Arabic-Speaking EFL Learners' Pronunciation of British English Vowels: A Production-Based Study

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Abstract—**The present study investigated the production of British English (BrE) vowels by Yemeni-Arabic learners of English. Specifically, the most problematic BrE vowels for those learners were explored in relation to Lados' (1957) contrastive analysis hypothesis (CAH) and Flege's (1995) Speech Learning Model (SLM). Sixty-seven Yemeni EFL learners at different proficiency levels completed a questionnaire, which mainly explored how difficult the BrE vowels are for them, and a vowel production test, which measured the learners' production accuracy of the BrE vowels. Overall, the results revealed that Yemeni EFL learners encountered some difficulties when pronouncing BrE vowels, but their production accuracy rates increased as their levels grow. It was found that the same vowels, /e/, /ɒ/, /eə/, /ɔ:/, /ʊ/ & /u:/, were found to be the most inaccurately produced sounds by learners at all levels. The subtle differences between vowels might have caused the learners' production problems. Findings also showed that learners' L1 vowels that are different from the BrE vowels were easier to produce, and this is congruent with the SLM.**

Index Terms—**British English Vowels, production, Arabic-Speaking EFL learners, pronunciation**

I. INTRODUCTION AND STUDY BACKGROUND

British English (BrE) is considered one of the most famous English varieties; it has its own speech vowel sounds that make it different from other English varieties, e.g., American English (Roach, 2010). The "standard variety of English in Great Britain is called standard British English" (Burleigh and Skandera, 2011, p. 6), and such a variety refers to popular non-linguistic terms such as BBC English, Oxford English, etc. According to Burleigh and Skandera (2011) and Roach (1999), BrE is spoken in different accents; one of these accents is Received Pronunciation (RP) which can be used as a model for teaching English pronunciation. RP is considered the most powerful and prestigious accent of standard BrE. Thus, it "has always been chosen by British teachers to teach foreign learners". Additionally, it is "the accent that is fully described and used as the basis for textbooks and pronouncing dictionaries" (Roach, 1999, p. 5). Moreover, BrE is considered one of the most commonly used and taught varieties in most world countries, particularly in the Arab world (Almbark, 2013).

Vowels are the hardest sounds for second/foreign language learners to produce (Geoffrey et al., 2016). Accordingly, the inaccurate production of non-native speech sounds (such as English speech sounds to Arab learners of EFL as non-native speech sounds) may be due to their failure to distinguish the different speech sounds (Evans & Alshangiti, 2018; Flege et al., 1999). As a matter of fact, producing speech sounds inappropriately, especially vowel sounds, "will lower their intelligibility and comprehensibility and interfere with successful communication" (Ho, 2009, p. 2). For instance, producing cut as cot or caught; bit as bet or beat; bought as boot and vice versa, etc., could be confusing and impair the meaning being communicated (Ho, 2009).

There are many hypotheses and models which proposed different claims and predictions regarding second language (L2) or foreign language (FL) speech sounds production. For example, it was early claimed by Lado (1957), who first proposed the contrastive analysis hypothesis (CAH), that "L2/FL sounds that are phonetically different from L1's are most difficult for L2/FL learners to recognize but those that have a counterpart in L1 are produced with ease "(Hung, 2008, p. 7). In other words, the "L2 sounds that are similar to the learners' L1, will be easy to acquire", whereas "the L2 sounds that are different from L1, will be difficult to acquire" (Fu, 2010, p.11). By contrast, Flege (1995) in his Speech Learning Model did not agree with Lado's CAH. According to Flege's (1995) model, "L2/FL sounds that are phonetically similar to or are the same as L1's are most difficult for L2/FL learners to acquire, whereas those that are phonetically distinct from L1's are the easiest" (Hung, 2008, p. 7).

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Noticeably, these two models, which are the focus of our analysis, are based on the differences and similarities occurring between L1 and TL in terms of speech sounds acquisition. In general, according to CAH (Lado,1957), the similar sounds in L1 and L2 are easy to acquire, whereas the recent SLM (Flege, 1995) claims that the different sounds in the two languages (L1 & L2) or the L2 sounds that are not similar to or do not exist in learners' L1 are easy to acquire. Based on CAH, it is seen that most vowels of English as an L2 or an FL are not similar to learners' L1 (Arabic) as they do not exist in their native language (NL). So, this may make such different sounds difficult to acquire by these FL/L2 learners. According to Flege's SLM (1995), by contrast, most English vowels are different from those of learners' L1 (e.g., Arabic); thus, this may make these FL speech sounds easy to acquire.

A considerable body of literature has been produced to examine how EFL learners produce the English vowel sounds by Arabic-speaking EFL learners (e.g. Alshangiti, 2015; Al-Homaidhi, 2015; Evans & Alshangiti, 2018; Tajeldin Ali, 2013; Munro, 1993) and learners from different L1 backgrounds (e.g., Escudero et al., 2012; Cenoz & Lecumberri, 1999; Ho, 2009; Fridland & Kendall, 2012; Hung, 2008; Iverson & Evans 2007; Lambacher et al., 2005; Mokari & Werner, 2017; Nikolova-Simi, 2010; Nishi & Kewley, 2007; Strange et al., 1998; Yang, 2006) among many others. The findings of the studies mentioned above (e.g., Nikolova-Simic, 2010; Mokari & Werner, 2017; Iverson & Evans, 2007), generally, showed that speakers of languages (e.g., German and Norwegian) with large and complex vowel systems can produce English vowels better than speakers of languages (e.g., Spanish, Arabic, and French) with small and simple vowel systems. According to Iverson and Evans (2007), learners of English, whose native language (NL) is German, were found able to acquire vowels of English more quickly than learners of English whose L1 is Spanish. These results suggested that Arab EFL learners may find English vowels difficult to acquire as their NL has a smaller and simpler vowel system than the vowel system of BrE that appears to be challenging for them.

A few number of studies (e.g., Munro & Derwing, 2008; Pillai & Delavar, 2012; Piske et al., 2002) focused on examining the production of vowels. Surprisingly, the majority of previous studies (e.g., Nikolova-Simic, 2010; Ho, 2009; Strange et al., 1998; Tsukada et al., 2005; Nishi & Kewley, 2007, 2008) have focused more on investigating the American English (AE) vowels production rather than those vowel sounds of BrE which appear to be more extensive than the AE ones. In addition, the participants of most above studies were not EFL learners —i.e., they were ESL learners. Moreover, the majority of such studies did not examine the production accuracy of all vowels of English. They instead concentrated on investigating the production of a few certain English vowels such as the contrasting segments or pairs of vowels (Fabra, 2012; Perkell et al., 2004; Yang, 2006), high-mid front vowel sounds (Escudero et al., 2012; Ho, 2009; Lambacher et al., 2005) and some simple segments or monophthongs (Strange et al., 1998; Tsukada et al., 2005). For instance, the study conducted by Marković (2009) focused only on examining Serbian ESL students' vowel production accuracy of the English segments /e/ and / æ/. The current study, thus, differs from the earlier ones in terms of both kinds and numbers of English vowels that are investigated (BrE vowel sounds rather than those of AE segments; all BrE vowels rather than just a few distinct sounds like those segments of the front or back area of the tongue or the contrasting vowel sounds), environment or the context in which study is conducted (Yemen), the type of learners (i.e., EFL Arabic-speaking Yemeni learners rather than learners of EFL or ESL of different L1 backgrounds).

Finally, in the Yemeni-Arabic learners' context, it appears that no studies (to the researchers' knowledge) have examined how Yemeni EFL learners at different proficiency levels (beginning, intermediate & advanced levels) produce the BrE vowels. Because of the lack of research in this area, the researchers intend to primarily assess the BrE vowels production accuracy by Yemeni-Arabic learners of English Arabic to find out how they produce these types of English sounds, and to see to what extent they correctly pronounce these sounds based on their proficiency levels of English. The present study, thus, addresses this research gap; it attempts to answer the following research questions:

1.   What are the most problematic BrE vowels for Yemeni EFL learners to produce?

2.   Are the assumptions of the CAH and SLM hypotheses applicable to Yemeni EFL learners' production of BrE vowels?

Vowel Systems in English and Arabic

Vowel systems in English and Arabic are different from each other. Arabic is a Semitic language whereas English is a Germanic language of an Indo-European language family (Holes, 2004; Ryding, 2014). This means that the two languages belong to different language families. Such a difference may give us a hint that they differ from each other in their vowel inventory systems. A complete description of the vowel system in English has been given in previous literature (e.g., Naji & Almakrob, 2023), so to avoid repetition, it is not discussed here.

The two languages differ phonetically and phonologically in terms of the number of their speech sounds, particularly vowels. Arabic has a smaller vowel system than the BrE. With reference to the vowels (i.e. simple and diphthongs) of the two languages, Arabic is an 8-vowel sound system composed of / i, ī , a, ā , u, ū , ai, & au/ (Ryding, 2014), whereas BrE is a 20-vowel sound system composed of /iː/, /ɪ/, /e/, /æ/, /aː/, /ɒ /, /ɔː/, /ʊ/, /uː/, /ʌ /, /ɜː /, /ə /, /aɪ /, /eɪ /, /ɔɪ/, /aʊ/, /əʊ /, /eə /, / ɪə/ and /ʊə/ (Nikolova-Simic, 2010).

Additionally, Arabic has only three short vowels and three long vowels, whereas BrE has seven short vowels and five long ones. In terms of diphthongs, Arabic has only two diphthong phonemes, whereas BrE has eight vowel diphthongs. This large vowel inventory system of BrE might be challenging for L2 learners whose primary language vowel system is small, e.g., Arab learners of English. So L2 learners whose L1 is limited in its vowel system (e.g., Japanese, Spanish, Korean etc.) may find it difficult to successfully acquire the vowel system of another language (e.g., English)

that consists of a larger number of vowels (Flege et al., 1997; Flege et al., 1999; Hung, 2008; Lado, 1957; Nikolova-Simic, 2010).

On the other hand, Arabic and English vowel systems are similar in terms of voicing, meaning that all vowels of the two languages are voiced as they are all articulated without any airflow obstruction in the mouth because it moves smoothly to the lips coming from the larynx (Roach, 2010; Ryding, 2014; Watson, 2007). In terms of vowel occurrence, Arabic vowels occur in the medial and final positions of a word; however, they never occur in the initial positions of a word unless they are preceded by a glottal stop, 'ḥamzah' (Al-Ani, 1970).

Similarly, few vowel sounds of English rarely appear in the initial and final positions of a word. Consider the following English vowels /æ/, /e /, and /ɒ / which rarely occur in the final positions of words. Also, the vowel / ʊə / rarely occurs initially (Mugair & Mahadi, 2014). Table 1 summarizes the differences and similarities between British English and Arabic.

TABLE 1
DIFFERENCES AND SIMILARITIES BETWEEN ARABIC & BRE VOWEL SYSTEMS

Features	BrE	Arabic
Indo-European language family	Germanic	Semitic
Vowel inventory system	Large, crowded, complicated	Small and simple
N. of vowels	20	8
Short vowels	7	3
Long vowels	5	3
Diphthongs	8	2
Vowels occurrence	Occur in all word-positions except some vowels, e.g., /æ/, /e/ & /ɒ / rarely occur in final word-positions	Never occur in initial positions of a word
Voicing	Voiced	Voiced

Based on the previous comparison between the two vowel systems of English & Arabic, it is seen that most of the vowels of British English are different from those vowels of Arabic, that is, most English vowels do not exist in Arabic. Thus, they might be difficult to be acquired by Arab learners of English as L2 learners. According to Levey and Cruz (2004), "one difficulty in the acquisition of the sound system of an L2 may derive from the differences between the number and the identity of vowels in the L2 and those in the speaker's native language" (p. 162) (e.g., British English has twenty vowels, whereas Arabic has only eight vowels).

II. METHOD

This study, which aimed at investigating Yemeni EFL learners' production of BrE vowels, focused on the standard BrE because it is the most common English variety used in the education system in Yemen where English is taught as an FL. Furthermore, most English course books/textbooks taught at government schools and universities in Yemen often focus on BrE vowels, especially phonetics and listening-speaking courses. Further, the current investigation focused on vowels because they present difficulties for Arab learners EFL learners to produce (Flege et al., 1997), and this is attributed to their inability to discriminate these sounds.

A. Participants

The total number of learners who participated in the present study was 70. The participants who actually took part in the study were 67 (between 20 and 26 years old) as three learners did not complete the production task, so they were excluded. All of the participants were Yemeni-Arabic learners of English enrolled in the Department of English at Amran University, Yemen. Learners were conveniently selected from all levels except level one learners; they were not included because they were considered real beginners. Additionally, it was observed that the vowel production task was beyond their level, thus, they were excluded. However, the participants' university English levels were not considered for the purpose of the current study as they do not always reflect learners' actual English proficiency levels. Therefore, the Michigan English test (MET) was used as a measure to group the participants into their English proficiency levels and to subject all of them to the same standard.

The scores of the MET test were used for grouping the participants into three proficiency levels (Beginners: 26, Intermediate: 25 and Advanced: 16). More specifically, as is shown in Table 2, beginners were the participants who scored below 40 marks (= 0-49%); the participants who scored higher than 39 and below 63 marks (=50-79%) were classified as intermediate learners, and the advanced learners were the participants who scored higher than 64 marks (=80-100%)

TABLE 2
PARTICIPANTS' DISTRIBUTION BASED ON THEIR MET PROFICIENCY LEVELS (N=67)

level	Beginners	Intermediate learners	Advanced learners
No.	26	25	16
Cut scores	0-39	40-63	64-80
	(0-49)	(50-79)	(80-100)

B. Instrumentation and Procedures

This study employed two research instruments for data collection: a questionnaire and a vowel production test. The purpose of the questionnaire was to find out the participants' personal background information. Additionally, the participants were invited to state to what extent their English instructors used the teaching techniques related to English vowel pronunciation in the classroom, specifically when teaching English vowel segments, e.g., repetition drills and examining learners' vowel performance accuracy. Furthermore, the questionnaire included several items related to EFL instruction. For instance, the items focused on the numbers of listening/speaking and phonetics courses learners took in the past, the extent to which teaching aids were used by their English teachers, etc.

Regarding validity and reliability, the majority of the questionnaire items were adapted from earlier literature (Tajeldin Ali, 2011; Jung, 2016) and minor modifications were made to fulfill the study's objectives. As some of the questionnaire items were prepared by the researchers, it was validated by three experts in the field to measure its content validity. Then the appropriate adjustments and changes were made.

The second research instrument used in the current study was a vowel production test whose purpose was to find out the extent to which Yemeni EFL learners can produce the BrE vowels. This test included 57 monosyllabic words presented to each participant and then each participant was asked to read/pronounce these words clearly, i.e., the participants were informed to pronounce the stimuli neither very slow nor very fast, as shown in examples (1) and (2). Overall, 3819 items were produced by all participants on the production test (19 vowels x 3 = 57 words x 67 = 3819).

(1) pot, set, put, sat, boot, part, seat, bought

(2) pat, bet, male, boil, mile, hut, hot, boy

On the production test, each vowel sound of BrE examined in this study was displayed three times in medial places of monosyllabic words. The three stimulus words for each English vowel then were put on the test sheet in a random order since they contained the similar vowel. The researchers' job in this task was to meet each participant individually, distributing the wordlists, and then record the productions of the BrE vowels for every single participant employing a low-noise S-mic system and high-sensitivity Sony Stereo IC recorder [ICD-UX560F], in a calm study room.

After meeting all the participants individually and recording their productions of the stimulus words used to elicit their English vowel production accuracy, we transferred all the recordings from the recorder into a laptop computer for evaluation. To assess whether these Arabic-speaking EFL learners are able to pronounce the BrE vowels accurately, all the participants' English vowel production recordings were given to a native English speaker for judgment to decide whether these English vowels were produced in an intelligible way or not. This way of evaluation (native listener judgments) was used by many researchers (e.g., Murno & Derwing, 2008; Mokari & Werner, 2017). The native English speaker was asked to evaluate the vowel productions of the participants in order to reduce the subjectivity to a minimum; he was provided with a scoring key adapted from Nikolova-Simic (2010) on which he wrote down the participants' scores. The scoring key sheet included the correct vowel productions and 3-4 alternatives for each vowel the participants may mispronounce instead of the target vowel. The rater was also asked to identify the vowels which were not produced properly by the participants. Finally, all the participants' responses to the vowel production test were entered into excel sheets and then transferred into the Statistical Package for the Social Science (SPSS) software, version 20.0., for further statistical analysis. Concerning the test validity, the same teaching experts who were consulted to review and judge the content of the questionnaire, evaluated the extent to which the production test is suitable for measuring learners' ability of English vowel pronunciation. As for reliability, it was statistically found that the vowel production test had very good internal consistency, meaning that it was reliable.

C. Data Analysis

Separate analyses were done on the data gathered from both the questionnaire and the production task. All of the participants' responses to the questionnaire were put into excel sheets and then imported into the SPSS program for additional statistical analysis. Descriptive statistics were used to analyze the questionnaire items, calculating the frequency, percentage, and overall percentages of participants' responses for each item.

As for the vowel production test, all the stimulus words produced by the participants in the vowel production task were evaluated by a native English speaker to reduce the subjectivity of ratings to a minimum. The native English speaker determined the intelligibility of the produced vowels. That is, if a vowel was not produced properly, the native speaker would identify the mispronounced vowel that was produced instead of the target one. The scoring key worksheet included two main columns: one column for the correct responses (i.e., the correct productions of vowels) coded with A and another column for alternatives coded with B, C, D and E for each vowel that the participants produced incorrectly instead of the target vowel. For example, when a participant produced the luck vowel /ʌ / incorrectly, the native English speaker could identify the substituted vowel for the target one (from the given alternatives: e.g., lack, look, or lock), i.e., the vowel that was mispronounced instead of the target one.

Because the English vowel production test had three items per vowel, three ratings of the correct productions for each vowel were measured. Then, the mean and standard deviation of the correct productions for each vowel were calculated. Finally, One-Way ANOVA was run to determine the variations in the vowel production performance between learners across the proficiency levels.

III. RESULTS

A. The Results of the Questionnaire

Most participants, across the three proficiency levels, reported they were taught only one course of English phonetics (n= 40, 59.7%). Few learners of the advanced level mentioned they had studied more than one course related to English phonetics and phonology (n= 6, 37%). Also, it was found that four participants (5.9%) had never previously attended a course on English phonetics. Concerning the courses of English listening/speaking the participants completed, 22 (32.8%) of them stated they had attended more than two of such English courses (13: advanced level {81.0%}, 6: intermediate participants {24.0%} & 3 learners of the beginning level {11.53%}). The results also revealed that the majority of learners who took more than three of these types of English courses were learners of the advanced level (7, 43.75%).

Learners were asked how much their teachers used recording devices and labs as teaching aids while teaching English vowels. Only three (4.47%) learners mentioned their English teachers frequently used these teaching tools (two at the beginning & intermediate levels and one participant at the advanced level). Additionally, the majority of participants (n=33: 49.25%) stated that their teachers sometimes employed these instructional tools. Moreover, several participants stated that their English professors hardly often (or never) used the aforementioned aids (27.0% & 18.0%). These responses imply that Yemeni EFL teachers do not always employ teaching tools like recorders or labs; they suggest that they are not paying enough attention to the usage of the teaching tools that could enhance their students' acquisition of these English vowel sounds more precisely.

Regarding whether Yemeni instructors of EFL assess their students' accuracy of English vowel pronunciation, it was observed that these English instructors did not always take care about whether or not their learners produce English vowels accurately. The Yemeni participants who reported that their English teachers always examined their accurate English vowel production in the classroom were only two. Similarly, another two Yemeni participants claimed that their English instructors often assessed their accuracy and ability in producing English vowels and provided them with immediate feedback to know how correctly each vowel of English was pronounced. On the other hand, about 29 participants (43.3%) stated that their English instructors hardly often (or never) examined their accuracy and ability in pronouncing English vowels. Concerning the use of the repetition drill by these English teachers, 31.4% of Yemeni learners (n=21) reported that their teachers, who taught them English vowels, never or rarely used such a teaching technique. Moreover, about 30% of participants (n=20) stated that their instructors of English sometimes used the repetition exercise to teach these English speech sounds.

B. The Overall Production of the BrE Vowels by Yemeni EFL Learners

As is shown in Table 3 below, the average rate of the accurate production of English vowels was the highest by learners of high levels (76%, SD=0.106) and the lowest by learners of the beginning levels (52%, SD=0.117). This indicates that the accuracy rate of English vowel pronunciation increased with the participant level. As a result, across all the learning levels, English vowel production accuracy gradually improved (beginners: 52%, intermediate: 62%, & advanced: 76 %, respectively).

TABLE 3
TOTAL ACCURATE VOWEL PRODUCTION PERFORMANCE FOR PARTICIPANTS BASED ON THEIR PROFICIENCY LEVELS

level	Beginners		Intermediate		Advanced		Total	
N	26		25		16		67	
	%	SD	%	SD	%	SD	%	SD
Overall accurate vowel production	52	0.117	62	0.106	76	0.106	61	0.142

With regard to the most problematic vowels produced by learners, it was found that some English vowels, which were found difficult for beginners to produce, were also found difficult to pronounce by intermediate or advanced levels. For example, the vowels /e/, / ɒ / & / eə / were regarded as the hardest vowel sounds to pronounce by most participants at all levels. Similarly, the result of the production test revealed that some English vowels, which were found easy for advanced learners to produce, were found easy for beginners or intermediate learners too. For example, English vowels such as /ɔɪ/ and /i:/ appeared to be easy to produce for all participants.

One Way-ANOVA and Sheffe Test

Table 4 presents the findings of the ANOVA test, which revealed that learners' performance was significant across the three groups (beginners, intermediate and advanced) in terms of their English vowel production performance. More specifically, the vowel production performance of Yemeni learners across their three proficiency levels was significantly different, $F (2, 64) = 22.735$, $P = 0.000$ (< 0.05).

TABLE 4
THE DIFFERENCE BETWEEN/WITHIN LEARNER GROUPS BASED ON ANOVA

	Sum of Squares	DF	Mean Square	F.	sig.
Between Groups	.554	2	.277	22.735	0.000
Within Groups	.780	64	.012		
Tot.	1.335	66			

Table 5 shows the findings obtained from the Scheffe test which was used to ascertain whether there were any significant variations among learners' English proficiency levels in terms of their performance of English vowel pronunciation. The Scheffe test findings indicated that the mean scores of the vowel production performance were significantly different for all participants across their proficiency levels, $P < 0.05$. The results, as seen in Table 5, showed significant differences among the three proficiency levels as the significant levels were less than 0.05 ($P < 0.05$).

TABLE 5
THE MEAN DIFFERENCE AMONG LEARNERS' LEVELS BASED ON SCHEFFE TEST RESULTS

(I) Levels	(J) Levels	mean difference [I-J]	Sig.
Beginners	Int. level	-0.9457-*	0.013
	Adv. level	-0.23650-*	0.000
Intermediate	Big. level	0.9457*	0.013
	Adv. level	0.14193*	0.001
Advanced	Big. level	-0.23650-*	0.000
	Adv. level	0.14193*	0.001

C. Participants' Production of BrE Vowels

(a). Production of BrE Short Vowels

Table 6 below shows that the short vowel /e/ was found to be the most difficult in pronunciation for Yemeni learners across the three proficiency levels as it was pronounced with the lowest rates of correct productions (11.5%, 16% & 21.7%). Moreover, Yemeni learners produced the short vowel /ɒ / with a moderate rate of the correct production (62%), showing that they pronounced this English sound better than /ʊ/ (54.8%). By contrast, the production of the short vowel /ɪ/ was determined to be the simplest for learners at the beginner and intermediate levels (64.1%, 84%), and /æ/ was the simplest for those at the advanced level (95.8%).

TABLE 6
THE ACCURATE PRODUCTIONS OF SHORT VOWELS OF BRE

Vowel	Beginners	Intermediate	Advanced	Total	
	M%	M%	M%	M%	SD
ɪ	64.1	84.0	79.2	75.8	.292
e	11.5	16.0	37.5	21.7	.254
æ	47.4	73.3	95.8	72.2	.338
ʌ	52.6	64.0	81.3	66.0	.300
ɒ	62.8	58.7	64.6	62.0	.280
ʊ	43.6	52,0	68.6	54.8	.273

M= mean

(b). Production of the BrE Long Vowels

Table 7 below shows the accuracy rates of the long vowels as produced by Yemeni learners across their three levels. It appeared that English long vowels were easier to produce than short vowels. The long vowels that were either easy or difficult to pronounce for beginners appeared to be the same vowels that were either difficult or easy to pronounce for intermediate or advanced learners. For Example, /i:/ and /ɑ:/ were produced with the highest rates of the correct productions. This means that these two English vowels were the easiest long vowels to pronounce by these two groups. Similarly, /u:/ and /ɔ:/were found to be the most difficult to produce by these learners.

TABLE 7
THE ACCURATE PRODUCTIONS OF LONG VOWELS OF BRE

Vowel	Beginners	Intermediate	Advanced	Total	
	M%	M%	M%	M%	SD
i:	71.8	81.3	97.9	83.7	.261
ɑ:	78.2	86.7	89.6	84.8	.204
ɜ:	60.3	64.0	91.7	72.0	.274
ɔ:	39.7	57.3	68.8	55.3	.279
u:	47.4	49.3	64.6	53.8	.261

(c). Production of the BrE Diphthongs

Table 8 shows that although the advanced learners performed in producing English diphthongs better than the lower levels, they still had difficulty producing the diphthongs that were difficult for beginners or intermediate learners. For example, the diphthong /eə/ was problematic for beginners, intermediate learners and even for advanced learners. By contrast, the diphthong /ɔɪ/ was easy to produce by all participants. The overall rates of the correct production of English diphthongs ranged between 37.5% (/eə/) and 86.8% (/ɔɪ/), indicating the diphthong /eə/ is the most problematic diphthong in production and /ɔɪ/ was found the easiest segment at all learners' levels.

TABLE 8
THE ACCURATE PRODUCTION OF BRE DIPHTHONGS

Vowel	Beginners	Intermediate	Advanced	Total	
	M %	M %	M %	M%	SD
eɪ	30.8	57.3	85.4	57.8	.414
aɪ	56.4	65.3	97.9	73.2	.370
ɔɪ	71.8	90.7	97.9	86.8	.254
aʊ	52.6	64.0	66.7	61.1	.176
əʊ	43.6	60	52.1	51.9	.261
eə	33.3	29.3	50.0	37.5	.303
ɪə	64.1	56.0	77.1	65.7	.292
ʊə	75.6	81.3	79.2	78.7	.230

IV. DISCUSSION

To find out the most difficult BrE vowels produced by Yemeni learners of EFL, the rates of the correct production of these English sounds were ranked from the lowest to the highest. The results of the production test indicated that Yemeni learners had difficulty in producing the vowels of the BrE correctly. The learners' production of the BrE vowels, however, differed significantly across their proficiency levels, in which their performance improves and develops as their levels grow. Additionally, learners at all levels encountered difficulty in producing the same vowels (/e/, /ɒ/, /eə/, /ɔ:/, /ʊ/ & /u:/). These sounds were challenging for the learners because they have subtle differences with other vowels (particularly with their close vowels, neighbors or contrasts). Thus, the production difficulties might be attributed to the closeness and similarity existing among these English vowels (e.g., /eə/ as /ɪə/ and vice versa as in fare-fear; /e/ as /ɪ/ as in bet-bit and vice versa).

The findings of the current study support Al-Homaidhi's (2015) findings, in which Saudi female students could not produce the BrE vowels with high accuracy rates; they only achieved 56.6% of the accurate production performance for the beginning learners and 56.9% for advanced students. Al-Homaidhi's (2015) learners' accurate vowel production performance was worse than their accurate vowel perception performance and this is not in line with the results of the present investigation and many previous studies (e.g., Evans & Alshangiti, 2018; Flege et al., 1997, 2004; Ho, 2009; Perkell et al., 2004; Rauber, 2010). Similarly, in Tajelldin Ali's (2011) study, Sudanese learners of English showed lower intelligibility scores; they overall correctly scored no more than 69.2% of vowel production accuracy.

Concerning the most problematic English vowels for Yemeni learners and EFL or ESL learners of different L1 backgrounds in the previous studies, it is noticed that the vowel production results of the current study support many findings obtained in the literature (e.g., Al-Homaidhi, 2015; Evans & Alshangiti, 2018; Ho, 2009; Munro & Derwing, 2008; Nikolova-Simic, 2010). It was observed that many English vowels which were found difficult to produce by EFL /ESL learners in many previous studies were also found difficult to produce by Yemeni EFL learners. For example, the vowel /e/ which was the most difficult sound to produce by Yemeni learners at all levels was also found problematic to pronounce properly by Taiwanese EFL learners as it was mapped to their L1 /eɪ/. For Mandarin speakers of English, the vowel /e/ was also among the less intelligible vowels and did not show much improvement over time. (Ho, 2009; Munro & Derwing, 2008).

The learners' production difficulty of BrE vowels, according to the questionnaire findings, may refer to various factors, e.g., teaching aids, testing learners' vowel production accuracy & repetition exercises. According to the data reported in the questionnaire, very few number of the learners who stated that their English instructors always use the teaching tools such as labs and records (6%, n= 4). This indicates that a lot of English teachers in Yemen may often neglect using the teaching aids that help their EFL learners to improve their pronunciation of English vowels. Similarly, a very small number of Yemeni learners (6%, n=4) reported that their English teachers often tested their production accuracy of English vowels and provided them with immediate feedback to know how correctly each vowel of English is pronounced. This also indicates that Yemeni EFL teachers do not usually pay more attention to evaluate whether or not their English learners are able to produce these English sounds accurately. Further, many Yemeni learners reported that their English teachers rarely used the repetition exercise (31.4%, n=21) when teaching these English sounds. Other factors that may affect the acquisition of English vowels by EFL learners include the complicated vowel inventory system of English, transfer, closeness of English vowels, the effect of L1, similarities and differences between L1 and L2, age, type of instruction, training, English experience, activities learners try to improve their English, etc.

With regard to whether or not the claims of CAH and SLM are true regarding the English vowel production by Yemeni EFL learners, it was found that some findings obtained from the vowel production test support such claims of

SLM, but not the CAH. More specifically, it was found that the vowel /ɔɪ /, for example, which is different from learners' L1 vowels (Arabic), was the easiest English vowel to produce by Yemeni learners. This result does not support the CAH hypothesis which claimed that the L2 speech sounds will be difficult to acquire when they are different from those sounds of learners' L1. However, this finding is in line with Flege's (1995) SLM as the vowel /ɔɪ/ is not similar to Arabic vowels. Thus, according to Flege's (1995) SLM, L2 learners will acquire the new or different speech sounds better than those sounds which are similar to those sounds of their native language (Flege, 1995). To conclude, the claims proposed by L2 speech sounds hypotheses and models are not always true because no one of these hypotheses and models is completely accurate regarding the productions of English vowels by Yemeni EFL learners.

V. Conclusions, Limitations and Future Directions

The current study sought to explore how difficult the BrE vowels are for Yemeni EFL learners at different proficiency levels. Results of both the production test and questionnaire showed that Yemeni EFL learners had a difficulty in producing the BrE vowels. The participants did not correctly produce most BrE vowel sounds with high ratings of accurate productions. Learners at the three levels were found significantly different in producing the BrE vowels, in which their performance improves and develops as their levels grow. Thus, there is a gradual development in learners' performance across their English proficiency levels in terms of English vowel production. Additionally, some of the BrE vowels were found to be difficult for Yemeni EFL learners at all levels.

The current study has two limitations. First, it was only limited to evaluating the extent to which Yemeni learners of EFL are able to pronounce the BrE vowels; it was not concerned with examining the learners' L1 influence on their production of vowels. In this analysis, the participants were from different regions and they might have different dialects. Thus, it is impossible to examine the effect of different dialects on the production of the BrE vowels as investigating such a topic requires a great deal of preliminary research. Another limitation is related to the approach by which the vowel production is evaluated (native listeners' judgments). Since the researcher has conducted the research in a foreign country (Yemen), it was hard to find more than a native English speaker, born and grew up in the UK, to rate the participants' productions of English vowels. However, using three items on each vowel of BrE examined through the production test might reduce the subjectivity of ratings to a minimum.

Based on the findings of this study, some directions for future research are suggested. First, further comparative research replicating the research methodology is needed to compare the accuracy of English vowel production by EFL learners vs. native English learners. Such future work might find out the extent to which the English vowel production performance of EFL learners differs from the English vowel production of the native English speakers. Second, this study explored the problematic English vowels that were mispronounced by Yemeni EFL learners. Accordingly, more in-depth research is needed to investigate the sources of mispronunciations (errors) Yemeni EFL learners make when producing BrE vowels. In other words, further research is needed to examine the possible factors that might affect the English vowel pronunciation of EFL learners, and that lead to difficulties acquiring these types of English sounds by these types of English learners. Third, since the present study was limited to participants from one college of language, further research could replicate the research methodology including different types of learners from different colleges of different universities in Yemen in order to get a more complete picture of BrE vowel perceptions and productions by these EFL learners. Finally, as this study focused on how BrE vowels are pronounced by Yemeni male learners, a further investigation could replicate the current study to examine female EFL learners' productions of these English sounds. Such an investigation may help find out the effect of gender in acquiring L2 sounds.

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