Production of English Consonants by Yemeni EFL Learners of English: The Case of /p/ and /v/

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Abstract
EFL learners commonly strive to attain near-native English pronunciation. Nevertheless, Arab learners of English may incorrectly produce certain sounds of the English language due to their first language interference. The current study examined Yemeni EFL learners' production of the English consonants /p/ and /v/. The study employed a quantitative case study design, and its speakers were two Yemeni EFL postgraduate students. At the time of the present study, the participants were postgraduate students at Utara Universiti Malaysia. The subjects were asked to read three lists of isolated words in random order. Each list included the same 36 words: six words for each target sound in three word positions, to be read three times. The pronunciations were recorded and then evaluated using two methods: (1) rating by four raters; and (2) an acoustic analysis via Praat. The results indicate that the two target sounds are problematic among Yemeni EFL learners. Additionally, the environment greatly influences the production of /p/ and /v/. Two patterns are identified: (1) /p/ is voiced and substituted with /b/; and (2) /v/ is devoiced and substituted with /f/. The findings generally shed light on the pronunciation difficulties among Arab speakers when producing English consonants and specifically confirmed previous findings regarding L2 speech production by Yemeni EFL learners of English.

Keywords: Devoicing, EFL, First Language Interference, Speech Production, Voicing

Introduction

In the field of L2 pronunciation, there has been a debate whether English sounds could be produced accurately by Arab learners of English. As argued by Watson (2002), the consonant contrasts: /f/-/v/, /p/-/b/, and /tʃ/-/dʒ/ tend to be troublesome for most Arab L2 speakers of English because such contrasts are not found in Arabic (Al-Sobhi & Preece, 2018; Alteyp, 2019). The main problems emerge from the contrasting patterns of such sounds in both Arabic as well as English languages, which pose challenges in L2 learning (Abdelgadir, 2019). English has 24 consonants, whereas Arabic includes 28 consonants. Arabic is thus a consonantal language. When Arabs learn to speak English, they may commit several errors because of the linguistic variations between Arabic and English. For instance, Arabic lacks some English sounds, including /p/ and /v/ (Abdelgadir, 2019; Javed, 2013). Hence, Arab learners show the tendency to substitute /p/ and /v/ with /b/ and /f/, respectively (Alteyp, 2019; Ashour, 2017; El Zarka, 2013; Mohammed, 2019).

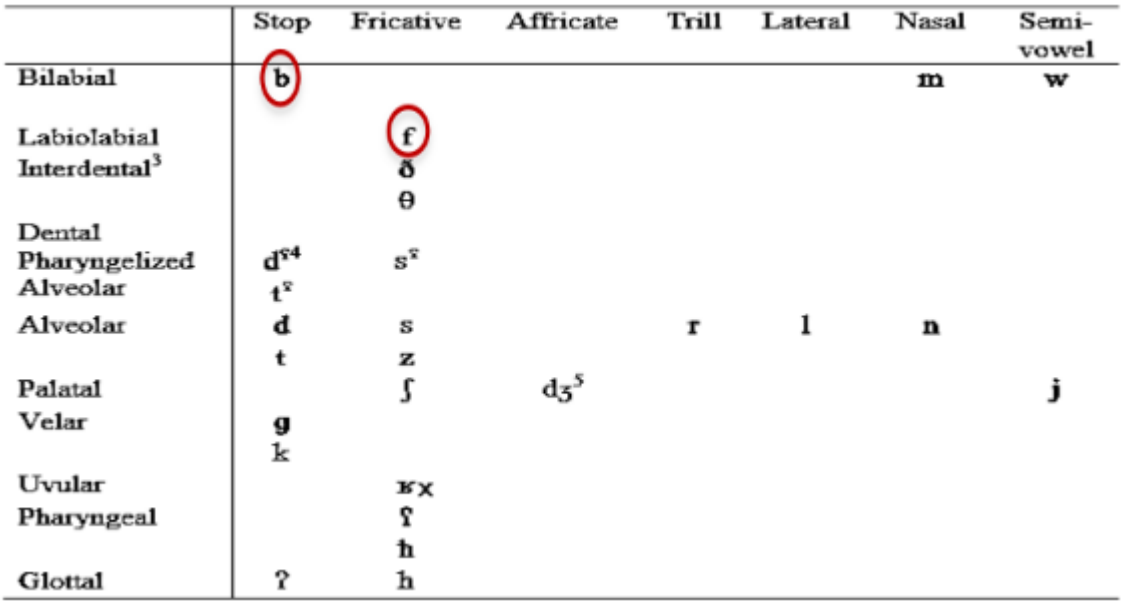
The English voiceless bilabial stop /p/ is absent in Arabic. Consequently, EFL Arab learners commonly use the voiced stop /b/ instead of /p/, using the voicing as a repair strategy (El Zarka, 2013). Such usage of voicing in this context could potentially result in miscommunication or incorrect-message delivery, as in "Can I *bark* here?" instead of "Can I *park* here?" (El Zarka, 2013, p.17), thus hindering mutual intelligibility (Mohammed, 2019). The same trend goes to the English voiced labiodental fricative /v/ that induces most Arabs to apply the repair strategies of devoicing due to its absence in Arabic.

The current study aimed to examine specific issues regarding the production of the English consonants /p/ and /v/ by Yemeni EFL learners in three-word positions. The assessment of the participants' pronunciation of the two target sounds was made using four raters' auditory evaluation along with Praat analyses. This has been found in very few previous studies, as many past researchers have mostly used impressionistic methods to evaluate the production of L2 sounds.

The English /p/ and /v/ sounds are not available in Modern Standard Arabic (see Figure 1) and in Mukallaene Arabic used in South Yemen, where the speakers of the current study came from (see Figure 2).

Place→ ↓Manner	Bilabial	Labiodental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b	f v		t d (tˤ dˤ)				k g	(q)		(ʔ)
Nasal	m			n				ŋ			
Tap/flap				(ɾ)							
Fricative			θ ð (ðˤ)	s z (sˤ)	ʃ ʒ				(χ ʁ)	(ħ ʕ)	h
Lateral				l							
Approximant	w			ɹ			j	w			
Affricates					ʧ ʤ						

Figure 1: IPA chart of English and Arabic consonants (sounds in parentheses are present only in Arabic, while highlighted ones are only available in English). The sounds in circles are the target sounds of the current study (source: Kalaldeh, 2016).



	Stop	Fricative	Affricate	Trill	Lateral	Nasal	Semi-vowel
Bilabial	b					m	w
Labiolabial		f					
Interdental[3]		ð					
		θ					
Dental							
Pharyngelized	$d^{ʕ}$[4]	$s^{ʕ}$					
Alveolar	$t^{ʕ}$						
Alveolar	d	s		r	l	n	
	t	z					
Palatal		ʃ	$dʒ$[5]				j
Velar	g						
	k						
Uvular		ʁ χ					
Pharyngeal		ʕ					
		ħ					
Glottal	ʔ	h					

Figure 2: Consonants in Mukallaene Arabic. Sounds in circles are the target sounds of the current study (source: Al Tairi, 2010)

Related Literature

Production of /p/ and /v/ by Non-Arab L2 Speakers of English

Some non-Arab learners of English face difficulties in producing the English consonants /p/ and /v/. For instance, Inyang, Okon and Ebong (2017) examined phonological difficulties encountered by Ibibio speakers. It was reported that 52% of the respondents were unable to produce /v/ and substituted it with /f/. Concerning /p/, 45% of the respondents replaced it with /b/. Additionally, Lengeri and Nicolaidis (2016) reported that /p/ was always confused with /b/ among Greek speakers. Moreover, Puspita, Sudarsono and Susilawati (2017), who investigated the interference of Sambas Malay on producing English consonants, found that /v/ was substituted with /p/ or /f/. Likewise, Begum and Hoque (2016) showed that Bangladeshi learners of English replaced /v/ with /b^h/ and /p/ with /f/. Such a substitution of /v/ with /b/ was also detected in the production of /v/ by Hausa English speakers (Keshavarz & Khamis, 2017). However, /v/ was substituted with /w/ by Slovak speakers (Metruk, 2018), Turkish speakers (Ercan, 2018), and Chinese L2 speakers of English (Meng et al., 2007).

Some studies have shown evidence for the difficulties in producing /p/ and /v/ in a specific word position. For example, Chakma (2014) revealed that /v/ was most challenging among Thai learners in word-initial position. The sound /v/ is also problematic for Spanish learners when it occurs word-initially (Poll, 2019). Likewise, Rahman Asmaradhani and Sutarto (2002) found that /v/ was mispronounced as /f/ by Indonesian EFL speakers in word-medial and word-final positions. Similar patterns among Indonesian learners were also observed by Ambalegin and Arianto (2018), who revealed that /v/ was replaced with /f/ across all word positions (initial, medial, and final), whereas Stefani and Roba'i (2019) found that /v/ was replaced with /f/ in word-initial and word-final positions. In another related study, Senowarsito and Ardini (2019) observed the substitution of /v/ with /f/ in word-initial and word-final positions among Javanese EFL learners.

Production of /p/ and /v/ by Arab L2 speakers of English

Most previous researchers have found that the English consonants /p/ and /v/ are problematic for Arab learners of English. For instance, Khalifa (2020) indicated that /p/ and /v/ were among the problematic English sounds for Arabs when learning English. He confirmed that /p/ and /v/ did pose a difficulty for the participants since these two sounds are absent in the Arabic language and found only in borrowed words. Therefore, as a result of their L1 negative transfer, the learners replaced them with /b/ and /f/, respectively, as /b/ and /f/ are equivalent sounds in Arabic. In some cases, the learners produced /p/ without aspiration when it occurs word-initially. Similar results were obtained by Ababneh (2018), who found that Saudi learners faced challenges with /p/ as well as /v/, which were substituted with /b/ and /f/, respectively.

Another related study by Alotaibi (2018) aimed to test the effect of the language variety of Arabic-speaking teachers (in terms of their dialectal accents: Saudi Arabian, Tunisian and Egyptian) on their students' productions of English consonants. Concerning /p/, Alotaibi indicated that this sound was produced by the Arabic teachers as RP (Received Pronunciation), while the students were unable to distinguish between /p/ and /b/. Regarding /v/, Alotaibi found that this sound was produced like RP by Saudi and Tunisian teachers, yet Egyptian teachers pronounced it as /z/ in most cases. Another study by Khayra (2017) suggested that Algerian learners of English faced difficulties to produce English consonants (e.g., /b/ and /p/; /d/ and /ð/; /ʃ/ and /tʃ/; and /t/ and /θ/). Likewise, as revealed by Al Yaqoobi, Ali and Sulan (2016), /p/ and /v/ were among the most troublesome English sounds for Omani EFL learners, especially when they occur in word-final position. The learners tended to replace /v/ with /f/ and /p/ with /b/. It was also found that most errors occurred in producing /p/, while the least errors were found in producing /v/ (see also Thakur, 2020). The Egyptian learners of English also experienced difficulties in producing /p/ and /v/, as indicated by Huwari (2019), who observed that some learners mispronounced /p/ as /b/ and /v/ as /f/ in some words. The Jordanian learners of English also have problems in pronouncing /p/ and /v/ correctly, as proven by Kalaldeh (2016), who found that /p/ was frequently confused with /b/ specifically in word-initial position.

The Palestinian learners had problems in producing /p/ as well. It was revealed by Jabali and Abuzaid (2017) that /p/ was more problematic for Palestinian learners of English when occurring in word-final position, while it was less difficult for them when it occurs in word-initial position. Likewise, Alzinaidi and Abdel Latif (2019) found that /p/ and /v/ were among the most difficult English sounds for Saudi female university learners. Their study demonstrated the challenge of producing /p/ in both word-medial and word-final positions and /v/ in word-initial position. Moreover, Hassan (2014) found that several Sudanese learners of English replaced /p/ with /b/ in certain words like 'pen,' 'happy,' and 'map,' implying that Sudanese learners had problems pronouncing /p/ across all three word positions.

The two target sounds of the present study were also challenging for Yemeni EFL learners. For instance, Hamzah and Bawodood (2019) examined the extent to which minimal pairs could improve the production of English consonants among Yemeni EFL learners. Concerning /p/ and /v/, in the pre-test, /p/ was found to be the most challenging sound since most of the learners were unable to pronounce it correctly. Regarding /v/, half of the learners experienced problems in producing it accurately in the pre-test. Nevertheless, after the intervention, the ability of the learners to produce /v/ was increased, while most learners were

able to produce /p/ correctly. Similarly, as indicated by Al Mafalees (2020), only 20 Yemeni learners produced /p/ accurately, while 80 of them encountered challenges and substituted /p/ and /v/ with /b/ and /f/, respectively. Another study by Baagbah, Jaganatha, and Mohamad (2016) showed that older Yemeni learners experienced more challenges in producing /v/ compared to younger ones (see also Hadjah & Hamzah, 2022).

On the other hand, some researchers showed that /p/ and/or /v/ were less challenging for Arab or non-Arab learners of English. For example, Abdelaal (2017) found that Arab learners were able to distinguish between /p/ and /b/ in terms of aspiration or voicing, refuting the argument that Arab learners of English have difficulty in the production of these consonants (see also Hamzah et al., 2020; Yeldham, 2018).

Research Questions of the Present Study

In light of the past studies reviewed above, the current study aims to answer the following questions:

1. How do Yemeni EFL learners produce the voiceless bilabial stop /p/ and the voiced labiodental fricative /v/ of the English language?
2. To what extent does word position (i.e., word-initial, word-medial, word-final positions) affect the accuracy of their production?
3. Do voicing (for /p/) and devoicing (for /v/) take place in their production?

The results of this study will elaborate whether or not Yemeni EFL learners have problems in the production of the English sounds /p/ and /v/. The methodology implemented in the current study is described in the following section.

Methods

Materials

The current study employed a list of thirty-six isolated words consisting of two target consonants (i.e., the voiceless bilabial stop /p/ and the voiced labiodental fricative /v/) identified as problematic among Yemeni EFL learners of English. The words chosen include the two target consonants in all three-word positions (i.e., word-initial, word-medial, and word-final positions) (see Appendix A).

Speakers

The speakers of this study were two Yemeni EFL learners: one female speaker (S1) and one male speaker (S2). At the time of the study, S1 was thirty-two years old, whereas S2 was thirty years old. Both of them were born and grown up in Hadhramout in Yemen. They studied English as a foreign language in Yemen for more than ten years. At the time of this study, they were Ph.D. students at UUM majoring in IT (S1) and accountancy (S2). They enrolled in an intensive English course at UUM. Their level of English language proficiency was similar. S1 scored Band 7, while S2 scored Band 6 for the intensive English course at UUM. They had never been to any English-speaking countries and therefore had no exposure to a native environment of the English language.

Data Collection

The spoken data were recorded using professional recording equipment. First, each speaker was given four minutes to read the words in silence to familiarise themselves with the words. After that, each speaker was asked to read the words in the three lists in natural intonations. Each word was read by each speaker three times.

Data Analysis

The speakers' productions of the isolated words were analysed, firstly, by four raters who had experience in teaching English. At the time of the study, Rater 1 was a Ph.D. Arab student at UUM; Rater 2 was a master's degree Arab student at UUM; while Rater 3 and Rater 4 were Malaysian Master's degree students at UUM. All of the raters majored in Applied Linguistics. The errors in the production of the two target sounds were evaluated by the raters using an evaluation form (see Appendix B).

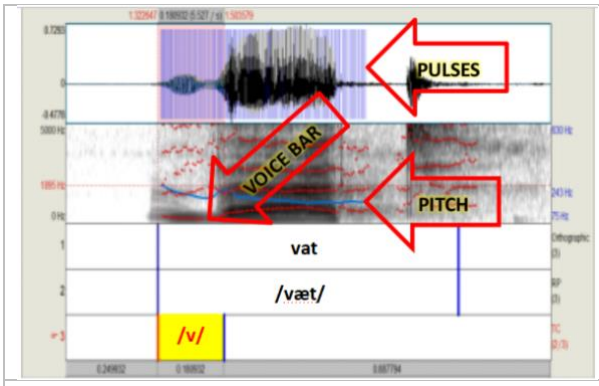


Figure 3: Production of 'vat' by S1
(the target sound /v/ in word-initial position)

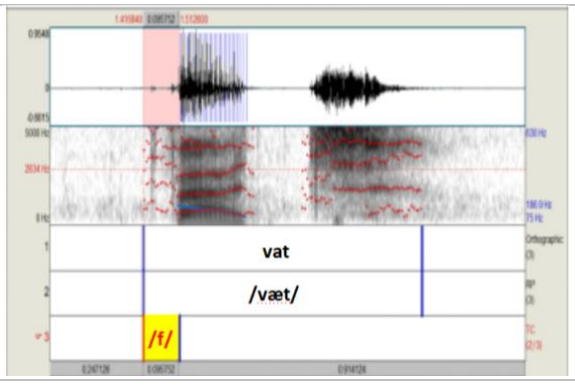


Figure 4: Production of 'vat' by S2
(the sound /v/ was devoiced and incorrectly produced as /f/)

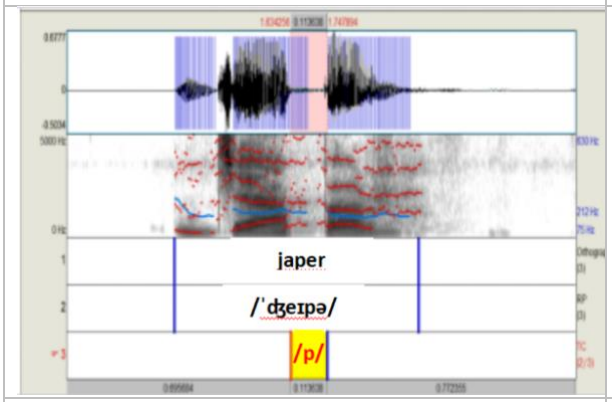


Figure 5: Production of 'japer' by S1
(the target sound /p/ in word-medial position)

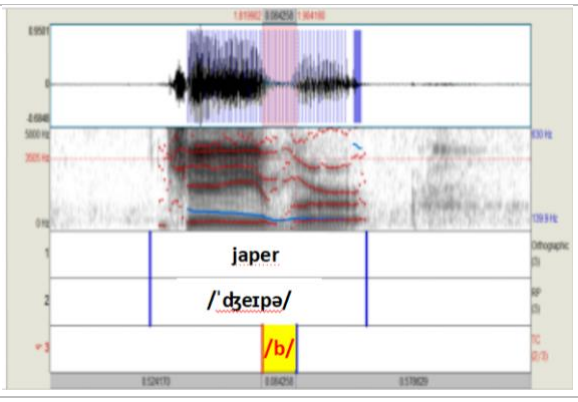


Figure 6: Production of 'japer' by S2
(the sound /p/ was voiced and incorrectly produced as /b/)

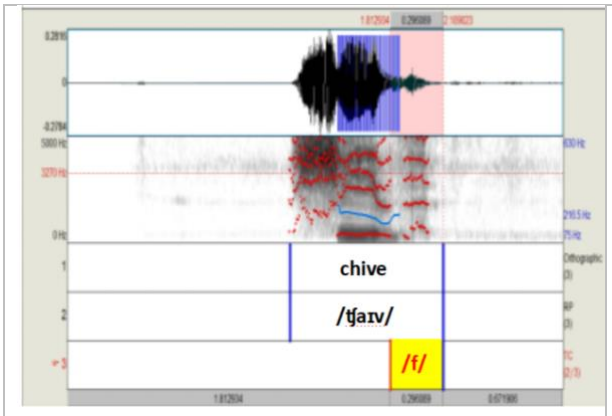


Figure 7: Production of 'chive' by S1 (the target sound /v/ in word-final position, /v/ was devoiced and mispronounced as /f/)

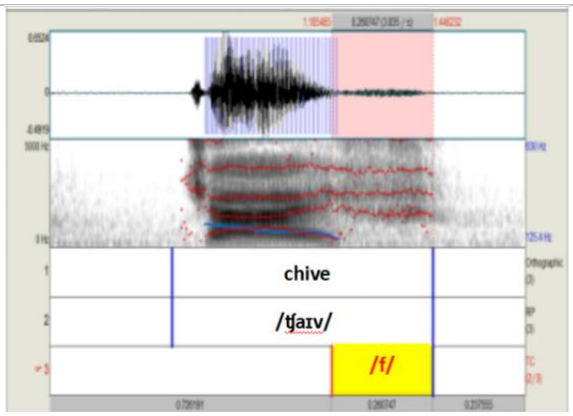


Figure 8: Production of 'chive' by S2 (/v/ was devoiced and mispronounced as /f/)

The productions of the two target sounds by each speaker were then supported by acoustic-phonetic analyses using Praat (Version: 5.3.56). The researchers aimed to identify voicing or devoicing of the target sounds /p/ and /v/ by visually inspecting the presence of voice bar, pitch, and pulses in waveforms and spectrograms in Praat. The presence of one of them in waveforms and spectrograms indicates the existence of voicing, whereas there is no voicing if all are absent (as exemplified in Figures 3-8).

Results

A. Results of Producing /p/ and /v/ as Revealed by the Four Raters

The production of the two target sounds (/p/ and /v/) for each speaker as revealed by the four raters are provided in Figures 9, 10, 11, and 12; and the same findings by the raters are included in Tables 1, 2, 3 and 4.

The results from the raters show that the two speakers mispronounced the two target sounds of the present study. As shown in (Figure 9, Table 1), in word-initial position, S1 produced /p/ as follows: completely correct 21%; slightly correct 17%; slightly wrong 17%; and she substituted /p/ with /b/ 33%. In word-medial position, S1's production of /p/ was as follows: slightly correct 29%; slightly wrong 42%; and her substitution of /p/ with /b/ occurred 17%. In word-final position, S1 produced /p/ as follows: completely correct 54%; slightly correct 13%; slightly wrong 21%; and she replaced /p/ with the /b/ 4%.

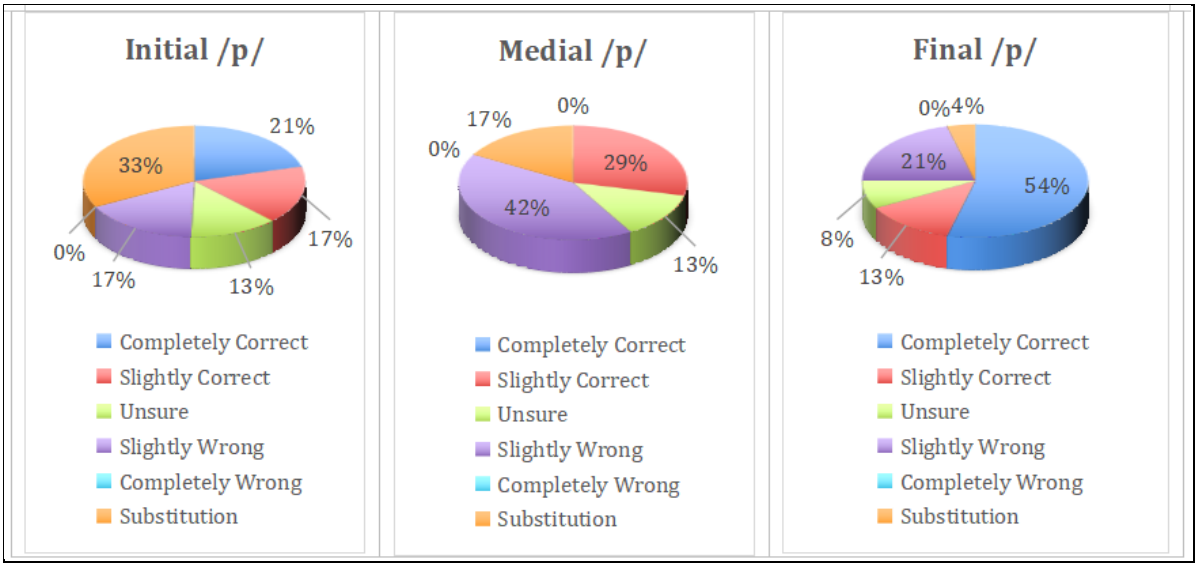


Figure 9: Productions of /p/ in three word positions by S1 (Raters' evaluation)

	Initial /p/	Medial /p/	Final /p/
Completely Correct	21%	0%	54%
Slightly Correct	17%	29%	13%
Unsure	13%	13%	8%
Slightly Wrong	17%	42%	21%
Completely Wrong	0%	0%	0%
Substitution	33%	17%	4%
Sum	100%	100%	100%

Table 1: Productions of /p/ in three word positions by S1

In contrast, fewer errors were found in S1's production of /v/ as she produced initial /v/ and medial /v/ in most words completely or slightly correct. In word-final position, S1 pronounced /v/ slight wrongly 8% and substituted /v/ with /f/ 4% (see Figure 10, Table 2).

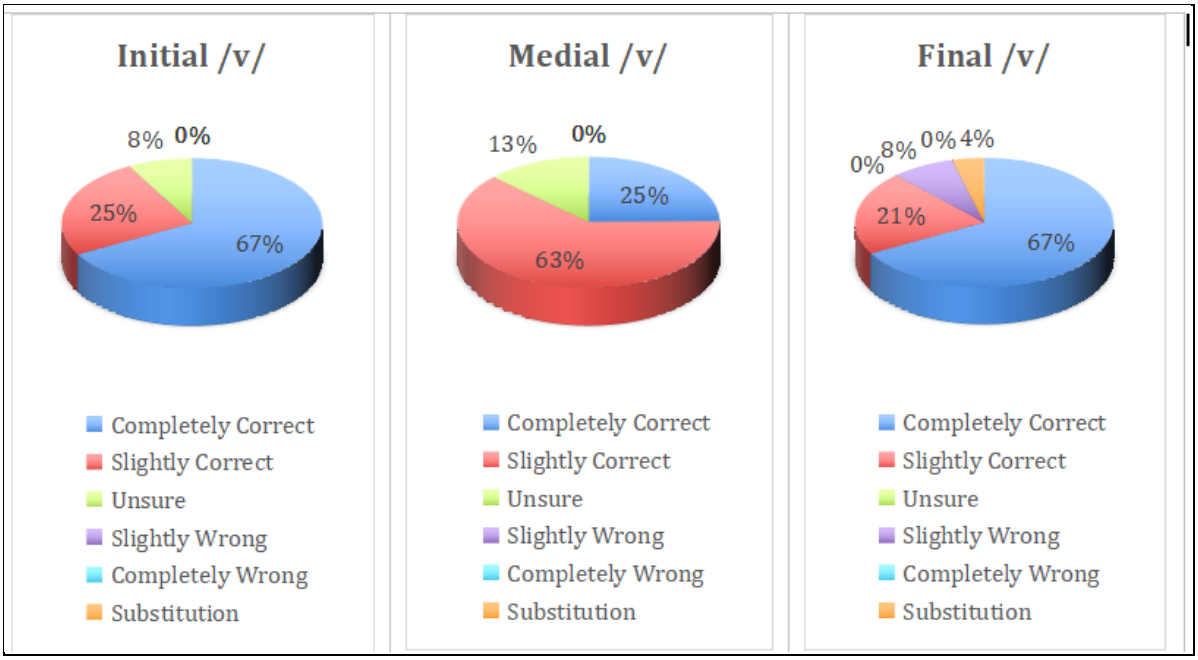


Figure 10: Productions of /v/ in three word positions by S1(Raters' evaluation)

	Initial /v/	Medial /v/	Final /v/
Completely Correct	67%	25%	67%
Slightly Correct	25%	63%	21%
Unsure	8%	13%	0%
Slightly Wrong	0%	0%	8%
Completely Wrong	0%	0%	0%
Substitution	0%	0%	4%
Sum	100%	100%	100%

Table 2: Productions of /v/ in three word positions by S1

With regard to S2, this particular speaker's production of /p/, in word-initial position was completely correct 46%, slightly correct 25%, slightly wrong 4%, and he substituted /p/ with /b/ 17%. In word-medial position, S2's production of /p/ was slightly correct 17%, slightly wrong 29%, completely wrong 4%, and he substituted /p/ with /b/ 29%. In word-final position, S2's production of /p/ was completely correct 50%, slightly correct 4%, slightly wrong 25%, and he produced /b/ instead of /p/ 17% (see Figure 11, Table 3).

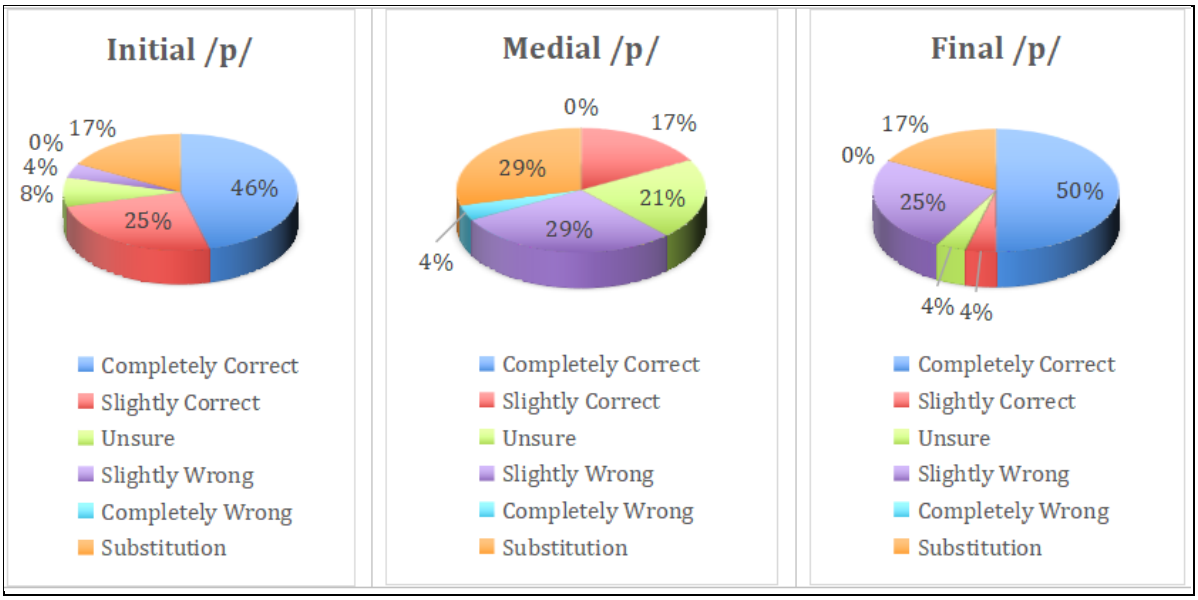


Figure 11: Productions of /p/ in three word positions by S2 (Raters' evaluation)

	Initial /p/	Medial /p/	Final /p/
Completely Correct	46%	0%	50%
Slightly Correct	25%	17%	4%
Unsure	8%	21%	4%
Slightly Wrong	4%	29%	25%
Completely Wrong	0%	4%	0%
Substitution	17%	29%	17%
Sum	100%	100%	100%

Table 3: Productions of /p/ in three word positions by S2

On the other hand, fewer errors were indicated in S2'production of /v/. In word-initial position, S2 produced /v/ as follows: completely correct 54%; slightly correct 21%; and slightly wrong 17%. In word-medial position, S2's production of /v/ was completely correct

63% and slightly correct 29%. Substitution did not occur in words with initial and medial /v/. In word-final position, S2's production of /v/ was completely correct 21% and slightly correct 4%. However, S2's production of /v/ was slightly or completely wrong 17%, and he also substituted /v/ with /f/ 42% (see Figure 12, Table 4).

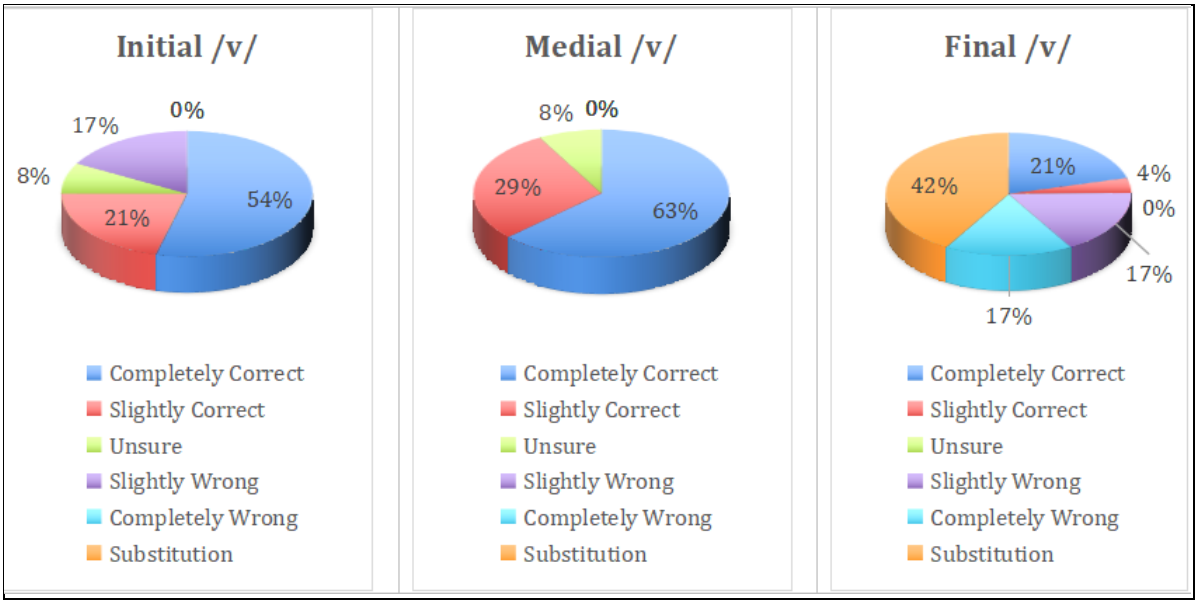


Figure 12: Productions of /v/ in three word positions by S2(Raters' evaluation)

	Initial /v/	Medial /v/	Final /v/
Completely Correct	54%	63%	21%
Slightly Correct	21%	29%	4%
Unsure	8%	8%	0%
Slightly Wrong	17%	0%	17%
Completely Wrong	0%	0%	17%
Substitution	0%	0%	42%
Sum	100%	100%	100%

Table 4: Productions of /v/ in three word positions by S2

B. Results of Producing /p/ and /v/ as Revealed by Praat Analyses

Praat analysis demonstrated that the two speakers incorrectly produced the two target sounds of this study. Concerning /p/, this English sound is voiceless, yet similar to other Arab learners of English, the two speakers voiced the /p/ sound in some words (i.e., they produced it as /b/). Concerning the second target sound of this study (/v/), this sound is voiced, but it was devoiced (i.e., it was pronounced like /f/) by both speakers in a number of words.

As observed in Figure 13, S1 voiced the sound /p/ in word-initial position 94%, in word-medial position 17%, and in word-final position 11%. This suggests that the English stop /p/ was more problematic for S1 when it occurs word-initially. However, it was of the least difficulty for her when it exists word-finally.

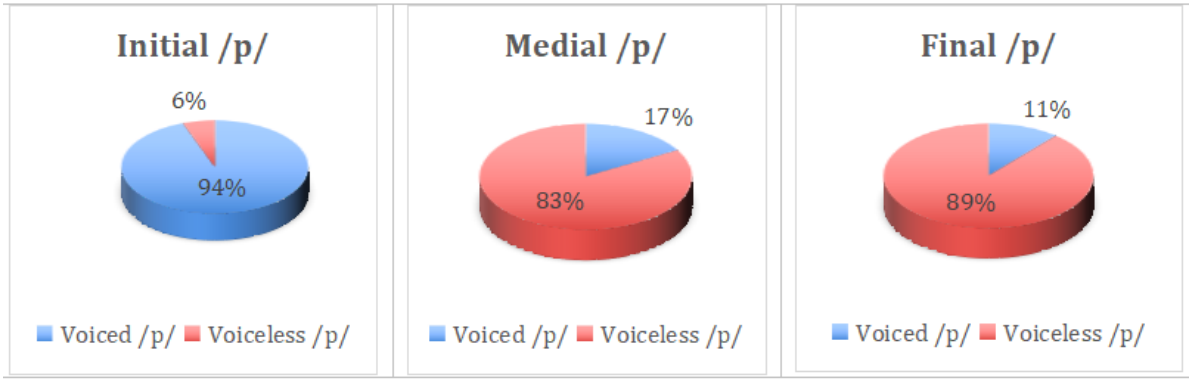


Figure 13: Productions of /p/ in three-word positions by S1 (Praat analysis)

Conversely, the English fricative /v/ was not troublesome for S1 especially when occurring initially or medially in words because her devoicing of /v/ did not take place in these two-word positions. Her difficulty with producing /v/ was found only in word-final position since she devoiced the /v/ sound 61% (see Figure 14).

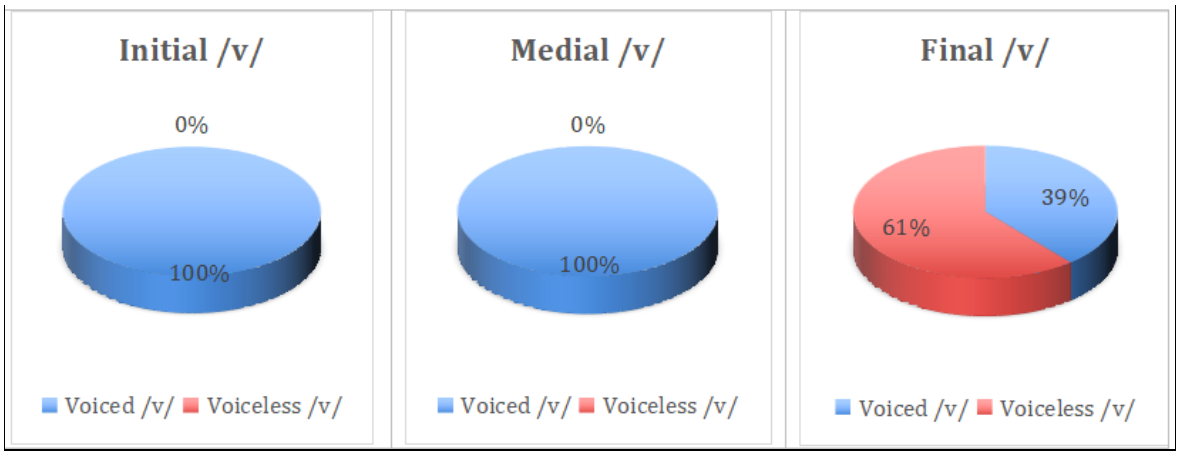


Figure 14: Productions of /v/ in three-word positions by S1 (Praat analysis)

S2 also incorrectly produced /p/ and /v/. Similar to S1, the /p/ sound was most problematic for S2 in word-initial position because he voiced the sound /p/ in word-initial position 78%. However, S2 voiced /p/ when occurring word-medially 61%, while his voicing of final /p/ was only 11%. This implies that, for S2, /p/ was of secondary difficulty when occurring medially in a word, whereas in the final position of words, /p/ was not very challenging for him to produce (see Figure 15).

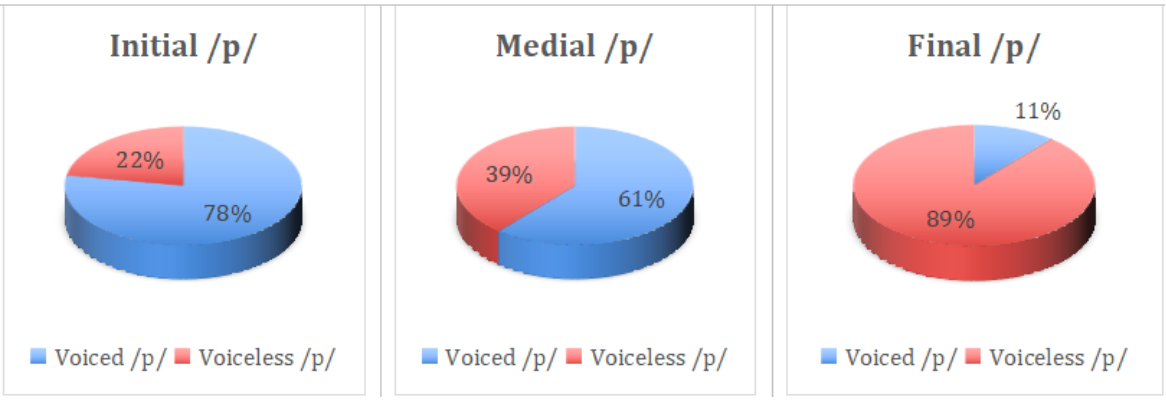


Figure 15: Productions of /p/ in three-word positions by S2 (Praat analysis)

Contrary to this, the real challenge with producing /v/ by S2 was discovered in word-final position because he devoiced /v/ in this word position in all words. He also had difficulties producing /v/ in word-medial position as his devoicing of /v/ occurred 78% in words with medial /v/. His devoicing of /v/, on the other hand, took place only 11% in word-initial position, indicating that it was easier for S2 to produce /v/ when it occurs word-initially (see Figure 16).

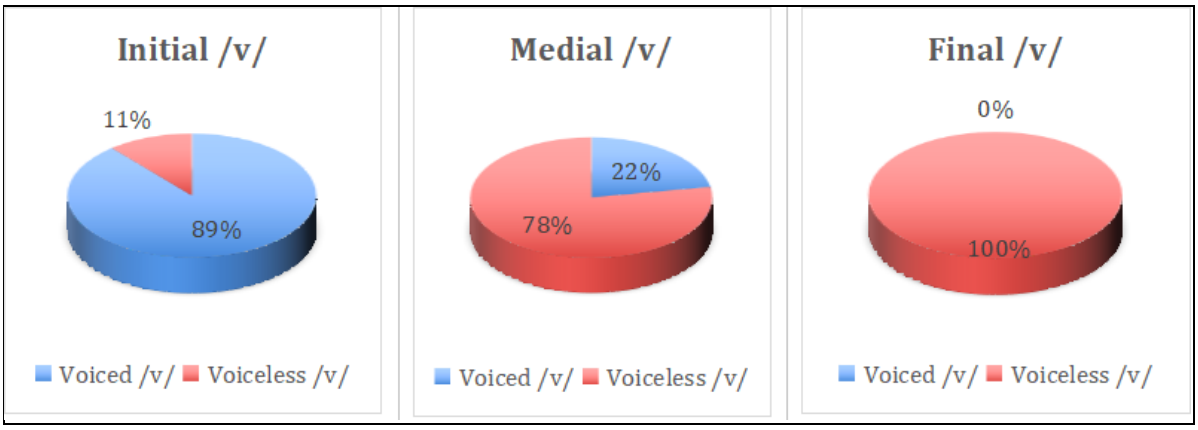


Figure 16: Productions of /v/ in three-word positions by S2 (Praat analysis)

Discussions

Difficulty with Production of /p/ and /v/

The first research question aimed to find out how Yemeni EFL learners produce the voiceless bilabial stop /p/ as well as the voiced labiodental fricative /v/ of the English language. In other words, the purpose of this question is to explore whether or not these two English sounds are challenging for Yemeni EFL learners to produce. The findings (provided by both the raters and Praat analyses) lend evidence that the English /p/ and /v/ consonants do cause some difficulties for the two speakers since both of them incorrectly produced /p/ and /v/ in several tokens.

Concerning the difficulties in producing /p/ by S1, it was revealed by the raters that S1's completely correct productions of /p/ occurred only 21% in word-initial position, while her substituting of /p/ with /b/ in this word position was 33%. Moreover, S1 was unable to produce any word with medial /p/ completely correctly, and her replacement of /p/ with /b/ in word-medial position was 17%. Besides, the completely correct production of final /p/ by S1 was 54%, while her mispronunciation of /p/ as /b/ occurred only 4%. Praat analysis also showed that S1 had challenges in the production of /p/ as she voiced the sound /p/ with the percentage of 94% when occurring word-initially, 17% when it occurs word-medially, and only 11% when occurring word-finally.

Regarding S1's production of /v/, as identified by the raters, S1 did not find it difficult to produce /v/ when it occurs word-initially or word-medially since she produced most words with initial and medial /v/ either completely correctly or slightly correctly without substituting it with /f/ or any other sounds. Even in word-final position, she substituted it only 4%. Praat analysis also demonstrated the challenge of producing final /v/ by S1 as she devoiced /v/ when it occurs word-finally 61%, while her devoicing of /v/ did not take place in word-initial and word-medial positions.

Thus, results obtained from both the raters and Praat in relation to S1's production of /p/ and /v/ confirm that: (1) /p/ was more difficult for S1 to produce in word-initial position than in word-medial and word-final positions; (2) /v/ was more troublesome for her in word-final position compared to word-initial and word-medial positions; and (3) Generally, /p/ was more problematic for S1 to produce than /v/.

Concerning the challenges in producing /p/ by S2, as illustrated by the raters, S2 was able to produce half of the words with final /p/ completely correct 50%. In comparison, his completely correct productions of initial and medial /p/ were 46% and 0%, respectively. The raters, however, found that S2's replacement of /p/ with /b/ occurred 29% in word-medial position and 17% in both word-initial and word-final positions. Praat analysis also indicated that the voicing of /p/ by S2 took place 78% when occurring word-initially, 61% when occurring word-medially in words, and only 11% in word-final position.

With regard to his production of /v/, the raters found that S2 substituted /v/ with /f/ only in word-final position with the percentage of 42%. He had fewer problems with the production of /v/ when it occurs initially and medially in words because his completely correct production of /v/ in these two-word positions took place 54% and 63%, respectively. Praat analysis, on the other hand, showed that S2 devoiced /v/ in all tokens with final /v, while his devoicing of /v/ occurred 78% when /v/ occurs in word-medial position and only 11% with /v/ in word-initial position.

Therefore, the results as found by the raters and Praat analysis regarding how S2 produced /p/ and /v/ can be summarised as follows: (1) Both the raters and Praat analyses revealed the difficulty of producing /p/ by S2 when it appears word-initially and word-medially (i.e., the raters found that /p/ was more problematic for S2 to produce in word-medial position and then in word-initial position, while Praat analysis showed that the challenge in producing /p/ by S2 was found in word-initial position and then when it occurs word-medially; (2) /v/ was more difficult for S2 to produce in word-final position (as revealed by both the raters and Praat); and (3) The raters showed that /p/ was more problematic for S2 to produce than /v/; while Praat analysis demonstrated the great difficulty of producing both /p/ and /v/ by S2. However, when the researchers calculated all tokens produced by the two speakers in which they voiced the /p/ sound and the tokens in which they devoiced the /v/ sound, as shown by Praat analyses, it can be observed that /p/ was voiced in 272 tokens. In contrast, /v/ was devoiced in 250 tokens, suggesting that, in general, /p/ was more problematic to produce by the two speakers than /v/. This result was confirmed by the raters.

To sum up, regarding the first question of this study, the results suggest that Yemeni EFL learners have difficulties with the production of /p/ and /v/. These two sounds have been found to be typically challenging for Arab L2 learners of English (Ahmad, 2011; Ahmad & Nazim, 2013; Al Mafalees, 2020; Al Yaqoobi, Ali & Sulan, 2016; Hamzah & Bawodood, 2019; Huwari, 2019); and also, for non-Arabic L2 learners of English (Begum & Hoque, 2016; Inyang, Okon & Ebong, 2017; Kho, 2011). Nonetheless, the present study verified that /p/ is generally more challenging to produce than /v/. Similarly, Al Yaqoobi, Ali and Sulan (2016) revealed that most errors occurred in producing /p/, while the least errors were observed in the production of /v/ (see also Alfallaj, 2013; Alzinaidi & Abdel Latif, 2019; Hago & Khan, 2015; Hamzah & Bawodood, 2019).

The Effect of Word Position on the Accuracy of Producing /p/ and /v/

The aim of the second question of this study is to examine the extent to which word position (i.e., word-initial, word-medial, word-final positions) can affect the accuracy of producing /p/ and /v/ by Yemeni EFL learners. The findings show that word position significantly affected the speakers' production of both /p/ and /v/. Firstly, as revealed by the raters and Praat analyses, for S1, /p/ was more problematic to produce when occurring word-initially than in the other two-word positions, whereas /v/ was more difficult for her in word-final position compared to word-initial and word-medial positions. Secondly, for S2, the raters found that /p/ was more challenging to produce in word-medial position and then in word-initial position, whereas Praat analysis showed that the difficulty of producing /p/ by S2 was more in word-initial position and then in word-medial position. However, /v/ was more difficult for S2 when occurring word-finally, as found by both the raters and Praat. Such an influence of the word position on the accuracy of producing English /p/ and/or /v/ by Arab L2 learners of English was revealed by other researchers (e.g., Alzinaidi & Abdel Latif, 2019; Binturki, 2008; Hago & Khan, 2015) and by non-Arab EFL/ESL learners of English (e.g., Ambalegin & Arianto, 2018; Senowarsito & Ardini, 2019; Chakma, 2014; Poll, 2019; Rahman, Asmaradhani & Sutarto, 2002; Stefani & Roba'i, 2019).

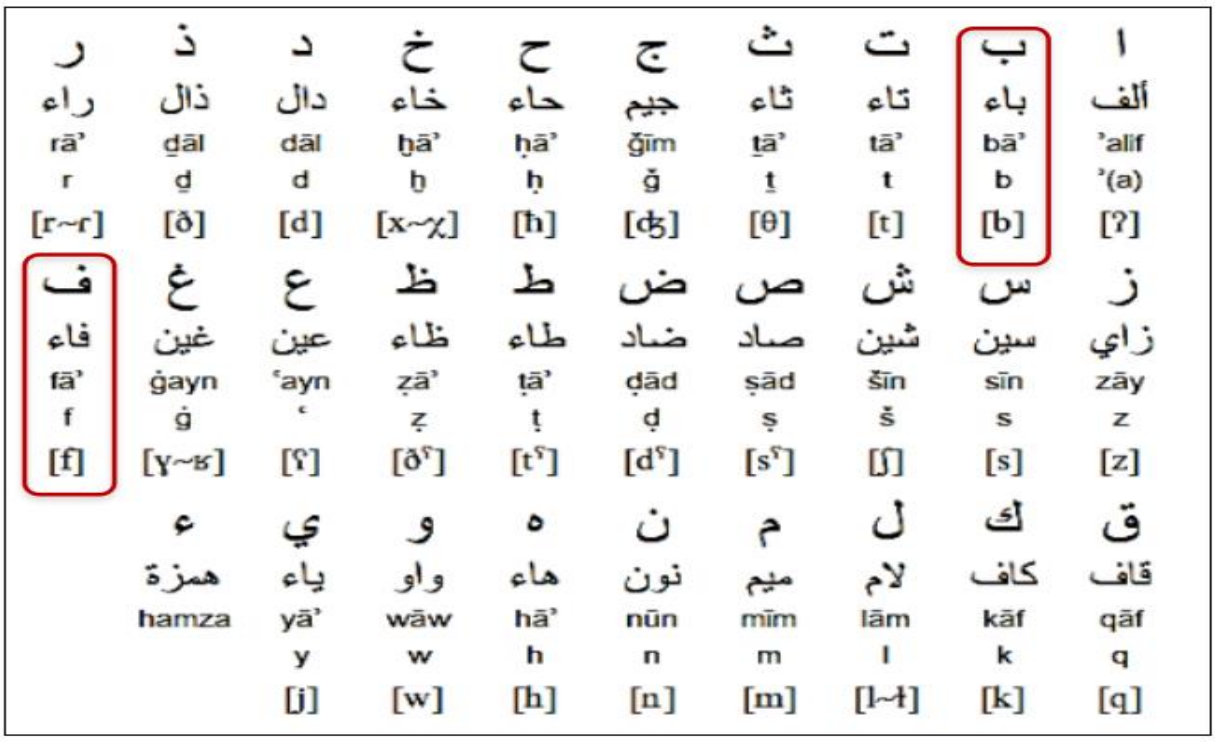
For instance, Jordanian learners of English almost always produced /p/ like /b/ particularly when it occurs word-initially (and between vowels) as found by Kalaldeh (2016). Moreover, Binturki (2008) reported that the production of /p/ and /v/ by Saudi ESL learners in word-initial position was more accurate than in word-final position. According to him, despite the dominance of the /v/ difficulty in both initial and final positions, it was less obvious in word-final position than in word-initial position. Another study by Hago and Khan (2015) demonstrated that /v/ was not found to be a big problem for the subjects, particularly when occurring in word-medial and word-final positions. In addition, Alzinaidi and Abdel Latif (2019) revealed that more errors in producing /p/ by Saudi EFL learners occurred in word-medial and word-final positions than in word-initial position. Most errors occurring in their production of /v/were observed in word-initial position. Likewise, /v/ was evidenced to be most challenging among Thai learners (Chakma, 2014) and Spanish learners (Poll, 2019) when it occurs word-initially.

Main Types of Mispronunciation

Two patterns were discovered in this study: (1) /p/ was voiced and replaced with /b/, and (2) /v/ was devoiced and produced like /f/. Voicing the sound /p/ occurred in the productions of the two speakers across the three-word positions while devoicing the /v/ sound was made by S1 in word-final position, and across the three-word positions by S2 (as shown by Praat analysis). However, the raters' auditory evaluation revealed the occurrence of devoicing /v/ by S2 when it occurred word-finally. Similar substitution of /p/ with /b/ and /v/ with /f/ by Yemeni EFL learners was indicated few studies (e.g., Bin Hadjah and Hamzah, 2022; Al Mafalees, 2020). Arab learners of English have been also found to substitute /p/ with /b/ (Ababneh, 2018; Al Yaqoobi, Ali & Sulan, 2016; Hago & Khan, 2015; Hamzah et al., 2020; Jabali & Abuzaid, 2017; Nazari & Younus, 2020); and /v/ with /f/ (Ababneh, 2018; Al Yaqoobi, Ali & Sulan, 2016; Hago & Khan, 2015; Nazari & Younus, 2020). Likewise, non-Arab learners of English have also been found to replace /p/ with /b/ (Inyang, Okon & Ebong, 2017; Lengeris & Nicolaidis, 2016); and /v/ with /f/ (Ambalegin & Arianto, 2018; Inyang, Okon & Ebong, 2017; Senowarsito & Ardini, 2019).

Such a poor performance in producing /p/ and /v/ and substituting them with /b/ and /f/, respectively, by Arab learners of English can be explained by certain theories in second-language acquisition like the Markedness Differential Hypothesis (MDH) and the Language Transfer Theory (LTT). As highlighted by Eckman (2008), MDH proposes that areas of the L2 that vary from the L1 but are more marked than the L1 would be challenging. The application of the MDH can indeed assist researchers in explaining the phonological discrepancy between Arabic and English and how such discrepancies may affect the learners' production. Concerning the LTT, Gass and Selinker (1992) remarked that a learner's native language (NL) interference occurs during the process of acquiring a target language (TL). Such interference can be either positive (when leading to errors in producing the TL by learners as a consequence of successful transfer) or negative (when leading to errors in producing the TL by learners as an effect of unsuccessful transfer of specific features found in learners' NL).

Thus, Yemeni EFL learners face challenges in producing the English voiceless stop /p/ and the English voiced fricative /v/ since they are more marked than /b/ and /f/, respectively. The English /b/ is somehow similar to the Arabic 'ب', while /f/ is quite similar to the Arabic 'ف' (see Figure 17).



Source: https://omniglot.com/writing/arabic.htm

Figure 17: Arabic consonants

Conclusion

This study investigated the production of English /p/ and /v/ sounds by EFL Yemeni learners. As revealed by the findings, the two sounds investigated in this study were troublesome among Yemeni EFL learners. Moreover, word position significantly affected the production of /p/ and /v/. This study illustrated not only the challenge in producing the two sounds yet also where the challenge depending on the position of a word. As shown by the results of this study, the two participants faced challenges in specific word positions. Furthermore, two

patterns were discovered in the production of /p/ and /v/ by the two speakers and these patterns were: devoicing /v/ and substituting it with /f/; as well as voicing /p/ and replacing it with /b/. The results have primarily shed some light on the pronunciation challenges that Arab speakers may face when they produce English consonants and have particularly verified prior findings concerning Yemeni EFL English learners. Further studies are suggested by the researchers using larger samples to examine the challenges in the production of /p/ and /v/. Studies adopting a quantitative research method and a mixed-methods approach (e.g., interviewing EFL teachers and students) are recommended for future research to explore the reasons beyond such difficulties.

Appendix A

Isolated words with /p/ and /v/ in three-word positions

Target Sound	Word Position	Word	IPA Transcription
/p/	Initial	Pat	/pæt/
		Pax	/pæks/
		Pad	/pæd/
		Pal	/pæl/
		Pan	/pæn/
		Pam	/pæm/
/p/	Medial	Caper	/ˈkeɪpə/
		Japer	/ˈʤeɪpə/
		Paper	/ˈpeɪpə/
		Taper	/ˈteɪpə/
		Gaper	/ˈgeɪpə/
		Shaper	/ˈʃeɪpə/
/p/	Final	Skype	/skaɪp/
		Snipe	/snaɪp/
		Type	/taɪp/
		Wipe	/waɪp/
		Ripe	/raɪp/
		Stripe	/straɪp/
/v/	Initial	Vat	/væt/
		Van	/væn/
		Val	/væl/
		Vac	/væk/
		Vag	/vædʒ/
		Vas	/væs/
/v/	Medial	Slaver	/ˈsleɪvə/
		Raver	/ˈreɪvə/
		Saver	/ˈseɪvə/
		Haver	/ˈheɪvə]
		Caver	/ˈkeɪvə/
		Waver	/ˈweɪvə/
/v/	Final	Chive	/ʧaɪv/
		Five	/faɪv/
		Arrive	/əˈraɪv/
		Strive	/straɪv/
		Dive	/daɪv/
		Alive	/əˈlaɪv/

Appendix B

Evaluation form for the isolated words

	Word	Perfectly correct pronunciation 1	2	3	4	Completely wrong pronunciation 5	Substitution
1.	Pat						
2.	Pax						
3.	Pad						
4.	Pal						
5.	Pan						
6.	Pam						
7.	Vat						
8.	Van						
9.	Val						
10.	Vac						
11.	Vag						
12.	Vas						
13.	Caper						
14.	Japer						
15.	Paper						
16.	Taper						
17.	Gaper						
18.	Shaper						
19.	Slaver						
20.	Raver						
21.	Saver						
22.	Haver						
23.	Caver						
24.	Waver						
25.	Skype						
26.	Snipe						
27.	Type						
28.	Wipe						
29.	Ripe						
30.	Stripe						
31.	Chive						
32.	Five						
33.	Arrive						
34.	Strive						
35.	Dive						
36.	Alive						

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