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Diagnosing Saudi Students' English Consonant Pronunciation Errors

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Abstract
Diagnosing the pronunciation difficulties second language (L2) learners encounter assists in identifying their training needs. Since a clearer profile of Arab students' English pronunciation difficulties is yet to be reached, this study tried to identify which English consonant sounds and clusters Saudi English-as-a-foreign-language (EFL) students have difficulty in pronouncing, and examine how students' language proficiency levels may influence their English consonant pronunciation performance. Forty Saudi female university students with two different English proficiency levels (lower-intermediate versus intermediate) took part in the study (20 students in each group). They completed a 4-section productive pronunciation test diagnosing their errors in pronouncing problematic consonant sounds and clusters in varied word positions. The data analysis showed that the participants' highest error percentages were in pronouncing: /ʒ/, /ŋ/, /p/, /ɹ/ and/ʧ/; /t/ and /d/ of the regular past morpheme -ed; and the 4- and 3-consonant clusters. It was also found that the lower-intermediate level students made more errors than the intermediate ones in pronouncing the majority of the consonant sounds and clusters, and that the variance between their errors is generally higher in the word-initial positions than the word-medial and -final ones. The study indicates that the consonants in the word-initial and -final positions are likely to cause more pronunciations difficulties than the ones in the word-medial position.
Keywords: Arab students, consonant pronunciation, English pronunciation, pronunciation errors, Saudi learners

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1. Introduction

Pronunciation plays an essential role in communication because it makes speech comprehensible and intelligible (Varol, 2012). Proper pronunciation can promote L2 acquisition, while poor pronunciation may lead to hindering it (Zhang, 2009). L2 learners encounter more difficulties in mastering the target language pronunciation when they are exposed to a linguistic system whose characteristics are different from those of their first language (L1). Pronunciation errors can also influence other linguistic features such as spelling. In some cases, learners' foreign accent is affected in one way or another by their native one (Vergun, 2006). Other factors potentially influencing L2 learners' pronunciation include age, gender, motivation, language learning experience and attitude towards the target language.

Several studies have tried to provide insights into the main pronunciation difficulties ESL/EFL learners encounter (e.g., Ambrozová, 2014; Centerman & Krausz, 2011; Nguyen, 2007; Varol, 2012). Some other studies have focused on identifying the English pronunciation errors commonly made by Arab learners. Specifically, these studies investigated the English pronunciation difficulties of students in Yemen (Al-Shuaibi, 2009), Jordan (Al-Saidat, 2010), Sudan (Hassan, 2014), Oman (As-Sammer, 2014), and Saudi Arabia (Ahmad, 2011; Ahmad & Nazim, 2013; Al-Jasser, 1978, Alqarni, 2013; Ammar & Alhumaid, 2009; Binturki; 2008).

Though many of these studies revealed significant findings about the English pronunciation difficulties Arab learners encounter, there is a need for reaching a clearer profile of such difficulties. In an attempt to contribute to such profile, the study reported in this paper focused on diagnosing Saudi EFL students' English consonant pronunciation errors. Given the purpose of the present study, the following section provides a description of the difficulties Arab learners are likely to encounter in English consonant pronunciation and their potential factors.

2. Consonants in English and Arabic

In order to understand how a new phonological system is acquired, we need to consider linguistic differences in both L1 and L2 systems. It is commonly noted that the influence of L2 speakers' mother tongue is characterized by their accents. Arabic and English have quite different phonological systems. While Arabic is descended from the Afro-Asiatic Central South Semitic language family (Al-Huri, 2015), English is a member of the Indo-European West Germanic language one (Baugh & Cable, 2002). Due to these phonological system differences, Arab learners are expected to encounter many difficulties in English pronunciation, particularly English consonants.

There are some main differences between Arabic and English consonants. Arabic has 28 consonants, whereas English has 25 ones. Most of the consonants in Arabic and English are identical, but some of them are only found in one language rather than the other. Second language learners can easily acquire consonants shared in the two languages whereas they find difficulty in learning the pronunciation of the ones that exist only in one language (El Zarka, 2013). Some English consonants are not found in Modern Standard Arabic such as /p/, /v/, /g/, and /ʧ/.

Apart from the English consonants not found in Modern Standard Arabic, the phonological systems of the two languages differ in the characteristics of their consonant clusters. A consonant

cluster is a syllable structure feature and a group or combination of consonant sounds occurring together with no intervening vowel; it can come at the beginning or end of words. While English permits initial clusters of either two or three consonants (e.g., pray and spray, respectively) and two, three or four final-consonant clusters (e.g., ask, asked, and texts, respectively), Arabic has no initial-consonant clusters but allows final 2-consonant cluster (Amer, 2010). Accordingly, English as compared to Arabic has more varied and longer consonant combinations. With these different English consonant cluster features, Arab EFL/English-as-a-second-language (ESL) learners may tend to insert a vowel somewhere within a consonant combination (Ammar &Alhumaid, 2009; Al-Shuaibi, 2009; Na'ama, 2011).

Another factor of Arab learners' difficulties in English consonant pronunciation is the differences between the writing systems of English and Arabic. While the Arabic orthographic system is a shallow one in which a letter corresponds closely to phonemes, the orthography system of English is deep and goes beyond sound-to-letter correspondence (El Zarka, 2013). Thus, the complexity of the English orthographic system allows sounds to be spelled in more than one way and letters to represent more than one sound and most rules for spelling have many exceptions (Bassetti, 2009). For example, while spoken English has three ways of pronouncing the morpheme -s (the regular plural and third- person singular simple present suffixes), written Arabic uses a single spelling. This inconsistency makes English consonant pronunciation a complicated process for nonnative speakers.

In light of the above-mentioned differences in the characteristics of consonant sounds and combinations in the phonological system of Arabic and English, Arab learners of English are expected to encounter difficulties in English consonant pronunciation. It is noteworthy that not much research has been reported about the types or frequencies of these difficulties. This will be highlighted in the next section.

3. Previous Related Studies

Some studies probed the pronunciation difficulties encountering non-Arab learners of English. For example, Nguyen (2007) looked at the errors made by Vietnamese learners in pronouncing the final consonants in English. The pronunciation performance of 5 learners of different ages was evaluated by six native-speakers of English. The results of this study revealed that when pronouncing English word-final consonants, Vietnamese learners tend to add schwa or replace them with sounds closer to their mother-tongue consonants. In another study, Varol (2012) investigated the influence of Turkish phonology on the pronunciation of English words which exist in Turkish as Indo-European loanwords. The results of this study indicate that Turkish adult speakers face difficulties in pronouncing the English phonemes θ, ð, ɹ, and t which do not exist in their L1. These sounds were replaced by the participants with the closest Turkish phonemes t, d and r. In the Swedish context, Centerman and Krausz (2011) investigated the errors made by public school students in pronouncing the English speech sounds /θ/, /ð/,/ʧ/, /ʃ/ and /ʤ in initial and final positions. The results indicate that Swedish L2 students have more difficulties in pronouncing these sounds when they are in initial positions than in final ones due to their absence in Swedish language. In a study of the English pronunciation difficulties encountered by Czech learners of English, Ambrozová (2014) found that their four main problematic sounds are dental fricatives /θ/, /ð/, aspirated plosives /p/, /t/, /k/, bilabial approximant /w/ and velar nasal /ŋ/. The cause of these

pronunciation difficulties was attributed to the influence learners' L1 phonetic system. As can be noted, difference between L1 and L2 phonological systems was the main cause of consonant pronunciation as noted in these studies.

The researchers examining the consonant pronunciation difficulties of Arab learners of English depended on the Contrastive Analysis Hypothesis (CAH) and/or the Critical Period Hypothesis (CPH) as a point of departure for their studies. Collectively, these studies support the conclusion that differences in Arab backgrounds and Arabic dialects result in different mispronunciations in English. In the ESL context, Barros (2003) examined the pronunciation difficulties of 6 Arabic native speakers who arrived in the USA after the age of puberty. Though the results of the study showed that /ŋ/, /p/, /v/, /d/, and /ʤ/ were their most frequently mispronounced consonants, the degree of pronunciation difficulties varied among the learners due to their different L1 dialects. In the Jordanian context, Al-Saidat found that Arab learners of English tended to insert a short vowel between consonants at the beginning and end of certain English syllables. On the other hand, Na'ama's (2011) study revealed that Yemeni University had difficulty in pronouncing the 3- and 4-final-consonant clusters in English words because these clusters are not found in Arabic segmental features. Finally, Hassan (2014) found that Sudanese learners of English have pronunciation difficulties in consonant sound contrasts such as /z/ and /ð/, /s/ and /θ/, /b/ and /p/, /ʃ/ and /ʧ/.

A group of studies focused particularly on the pronunciation errors made by Saudi learners of English. An earlier study was reported by AL-Jasser (1978) who found that /p/, /v/, /g/, /r/, /ʧ/, /ʒ/ and /ŋ/ which do not exist in Arabic as independent phonemes are problematic sounds for Saudi learners of English. In an ESL context, Binturki (2008) found that Saudi students have difficulty in pronouncing the voiced interdental fricative /v/, /p/ and /ɹ/, and that such difficulties depend on their word positions. Ammar and Alhumaid (2009) investigated Najdi Arabic's phonetic interference in the acquisition of English consonants and consonant cluster by Saudi female undergraduates. Their study looked at the sounds /p/, /v/, /ŋ/, /ʧ/, /ʤ/, /ʒ/, /ð/, /θ/, /r/, and /l/ in all initial, medial and final word positions. The results of this study have emphasized the influence of L1 interference on Arab L2 learners of English. Besides, Ahmad's (2011) study indicates Saudi learners of English have difficulty in pronouncing the following consonant sounds are: /p/, /d/, /v/, /ʧ/, /ʒ/, and /ŋ/. Drawing on the CAH, Alqarni (2013) investigated Najdi Saudi ESL learners' production of the English voiceless postalveolar affricate /ʧ/. This study showed that the learners encountered difficulties in pronouncing the sound /ʧ/ usually replacing it with /ʃ/ particularly in final words positions. Adopting a different approach, Ahmad and Nazim (2013) explored teachers' views on English consonant pronunciation errors made by Saudi EFL learners. In this study, the teachers reported that their students generally make frequent errors in pronouncing /p/, /d/, /v/, /ʧ/, /ʒ/, and /ŋ/.

As these previous studies show, both Arab and non-Arab learners of English have difficulties in pronouncing English consonants not found in the phonological systems of their L1s. Due to the wider differences between Arabic and English consonant features, Arab learners of English are particularly expected to encounter more difficulties. Given this, further research attempts are needed to reach a clearer profile of Arab EFL/ESL learners' consonant pronunciation problems and what may influence them. One way for accomplishing this is to use a measure for examining

a wider range of the potential consonant pronunciation difficulties in varied word positions. Important also is to look at how these errors vary among learners with different language levels. Addressing these issues in the Saudi context, the present study tried to answer the following two research questions:

1. Which English consonant sounds and clusters do Saudi female EFL learners have difficulty in pronouncing?
2. How do learners with different language proficiency levels vary in their English consonant pronunciation performance?

3. Method

3.1 Participants of the Study

The sample of this study consisted of 40 Saudi female students. They were enrolled in an undergraduate program at a Saudi university and their ages ranged from 19 to 24 years at the time of collecting the data. The participants were divided into two groups, each consisted of 20 students. The students in the first group were of an intermediate English language proficiency level, whereas the ones in the second group had a lower-intermediate level. Identifying the participants' language proficiency was based on their academic study levels, i.e., intermediate students were studying Level 4 courses and lower-intermediate ones were attending Level 1, and on the language ability evaluation made by their teachers. All the participants studied English formally in Saudi schools for six years (four classes per week with each lesson lasting 45 minutes) before joining the university. They took part in the study on a voluntary basis and informed consent was obtained from them prior to collecting the data.

3.2 Instrument of the Study: the English Consonant Pronunciation Test

To fulfill the purpose of this study, a productive pronunciation test of English consonants was developed to assess the participants' oral performance. The test was developed based on reviewing the instruments used in the studies reported by Barros (2003), Binturki (2008), Ammar and Alhumaid (2009) and Ahmad (2011). Three drafts of the test were developed based on the consultations between the two authors. The final draft of the test consists of four parts, each includes a list of words (see Appendix). The first part includes a list of 30 words with 10 problematic sounds, /p/, /v/, /ʃ/, /ʤ/, /ŋ/, /ʒ/, /ɹ/, /l/, /ð/ and /θ/, distributed in three word-positions (initial, medial and final), with the exception of the sound /ʒ/ which only occurs in word-medial and -final positions, and the sound /ŋ/ was tested in final position only. Additionally, 20 words were used as distracters. Focusing on these 10 sounds in particular was due to their absence in the Arabic phonological system. Relying on the contrastive analysis, differences between Arabic and English phonological systems lead to the prediction that these 10 consonant sounds are likely to be problematic for Arab learners of English. The second and third parts tested the difficulties related to the phonetic realization of the morpheme -s (the regular plural and third- person singular simple present suffixes) and its three pronunciation alternatives- [s], [z] or [ɪz]- and the regular past tense morpheme -ed with its three pronunciation ways- [d], [t] or [ɪd]. These two parts include 16 words, eight words for each morpheme, beside 6 words used as distracters. Finally, the fourth part includes a list of 12 words used to examine the difficulties encountered in pronouncing English consonant clusters. Six words were used to test the word-initial consonant clusters and other 6 words were used for the word-final consonant clusters. Besides, 6 other words were used as

distracters. The measure tested the students' pronunciation of consonant clusters in initial and word-final positions, and it includes 2- and 3-constanant clusters (CC and CCC, respectively) in word-initial positions whereas 2-, 3- and 4-consanant clusters (CC, CCC and CCCC respectively) were used for final ones. Thus, five types of consonant clusters were included in the test.

3.3 Data Collection and Analysis Procedures

Prior to collecting data, institutional and participant informed consent was obtained. The first author explained to the participants the general purpose of the study and the recording procedures, and notified them that the test would be used only for academic and research purposes. The pronunciation test developed was given to each participant in a quiet room at their university. They were given a printed version of the test and asked to read the four lists of words silently for five minutes to get familiar with them. Following this, the researcher recorded each participant's pronunciation performance using a high sensitive recorder while they were reading the words in the four lists. The participants were informed they could reread any word if they thought it has been mispronounced.

After collecting the data from all the participants, the recordings were saved as digital sound files and labeled individually by numbers "S1, S2" etc. for easy access and to ensure the protection of students' identities. Following this, the recordings were co-analyzed by the two authors. Each target sound was phonetically transcribed by using the International Phonetic Alphabet (IPA).Then, a female American English native speaker, was consulted to check the accuracy of the transcribed data. The data obtained from analyzing students' pronunciation performance was calculated. Any pronunciation error made was counted as one and a score of zero was given for a correct answer. The pronunciation errors made by each participant were tabulated and converted into percentages. Then, the average percent frequencies of the pronunciation errors were calculated for all problematic sounds and consonant cluster in different word positions in each group.

4. Results of the Study

The results obtained from statistical analysis of the students' performance on the pronunciation test are presented in this section. These results are presented in the light of the two research questions. First, the results of analyzing all the participants' pronunciation are presented quantitatively. Second, a comparison between the pronunciation errors of the participants in the two language proficiency levels is provided.

4.1 Frequencies of Students' Consonant Pronunciation Errors

In this section, the authors provide the frequencies of the participants' errors in pronouncing the 10 problematic consonant sounds, the morphemes -s and -ed of the regular plural and simple present, and the past tense suffixes, and consonant clusters. Table 1 shows the frequencies of the participants' errors in pronouncing the 10 problematic consonants. As shown in the table, the participants have pronunciation difficulties in many of these English consonant sounds. Specifically, the highest frequencies of the participants' errors were in pronouncing the following 6 consonants: the voiced postalveolar fricative /ʒ/ (error percentage = 84.20%), the voiced velar nasal /ŋ/ (error percentage = 80.80%), the voiceless bilabial plosive /p/ (error percentage = 63.33), the voiced alveolar approximant /ɹ/ (error percentage = 56.70%), the voiced interdental fricative /ð/ (error percentage = 46.70%), and the voiceless postalveolar affricate /ʧ/ (error percentage =

30%). They also made errors in the other 4 consonants but with much lower frequencies: the voiced labiodental fricative /v/ (error percentage = 14.20%), the voiceless interdental fricative /θ/ (error percentage = 10.83%), the voiced alveolar lateral approximant /l/ (error percentage = 7.5%) and the voiced velar plosive /g/ (error percentage = 5%).

Table 1. *Mean percentages of all students' mispronunciation of the problematic consonants*

problematic consonants	initially	medially	finally	All positions
/ʒ/	---	77.50%	87.50%	84.20%
/ŋ/	---	---	80.80%	80.80%
/p/	57.50%	70%	62.50%	63.33%
/ɹ/	45%	62.50%	62.50%	56.70%
/ð/	42.50%	12.50%	85%	46.70%
/ʧ/	45%	30%	15%	30.00%
/v/	20%	12.50%	10%	14.20%
/θ/	30%	2.50%	0%	10.83%
/l/	2.50%	5%	15%	7.50%
/g/	0%	5%	0%	5.00%

As noted also in table 1, the percent frequencies of the pronunciation errors made in different word positions vary from one sound to another. For example, the participants made more errors in pronouncing /p/ and /ɹ/ in the word-medial and -final positions than in the word-initial ones. Similarly, they made more pronunciation errors in the word-final position than the medial and/or initial one of /ʒ/, /ð/ and /l/. In contrast, more errors are noted in their pronunciation of /ʧ/, /v/ and /θ/ in word-initial positions than in the medial and final ones. Compared to word-initial and -final positions, the errors made in pronouncing the test words in word-medial positions are not of the highest frequency in all the 10 sounds with the exception of /p/ and /g/.

The frequencies of the participants' errors in pronouncing the morphemes -s and -ed of the regular plural and simple present, and past tense suffixes are given in table 2. As noted in the table, the highest number of errors was made in mispronouncing the sounds /t/ and /d/ of the morpheme -ed (error percentage = 68.75%). In many cases, the participants made this error by deleting the morpheme, or replacing it with -d and inserting a vowel prior it; for example, pronouncing "jumped" [ʤʌmpt] as [ʤʌmp] or [ʤʌmpɪd]. The second highest frequency of errors was made in pronouncing the sound /ɪz/ of the morpheme -s (error percentage = 20 %). The participants made a few number of errors in pronouncing the sounds /s/ or /z/ of the morphemes –s, and the sound /ɪd/ of the of the morpheme -ed. The pronunciation errors of the sounds of the two morphemes were made mainly due to the participants' tendency to generalize their pronunciation by uttering them as /s/ or /d/, and to the difficulty in pronouncing word-final consonant clusters (the final consonant + -s or -d).

Table 2. *Mean percentages of all students' mispronunciation of the morphemes -s and -ed of the regular plural and simple present, and past tense suffixes*

-s			-ed		
/s/ or /z/	**/ɪz/**	**Total of errors**	**/t/ or /d/**	**/ɪd/**	**Total of errors**
10 %	20 %	15.02%	68.75%	5 %	36.88%

Table (3) gives the mean percentages of all students' mispronunciation of consonant clusters in word-initial and -final positions. As noted, the participants' errors in pronouncing word-final clusters (error percentage = 48.33%) are much higher than their mispronunciation of the word-initial ones (error percentage = 12.08%). Additionally, they made much more errors in pronouncing 3- and 4-consanant clusters than the 2-consonant ones. This indicates that the more consonants these clusters contain, the more difficult their pronunciation becomes. The participants made the least errors in pronouncing the 2-consonant clusters in word-initial position (error percentage = 0.83%). This can be interpreted by the fact that their Arabic dialect allows the combination of this consonant cluster type in the onset of the syllable (Al-Saidat, 2010). The highest number of errors, on the other hand, is in pronouncing the 4- and 3-consonant clusters in word-final positions (error percentage = 83.75% and 51.25%, respectively). A main reason for this is that such cluster combinations are found in Arabic

Table 3. *Mean percentages of students' mispronunciation of consonant clusters in word-initial and -final positions*

Initial Clusters			Final Clusters			
CC	**CCC**	**Total of errors**	**CC**	**CCC**	**CCCC**	**Total of errors**
0.83%	23.33%	12.08%	10.00%	51.25%	83.75%	48.33%

While analyzing the participants' errors, the authors noted that many of them used two processes in their consonant cluster pronunciation: (1) vowel insertion and (2) consonant deletion. In some cases, the participants inserted a short vowel, for instance, they mispronounced the word "street" [strit] as [sɪtrit] or [stɪrit], "terms"[tərmz] as [tərmɪz] or [tərɪmz]. There was a single case in which two vowels were inserted: "against" [əgɛnst] was mispronounced as [əgɛnɪsɪt]. As for consonants deletion, it was noted the participants reduced the cluster by deleting one or two of its consonants. The deletion can occur in the medial consonant(s) such as reducing "sixths" [sɪksθs] to [sɪkθs] or [sɪks], and or in the final consonant(s) when deleting the inflectional suffix; for example pronouncing "worlds"[wərldz] as [wərd] or [wərld].

4.2 Consonant Pronunciation Errors of Students with Different English Proficiency Levels

The second research question was concerned with examining the extent to which learners' English proficiency level may influence their consonant pronunciation errors. To answer this question, the authors compared the consonant pronunciation errors made by the students with intermediate English language proficiency level (I-L learners) and those with the lower-intermediate one (L-I-L learners). Table (4) gives the percentages of the errors made by the two groups in pronouncing the 10 problematic consonant sounds. As the table shows, the lower-intermediate level students had more or equal percent frequencies of errors than the intermediate level ones in pronouncing the very vast majority of the 10 problematic consonant sounds. The only exceptional cases in which the intermediate level students had the higher percent error frequencies are pronouncing /v/ in the word-final position and /g/ in the word-initial position. This might be ascribed to some pronunciation habits developed by some students in this group. Remarkable also is the variance between the percent errors of the two groups in pronouncing the 10 sounds in the three positions. As noted, the variance between the percent errors of the two groups is generally higher in the word-initial position than the word-medial and –final ones.

Table 4. *Percent frequencies of the errors made by the lower-intermediate-level (L-I-L) and intermediate-level (I-L) learners in pronouncing the 10 problematic consonant sounds*

	Word-initial position		**Word-medial position**		**Word-final position**		**All positions**	
Problematic consonants	**L-I-L learners**	**I-learners**	**L-I-L learners**	**I-L learners**	**L-I-L learners**	**I-L learners**	**L-I-L learners**	**I-L learners**
/ʒ/	---	---	82.50%	72.5%	93%	82%	87.75%	77.25%
/ŋ/	---	---	---	---	79%	82%	79%	82%
/p/	61%	54%	71%	69%	65%	60%	65.6%	61%
/ɹ/	57%	33%	73%	52%	68%	57%	66%	47.33%
/ð/	60%	25%	15%	10%	90%	80%	55%	38.33%
/ʧ/	55%	35%	50%	10%	15%	15%	40%	20%
/v/	25%	15%	20%	5%	15%	5%	20%	8.33%
/θ/	45%	15%	0%	5%	0%	5%	15%	8.33%
/g/	0%	15%	25%	5%	0%	0%	8.33%	6.70%
/l/	0%	0%	25%	5%	0%	0%	8.33 %	1.66%

In their pronunciation of the regular morphemes -s and –ed, the lower-intermediate students also made a higher number of errors than the intermediate ones. Table (5) gives the percentages of the errors made by the two groups in this category of consonant sounds. As seen in the table, with the exception of /ɪz/, the lower-intermediate level students had higher or equal percent frequencies of errors than the intermediate level ones in the other morpheme pronunciation alternatives (i.e., /s/ or /z/, /t/ or /d/, and /ɪd/). Noted also is the small variance between the percent error frequencies of the two groups in pronouncing this consonant category.

Table 5. *Percent frequencies of the errors made by the lower-intermediate-level and intermediate-level learners in pronouncing the regular morphemes -s and -ed*

	-s			**-ed**		
	/s/ or /z/	**/ɪz/**	**Total of errors**	**/t/ or /d/**	**/ɪd/**	**Total of errors**
LI-L learners	12.5%	18.75%	**15.63%**	72.5%	5%	**38.75%**
L-L learners	7.5%	21.25%	**14.4%**	65%	5%	**35%**

Finally, table (6) shows the percent frequencies of the errors made by the two groups in pronouncing word-initial and -final consonant clusters. As the table shows, the lower-intermediate-level learners had higher error percent frequencies than the intermediate-level ones in pronouncing all the five types of consonant clusters. Two issues are noteworthy in the table. First, both groups had more errors in pronouncing 3- and 4-consanant clusters than 2- consonant ones, and in pronouncing word-final clusters than word-initial ones. Second, the variance between the two groups' error percent frequencies is much higher in word-final clusters than in word-initial ones.

Table 6. *Percent frequencies of the errors made by the lower-intermediate-level and intermediate-level learners in pronouncing word-initial and -final consonant clusters*

	Initial Clusters			**Final Clusters**			
	CC	**CCC**	**Total of errors**	**CC**	**CCC**	**CCCC**	**Total of errors**
L-I-L learners	1.67%	25%	**13.33%**	15%	62.5%	90%	**55.83%**
L-L learners	0%	21.67%	**10.38%**	5%	40%	77.5%	**40.83%**

5. Discussion and Conclusion

This study has provided further evidence with regard to the difficulties Saudi EFL learners find in pronouncing some English consonant sounds and clusters. Specifically, the study found that they make many errors in pronouncing: /ʒ/, /ŋ/, /p/, /ɹ/, and /ʧ/; /t/ and /d/ of the regular past morpheme -ed; and the 4- and 3-consonant clusters. The results also indicate that the position of particular consonant sounds and clusters in the word plays a significant role in the difficulty of their pronunciation. This was noted, for example, in the more errors made in pronouncing: /p/ and /ɹ/ in word-medial and -final positions; /ʒ/, /ð/ and /l/ in word-final positions; /ʧ/, /v/ and /θ/ in word-initial positions; and word-final consonant clusters. Overall, the data show that more consonants in the word-initial and -final positions are likely to cause more pronunciation difficulties than the ones in the word-medial position. The study also found an important impact of the learners' English proficiency level on their consonant pronunciation errors. The lower-intermediate students made more errors than the intermediate ones in pronouncing the majority of

the consonant sounds and clusters. As noted, the variance between the percent errors made by the two groups in pronouncing the 10 problematic sounds is generally higher in the word-initial positions than the word-medial and -final ones.

The findings of the current study provide further evidence for the CAH and concur with those of previous studies suggesting that Arab and Saudi learners of English have difficulty in pronouncing such consonant sounds and clusters (e.g., Al-Jasser, 1978; Barros, 2003; Binturki, 2008; Ammar and Alhumaid, 2009; Ahmad, 2011; Alqarni, 2013; Altamimi, 2015); although the degree and order of difficulty of each sound are relatively different from one study to another. Unlike English, Arabic does not have a big variety of consonant clusters, and therefore many English syllables are expected to be difficult for Arab learners. In light of these congruent findings, it can be argued that many of the pronunciation errors made by the participants were due to the influence of their L1 phonological system. Due to these phonological differences, they also had difficulty with the types of consonant clusters that are not found in Arabic. This major influence of L1- as Ammar and Alhumaid (2009)- suggest is inversely proportional to the language proficiency level which is the second factor of pronunciation difficulty addressed in this study. This is consistent with the results of the previous studies reported by Saadah (2011), Varol (2012) and Al-Jasser (1978). The role of adequate input or learning experience is also supported by Krashen's (1985) Input Hypothesis.

A third factor that accounts for the pronunciation difficulties noted is the lack of consciousness raising. Arguably, this is the main cause of the errors the participants made in pronouncing the regular morphemes -s and -ed. Since there are learnable rules for mastering the pronunciation of these two morphemes, it is believed that the students could have avoided these errors had they provided with some activities targeting raising their awareness of such pronunciation rules or guidelines.

Future English consonant pronunciation training of Arab students in general and Saudi ones in particular need to be designed in light of the empirical evidence provided by the present study and previous related research as well. Specifically, teachers providing and designing such training are to be aware of which consonant sounds and clusters are less or more difficult to their students, and how the word-position of the sound and learners' level may influence pronunciation difficulty. Teachers should be also aware of the differences between English and Arabic phonological systems in order to predict learners' sources of pronunciation difficulties. Important also is making use of computer-aided pronunciation training (CAPT) which offers many advantages to ESL/EFL students, including having a stress-free learning environment rich with unlimited instructional materials, personalized and independent practice, and immediate feedback, and receiving instruction in the pronunciation features related to L1 background and language learning objectives (Pennington, 1999, Neri et *al*., 2002).

There is a need for further research to support the evidence provided by the present study and the previous ones about Arab students' difficulties in English consonant pronunciation. Since the current study tested the participants' pronunciation through getting them to read word-lists, future studies may explore the same issue using other measures such as sentence reading and spontaneous speech. Future research can also examine English consonant pronunciation

difficulties encountered by male Saudi university students, or by Saudi pre-university students or learners with other Arab backgrounds. This in fact would help in exploring the influence of factors such as gender, language input, and L2 learning age on consonant pronunciation difficulties. Another important issue that is worth investigating is the relationship between consonant perception and production. Finally, it will be of interest also to test the effectiveness of courses making use of various training treatments in improving Arab students' English consonant pronunciation.

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Appendix
The English Consonant Pronunciation Test

A- Please read out the following words

1- pass - language - happy - left - stop - poor
2- value - house - valid - wander - over - leave
3- gate - bed - neglect - class - big - agree
4- rouge - occasion - garage - town - beige - sky
5- chip - loud - nature - blue - couch - approach
6- reading - pencil - bringing - book - sink - thinking
7- rain - small - dream - cottage - car - red
8- thin - foot - bathroom - freezer - math - thousands
9- therefore - brother - silk - window - smooth - either
10- leg - fan - building - ball - carpet - class

B- Please read out the following words

1- hats - cups - book - sleeps - starts - English
2- fans - wives - beautiful - belongs - wears - wood
3- dishes - buses - roof - watches - changes - garden

C- Please read out the following words

1- jumped - look - missed - worked - drank - watched
2- closed - learned - went - planned - sleep - lived
3- added - painted - ate - voted - decided - play

D- Please read out the following words

1- drink - joy - print - green - pencil
scream - doll - spray - street - four
2- cold - note - insect - sea - camp
against - terms - silks - first - surfs
sixths - dress - bed - attempts - worlds