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An Acoustic Analysis of Monophthong Vowels and their Allophonic Pharyngealized Counterparts in the Gulf Pidgin Arabic

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Abstract:
The study explores the possible effect of the length of residence (LOR) in an Arabic-speaking country (i.e., Saudi Arabia) and/or L1 on the realization of the Arabic monophthong vowels /i, iː, a, aː, u, uː/ and their allophonic pharyngealized ones as produced by 20 male GPA speakers from India whose L1 is Malayalam, using 3 speakers of Arabic as a baseline. Acoustic parameters, including spectral and temporal structures of the Arabic vowels, were measured and analyzed. The values of each group of GPA speakers were compared to the values of the control group to determine similarities and differences in vowel production, a within-group (GPA-speaking groups) and between group comparison and the local norm. The results indicated that both groups of the GPA speakers similarly realized most of the Arabic vowels /i, a, aː, u, uː/ with values much like those of native speakers, regardless of their LOR, except for the Arabic /iː/, which could be only realized by the GPA speakers of the long-stay group. As for Arabic length patterns. The results also reported that both the short and long-stay groups took advantage of the existence of the length feature in their L1, which in turn, facilitated their performance in Arabic duration. Overall, the long stay group shows superiority over the short stay group in most performances (i.e., Arabic pharyngealized vowels and durational patterns), supporting the argument of the Speech Learning Model (SLM) (Flege, 1995).

Keywords: Gulf Pidgin Arabic, SLM, Substrate Language, Superstrate Language, Acoustic Cues.

1. Introduction

The current study investigates the acoustic analysis of the Arabic monophthong vowels and their allophonic pharyngealized ones and how the length of residence in Saudi Arabia and L1 may influence on the Gulf Pidgin Arabic speakers' production. Pidginization is both a social and linguistic phenomenon: a language that emerges as a result of contact with or acculturation of the target language (Al-Jasser, 2012). Historically, the emergence of pidgins around the world results from migration, trade, slavery, colonization and an internationally mobile workforce (Bassiouney, 2010; Winford, 2003). Most commonly, pidgins emerge among traders who have a great deal of contact with a group of native speakers of the target language[1] (Yule, 1996). According to Almoaily (2012, 2014) pidgin languages are made up of at least two languages: non-dominant language in a language contact setting, namely substrate language and the dominant language on which the pidgin is based, namely superstrate language. Almoaily also states that the term pidgin lacks a unanimous explanation; however, most scholars (e.g., Holm, 2000; Almoaily, 2012; E Alghamdi, 2014; Özüorçun, 2014) agree that pidgin is a reduced variety of a language used as a means of communication between two groups not sharing a common language in the same geographical region. Moreover, it is no body's native tongue (Wardhaugh, 2010).

A pidgin typically has general linguistic features, in that it has a simplified grammar structure and phonology, and limited lexicon. Pidgins have common characteristics in their phonology; they have reduced vowel inventories due to the difficulty pidgin speakers encounter in producing and acquiring the marked vowels that are rare in languages (e.g., close front rounded vowels such as /y/). Pidgin speakers mostly face difficulties in acquiring marked sounds, and they tend to simplify them by replacing them with the closest equivalents in the substrate languages (Klein, 2006). Accordingly, pidgins have reduced vowel inventories compared to their lexifiers, and range from five to eight vowels (Klein, 2006). However, in most cases, pidgins consist of the following five vowels, /i, e, a, o, u/, as found in Juba Arabic, Kituba and Kinubi (Sebba, 1997; Klein, 2006; Özüorçun, 2014). Klein (2006) claims that most, if not all, pidgins consist of the most frequent vowels in the world's languages (e.g., /i/, /a/, /u/). This is the case in GPA, which also includes all the previous common vowels (Neass, 2008).

Moreover, vowel contrastive length is another issue that might cause issues in producing vowels among pidgin speaker. Sakoda and Siegel (2008) claim that pidgins have no distinction in vowel length and the overlapping pairs of the vowels do not show a different vowel length; especially when this distinction is absent from the substrate languages. In the current study, vowel length in both the substrate

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[1] The Terms "target language, L2, non-native language" have a similar meaning and thus will be used interchangeably throughout the paper.

language *Malayalam* and the superstrate language *Gulf Arabic* (GA) is phonemic. Thus, it is necessary to investigate how these vowels are patterned in each variety and find out whether or not the two languages have the same durational and phonological vowel length patterns. The production of L2 sounds (consonants/vowels) of pidgin speakers are likely to be affected by linguistic factors such as L1 transfer (i.e., a process of a second language acquisition) and/or non-linguistic factors such as a long period of exposures to the lexifier.

The reason behind investigating short vowels, /i, a, u/, and their long counterparts, /iː, aː, uː/is that these vowels are agreed upon in most research on GA (Smart, 1995; Neass, 2008; Almoaily, 2008, 2014). Additionally, the monophthongal vowel inventories of Najdi Arabic (a sub-dialect of GA), which is spoken in the Qassim region as well as other neighboring regions where the participants of this study have their primary contact with GA, is sharing most of the short-long mono vowels of Modern Standard Arabic (specifically, i, iː,a, aː,u, uː) (Almoaily, 2008). This study considers how the LOR in the Kingdom of Saudi Arabia and the GPA speakers' L1 participating in this study impact their pronunciation. I will employ the term "GPA speakers" throughout the rest of this paper to refer to the speakers participating in this study. Typically, pidgin speakers are adults, and the adult learners of a given language are expected to encounter difficulty in producing some of the non-native sounds (i.e., consonants/vowels) in a native-like fashion (Munro, 1993). Some linguists (e.g., Schumann, 1976; Siegel, 2009) consider pidginization as a model for adult second language acquisition (SLA) at the early stage. Adult learners, particularly in the initial stage (Major, 2008), apply their L1's phonology to produce the sounds of the target language. That is, speakers tend to transfer sound properties of their L1 into their production of target language. Accordingly, the speakers fail to achieve native-like production. One of the influential factors, which is found in the extant L2 literature regarding the failure of achieving native-like performance, especially at the phonological structure, is the speaker's age of learning. This is clear from the claim of Critical Period Hypothesis (CPH) as put forth by Lenneberg (1967). The CPH claims that there is an ideal period for acquiring a language in a native-like manner. The acquisition should begin before the start of puberty, and the speaker will show a noticeable foreign accent if acquiring the L2 after the critical period. However, Flege (1981) states that the speaker's age may not hinder adult speakers from obtaining native-like acquisition, and acquiring the language in a native-like manner is never lost. Both adult and young speakers have the ability to learn the language in a native-like manner, but with disparate degrees of learning. Flege (1995) developed the Speech Learning Model (SLM) as a model for SLA of sounds in adulthood. This model relies on the duration of immersion in the L2 environment as opposed to age. The adult speakers/learners have the ability to form new phonetic categories for new L2 sounds after many years of speaking L2 speech. Therefore, L2 adult learners/pidgin speakers with long exposure to L2 sounds are more likely to produce the non-native sound in a native-like way than those who have less exposure to the L2 sounds. Flege, Bohn, and Jang (1997) conducted a study on the production of

English vowels produced by speakers having different L1s, including German, Mandarin, Spanish, and Korean. The speakers vary in their LOR in the United States (US). Flege reports that speakers who have been longer in the US realize the new vowels of English in a more native-like manner compared to those who stay for a shorter duration in the US. Thus, variability in the speakers' performance is predicted. In this case and based on Flege's claim, I expect that GPA speakers who have been longer in Saudi Arabia are able to produce the GA vowels with acoustic value closer or similar to the value of target vowels (i.e., GA vowels). On the other hand, the GPA speakers with a short stay in Saudi Arabia (less exposure to GA) are expected to have a value similar to their L1's value.

In what follows, I first review literature reviews of the current study including an overview of GA, Gulf Pidgin Arabic, and previous studies on GPA. I then present the methodology section. This is followed by the results and discussion and finally conclude with the conclusion and limitation.

2. Literature Review

2.1 An overview of Gulf Arabic (GA) and Gulf Pidgin Arabic (GPA)

GA is a variety spoken by people residing in the Arabian Gulf countries (i.e., Saudi Arabia, Kuwait, Bahrain, Iraq, Oman, Qatar and United Arab Emirates) (Smart,1990). My study will concentrate on the center of Saudi Arabia, specifically the Qassim Region/Central Region, where the data were collected. Thus, in this paper, the term GA will be used to indicate the variety that is spoken in the center of Saudi Arabia (i.e., Qassim).

The vowels of GA lack a unanimous description. Most researchers (e.g., Alghamdi, 1998; Hassig, 2011; Almisreb et al., 2016) assign six monophthongal vowels that appear in short-long counterparts, /i, iː,a, aː,u, uː/, while others assign eight vowels /i, iː, eː, a, aː, oː, u, uː / (Holes, 1990), nine vowels, /i, iː, eː, a, aː, o, oː, u, uː / (Qafisheh, 1977), and 10 vowels, /i, iː, e, eː, a, aː, o, oː, u, uː / (Johnstone, (1967). The phonological contrast of Arabic vowels is dependent on the vowel quantity (Saadah, 2011), and the vowel duration is contrastive, as is the case in Malayalam. The variability in assigning the vowels in GA might result from the regional dialects of GA spoken in different Arabian Gulf countries (i.e., Saudi Arabia, Qatar, etc.). M.Alghamdi (1998) conducts his study in the central part of Saudi Arabia, namely Riyadh; Holes (1990) conducts a study on GA spoken in Oman and United Arab Emirates, Qafisheh (1977) describes the GA spoken in Abu Dhabi (the capital city of United Arab Emirates); and Johnstone (1967) describes the GA spoken in Kuwait, Bahrain and Qatar.

GPA, on the other hand, is categorized as a pidgin by most scholars including Smart (1990), Næss (2008), and Bakir (2010). It is defined by Bakir (2010) as "the reduced linguistic system used in communication between the non-national labor and the native Arabic-speaking community in the various countries of the Arab Gulf and Saudi Arabia" (p.202). In addition, it is used as a way of communication as

lingua franca by the foreign labor force in this area, especially that group of speakers who have different linguistic backgrounds or who share no common language.

The development of GPA is little-documented, as is most common in pidgin languages, and there is no clear-cut evidence elucidating the early stages of GPA development. Bakir (2010) and Bassioney (2010) speculate that the initial stages of GPA appeared when the influx of immigrant workers came to the Gulf area to work in the oil industry after the discovery of oil in the Gulf region in 1938. Saudi Arabia witnessed massive development resulting from the oil industry and thus created many kinds of employment that could not be performed by the locals. As a result, many immigrant workers have been hired from varying linguistic backgrounds to work in different jobs. The existence of linguistic diversity that occurs within the expatriate community, who speak different languages, encourages forming a new variety with which the community is able to communicate. Another reason that has promoted the development of GPA is the different cultures and social distance between expatriates and local groups. This distance results in minimizing social contact and limiting the contact to business affairs (Næss, 2008). Therefore, the latter group (expatriates) might not make an effort to learn the language of the hosting country, and thus they tend to use a simplified and reduced variety of the dominant language (Arabic) for communication. Therefore, the GPA is assigned as a pidgin since it follows analogous developmental stages found in other pidgins, which are identified through linguistic criteria. It also resembles other pidgins in that there are no native speakers for GPA, and its usage is restricted for certain registers (work environment) and certain purposes (oral communication as everyday language).

The present study addresses only speakers from India who speak a South Dravidian language (in this case, Malayalam) as their L1. Malayalam is the official language of Kerala, a state located in southern India, and is spoken natively by more than 35 million speakers (Jiang (2010). The reason for selecting Indian speakers in this study to represent GPA speakers in Saudi Arabia is because the overwhelming majority of immigrant workers are from India. Indian and Pakistani people are the two largest groups in Saudi Arabia, with a total population of 2.1 million and 1.8 million, respectively. Jiang (2010), counted 11-monophthongal vowels including: /i, iː, e, eː, a, aː, ə, o, oː, u, uː/ in Malayalam, while Velayudhan and Howie (1974) reported only 10 monophthongal vowels /i, iː, e, eː, a, aː, o, oː, u, uː/ (note that diphthongs are out of the scope of this paper). This inventory lists illustrate only the short vowels and their long counterparts. All monophthong vowels, except for the schwa /ə/, show a phonological contrast based on the vowel quantity. That is, the vowel length in Malayalam is contrastive.

2.2 Previous studies on GPA

This section presents the literature regarding the phonological system of the GPA as it relates to the production of vowels. Most works on Arabic-based pidgins

chiefly discuss morpho-syntactic features such as inflectional affixation, possession, verb form, negation, word order, and copula (e.g., Smart, 1990; Almoaily, 2008; Næss, 2008; Avram, 2010; Almoaily, 2012; AlBakrawi, 2012; Salem, 2013; Al-Abed Al-Haq & Al-Salman, 2014, E Alghamdi, 2014; Al-Zubeiry, 2015).

Some scholars including Næss (2008), Almoaily (2008), Avram (2010), Salem (2013) provided a very fleeting glance on the vowels of GPA as an introductory part of their non-phonetic studies. They either present the vowel systems of pidgin or only present how the pidgin speakers realize vowel length in the lexifier. I will survey these studies, providing a general critique to their shortcomings as they relate to the current study.

Næss (2008) examines the linguistic features (i.e., negation and verbal system) of GPA in Oman and the United Arab Emirates. She also presents a brief overview of the phonology of GPA. The participants in her study have different linguistic backgrounds and their L1s include Urdu, Sinhala, Bengali, Tamil, and Tagalog. She adopts the *foreign talk theory* (Ferguson, 1971) to manifest the simplified input that contributes to GPA formation. She concludes that GPA is a pidgin variety since it shows great simplicity in the linguistic features of its lexifier (in this case, GA), resulting in reduction at most linguistic levels. For instance, at the phonological level, Næss finds that reduction appears in the inventories of both consonants and vowels; GPA comprises 18 consonants and 5 vowels /i, e, a, o, u/ as opposed to 29 consonants and 8 vowels, /i, iː, e, a, aː, o, u, uː/, of the lexifier (GA). The speakers of GPA are influenced by their L1s, and this is evident in the vowel length. The vowel length of GA is neutralized by GPA speakers. For instance, the words *gul* "say IMP" vs. *guːl* "said" carry the same meaning among GPA speakers. Thus, the absence of the phonemic length in the speakers' L1 results in the reduction of vowel inventories in GPA.

Almoaily (2008) describes the segmental phonology of this variety in his study on the phonology and morphosyntax of Urdu Pidgin Arabic (UPA), which is spoken in Saudi Arabia. He states that the speakers of UPA tend to simplify their phonological system by substituting the sounds that are typologically marked with more common sounds in their L1. This simplification phenomenon is found in other pidgins in the world as well. Furthermore, Almoaily adopts the *Universalist theory* to explain the similarities between Urdu Pidgin and other pidgins. His descriptive analysis is limited to the vowel systems of UPA, which include the following phonemes: /iː, i, eː, a, aː, ə, u, uː/ without any indication to their acoustic values.

Avram (2010) and Salem (2013) conducts qualitative research to describe the linguistic features of Romanian Pidgin Arabic (spoken in Iraq by Romanian and Arab oil workers) and Asian Pidgin Arabic (spoken in Kuwait by Asian housekeepers), respectively. Both authors employ the same method in collecting data, in that they use recorded sociolinguistic interviews of their participants. They allocate sections in their work to provide a brief overview on the phonology of Romanian Pidgin Arabic (RPA) and Asian Pidgin Arabic. Both studies reach similar conclusions based on their findings, especially the findings that relate to syntactic and morphological structures of the varieties. On the other hand, Avram and Salem

do not discuss the vowel systems of Romanian Pidgin Arabic and Asian Pidgin Arabic. They discuss only the vowel length, in that the speakers of both varieties have no distinction between short and long vowels. For instance, the speakers of Asian Pidgin Arabic realize the Arabic word *hut* "to put" as either *hut* or *hu:t*. Likewise, the speakers of RPA realize the Arabic word /*lazim*/ "must/necessary" as either /*lazim*/ or /*la:zim*/. Avram and Salem claim that the length contrasts are absent in the substrate language/L1 of the pidgin speakers. Accordingly, they fail to distinguish the vowel lengthening of the lexifier (GA).

Perhaps the most obvious shortcoming of the previous studies is that the analyses are based only on perceptual characterization of vowels. Unlike consonants, the vocal tract is open in producing vowels, and the tongue raises and drops inside the mouth without involving a necessary contact between articulators. This form of articulation makes it impossible to see visual articulatory signals in the production of these vowels. Accordingly, this kind of analysis lacks an accurate judgment, and does not provide an explicit description. One critique of Næss and Almoaily's methods is thus that without considering acoustic analyses, it is unlikely that they could determine the accurate vowel quality of the pidgins they were studying nor, by extension, how the production of GPA speakers is similar to or different from the local form.

Furthermore, these works do not provide detailed explanations of the phonology of the participants' L1s so that one can trace any phonological features transferred from the speaker's L1 to their pidgin variety. Moreover, they do not investigate if there is any bidirectional transfer between the substrate and superstrate languages. Næss (2008), in her study, does not provide any explanation as to why the vowel length is absent among the speakers of GPA although most of her participants' L1s which include Urdu, Malayalam, Tamil and Sinhala have vowel length contrast in their phonology. Salem (2013) also discusses the absence of vowel length among his participants but does not specify the participants' L1s. He only mentions that his participants are from Asia without classifying their ethnic groups, making his analysis opaque when it comes to vowel length.

It is obvious that there is a gap in these studies. The gap concerns the lack of accurate investigations of phonetic production in Arabic-based pidgins. To the best of my knowledge, there are no acoustic studies discussing in detail the phonetics of GPA, particularly how the vowels are produced by GPA speakers and how their production is similar to or different from their lexifiers, except for Aljutaily's work (2018) who investigates the acoustic analysis of marked consonants in the speech of GPA.

Additionally, these studies do not consider the role of LOR and the role of substrate language. Adopting acoustic measures in exploring vowel production is certainly an important contribution to the field of pidgin research, particularly on Arabic-based pidgins and one that brings the study of GPA in line with prevailing trends in the field. Hence, the present study aims to fill this gap by conducting an acoustic analysis addressing the following research questions:

1. How are the vowel spaces patterned in each variety and to what extent are the substrate (Malayalam) vowels similar or dissimilar to those of the superstrate/lexifier language (i.e., Arabic)?
2. Will the GPA speakers be able to produce pharyngealized1 vowels[2] of GA and match the values of GA speakers?
3. Will the GPA speakers be able to produce contrastive, durational features of vowels of GA?
4. Do the substrate languages (L1) of GPA speakers and/or the number of years of residency impact their production?

My hypotheses are based on the speakers' length of residency in Saudi Arabia. More specifically, I argue that the amount of GA input affects participants' production of the target forms. Therefore, I expect that there is more influence of L1 on the production of GA vowel among the short-stay group than the long-stay one. Those who have been longer in Saudi Arabia are more likely to produce the GA vowels closer to or similar to the value of target vowel than the short-stay group.

3. Methodology

3.1 Subjects

A total of 23 male participants divided into three groups participated in the current study: 10 GPA speakers who have lived in Saudi Arabia for 6 years or less (M= 2 -3 years), the short stay group; 10 GPA speakers living 10 years or more (M= 11 – 18 years), the long stay group; and 3 native speakers of GA as a control. All GPA speakers had Malayalam as their L1 and had been working in the Kingdom of Saudi Arabia for between 3 months and 23 years. All participants volunteered for participation in this study. The participants were chosen according to the following main selection criteria: having Malayalam as their L1 and having LOR in Saudi Arabia either for 6 years or less or 10 years or more.

3.2 Materials

In a picture-naming task, both GPA speakers and control speakers were recorded as they completed a picture task in which they were asked to identify 20 pictures that carried target monophthongal vowels: short vowels /i, a, u/ and their long counterparts /iː, aː, uː/ in a stressed position in order to ensure more accurate measurement of acoustic cues. In a frame sentence, the participants had to point to each picture and say, [haː ða ____] "this is a ____" with two repetitions. The number of tokens analyzed in the picture task elicitation was 276 (6 target vowels × 2 repetitions × 23 participants).

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[2] Pharyngealized vowels are those vowels that are adjacent to pharyngeal consonants.

Additionally, in order to show the patterns of Malayalam vowels, both groups of GPA speakers (short- and long-stay group) were asked to read a list of 6 Malayalam words consisting of the 6 Malayalam monophthongal vowels, /i, a, u, iː, aː, uː/. The target vowels were presented with a word in Malayalam carrier phrase, as in /Parayuka_____orikkal kuuti/ ("Say_____once again") with two repetitions. Each participant produced 12 tokens (6 words having the target vowels repeated twice). Collectively, the total number of tokens is 240 (12 tokens × 20 participants).

3.3 Procedures

The GPA speakers were met in their homes or workplaces (e.g., vegetable markets, car accessories stores, or cell phone stores). I used the GPA variety to communicate with the participants as well as to introduce my study to them. The exact purpose of the study was initially hidden to the participants so that they would not become overly aware of their speech and speak unnaturally. Thus, participants could be relied upon to produce as natural a sample of spoken language as possible given the format for data elicitation. The data were collected by recording the participants reading the whole list of words. Each participant had only one session for both word elicitation and picture naming, which lasted for approximately 15-20 minutes. Afterwards, the speech files were analyzed using Praat.

3.4 Acoustic measurements and data analysis

The study employs Praat to provide acoustic measurements of the investigated vowels. As previously stated, the vowels differ from consonants with respect to their articulation. They are produced without any required contact between articulators. Thus, a better description of vowels crucially depends on extracting relevant acoustic measurements of the target vowels. That is to say, these vowels are analyzed with the acoustic measurements of formant values (F1 and F2) and vowel duration and/or visual representation of the spectrograms, such as the existence of high-amplitude harmonics in the waveform along with clear formant bars.

Formant frequencies (i.e., F1, F2, F3, etc.,) are considered one of the most reliable acoustic cues for determining vowel quality (Kent, 1992). By using a Praat script, the present investigation considers the measurements of the first (F1) and second (F2) formants at the midpoint of the steady portion of the target monophthongal vowel. The reason I only measured the steady point of the target vowel is to minimize the influence of transition from and to the surrounding consonant. Moreover, the monophthongal vowels typically involve little change in the first two formants (F1 and F2) throughout their duration. Acoustically, the first two formants are related to the position and shape of the tongue. That is, the first formant (F1) is associated with tongue height, which means that a high vowel such as /i/ tends to have low F1 value, whereas low vowels such as /a/ tend to have high F1. The second formant (F2), on the other hand, is related to tongue backness/advancement (Zsiga, 2013). This means that the front vowels involve high F2, whereas the back ones involve low F2.

The study also examines the Arabic pharyngealized vowels. The pharyngealized vowels (which are typically in the vicinity of the pharyngeal

consonants) are articulated by the tongue root retraction towards the back of the pharynx (Hassan, 2012). Thus, a pharyngealized vowel tends to have a higher F1 and a lower F2 than the F1 and F2 values of a plain vowel (the vowel which is neighboring non-pharyngeal consonants).

Moreover, the current study considers vowel duration, which distinguishes between short and long vowels. The duration is measured in milliseconds (ms), and the measurement is taken from the onset to the offset of the vowels as depicted below in figure 1.

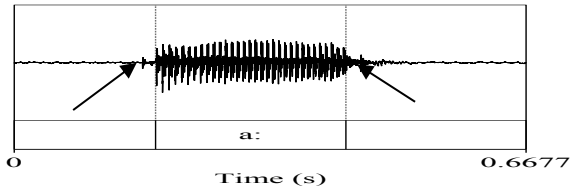

Figure 1. Duration of /a:/ in the Malayalam word /pa:/ taken from data of the current study. Arrows refer to the onset and offset of the vowel

The current study seeks to answer the aforementioned research questions, using acoustic measurements of the target vowels (the vowels of lexifier) produced by control speakers and making these measurements ready for a later comparison with the values of the vowels produced by GPA speakers. For each vowel, I first document the average of the measurements (F1, F2, and vowel duration) of the two repetitions by each speaker. Then, I take the averages of each vowel to reflect the value of each vowel in each group (short and long stay group speakers). The values of each GPA group might vary depending on a sociolinguistic factor (length of stay) and/or influence of L1. Accordingly, I compare the values of each vowel represented by each group with the average values of F1, F2 and vowel duration documented in control speakers' values. Thus, these previous measurements extracted from the data (a) facilitate plotting each vowel in an acoustic vowel space for all groups of participants and (b) show how the production of each GPA group is similar to or different from the control speakers. Using the statistical software SPSS, an independent-samples t-test was conducted to find out how the mean values (e.g., F1, F2, duration) of these vowels in each variety are similar or different from each other. In addition, a one-way ANOVA test was conducted to compare the mean formant (F1 and F2) values of the target vowels (Arabic vowels) of each group (short-stay, long-stay, and control group) in order to discover the extent of similarity and/or difference in the vowels' performance and to what extent the GPA speakers' performances in both groups (short and long stay) acoustically differ from or match the values of the vowels produced by the control speakers (Arabic native speakers of GA). This test is also followed by a Tukey Post-hoc test, which will be conducted only if I find a significant result with the ANOVA, in order to determine the differences between groups.

4. Results

As mentioned above, this study explores the realization of monophthong Arabic vowels by two groups of GPA speakers in Saudi Arabia (i.e., short and long stay group). In section 4.1, I demonstrate the overall pattern and distribution of the average measurements of F1 and F2 of the investigated vowels (i, iː, a, aː, u, uː) that exist in both Malayalam and Arabic to discover how they acoustically differ or match in these languages. In 4.2, I lay out the mean duration values of the vowels in both varieties to determine whether the two varieties have the same durational vowel length patterns. Then, section 4.3 deals with how the GPA speakers from the short and long stay groups perform the vowels (section 4.3.1) and whether they more closely approximate the L1 or the local norm with respect to vowel duration (section 4.3.2) and pharyngealized vowels (section 4.3.3).

Knowing the general patterns and some phonetic features (e.g., length, pharyngealization, etc.) in both the substrate and the superstrate languages will help determine if there is a possibility of an L1 effect/transfer from the participants in GPA usage. In other words, do the participants apply their L1 features (e.g., having the same height, frontness/backness, and/or duration) in performing the Arabic vowels or do they apply different patterns? Does the LOR in the Arabic-speaking country (here, Saudi Arabia) impact their performance?

4.1 Comparing vowel quality in Malayalam and Arabic

4.1.1 Vowel Quality

Table 1 below displays the mean values of F1 and F2 of the monophthong vowels in the superstrate language (Arabic) and the substrate language (Malayalam) produced by their native speakers who participated in the current study. In addition, the table presents the significant differences between the formant values of Arabic vowels and their Malayalam counterparts. For the sake of simplicity, the table is plotted and displayed below in Figure 2.

Table 1. Mean values of F1 and F2 of Arabic and Malayalam monophthong vowels produced by Control group (CG) and Malayalam group (MG)

Vowel	Mean F1 For CG	Std.	Mean F1 For MG	Std.	t	df	* P-value
/i/	540 Hz	87.774	337 Hz	32.245	-5.570	5.411	*.002
/iː/	363 Hz	22.038	342 Hz	34.043	-1.017	21	.321
/a/	636 Hz	85.537	684 Hz	51.116	1.725	24	.097
/aː/	717 Hz	61.753	698 Hz	51.334	-.592	21	.560
/u/	473 Hz	30.450	463 Hz	72.227	-.357	24	.724
/uː/	426 Hz	22.106	466 Hz	66.937	1.006	21	.326

	Mean F2 For CG	Std.	Mean F2 For MG	Std.	t	df	* P-value
/i/	1791 Hz	261.04	2103 Hz	147.220	2.798	5.985	*.031
/iː/	2318 Hz	81.198	2147 Hz	102.477	-2.758	21	*.012

/a/	1201 Hz	119.44	1214 Hz	78.568	.310	24	.759
/a:/	1596 Hz	47.500	1191 Hz	59.683	-10.681	21	*.000
/u/	1004 Hz	47.182	872 Hz	176.221	-1.794	24	.085
/u:/	1006 Hz	51.272	930 Hz	233.428	-.550	21	.588

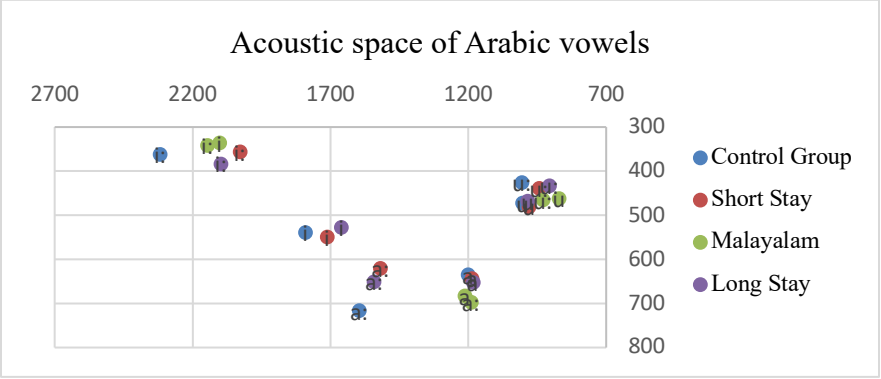

Figure 2. Malayalam vowels and Arabic vowels spaces produced by the four groups (short, long stay, Malayalam and control group)

The investigated Arabic vowels (i.e., short and long) already appear in the Malayalam vowel inventory, but some of the acoustic values of the Arabic vowels appear somewhat distinct from their Malayalam counterparts. As demonstrated in Table 1, most of the differences between Malayalam and Arabic vowels are not statistically significant and have similar acoustic measurements, except for the Arabic short high front vowel /i/ and long low central vowel /a:/.

It is shown that the Malayalam short vowels and their long counterparts are aligned at a similar height and backness in the vowel space. On the other hand, unlike the Malayalam system, Arabic shows a different space between the short vowel and long vowel, especially for the high front /i/ and low vowel /a/ and their long pairs. All speakers of both languages produced all vowels at a similar height except for /i/. On the other hand, they produce most of the vowels with similar backness except for /i, i:, a:/ in which the t-test reflects that the mean values of these pairs show a significant difference between the form of Malayalam and that of Arabic.

4.2 Comparing Vowel quantity in Malayalam and Arabic

4.2.1 Vowel Quantity

Figure 3 below displays the mean duration values of the monophthong vowels in the superstrate language (Arabic) and the substrate language (Malayalam) produced by their native speakers who participated in the current study.

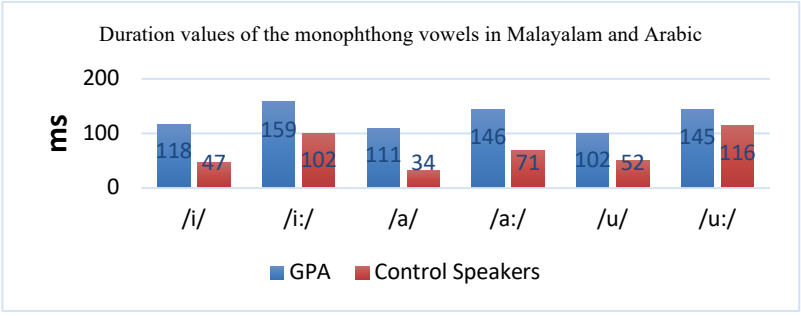

Figure 3 Mean vowel durations of Malayalam and Arabic vowels by GPA/Malayalam speakers and control/ Arabic speakers.

As illustrated in the figure, the vowel length in both the substrate (Malayalam) and the superstrate language (GA/Arabic) is phonemic. However, as indicated above in Figure 3, these vowels are patterned differently in each language and the two languages exhibit significant differences in durational and phonological vowel length contrast patterns for all the monophthong vowel identities, except in the case of the high back long vowel /u:/. The vowel /u:/, which had an almost similar duration in both varieties. Accordingly, the short and long vowels in Malayalam are relatively longer than their Arabic parallels, and the short vowels of Malayalam are more than twice the length of the short vowels in Arabic. Therefore, the length of vowels in both languages is clearly distinct.

In sum, the general findings observed thus far between the GPA speakers and Arabic native speakers (control group) show that there are a few vowels produced differently in both languages, in that they differ in backness including /i, i:, a:/. Moreover, the results show that, as previously studies have shown, both languages rely on duration to form vowel length contrasts, and each language presents different durational patterns. As previously stated, the main purpose of this study is to explore the possible effect of the length of stay on the realization of the target vowels.

Therefore, in the subsequent section 4.3, I divide the GPA speakers into two groups (i.e., short and long stay group), and determine whether the short and long stay groups behave alike or differently in vowel production, as well as which one of these groups is closer in values to the local norm.

The Speech Learning Model as proposed by Flege (1995) predicts that speakers who are highly experienced in the target language are more likely to produce the new sounds/features of L2 in values that are identical or approximate to values of the local norm than those who have less experience in L2. Bearing Flege's claim in mind, the GPA speakers who stay longer in Saudi Arabia are predicted to perform more successfully than those who have stayed for less time in the contact setting. The length of residency entails high exposure to the input of the target language, allowing more knowledge of and proficiency in the target language. People who remain longer in the contact setting speak the dominant or target language repeatedly on a daily basis, and this repetition allows the speaker to become highly experienced in the target language. In addition, speakers with a longer duration of stay are likely to perceive more input and consequently create a new phonetic category for the new sound/features, which results in successful production of the L2 sound/feature.

4.3 Performance of each group of GPA speakers

4.3.1 Vowel quality in short- and long-stay groups

This section will examine how people who belong to the short and long stay groups produce the Arabic vowels, taking into account the overall difference with the control group explained in the previous section. The following paragraph presents the mean values of F1 and F2 for the Arabic monophthong vowels (i, iː, a, aː, u, uː) in the superstrate language produced by both groups of GPA speakers, and the mean values of the Arabic vowel produced by the control group for comparison.

To begin, this section will demonstrate the Arabic short high front vowel /i/. Although the Arabic /i/ is produced with different height and backness than its Malayalam counterparts, both groups (i.e., short and long stay groups) realize the Arabic vowel /i/ with values similar to the control group. A one-way ANOVA revealed that the differences of F1 values between the control group (n = 6, M = 540, SD = 87.77), the short stay group (n = 20, M = 550, SD = 79.98), and the long stay group (n = 20, M = 528, SD = 83.00) were not statistically significant, F (2,43) = 0.360, p = .700. Likewise, the test also reported that the F2 values between the control group (n = 6, M = 1791, SD = 261.04), the short stay group (n = 20, M = 1713, SD = 172.10), and the long stay group (n = 20, M = 1661, SD = 255.07) were not statistically significant, F (2,43) = 0.838, p = .440, indicating that both groups of the GPA speakers did not differ from the native speakers in terms of their realization of the Arabic vowel /i/.

The Arabic long high front vowel /iː/, on the other hand, is produced with a similar tongue height across the three groups. The test shows that the differences of F1 values between the control group (n = 3, M = 363, SD = 22.03), the short stay group (n = 10, M = 357, SD = 31.31), and the long stay group (n = 10, M = 384, SD

= 42.38) were not statistically significant, F (2,20) = 1.447, p = .259. On the other hand, the frontness/backness (F2) is produced differently. There is a significant difference of F2 values for the three groups, F (2,20) = 4.120, p = .032. Tukey post-hoc tests reported that the mean F2 for the control group (n = 3, M = 2318, SD = 81.19) was significantly different than for the short stay group (n = 10, M = 2029, SD = 159.27). However, the long stay group (n = 10, M = 2097, SD = 159.16) shows no significant difference from the control group or the short stay group. Taken together, I assume that statistically insignificant difference between the short and long stay groups as well as between the long stay and control groups suggest that the LOR might have a minor effect in realizing the Arabic backness of /i:/. Figure 2 shows that the GPA speakers of the long stay group produce it similarly to the Malayalam long /i:/ (their native version). Unlike the short stay group, the long stay group positioned the Arabic vowel /i:/ in the acoustic space closer to the local form than did the short stay group tending to shift towards the local form.

For the Arabic short /a/, both short and long stay groups realize the vowel /a/ with F1 and F2 values closer to the control groups. A one-way ANOVA reported that the differences of F1 values between the control group (n = 6, M = 636, SD = 85.53), the short stay group (n = 20, M = 644, SD = 49.50), and the long stay group (n = 20, M = 653, SD = 69.67) were not statistically significant, F (2,43) = 0.216, p = .807. As for the F2 values, on the other hand, the test also shows that the F2 values between the control group (n = 6, M = 1201, SD = 119.44), the short stay group (n = 20, M = 1187, SD = 64.30), and the long stay group (n = 20, M = 1184, SD = 61.77) were not statistically significant, F (2,43) = 0.127, p = .881, suggesting that all the three groups did not differ from each other in realizing the Arabic /a/, showing no effect of the LOR on the production of /a/ in that they realize it with similar tongue height and backness.

With respect to the Arabic long /a:/, as is the case in its short counterpart, all three groups realize the vowel /a:/ with similar F1. A one-way ANOVA reported that the differences of F1 values between the control group (n = 3, M = 717, SD = 61.75), the short stay group (n = 10, M = 621, SD = 56.71), and the long stay group (n = 10, M = 651, SD = 60.63) were not statistically significant, F (2,20) = 3.101, p = .067. The same thing happened for the F2 values: the test reports that the control group (n = 3, M = 1596, SD = 74.50), the short stay group (n = 10, M = 1519, SD = 75.93), and the long stay group (n = 10, M = 1542, SD = 122.73) were not statistically significant in the F2 values, F (2,20) = 0.697, p = .510. This result suggests that the length of residency has no effect on the production of Arabic /a:/, especially among the short stay speakers; in other words, although the Arabic /a:/ is produced differently than its Malayalam counterpart, both groups (i.e., short and long stay group) realize the Arabic vowel /a:/ with values nearly similar to the Arabic native speakers. However, the speakers of the LOR group had a tendency to approximate Arabic native speakers, in that they positioned the vowel in the acoustic space (Figure 2) closer to the Arabic vowel than did the short stay group.

Finally, the Arabic short and long high back vowels /u, u:/ are produced in a similar way in both Arabic and Malayalam, the L1 of the studied GPA speakers.

Thus, it is not surprising that both groups of the GPA speakers realize them with F1 and F2 values similar to the control group. To begin with the short /u/, a one-way ANOVA reported that the differences of F1 values between the control group (n = 6, M = 473, SD = 30.45), the short stay group (n = 20, M = 481, SD = 42.51), and the long stay group (n = 20, M = 369, SD = 51.78) were not statistically significant, F (2,43) = 0.322, p = .727. As for the F2 values, on the other hand, the test also shows that the F2 values between the control group (n = 6, M = 1004, SD = 47.18), the short stay group (n = 20, M = 980, SD = 98.77), and the long stay group (n = 20, M = 986, SD = 67.72) were not statistically significant, F (2,43) = 0.195, p = .824. For the long /u:/, the test reveals that the differences of F1 values between the control group (n = 3, M = 426, SD = 22.10), the short stay group (n = 10, M = 440, SD = 55.88), and the long stay group (n = 10, M = 433, SD = 26.83) were not statistically significant, F (2,20) = 0.159, p = .854. Likewise, in the F2 values, the test presents that the F2 values between the control group (n = 3, M = 1005, SD = 51.27), the short stay group (n = 10, M = 944, SD = 88.37), and the long stay group (n = 10, M = 907, SD = 92.93) were not statistically significant, F (2,20) = 1.532, p = .240. Accordingly, the phonetic similarities of some of these vowels in the speakers' L1 facilitate their production in that both groups of the GPA speakers did not differ from the Arabic native speakers with respect to their realizations.

In sum, Figure 2 is placed again in this section to summarize the previous results. The figure below displays the Arabic vowel positions in the vowel space produced by short stay, long stay, and control group. In addition, the Malayalam vowels are included in the space in order to determine how the short and long stay groups approximate to either the local norm (Arabic) or L1 form (Malayalam).

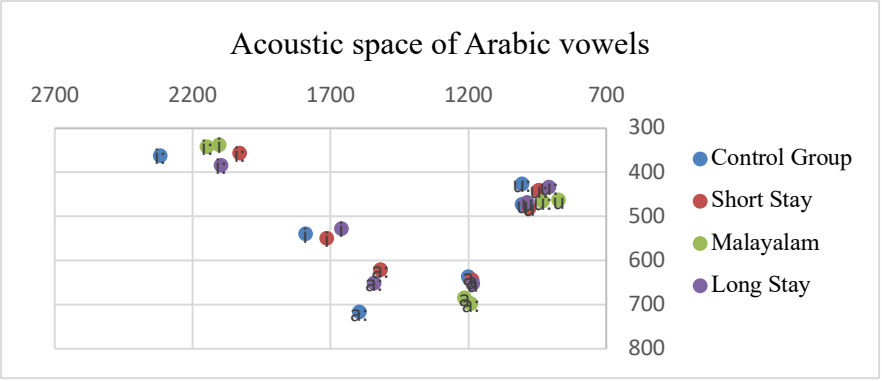

Figure 2. Malayalam vowels and Arabic vowels spaces produced by the four groups (short, long stay, Malayalam and control group).

As shown in the figure, the vowels /a, u, u:/ are produced in a similar way in the speakers' L1s; thus, all the three groups realize them similarly without any significant differences resulting in crowdedness in the space. That is, they occupy

similar position in the acoustic space. However, the Arabic vowels /i, i:, a:/ differ somewhat in their height/backness from their Malayalam counterparts. The vowel space above shows that the Arabic /i/ is articulated further back than is the Malayalam vowel /i/, while the Arabic vowels /i:, a:/ are more fronted than their Malayalam counterparts. Nevertheless, both the short and long stay groups could realize them with phonetic cues similar to the local norm, except for the Arabic /i:/ that could be only realized by the GPA speakers of the long stay group. This indicates that the vowel realization of the long stay group is still superior to the short-stay group, as they are able to take advantage of increased exposure to the input of the target language (GA) offered by the length of their stay.

4.3.2 Vowel quantity in short and long stay group

As stated earlier, the vowel length feature occurs in the speakers' L1 (Malayalam and Arabic). However, the results in section 4.1.2 show that the durational pattern differs in each language. This section is dedicated to displaying the mean duration values of the Arabic monophthong vowels produced by both groups of GPA speakers, and the mean values of the Arabic vowel produced by the control group for comparison. Figure 4 displays the mean duration of Arabic vowels as realized by all groups of participants.

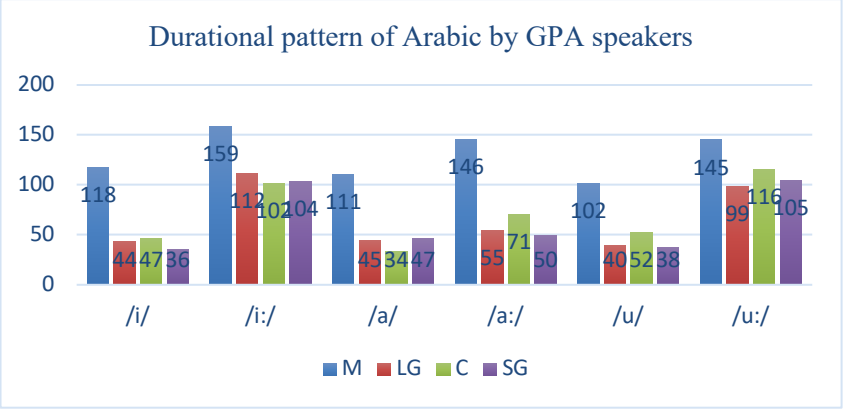

Figure 4. Mean duration values of Arabic long and short vowels produced by GPA speakers of long (LG), short stay group (SG) and control speakers (C), together with the durational pattern of Malayalam (M).

As the data indicate, GPA speakers perform different patterns in the Arabic vowel length than do Arabic native speakers. The length of short and long vowels in Malayalam is almost twice the length of vowels in Arabic. For the Arabic short /i/, there is a significant difference in duration for the three groups, F (2,43) = 6.306, p = .004. Tukey post-hoc tests reported that the mean duration for the control group (n =

6, *M* = 47, *SD* =.0081) is significantly different than for the short stay group (*n* = 20, *M* = 36, *SD* =.0093). Moreover, the short stay group is significantly different than the long stay group (*n* = 20, *M* = 44, *SD* =.0082). However, the long stay group did not show a significant difference from the control group. Accordingly, the GPA speakers who belong to the long stay group could realize the length feature of the Arabic vowel /i/ more similarly to the control group than the short stay group.

The duration of the Arabic long vowel /i:/, on the other hand, is realized similarly by both the short and long stay groups and both of them approximate to the duration of the local form. A one-way ANOVA supported this temporal (i.e., duration) similarity in that the differences of temporal values between the control group (*n* = 3, *M* = 102, *SD* = .029), the short stay group (*n* = 10, *M* = 104, *SD* = .028), and the long stay group (*n* = 10, *M* = 112, *SD* = .023) were not statistically significant, *F* (2,20) = 0.285, *p* = .755, indicating that both groups take the advantage of the length feature occurring in their L1, which in turn, facilitates their accuracy in the duration of the Arabic vowel /i:/.

In contrast to the previous performance with the duration of the high front vowels /i, i:/, neither group realizes the Arabic low vowel /a/. The test shows a significant difference in duration for the three groups, *F* (2,43) = 3.840, *p* = .029. Tukey post-hoc tests reported that the mean duration for the control group (*n* = 6, *M* = 34, *SD* =.0026) is significantly different than the short stay group (*n* = 20, *M* = 47, *SD* =.0108) and the long stay group (*n* = 20, *M* = 45, *SD* =.0100). In this case, both groups could not reach the local norm for the Arabic short /a/. I assume that their inability in realizing the duration is due to the influence of their L1, in that they have an exaggerated length in both short and long vowels.

For the long /a:/, the results report that the long stay group, but not the short stay group, performs a similar duration to the control group. Therefore, the test reveals a significant difference in duration for the three groups, *F* (2,20) = 3.600, *p* = .046. Tukey post-hoc tests reported that the mean duration for the control group (*n* = 3, *M* = 71, *SD* =.012) is significantly different than the short stay group (*n* = 10, *M* = 49, *SD* =.011). However, the long stay group (*n* = 10, *M* = 55, *SD* =.012) is not significantly different from the control group. Taken together, I maintain that the non-significant difference between the short and long stay group and between the long stay and control group suggests that speakers from the long stay group show a tendency to come close to approximating the duration of the local norm.

Finally, both the short and long stay groups show success in approximating the duration of the Arabic vowels /u, u:/. A one-way ANOVA supported this duration similarity. The difference of duration values of the Arabic vowel /u/ between the control group (*n* = 6, *M* = 52, *SD* = .014), the short stay group (*n* = 20, *M* = 38, *SD* = .0083), and the long stay group (*n* = 20, *M* = 40, *SD* = .014) were not statistically significant, *F* (2,43) = 2.950, *p* = .063. Likewise, the duration of the long vowel /u:/ is realized approximately to the duration of the local form by both groups. The test shows that the difference of duration values of the Arabic vowel /u:/ between the control group (*n* = 3, *M* = 116, *SD* = .047), the short stay group (*n* = 10, *M* = 105, *SD* = .024), and the long stay group (*n* = 10, *M* = 100, *SD* = .022) were not

statistically significant, F (2,20) = 0.457, p = .640. Collectively, the GPA speakers are successful in performing the duration of the Arabic vowels /u, u:/, taking advantage of the feature length that is extant in the grammar of their L1.

To conclude this section, I assume that the successful realization of Arabic vowel duration is because GPA speakers rely on duration to construct vowel contrasts in their L1. As a result, they maintain most of the duration in Arabic vowels. In other words, both the short and long stay groups take advantage of the existence of the length feature in their L1, which in turn, facilitates their performance in Arabic duration. However, the long stay group is superior to the short stay group in approximating the duration of the Arabic vowels to the local norm. The GPA speakers who have stayed longer in the Kingdom of Saudi Arabia approximate the duration of the local form in /i, i:, a:, u, u:/, while the speakers from the short stay realize the duration of the following Arabic vowels: /i:, u, u:/.

4.3.3 Pharyngealized vowels in short and long stay group

A pharyngealized vowel, as explained earlier, is an allophonic variation from a plain vowel, which occurs in the environment of pharyngeal context. It differs from a plain vowel in that it is articulated further back in the vocal tract (Saadah, 2011). That is to say, the pharyngealized consonant influences the adjacent vowel such that the pharyngealization is preserved throughout the production of the adjacent vowel. Consequently, the vowel is articulated further back than its plain counterpart due to tongue retraction.

This section presents the overall performance of pharyngealized vowels following the pharyngealized fricative /sˤ/ and stop consonants /tˤ/, which are produced by both groups (i.e., short and long stay group). The values of their productions are compared to the values of the control speakers' productions and then tested statistically to see how the values in both groups either match or differ. The pharyngeal feature does not occur in the grammar of the GPA speakers' L1 (Malayalam). Therefore, investigating this phonetic feature (i.e., pharyngealization) might also provide evidence of how LOR in a language contact setting (in this case, Saudi Arabia) might exercise an effect on vowel realization among GPA speakers by showing whether the short and long stay groups behave alike or differently in the pharyngealized vowels production as well as which one of these groups is closer in values to the local norm.

The results report that both groups of GPA speakers show a consistency in lowering F2, as the control group does, especially for the Arabic vowels /i, i:, a:/ following the pharyngealized fricative /sˤ/. The F2 values of /i, i:, a:/ and the values of control speakers do not show any significant difference. The differences of F2 values of the pharyngealized vowel /i/ between the control group (n = 3, M = 1296, SD = 111.84), the short stay group (n = 10, M = 1259, SD = 97.72), and the long stay group (n = 10, M = 1369, SD = 197.14) were not statistically significant, F (2,20) = 1.317, p = .290. As for the F2 of the pharyngealized vowel /i:/, the differences between the control group (n = 3, M = 1792, SD = 308.43), the short stay group (n = 10, M = 1949, SD = 167.54), and the long stay group (n = 10, M = 1908, SD = 151.65) were not statistically significant, F (2,20) = 0.873, p = .433. Similarly to /i,

iː/, the differences of the F2 values of the pharyngealized /aː/ between the control group (n = 6, M = 1142, SD = 55.07), the short stay group (n = 20, M = 1248, SD = 83.55), and the long stay group (n = 20, M = 1218, SD = 120.70) were not statistically significant, F (2,43) = 2.628, p = .084. These results indicate that both the short and long stay groups could realize the pharyngealized vowels, to a large extent, with values similar to the values of the Arabic native speakers, and both groups perform the new phonetic feature (pharyngealization) similarly. However, the pharyngealized vowel /u/ is only realized by the GPA speakers of the long stay group. There is a significant difference of F2 values for the three groups, F (2,20) = 3.898, p = .037. Tukey post-hoc tests reported that the mean F2 values for the control group (n = 3, M = 859, SD = 14.57) were significantly different than for the short stay group (n = 10, M = 1026, SD = 107.99). However, the long stay group (n = 10, M = 944, SD = 81.89) shows no significant difference from the control group and short stay group. Therefore, the significant difference of the F2 values between the control and short stay group, and the non-significant difference between the long stay and control group manifest different performances between both groups of GPA speakers for the pharyngealized /u/. For the pharyngealized vowel /a/, however, both groups of the GPA speakers could not attain native-like realization. The test shows a significant difference in F2 values for the three groups, F (2,20) = 6.127, p = .008. Tukey post-hoc tests reported that the mean F2 values for the control group (n = 3, M = 1080, SD = 43.47) is significantly different than for the short stay group (n = 10, M = 1190, SD = 60.56) and the long stay group (n = 10, M = 1189, SD = 39.88). However, both groups of GPA speakers did not show a significant difference in the F2 values, suggesting that they produce it similarly to one another and far from the local form.

The data of the current study provide tokens with pharyngealized stop only with long vowels /iː, aː, uː/. For the pharynealized /iː/, the test reports that there is a significant difference in F2 values for the three groups, F (2,20) = 9.074, p = .002. Tukey post-hoc tests showed that the mean F2 value for the control group (n = 3, M = 1868, SD = 93.42) is significantly different than for the short stay group (n = 10, M = 2205, SD = 96.81). Moreover, the short stay group is significantly different from the long stay group (n = 10, M = 1975, SD = 191.90). Therefore, the significant difference of F2 values of the pharyngealized /iː/ between the short stay and control group, and between the short and long stay group indicate that the short stay group is still far from realizing the pharyngealized vowel /iː/, while the long stay group realizes this target vowel /iː/with a value closer to the value of the local form. For the long pharyngealized /aː/, the results report that the long stay group, but not the short stay group approximates relatively to the values of the control group. The means of F2 values for the three groups differ according to a one-way ANOVA, F (2, 43) = 4.075, p = .024. Tukey post-hoc tests showed only one significant comparison. With the short stay group (n = 20, M = 1281, SD = 103.66), the F2 value is significantly different from the control group (n = 6, M = 1167, SD = 40.33). The other comparisons did not show any significant difference. Therefore, the long stay group (n = 20, M = 1222, SD = 94.16) is not significantly different

from the control group. Similarly, the pharyngealized /uː/ is only realized by the GPA speakers of the long stay group with an approximate F2 value to Arabic native speakers. The test reports that there is a significant difference in F2 values for the three groups, F (2,43) = 4.407, p = .018. Tukey post-hoc tests showed that the mean F2 value for the control group (n = 6, M = 869, SD = 24.48) is significantly different than the short stay group (n = 20, M = 1025, SD = 157.26). However, the short stay group is not significantly different from the long stay group (n = 20, M = 966, SD = 191.90). Taken together, I argue that the non-significant differences between the short and long stay groups and between the long stay and control groups suggest that speakers from the long stay group show a tendency to approximate the values of F2 of the local norm for the pharyngealized /aː, uː/. To conclude this section, Figure 5 and 6 below illustrate the overall performance of GPA speakers in realizing the pharyngealized vowels that follow the pharyngeal fricative /sˤ/and stop /tˤ/, respectively.

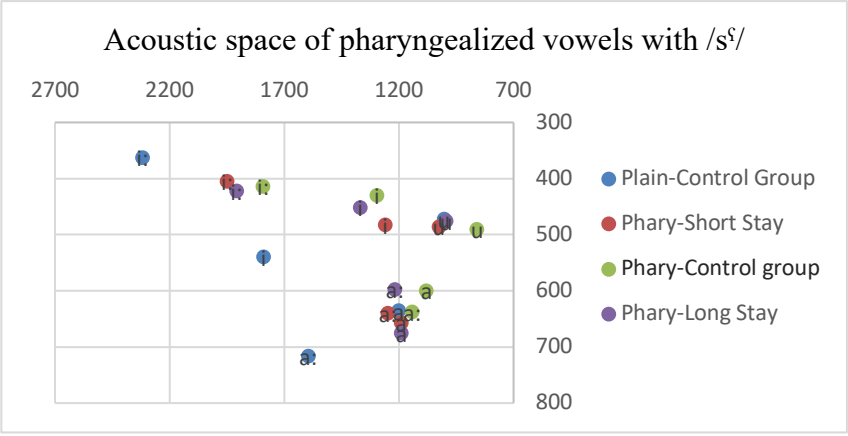

Figure 5. Mean F1 and F2 values of plain and pharyngealized Arabic vowels /i, iː, a, aː, u/ that follow fricative /sˤ/ for control, short, and long stay together with the mean F1 and F2 values of the Arabic plain vowels.

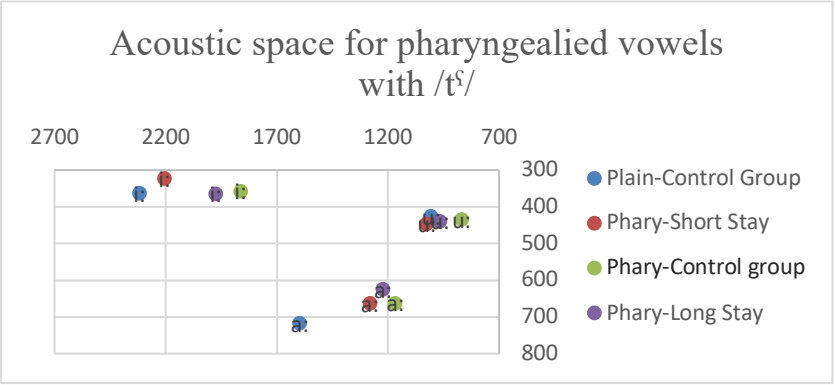

Figure 6. Mean F1 and F2 values of plain and pharyngealized Arabic vowels /i:,a:, u:/ that follow stop /tˤ/ for control, short, and long stay together with the mean F1 and F2 values of the Arabic plain vowels.

As shown in the previous figures (5 and 6), both groups of the GPA speakers produced the pharyngealized vowels somewhat disparate from each other. For the pharyngealized vowels following the fricative /sˤ/, both groups of the GPA speakers produced the pharyngealized vowels /i, iː, aː/ with lower F2 values, to a great extent, approximate to the control group performance, and their values and the values of control speakers do not show any statistical significance between them. Thus, they are somewhat close in position (see Figure 5) to the pharyngealized vowels of the control group. However, the acoustic space (Figure 5) shows that the GPA speakers of both groups have partially assimilated the pharyngealized vowel /u/ and also produce the pharyngealized vowel /a/ more closely to its Arabic plain counterpart, indicating that the GPA speakers could not fully realize the pharyngealized vowels /a, u/.

With regard to the vowels following the pharyngealized stop /tˤ/, Figure 6 shows that the GPA speakers in the long stay group, but not in the short stay group, could realize the pharyngealized vowels following the stop /tˤ/. Although the GPA speakers did not reach the values of the pharyngealized vowels of the control speakers, they demonstrate the same trend in making the pharyngealized vowels backer than the plain ones for the vowels /iː, aː, uː/, while the short stay group produced these vowels /iː, aː, uː/ with higher F2 and fronter in the tract. This suggests that the GPA speakers who belong to the long stay group are more successful in realization the Arabic pharyngealized vowel than those in the short stay group.

5. Discussion

The study examines the possible effect of the length of stay and/or L1 on the realization of the Arabic monophthong vowels as produced by the GPA speakers

having Malayalam as their L1. The study first considers spectral and temporal structures of the investigated vowels/ i, iː, a, aː, u, uː/ for comparing their distributions in both substrate and superstrate languages (Malayalam and Arabic), and to determine how they are patterned as well as whether they are similar or different from each other.

The first finding of this study, as illustrated above in Figure 2, is that the substrate (Malayalam) and superstrate (Arabic) vowel spaces show similar vowel qualities and most of the vowels occupy similar positions in the acoustic space (Figure 2), except for the Arabic /i/ and /aː/, which differ in their height and backness from their Malayalam counterparts. The results indicate that the tongue position for the vowel /i/ is more fronted, while the vowel /aː/ is lowered compared to the Malayalam ones. Thus, the Arabic /i/ and /aː/ occupy positions in the acoustic space that are quite distant from their Malayalam counterparts. Similar to what is found in Japanese and Thai vowels (Tsukada, 2009), the Malayalam vowels show a systematic pattern such that each short vowel and its long corresponding vowel are close to each other in the space, suggesting that both short and long pairs have a similar F1 (height) and F2 (backness), without any influence of vowel duration on the quality.

With regards to durational patterns, from the similarities among the majority of the investigated vowels in both varieties, it was expected that both languages would have, to a large extent, similar durational patterns. However, the results in Figure 3 show that vowel pairs differ significantly in duration from each other, and the vowel length in the substrate language (Malayalam) has a different pattern than the length in its lexifier. It can be observed that the substrate vowel shows a large durational pattern in both short and long vowels compared to the durational pattern in the lexifier; in fact, even that the short vowels in the substrate (Malayalam) are over twice the duration of the short vowels in Arabic and approximate to the Arabic long ones. In this case, the length contrast is present in the grammar of both languages. McAllister, Flege and Piske (2002) claim that lack of a phonetic cue or feature in L1 will result in difficulty detecting such cues/features in L2. Thus, based on this claim, I predicted that the GPA speakers would have a more target-like production of the Arabic duration because vowel length properties are present in their L1; consequently, they are expected to be able to control the duration when producing the Arabic short and long vowels.

The following section discusses the overall results of both groups of GPA speakers in the light of L2 studies. By considering the length of residency in Kingdom of Saudi Arabia, I determine whether the short and long stay groups behave alike or differently in Arabic vowel production, as well as which one of these groups is closer in values to the local form.

The results above reveal that the vowel systems of Arabic and Malayalam are similar in quality. The findings obtained from comparing the formants (F1 and F2) of Arabic and Malayalam revealed that most investigated Arabic vowels (e.g., a, u, uː) are similar to the vowels in Malayalam. Based on Flege's techniques (1984, 1997) for identifying the vowel similarities, most investigated Arabic vowels are

similar to the GPA speakers' L1 vowels and are represented phonetically by the same IPA symbol. So, each vowel has a close counterpart in both languages and most Arabic vowels do not show significant differences in most of their heights from their Malayalam counterparts. Building on the investigated similarities, it is reasonable to predict that both groups of the GPA speakers are more likely to realize most, if not all, Arabic vowels more closely resembling the control speakers, and in particular with the Arabic vowels /a, u, uː/, which are similar perceptually to the GPA speakers' L1 vowels.

As expected, both GPA groups realize the Arabic vowels in almost similar ways with values similar to the control groups. Thus, each vowel category is grouped together and occupies a similar position in the vowel space with its counterparts in Arabic spoken by the control group. It is worth noting (see Figure 2) that the similar vowels that show no significant acoustic differences (i.e., /a, u, uː/) have a tendency to assimilate with their Malayalam counterparts, tending to group and crowd in the acoustic space than other vowels. Such a similarity in both L1 and L2 enables the GPA speakers to match these vowels to already existing ones. The Arabic vowels /i, iː, aː/ , on the other hand, are phonemically similar to Malayalam ones, but differ somewhat acoustically. Although the vowel /i/ is produced with distinct height and backness in both languages, and the vowels /iː, aː/ are produced with distinct backness, both groups of the GPA speakers realize the vowels /i, aː/ with similar values to the local form, maintaining the contrast between F1/F2 of Arabic and Malayalam by making a modification to the native sounds. The Arabic /iː/, on the other hand, is produced slightly differently between the short and long stay groups, particularly in the realization of F2. Despite that fact that both groups realize the vowel close to their L1 form with a backness closer to its Malayalam counterpart (see Figure 2), the speakers from the long stay group are closer in values to the local form than are the short stay group. One of the reasons behind this successful realization in both groups comes from perceptual sounds similarities in both languages. It has been claimed by Flege (1987) that the sounds with counterparts in L2 are easily perceived and thus "produced more authentically than those without a close equivalent" (p.10). Another possible reason is the size and differences of the two languages' vowel inventories. The Malayalam (the GPA speakers' L1) has a larger vowel inventory than Arabic in which there are nearly double the number of Malayalam vowels than are present in Arabic. According to Hacquard et al. (2007), the speakers who have large inventories are more likely to "perceive the same sounds as less similar than speakers with smaller inventories" (p.295). Collectively, this should lead the GPA speakers to successful realization of the target Arabic vowels and enable the speakers to perform most of the Arabic vowels much like native Arabic speakers do. Overall, both groups behave alike and demonstrate similar performance regardless of their length of residency.

As mentioned earlier, the vowel length appears in the grammar of GPA speakers' L1 (Malayalam) and Arabic. McAllister et al. (2002) state that the speakers of quantity languages are more likely to realize L2 vowel length contrast easily. The existence of such durational vowel length patterns in the substrate

(Malayalam) might lead to an expectation that the GPA speakers might take advantage of their familiarity with the length feature in their L1, which in turn, facilitates the speakers' realization of the durational pattern of Arabic. One of the SLM hypotheses (Flege, 1995) is the feature hypothesis, which states that the L2 speaker/learner encounters difficulty in realizing a feature that does not exist in the L1 grammar (as cited in Aoki & Nishihara, 2011). Accordingly, I predict that the GPA speakers are sensitive to the length feature and might be able to employ the durational features occurring in their phonology to thus realize the durational features of Arabic efficiently regardless of their length of residency.

The results of the current study suggest that the GPA speakers realize the duration of long and short Arabic vowels differently. Unexpectedly, although the vowel length contrast appears in the speakers' L1, the short stay and long stay groups show a significant difference in duration for the short Arabic vowel /a/, in that both groups realize it with mean values significantly longer than the local form (see Figure 4). However, the findings report that the long stay group is more successful in processing Arabic vowel length contrasts than the short stay group; the long stay group realizes most of the Arabic vowels with similar duration values to the local form, while the short stay group, on the other hand, only realizes half of the target vowels with values similar to the local form. Accordingly, these results support the feature hypothesis (Flege, 1995) in all Arabic long vowels and most of the short vowels among the speakers of the long stay group, whereas the hypothesis is supported in the short stay group with only two long vowels /iː, uː/ and one short vowel /u/. Overall, the GPA speakers who stayed longer in Saudi Arabia are more successful than the short stay group in realizing the Arabic vowel duration in a native-like fashion. As for the short Arabic /a/, I assume that both groups could not reach the value of the local norm which is considered the shortest Arabic vowel in my data, and their inability in realizing the duration might come from the influence of their L1, which has an exaggerated length in both short and long vowels as found in Japanese (Tsukada, 2009). This increased length, in turn, hindered the speakers from controlling the Arabic duration pattern, particularly with the vowel /a/. I assume that the overuse of temporal cues in their L1 might make them unaware of the short duration of Arabic vowels.

Regarding pharyngealized vowels, a pharyngealized vowel acoustically tends to have lower F2 compared to the F2 values of the non-pharyngealized vowel (Alwan, 1989; Zawaydeh, 1997; Saadah, 2011; Hassan, 2012; Alsiraih, 2013). Similar to prior works on Arabic pharyngealization, the findings of the current study report that the mean values of F2 following the pharyngealized consonants are lowered, indicating that the pharyngealized vowel is produced further back in the tract than its non-pharyngealized counterpart (see Figures 5 and 6). Both groups of GPA speakers show disparate performances in realizing the pharyngealized vowels following the pharyngealized fricative /sˤ/ and stop /tˤ/. Contrary to what might be expected, both groups of GPA speakers realize most of the pharyngealized vowels, particularly those following the pharyngeal fricative /sˤ/. However, the short stay group encounters difficulty in realizing the pharyngealized vowels /a, u/, in that they

realize them similar to their non-pharyngealized vowels and show a tendency toward partial overlap with the non-pharyngealized /a, u/ (see Figure 5). The long stay group, on the other hand, comes close to realizing the pharyngealized /u/, but though the speakers produce F2 values with no significant difference from the control group, the vowel /u/ still did not approximate to the local form in the acoustic space. These results are incompatible with one of the predictions of SLM (Flege, 1995), particularly considering the performance of the short stay group. The SLM states that the extensive amount of exposure to the target language facilitates detecting the new feature that is absent in L1, and thus enables the speaker to realize it more successfully than the speakers with less exposure. The results obtained from the short stay group were contrary to what I expected, since they had the ability to realize the pharyngealized vowels after /sˤ/ with F2 values similar to the long stay and control group in most of the vowels despite their lower exposure/short period of residency. I assume that the short stay group's unexpectedly lowered F2, especially with the vowels that follows /sˤ/, may be explained by the nature of the preceding pharyngeal consonant. Alsayuty (1967) claims that the pharyngealization in the pharyngeal fricative /sˤ/ is less strong compared to the pharyngeal stop /tˤ/, attributing this weakness to the sibilance accompanying the articulation of /sˤ/. Therefore, I maintain that weakness of the pharyngealization in /sˤ/ facilitates realizing most of the pharyngealized vowels after the fricative /sˤ/. In contrast, the results of the pharyngealized stop /tˤ/ are compatible with the argument of SLM. The short and long stay groups did not behave alike and they differ in producing the pharyngealized vowels that follow /tˤ/. The long stay group realize all pharyngealized vowels following /tˤ/ more successfully than do the short stay group. The results suggest that the vowel values of all of the pharyngealized vowels following the stop /tˤ/ do not differ significantly between the long stay group and the Arabic native speakers in their F2 values. It is reasonable to claim that the LOR plays a role in realizing the pharyngeal feature, specifically among the long stay group, who acquired it successfully by producing the pharyngealized vowels with values analogous to the values of GA speakers. It has been claimed that adult learners have the ability to form new phonetic categories for new L2 features after many years of speaking L2 speech (Flege, 1995). Thus, it seems reasonable that the speakers of the long stay group realize the perceptual difference between the pharyngealized and non-pharyngealized vowels, and thus were able to form a new phonetic category for this new L2 feature (Arabic pharyngeal) after many years of speaking Arabic in that enabled them to be more likely to produce the new feature in a native-like way than those who have less contact/exposure to Arabic. Flege (1995) and McAllister et al. (2002) state that lack of a phonetic cue or feature in L1 will result in difficulty detecting of such cues in L2. Consequently, the short stay group are less successful in realizing the feature (i.e., pharyngeal) that is absent in their L1.

Overall, the GPA speakers who stayed longer in Saudi Arabia realized Arabic vowels characteristics (e.g., quality, quantity, and pharyngeal) more successfully than did the relatively short stay group. Moreover, the overall results performed by the GPA speakers, particularly those gleaned from the long stay group, support the

claim found in prior works, including Flege (1984b), Flege and Hillenbrand (1984), and Saadah (2011) in that the speakers who are highly experienced in the target language tend to be more capable of achieving native-like performance than those less experienced.

6. Conclusion and Limitations

The current study has explored the possible effect of the length of stay in an Arabic-speaking country (i.e., Saudi Arabia) and/or L1 on the realization of the Arabic monophthong vowels /i, iː, a, aː,u, uː/ and their allophonic pharyngealized ones as produced by two groups of GPA speakers (short and long stay groups) with Malayalam as their L1. The study considers spectral and temporal structures of the investigated vowels for comparing their distributions in both substrate and lexifier languages (Malayalam and Arabic), and for determining how they are patterned as well as their similarities and differences. The first findings of this study, as illustrated above, indicate that most of the investigated monophthong vowels (/iː, a, u, uː/) in the speakers' L1(Malayalam and Arabic) show no acoustic difference. Based on the perceptual similarities of most of the vowels in both languages, both groups of GPA speakers produce most of the Arabic vowels much like native Arabic speakers, and GPA speakers behave similarly in realizing the Arabic vowels irrespective of their LOR. Furthermore, the vowel length contrast also presents in the speakers' L1. However, the two groups of GPA speakers realize the Arabic duration differently. When the durations of Arabic vowels were compared across both groups of GPA speakers, it is found that the GPA speakers from the long stay group succeed in realizing the duration of every long and short Arabic vowel, except for /a/. On the other hand, the short stay group could realize only the duration of Arabic long /iː, uː/ and short /u/ without any significant difference from duration values of the local form. As for the pharyngealized vowels, although both groups of GPA speakers realized most of the pharyngealized Arabic vowels that follow the fricative /sˤ/ in a somewhat similar performance, the long stay group performs better than the short stay group in realizing the pharyngealized vowels after the stop /tˤ/, supporting the argument of SLM (Flege, 1995). They had the tendency to lower F2 and produce these vowels further back relative to their plain ones.

In future studies I plan to address some of the limitations of the current study. The data set needs to be expanded, especially the data that represent the pharyngealized vowels, in that I had only a small number of tokens that did not cover the whole target vowels of Arabic. Therefore, covering the whole target vowels might provide a clearer picture of the effect of pharyngealization on each vowel and show the degree of pharyngealization on each vowel quality if it is equal or varies. Furthermore, the data were taken from only a picture task and word list elicitation without any consideration for the conversational data or spontaneous speech. This methodological decision was a result of limited access to participants, more specifically, the sponsor of the workers did not allow his workers to spend much time for interviewing during the work hours. Therefore, I took the advantage

of the short time that I had from the sponsor for conducting only picture elicitation. Investigating vowels in spontaneous speech may result in providing different vowel performance than in picture tasks and word list elicitation. Finally, I plan to determine if other factors might influence the vowel realization, such as the amount of the Arabic usage in daily life and education.

References

[1] Albakrawi, H. (2012). The Linguistic Effect of Foreign Asian Workers on the Arabic Pidgin in Saudi Arabia. language, 2(9).

[2] Alghamdi, E. A. (2014). Gulf Pidgin Arabic: A Descriptive and Statistical Analysis of Stability. International Journal of Linguistics, 6(6), 110.

[3] Alghamdi, M. M., (1998). "A spectrographic analysis of Arabic vowels: A cross-dialectal study" Journal of King Saud University, 10, 3-24.

[4] Al-Haq, F. A. A., & Al-Salman, A. K. (2014). Jordanian Bengali Pidgin Arabic. US-China Foreign Language, 2(5), 331-348.

[5] Al-Jasser, J. A. (2012). Pidginization theory and second language learning/acquisition. Journal of King Saud University-Languages and Translation, 24(2), 71-74.

[6] Aljutaily, M. (2018). The influence of linguistic and non-linguistic factors on the variation of Arabic marked consonants in the speech of Gulf Pidgin Arabic: Acoustic Analysis. Unpublished Doctoral dissertation, University of Georgia.

[7] Almoaily, M. (2012). Language Variation in Gulf Pidgin Arabic. Unpublished Ph. D thesis, Newcastle University:UK.

[8] Almoaily, M. (2008). A data-based description of Urdu Pidgin Arabic. Unpublished MA dissertation, Newcastle University.

[9] Almisreb, A. A., Abidin, A. F., & Tahir, N. M. (2016). An acoustic investigation of Arabic vowels pronounced by Malay speakers. Journal of King Saud University-Computer and Information Sciences, 28(2), 148-156.

[10] Alsayuty, J. (1967). The Principle of perfection in mastering the Qura'an. Halab: Dar Alkitab Alarabi. (Arabic Reference).

[11] Alsiraih, W. (2013). Voice quality features in the production of pharyngeal consonants by Iraqi Arabic speakers. (Doctoral dissertation, Newcastle University).

[12] Alwan, A. (1989). Perceptual cues for place of articulation for the voiced pharyngeal and uvular consonants. The Journal of the Acoustical Society of America, 86(2), 549-556.

[13] Al-Zubeiry, H. Y. A. (2015). Linguistic Analysis of Saudi Pidginized Arabic as Produced by Asian Foreign Expatriates. International Journal of Applied Linguistics and English Literature, 4(2), 47-53.

[14] Aoki, R., & Nishihara, F. (2011, June). Sound feature interference between two second languages: An expansion of the feature hypothesis to the multilingual situation in SLA. In Annual Meeting of the Berkeley Linguistics Society (37, 1, pp. 18-32).

[15] Avram, A. A. (2010). An outline of Romanian pidgin Arabic. Journal of Language Contact, 3(1), 20-38.

[16] Bakir, M. J. (2010). Notes on the verbal system of Gulf Pidgin Arabic.Journal of Pidgin and Creole languages, 25(2), 201-228.

[17] Bassiouney, R. (Ed.). (2010). Arabic and the media: linguistic analyses and applications (Vol. 57). Brill.
[18] Flege, J. E. (1987). Effects of equivalence classification on the production of foreign language speech sounds. Sound patterns in second language acquisition, 9-39.
[19] Flege, J. (1981). The phonological basis of foreign accent. TESOL Quarterly, 15, 443-455.
[20] Flege, J. & Hillenbrand, J., (1984). Limits on phonetic accuracy in foreign language speechperception. The Journal of the Acoustical Society of America, 73 (3), 708-721.
[21] Flege, J. (1984b). The effect of linguistic experience on Arab's perception of the English /s/ vs./z/ contrast. Folia Linguistica, 18, 117-138.
[22] Flege, J. (1995). Second-language speech learning: Theory, findings, and problems. In W. Strange (Ed.), Speech perception and linguistic experience: Issues in cross-languageresearch (pp. 229–273). Timonium, MD: York Press.
[23] Flege, J., Bohn, O.-S., & Jang, S. (1997). The effect of experience on non-native subjects' production and perception of English vowels. Journal of Phonetics, 25, 437–470.
[24] Hacquard, V., Walter, M., & Marantz, A. (2007). The effects of inventory on vowel perceptionin French and Spanish: an MEG study. Brain Language, 100, 295-300.
[25] Hassan, Z. M. (2012) Pharyngeals vs Emphatics in Iraqi Arabic; Acoustic and Articulatory (Laryngoscopic) Study.
[26] Hassig, H. L. (2011). Deriving Cairene Arabic from Modern Standard Arabic: A framework for using Modern Standard Arabic text to synthesize Cairene Arabic speech from phonetic transcription. (Master's thesis).
[27] Holes, C. (1990) Gulf Arabic. London, Routledge.
[28] Holm, J. (2000). An introduction to pidgins and creoles. Cambridge University Press.
[29] Jiang, H. (2010). Malayalam: a Grammatical Sketch and a Text. Department of Linguistics, Rice University.
[30] Johnstone, T. M. (1967). Eastern Arabian dialect studies. London: Oxford University Press.
[31] Kent, R. D., Read, C., & Kent, R. D. (1992). The acoustic analysis of speech (Vol. 58). San Diego: Singular Publishing Group.
[32] Klein, T. (2006). Creole phonology typology: Phoneme inventory size, vowel quality distinctions and stop consonant series. In The structure of creole words: Segmental, syllabic and morphological aspects, ed. by Parth Bhatt & Ingo Plag. Tübingen: Niemeyer. 3–21
[33] Lenneberg, E. (1967). The biological foundations of language. Hospital Practice, 2, 59-67.

[34] McAllister, R., Flege, J., & Piske, T. (2002). The influence of the L1 on the acquisition of Swedish vowel quantity by native speakers of Spanish, English, and Estonian, Journal of Phonetics, 30, 229–258.
[35] Munro, M. J. (1993). Productions of English vowels by native speakers of Arabic: Acoustic measurements and accentedness ratings. Language and Speech, 36(1), 39-66.
[36] Næss, U. G. (2008). "Gulf Pidgin Arabic": Individual strategies or a structured variety? MA thesis, University of Oslo, Norway.
[37] Özüorçun, F. (2014). Language Varieties: Pidgins and Creoles. LAÜ Sosyal Bilimler Dergisi, 5(2).
[38] Qafisheh, H. A. (1977). A Short Reference Grammar of Gulf Arabic. Tucson, AZ. University of Arizona Press.
[39] Saadah, E. (2011). The production of Arabic vowels by English L2 learners and heritage speakers of Arabic (Doctoral dissertation, University of Illinois at Urbana-Champaign).
[40] Sakoda, K., & Siegel, J. (2008). Pidgin Grammar: an introduction to the Creole English of Hawai'i. Bess Press.
[41] Salem, A. A. M. (2013). Linguistic Features of Pidgin Arabic in Kuwait.English Language Teaching, 6(5), 105-110.
[42] Schumann, J. H. (1976). Second language acquisition: The pidginization hypothesis. Language learning, 26(2), 391-408.
[43] Sebba, M. (1997). Contact languages: Pidgins and creoles. London: Macmillan.
[44] Siegel, J. (2009). The emergence of pidgin and creole languages. Oxford University Press.
[45] Smart, J. R. (1990). Pidginization in Gulf Arabic: A first report. Anthropological linguistics, 32 (2-1), 83-119.
[46] Tsukada, K. (2009). An acoustic comparison of vowel length contrasts in Arabic, Japanese and Thai: Durational and spectral data. Int. J. of Asian Lang. Proc., 19(4), 127-138.
[47] Velayudhan, S., & Howie, J. M. (1974). Acoustical measurements of distinctive vowel quantity in Malayalam. Language and Speech, 17(1), 95-102.
[48] Wardhaugh, R. (2010). An introduction to sociolinguistics. Oxford: Wiley-Blackwell.
[49] Winford, D. (2003). Pidgin and Pidginization. In An introduction to contact linguistics. (pp.268-303). Malden, MA: Blackwell.
[50] Yule, G. (1996). The study of language. Cambridge University Press, New York, pp. 233–234.

[51] Zawaydeh, B. (1997). An acoustic analysis of uvularization spread in Ammani-Joranian Arabic.Studies in the Linguistic Sciences, 27,1, 185-200.
[52] Zsiga, E. C. (2012). The sounds of language: an introduction to phonetics and phonology. John Wiley & Sons.

" تحليل صوتي أكوستي لنطق الصوائت الفردية ونظيراتها المحلقة لمتحدثي لغة الهجين العربية"

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ملخص البحث: تهدف هذه الدراسة الى الكشف عن التأثير المحتمل لطول الإقامة في السعودية والتأثير المحتمل من اللغة الأم على نطق الصوائت الفردية العربية ونظيراتها المحلقة. حيث أجريت الدراسة على عشرين متحدثا للغة الهجين العربية من الجنسية الهندية (ممن لغتهم الأم اللغة الماليالامية) تم تقسيمهم الى مجموعتين: مجموعة الإقامة الطويلة بالسعودية ومجموعة الإقامة القصيرة، بالإضافة إلى ثلاثة متحدثين سعوديين لغتهم الأم العربية بغرض المقارنة مع المجموعتين الأخريين. اعتمدت الدراسة على تحليل صوتي أكوستي يتضمن تحليل الترددات وقياسها وقياس المدى الزمني للصوائت المستهدفة. بعد ذلك تمت مقارنة مقاييس كلتا المجموعتين مع مقاييس المتحدثين الأصليين للعربية لمعرفة أوجه التشابه والاختلاف في نطق هذه الأصوات. كما أشارت نتائج هذه الدراسة إلى أن كلتا المجموعتين من متحدثي لغة الهجين العربية قد نطقوا معظم الصوائت الفردية العربية بمقاييس وقيم تشبه الى حد كبير مقاييس نطق المتحدثين الأصليين للعربية بغض النظر عن طول وقصر إقامتهم في السعودية عدا الصائت الأمامي الطويل والذي لم تتمكن من نطقه بشكل صحيح إلا مجموعة الإقامة الطويلة. أما في حالة خاصية طول وقصر المدى الزمني للصوائت الممدودة، فقد أشارت النتائج بأن كلتا من مجموعتي الإقامة الطويلة والقصيرة استطاعتا مقاربة مقاييس المتحدثين الأصليين وأدائهم فيما يتعلق بالمدى الزمني للصوائت الممدودة، ويرجع سبب أدائهم السليم إلى وجود خاصية الصوائت الطويلة في لغتهم الأم؛ مما سهل عليهم نطق الصوائت الممدودة في العربية. بشكل عام، أشارت النتائج إلى تفوق مجموعة متحدثي الإقامة الطويلة في

السعودية على متحدثي الإقامة القصيرة في نطق معظم الصوائت العربية كتفوقهم في نطق الصوائت الفردية العربية المحلقة بالإضافة الى تفوقهم في نطق الصوائت العربية الممدودة وهذا يعزز ويدعم نموذج تعليم النطق لفليج 1995.

الكلمات المفتاحية: لغة الهجين العربية، نموذج تعلم النطق، لغة طبقة دنيا، لغة طبقة عليا، إشارات صوتية.