (2003) also investigated the difficulties which adult Arabic speakers have in pronouncing consonants. Although the subjects were six Arabs who have lived in the USA for at least four years, they experienced certain difficulties in eight consonants. She concluded that mother tongue interference was the major factor contributing to pronunciation problems. Besides, Mourtaga (2006) traced some reading problems of Arab EFL school and university students in Gaza Strip and found the English consonant clusters to be the most obvious problem in reading English texts. He pointed out that the problem was not confined to students, but also to Arab teachers of English, and attributed that to the differences between Arabic and English syllable structure. To overcome the problem, students tend to insert a vowel between the consonants, dividing them into two syllables. He suggested different ways of dividing the words of consonant clusters into two words. For example the word '*against*' can be divided into *again* and *st* and to ask students to read the two parts repeatedly until they master the correct pronunciation. Such a technique, however, has to be verified empirically. Al-Saidat (2010) also conducted a case study research of Arab learners of English to find the types of pronunciation difficulties which they encounter, and found that they unintentionally insert an 'anaptyctic' vowel in the onset as well as in the coda of certain English syllables. He called such a process 'declusterization' which, according to him, results from mother tongue influence.

On the other hand, Na'ama (2011) examined the errors produced by 45 Yemeni University students in English consonant clusters. He indicated that English consonant clusters are the most difficult aspects of pronunciation for Yemeni students to learn. He concluded that the errors are either interlingual or intralingual strategies and attributed the first to mother tongue interference (Arabic) and the second to the bad methods of teaching and lack of training. Ahmad (2011) investigated the difficulties which adult Saudi students encounter when pronouncing certain English consonant sounds. The results showed that the Arabic speakers had difficulties in pronouncing certain English consonant sounds, such as: /p/, /d/, /v/, /tʃ/, /ʒ/, and /ŋ/.

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As for L1 transfer, Marzouk (1993) inspected some aspects of phonological transfer from Arabic to English (i.e., vowel transfer and consonant clusters of two or more consonants together in a word). He reported a number of interlingual identifications of epenthesis (phonological intrusion) produced by Arabic learners in their oral production of English. Moreover, Gouskova and Hall (2009) presented experimental evidence showing that the epenthetic vowel that Lebanese Arabic inserts into final CC clusters, which is usually transcribed [i], is backer and shorter in duration than Lebanese lexical [i] for some speakers. Likewise, Sukkari (2012) conducted a contrastive study between the English and Lebanese Arabic consonant clusters and came up with many differences between them.

In relation to 'vowelization', Abu-Rabia (1998) studied the effect of text type, reader type and vowelization on reading narrative, informative, poetic and Koranic Arabic texts, and found that vowels had a significant effect on reading accuracy of poor and skilled readers. In another study, Abu-Rabia (2001) investigated the effect of vowels and context on reading accuracy of 65 skilled adult native Arabic speakers in Arabic and in Hebrew (their second language). He made them read fully vowelized and unvowelized lists of Arabic words, and vowelized and unvowelized paragraphs of Arabic as well as pointed and unpointed lists of Hebrew words, and pointed and unpointed paragraphs of Hebrew. He found that the vowelized texts in Arabic and the pointed and unpointed texts in Hebrew were comprehended significantly better. In Kuwait, Arnold (2010) also trained three Arabic speaking siblings in pronouncing final three-segment consonant clusters for six weeks using English speaker modeling, choral repetition, and self-correction. She recorded the subjects while reading the target words in word lists, sentences, and passages. She compared their performance before training and after training and found that training in pronunciation yielded more target-like pronunciation of final three-segment consonant clusters.

Transliteration vs. Transcription

An important question that entails an answer is whether the Arabic harakaat used over English letters are transliteration or transcription. People sometimes mix up *transcription* and *transliterations* while they are, in fact, two different but related processes. According to Longman Dictionary (2003, p. 1767), *Transliteration* is the conversion of letters or words into another alphabet, but *transcription* is writing down something exactly as it was said (2003, p. 1766). For Holloway (2012), the main aim of transliteration is to provide a different means of reading text using a different alphabet. Both transcription and transliteration focus on providing an accurate phonemic representation, though transliteration is intended to broadly preserve the sounds of the original script. Accordingly, the difference between these two terms can be summarized as: transcription is for sounds, but transliteration is for words and letters. Thus, Arabic harakaat over English letters is a type of phonetic transcription.

Research Methodology

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The present study is an empirical quasi experimental study using a one group design (Spector, 1981) to test two methods of writing English minimal pairs with consonant clusters at initial and final positions in English alphabet and comparing their effect on the pronunciation of these pairs by Arab students. Such a design allows researchers to "measure the effect of an intervention (i.e., instructional activity, innovation, or program)" (Instructional Assessment Resource, 2007). To be more specific, the study measures the effect of using Arabic *harakaat* over and under English minimal pairs written in English graphs to find the effect of these harakaat on Arab students' pronunciation of these pairs. The design enables the researcher to compare means of two methods measured with the same precision (Kirk, 2009). It is hypothesized that the use of Arabic *harakaat* will lead to better pronunciation of the matching pairs by the same group of students who participated in the study.

Research Setting

The study was carried out at Al Ain University of Science and Technology, United Arab Emirates (UAE) during the second semester of the academic year 2013/2014. Al Ain University is a private code university accredited by the Ministry of Higher Education in the UAE. The subjects of the study were students enrolled in the BA degree in English Language Teacher Education program at the College of Education (ELTE). The program, which started in 2005 and continued to grow, aims at preparing teachers of English for elementary schools. Before joining the program, students must pass either the IELTS (with 5 bands) or the TOEFL (with 500 marks). Aside from the university required English language courses that are taken by all students in all majors, all the courses in the program are taught in English. The program is divided into three sections: Obligatory core courses (language skills, linguistics, and literature), general education courses (curriculum, assessment and technology), and language teaching courses (methodology and teaching practice). Among the obligatory core courses are Listening and Speaking 1 & 2 and Phonetics and Phonology 1 & 2. Listening and Speaking 1 and Phonetics and Phonology 1 are offered during the first semester of the second year, while Listening and Speaking 2 and Phonetics and Phonology 2 are offered during the second semester of the second year. The researcher has taught both courses for three semesters.

Data Collection Instrument

Four lists of English minimal pairs of one syllable each were prepared as shown in Tables 1-4. The reason for selecting one syllable words is top to be able to precisely observe and control the students' pronunciation of the consonant clusters. The clusters were taken to represent all the combinations of three consonants in the initial position, except /skj/ and most of the combinations in the final position, as it was difficult to include all combinations in such a position. The structure of this cluster in initial position was CCC+V where /s/+ one of /p, t, k/ + one of /l, r, w/ were used. For example, *Splash*, *Spring*, *Stress*, *Screeds*, *Squash*, etc.

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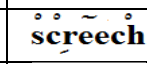
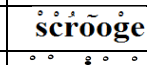
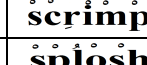
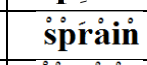
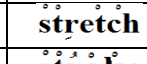
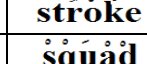
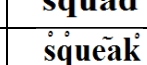
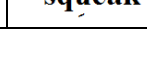
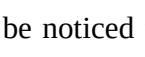
- List (A) was developed of 10 English words with three consonant clusters in the *initial* position. The words in this list (A) were written in English symbols **without** diacritics (harakaat). **Table 1**

Table 1: List (A) Words with 3 consonant clusters in **initial** position written in English letters **without** Arabic *harakaat*

No	Word	Cluster Position	Pronunciation
1	screeds	Initial	/skri:dz/
2	screw	Initial	/skru:/
3	script	Initial	/skrɪpt/
4	splodge	Initial	/splɒdʒ/
5	spring	Initial	/sprɪŋ/
6	spray	Initial	/spreɪ/
7	stress	Initial	/stres/
8	stroll	Initial	/strəʊl/
9	squash	Initial	/skwɒʃ/
10	squeal	Initial	/skwi:l/

- List (B) was developed of 10 English words matching the words in List (A) with three consonant clusters in the *initial* positions. Arabic harakaat were used in this list over and under each sound utilizing the *Paint* program in Microsoft Windows 7. (**Table 2)**

Table 2: (List B) Words with 3 consonant clusters in **initial** position written in English letters **with** Arabic *harakaat*

No	Word	Position	Pronunciation
1		Initial	/skri:tʃ/
2		Initial	/skru:dʒ/
3		Initial	/skrɪmp/
4		Initial	/splɒʃ/
5		Initial	/sprɪnt/
6		Initial	/spreɪn/
7		Initial	/stretʃ/
8		Initial	/strəʊk/
9		Initial	/skwɒd/
10		Initial	/skwi:k/

As can be noticed from Tables 1 and 2, all the initial positions started with /s/ as it is the only phoneme that can start English 3-consonant cluster syllables.

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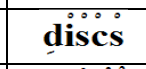
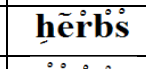
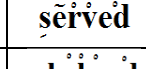
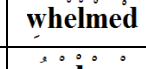
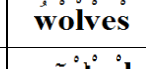
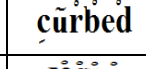
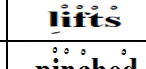
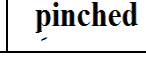
- List (C) was developed of 10 English words with three consonant clusters in the *final* position. The words in this list (C) were written in English symbols **without** diacritics (harakaat). (**Table 3)**

Table 3: List (C) Words with 3 consonant clusters in **final** position written in English letters **without** Arabic *harakaat*

No	Word	Cluster Position	Pronunciation
1	risks	Final	/rɪsks/
2	curbs	Final	/kɜːbs/
3	winked	Final	/wɪŋkt/
4	curved	Final	/kɜːvd/
5	filmed	Final	/fɪlmd/
6	selves	Final	/selvz/
7	herbed	Final	/hɜːbd/
8	gifts	Final	/gɪfts/
9	winched	Final	/wɪntʃt/
10	facts	Final	/fækts/

- List (D) was developed of 10 English words matching the words in List (C) with three consonant clusters in the *final* positions. Arabic harakaat were also used in this list over and under each sound utilizing the *Paint* program in Microsoft Windows 7. (**Table 4)**

Table 4: List (D) Words with 3 consonant clusters in **final** position written in English letters **with** Arabic *harakaat*

No	Word	Position	Pronunciation
1		Final	/dɪsks/
2		Final	/hɜːbz/
3		Final	/lɪŋkt/
4		Final	/sɜːvd/
5		Final	/welmd/
6		Final	/wʊlvz/
7		Final	/kɜːbd/
8		Final	/lɪfts/
9		Final	/pɪn ʧt/

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10	pacts	Final	/pækts/

- The 20 words in List (A) and List (C) were given numbers from 1 to 20. They represent consonant clusters *without* Arabic harakaat, while numbers from 21 to 40 were assigned to the 20 words in List (B) and List (D) to represent consonant clusters *with* harakaat. All words in the four lists were inputted into Power Point slides in the same order and with the same numbers. They were written with white color on dark blue background with font size 100 Arial, centered at landscape orientation. Each slide had only one single word that flashes automatically for 5 seconds and then fades away (See the Attached material: Power Point slides)

Arabic Harakaat Used in Data Collection Instrument

~ (madd) = long vowel
ُ (dhammah) = /ʊ/, /ɒ/
َ above the consonant (fat-hah)= /æ/, /ə/
ِ under the consonant (kasrah) = /e/, /ə/
ْ = over an consonant followed by another consonant

Participants

40 students were randomly selected from 56 students who were in the second, third and fourth year of their study in the ELTE program at Al Ain University of Science and Technology. Consent form was distributed to them, assuring them that their participation in the study would neither affect their grades in any of the courses nor reveal their personality in any term. The subjects were individually exposed to the Power Point slides that had the list of the English minimal pairs written in Arabic symbols (the previous section). Each subject was recorded while reading the words.

Data Collection

Each participant was given a number. The data show was played in one small classroom. Each participant was exposed to the 40 words one time. As mentioned in the previous section, each word was written in a single slide. Each word appeared for 5 seconds and then faded automatically. The interval between the fading of a word and the appearance of the next word was 2 seconds. Each participant was asked to read each word while being recorded, using one of the latest technology of mini recorders from Sony (Model ICD-PX312).

Data Analysis

Records were played and participants were scored on a scale of three: *Different* = 0 and *Close* = 1, and *Very Close*= 2. The reason for adapting such terms is based on the fact that second or foreign language learners will never reach the level of native speaker proficiency, especially in pronunciation (Yule, 2006). To have a reliable scoring, the records were played by two raters

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who have MA degrees in English language teaching. The two raters were provided with the phonemic transcription of each word taken from the electronic version of Cambridge Advanced Learner's Dictionary (3rd Ed) to guarantee reliable judgment of the subjects' pronunciation. Although harakaat were put over all sounds in each word, raters were instructed to judge each participant in the pronunciation of the consonant clusters only. The scores of the two raters were compared and Cronbach's Alpha was calculated for the two main lists revealing high agreement ($\alpha = 0.94$). To test the research hypothesis (*H1*) (directional hypothesis) and to reject the null hypothesis (*H0*), paired T-test was computed using SPSS program version 16.0 to compare the means of participants' scores in pronunciation of the consonants with harakaat (Lists B & D) with the means of their scores in pronunciation of the consonants without harakaat (List A & C). To test *H1a* and *H1b*, paired T-tests were also calculated between the means of participants' scores in list A and their scores in List B and the means of their scores in List C with their scores in List D using paired T-test, too.

Results

The average score for each participant was calculated and considered the score obtained in each word. Total scores were added for each participant and means of each list were also calculated as shown in Table 5 below:

Table 5: Participants average scores in the four lists

Participant Number	Average Scores in List A and C	Average Scores in List B & D	Participant Number	Average Scores in List A and C	Average Scores in List B & D
1	38.5	39.5	**21**	39	40
2	36.5	39	**22**	32	36
3	39.5	39	**23**	36	39.5
4	27	28.5	**24**	31	38
5	39.5	36.5	**25**	19.5	28
6	26	34.5	**26**	36	39.5
7	31	25.5	**27**	38.5	39.5
8	35.5	33	**28**	39	40
9	32.5	30	**29**	31.5	27
10	30.5	31	**30**	23.5	32.5
11	35	37	**31**	25.5	28.5
12	18	22	**32**	22	20.5
13	32.5	34	**33**	34.5	39
14	30	29.5	**34**	35.5	40
15	37.5	38	**35**	19.5	24.5

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16	18	17	**36**	33.5	34
17	21.5	28	**37**	19.5	21.5
18	38.5	36.5	**38**	16	17
19	38	36.5	**39**	30.5	35.5
20	21.5	17	**40**	22	22.5

The total average score was 30.29 in lists A and C and 31.88 in lists B and D. Participants' average scores ranged between 39.5 (the highest) and 16 (the lowest) in lists A and C (words without harakaat) and between 40 (the highest) and 17 (the lowest) in lists B and D (words with harakaat).

Results of Paired T-tests

1. The results of testing the research major hypothesis ***H1*** (i.e., Arab students' pronunciation of English words with consonant clusters in *initial and final* positions that are vowelized with Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *initial and final* positions that are not vowelized with Arabic *harakaat*) using paired t-test showed significant differences between the mean of words with harakaat (*M*=31.8750, *SD*= 7.27460) and the mean of words without harakaat (*M*=30.2875, *SD*=7.34575) at *P*= (*T*(39) =2.807, *P*=0.01) favoring writing words with harakaat. Table 6 summarizes the results.

Table 6: Paired Sample Statistics and T-test for all words with and without harakaat

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	All Words with harakaat	31.8750	40	7.27460	1.15022
	All Words without harakaat	30.2875	40	7.34575	1.16147

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 All Words with harakaat - All Words without harakaat	1.58750	3.57679	.56554	.44359	2.73141	2.807	39	.008

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2. For ***H1a*** (i.e., Arab students' pronunciation of English words with consonant clusters in *initial* position that are vowelized with Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *initial* positions that are not vowelized with Arabic *harakaat*), the t-test showed significant differences ($T(39) = 3.029$ $P<0.01$) between the mean of writing words with harakaat ($M=16.3750$, $SD=3.49496$) and the mean of writing them without harakaat ($M=15.0750$, $SD= 4.67063$) beyond $p < 01$, as follows: (Tables 7)

Table 7: Paired Sample Statistics and T-test for consonant clusters in initial position

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Consonants in initial with harakaat	16.3750	40	3.49496	.55260
	Consonants in initial without harakaat	15.0750	40	4.67063	.73849

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Consonants in initial with harakaat - Consonants in initial without harakaat	1.30000	2.71463	.42922	.43182	2.16818	3.029	39	.004

3. For ***H1b*** (i.e., Arab students' pronunciation of English words with consonant clusters in *final* position that are vowelized with Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *final* positions that are not vowelized with Arabic *harakaat*), t-test showed no significant differences between the mean of clusters with harakaat ($M= 16.0500$, $SD= 2.57652$) and the mean of clusters without harakaat ($M= 15.2500$, $SD= 3.61443$). The T value ($T(39)=1.964$) was non-significant at 0.05 level, though words with harakaat were favored over words without harakaat as shown in Table 8.

Table 8: Paired Sample Statistics and T-test for consonant clusters in final position

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Consonants	16.0500	40	3.59094	.56778

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in final with harakaat	15.2500	40	3.61443	.57149
Consonants in final without harakaat				

	Paired Differences					t	df	Sig. (2-tailed)
Pair 1	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Consonants in final with harakaat - Consonants in final without harakaat	.80000	2.57652	.40738	-.02401	1.62401	1.964	39	.057

Discussion

The recent study was carried out to test the effect of using Arabic harakaat on English consonant clusters at initial and final positions. It was hypothesized that using these harakaat would result in better pronunciation of these consonant clusters by Arab students. Accordingly, three directional hypotheses (one major and two subsidiaries) were tested at significant level $p<0.05$. The first hypothesis (*H1*) stated that: Arab students' pronunciation of English words with consonant clusters in *initial and final* positions *with* Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *initial and final* positions *without* Arabic *harakaat*. The results proved this hypothesis (*H1*) showing paired t-test to be 2.807 ($p< 0.008$) and rejected the stated null hypothesis (*H0*) beyond level $p<0.05$. Such results support the claim that using Arabic harakaat over and under English consonant clusters (vowelizing) would improve their pronunciation by Arab students.

Furthermore, the results supported the first subsidiary hypothesis (*H1a*) that Arab students' pronunciation of English words with consonant clusters in *initial* position *with* Arabic *harakaat* will be significantly better than their pronunciation of matching English words with consonant clusters in *initial* positions *without* Arabic *harakaat*. The revealed paired *t*-test was 3.029 which is far significant beyond $p<0.05$. As for the second subsidiary hypothesis of the study (*H1b*), the value of the paired *t*-test (1.964) was not significant at $p<0.05$, though significant at $p<0.1$, to reject the null hypothesis. The t-value needed to reject the null hypothesis at $p<0.05$ with $df=39$ is 2.0227. So, the results of testing H1b suggest that Arab students may not benefit from

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vowelizing consonant clusters in final position as they might do from vowelizing consonant clusters in both positions or in initial position.

The findings of this study are in harmony with the previous studies in the general claim that English consonant clusters are one of the most difficult concepts which Arab students have in ESL pronunciation (Avery & Ehrlich, 1992; Mourtaga, 2006; Al-Saidat, 2010; Gouskova and Hall, 2009). The results partially support Na'am's (2011) claim that Arab students repeatedly make errors in English clusters. Na'ma's claim that no one of his subjects (45 university students) could pronounce the 3 consonant cluster words in initial position should be reconsidered as the results of the current study shows full marks for some students in such a matter. While Na'am's subjects inserted a short vowel after the second consonant and before the third consonant, the common noticeable behavior among Arab students is to insert a schwa between the first and the second consonants, so /*spred*/ is pronounced as /*səpred*/. Training Arab students to pronounce English words with consonant clusters in initial and final positions along with Arabic harakaat, as Abu-Rabia (2001) did with Arabic and Hebrew, could yield a better pronunciation of these words and solve one of the commonly noticed problems in this regard.

In addition, the results showed that consonants cluster /str/ in the words *stroll* and *stroke* in initial positions, and /fts/ and /kts/ in the words *gifts*, *facts* and *pacts* in final positions were the easiest as participants obtained 73.5, 74.5, 78, 78, and 77.5 average scores respectively (Table 9).

Table 9: The easiest and most difficult pairs pronounced by subjects

Score	Initial				Final			
	Without Harakaat		With Harakaat		Without Harakaat		With Harakaat	
	Word	Score	Word	Score	Word	Score	Word	Score
Highest	stroll	73.5	stroke	74.5	gifts facts	78 78	pacts	77.5
Lowest	squeal	46	sprain	59.5	curbs	40	served	33.5

The words *stroll*, *gifts*, *facts* were in the lists written without harakaat, while *stroke* and *pacts* were in the lists written with harakaat. One possible reason for that is the participants' familiarity with the words, (i.e., they are words which students frequently encounter in their daily events). On the other hand, the initial position clusters /skw/ and /spr/ in the words *squeal* and *sprain* had the lowest average scores (46 and 59 respectively), while final position clusters /rbz/ and /rvd/ in the words *curbs* and *served* had also the lowest average score (40 and 33.5 respectively). Such findings indicate the level of difficulty which Arab students have in pronouncing these clusters. Arab students usually insert a schwa /ə/ between the /v/ and the /d/ in *served* and between the /b/ and the /z/ in *curbz*. The long vowel /ɜ:/ seems to be one of the difficult vowels in English for

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Arab learners. However, such a claim needs to be tested through experimental data in future researcher. The difficulty in pronouncing /skw/ and /spr/ in initial position is related to Arabic phonotactics where it is prohibited to start a syllable with two or more consonants. Such a rule results in the intrusion of the vowel /I/ before the first consonant, leading to dividing the syllable into two: the first with two consonants at the coda position and the second with one consonant at the onset position. This is not to mention the shift of the stress from the first syllable into the second syllable. The word *squeal*, for example, would be then transcribed as /ɪsk.ˈwi:l/. As for /spr/, Arab students, especially beginners, seem to insert a schwa /ə/ that divides the word into two syllables with the second syllable stressed, too. For instance, the word *sprain* /spreɪn/ is pronounced as /səpˈreɪn/ making two syllables with onset and coda both in a balanced number of consonants in each position. Such results are in harmony with Mourtaga's (2006) who reported that Arab EFL students tend to divide the English consonant clusters by inserting a vowel between them so as to facilitate pronunciation.

Participants were asked after being recorded whether Arabic harakaat helped them in their pronunciation or not. 34 students (85% of the sample) said harakaat helped them very much, while the remaining 6 (15%) of the subjects said they help them somehow. Such results lend a support the major hypothesis (H1) of the study as well as the supportive hypothesis (H1a).

Implications and conclusions

Based on the results of the current study, language teachers who are involved in teaching English to Arab students may develop lists of English words that contain consonant clusters in both initial and final positions vowelized with Arabic harakaat for their students to practice on daily bases until they overcome the difficulty of consonant clusters. This may mark the reappearance of the issue of L1 role in learning L2, which is not settled yet. The matter that is indisputable is that some SL aspects are difficult to learn; others are easy. According to behaviorists, the level of difficulty in learning an SL item depends on the degree of its similarity to L1. The more different it is, the more difficult it becomes (James, 1980; Ellis, 1985; Larsen-Freeman & Long, 1991). In language teaching, such an idea has led to Contrastive Analysis (CA), where teachers of a second language become responsible for comparing and contrasting learners' L1 and L2 to find the similarities that facilitates learning through positive transfer and differences that lead to negative transfer and consequently errors (James, 1980).

Apart from the criticism which CA has received, and the new trends in language teaching, L1 continued to play an important role in L2 acquisition. To use L1 in L2 classes, however, is still controversial (Mouhanna, 2009). For example, while the advocates of Grammar Translation method see it as a crucial part of L2 teaching and learning, the proponents of communicative language teaching approach allow the teacher to use L1 in teaching L2 in limited cases. On the other hand, direct method and natural approach supporters banned using L1 in teaching L2 and consider it like a sin (Larsen-Freeman, 1986).

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The findings of the study will be of great value to contrastive phonetics and language teaching as well as reading theory. The use of Arabic diacritics over and under English words would open the door for more research on this area and help improve the teaching process of sounds, vocabulary and reading. Further research, however, is needed in more than one syllable-word in English with Arabic harakaat to have a broad view of the effect of using these harakaat on English words. Moreover, research is also needed on other aspects of English sound pronunciation, such as the most difficult English vowel for Arab students and the way teachers could help with harakaat to solve this problem.

In conclusion, the present study tried to introduce a new teaching technique that may help Arab students pronounce English consonant clusters. Such a technique depends on using Arabic harakaat over and under English words of three consonant clusters in initial and final position. This technique is based on the results of presenting two main lists of English words of three consonant clusters in initial and final position to a group of Arab university students to read them. One of the lists was written with Arabic harakaat and the other was written without harakaat. The results were in favor of the using Arabic harakaat over and under English words.

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