

Addressing the Difficulties of Arabic Learners of English: A Case for the Acquisition of Allophonic Variance in English Consonants

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Abstract: There has been a recent interest in the perception of laterals and coronal plosives by adult learners of English in the Arab world. The purpose of the study was to examine how context-specific allophones of English laterals and plosives were perceived by adult Arabic learners of English. For this purpose, two perception tests were developed. A group of undergraduate students at a public university in Saudi Arabia listened to aspirated and unaspirated coronal stops and dark and clear laterals and identified the allophones. The results showed that Arabic learners of English related unaspirated and aspirated coronal plosives with emphatic and non-emphatic plosives of their first language (L1), respectively. Similarly, they also equated the dark and clear laterals of a second language (L2) with the corresponding context-specific variants of Arabic laterals. The study's findings suggest that adult Arabic learners of English have the ability to acquire English allophonic variance based on the equivalence classification between L1 and L2 sounds.

Keywords: acquisition of English consonants, allophonic variance, Arabic, aspiration, perception of allophones.

الصعوبات التي يواجهها طلاب اللغة الإنجليزية العرب: دراسة حالة لاكتساب التباين الصوتي في الحروف الساكنة الإنجليزية

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المستخلص: كان هناك اهتمام مؤخرًا بطريقة إدراك طلاب الجامعة العرب الدارسين للغة الإنجليزية للأصوات الجانبية والأصوات الانفجارية، ويهدف هذا البحث إلى دراسة كيفية إدراك طلاب الجامعة العرب الذين يدرسون اللغة الإنجليزية للبدائل الصوتية (الألوفونات) للأصوات الجانبية (المنحرفة) والانفجارية في اللغة الإنجليزية. ولتحقيق هذا الغرض قام الباحث بإجراء اختياري إدراك، حيث استمعت مجموعة من الطلاب الجامعيين في إحدى الجامعات الحكومية في المملكة العربية السعودية إلى الأصوات الانفجارية المهموسة وغير المهموسة، وكذلك للأصوات الجانبية (المنحرفة) المفخمة والمرققة، وتعرفوا على الألوفونات.

وأظهرت النتائج أن طلاب اللغة الإنجليزية - محل الدراسة - ربطوا بين الأصوات الانفجارية المهموسة وغير المهموسة، وبين الأصوات الانفجارية المفخمة والمرققة في لغتهم الأولى على الترتيب، وبالمثل فقد ساووا بين الأصوات الجانبية المفخمة والمرققة في اللغة الإنجليزية، وبين المتغيرات الصوتية للأصوات الجانبية في اللغة العربية، وتشير نتائج الدراسة إلى أن طلاب اللغة الإنجليزية العرب لديهم القدرة على اكتساب التباين الصوتي (الألوفون) في اللغة الإنجليزية بناءً على تصنيف التكافؤ بين الأصوات في اللغتين: الأولى والثانية.

الكلمات الأساسية: اكتساب الحروف الساكنة الإنجليزية - التباين الألفوني - اللغة العربية - الهمس - إدراك الألوفونات.

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Introduction

Learning a new language in adulthood always involves a discussion of the role of L1 grammar. It is almost improbable to expect the acquisition of L2 after puberty without interference from L1, particularly when L2 is being taught in a foreign setting by non-native teachers (Lado, 1957). English is an international language that is being taught in most parts of the world (Crystal, 2003). Therefore, discussion on adult L2 in a foreign setting cannot be complete without referring to English. The current paper is also a study of the same nature. It reports on an experiment with some undergraduate students of English at a university in Saudi Arabia to see what triggers the influence of L1 on L2 and how this influence can be exploited positively in the process of learning a new language in adulthood. The current section provides an introduction and the theoretical background of the study.

The influence of L1 on learning a second language in adulthood is an established and widely discussed issue (Major, 2008). What is the motivation and nature of such influence? This has been a point of interest for educationalists, linguists, and researchers working in the field of psychology and learning. For example, Best and her colleagues think that learners perceive and equate two sounds in articulatory gestures (Best, 1995; Best & Tyler, 2007). But Brown is of the opinion that learners' perceptions are based on phonological features (Brown, 1997, 1998, 2000). In this regard, Flege considers that adult learners equate corresponding L1 and L2 phonemes on the basis of the acoustic phonetic nature of the phonemes (Flege, 1993, 1995). The assertion posits that learners attribute equivalence between two similar sounds when they cannot discern a shared acoustic resemblance (Flege & Bohn, 2021). Historically, this phenomenon has been denoted as 'equivalence classification' by Flege (1987a, 1987b). Furthermore, Flege contends that learners not only perceive but also establish equivalence between two sounds at the phonetic allophonic level (1995). Of these perspectives, Flege's standpoint emerges as the most compelling and germane for comprehending the acquisition of allophonic variation. It is noteworthy that while a

substantial body of literature exists on the acquisition of L2 phonemes, the investigation into the acquisition of L2 allophonic variation remains an underexplored area of study. The ensuing section will provide a succinct summary of pertinent preceding research in this domain.

Literature Review

In the first half of the previous century, the focus of phonologists was on the phonemes of language and their phonemic representation. Phonemes create abstract categories in a language. On the other hand, allophones represent the real, concrete boundaries of a sound. Therefore, linguists' attention was diverted towards other aspects of sounds, such as acoustic signals, allophonic representation, and phonological features. In the second half of the previous century, phonologists came to the conclusion that a phoneme is a bundle of different features. A phoneme, by its nature, is not considered a fundamental unit of speech. They also realized that the human mind processes different cognitive activities, considering allophones and features as the basic processing units. Flege (1995) explicitly claimed that adult L2 learners' perception and processing are based on context-specific allophonic representations of sounds instead of abstract phonemic representations. Nonetheless, there is not ample literature on this topic. The study of allophonic representation and its acquisition is still a neglected field of study in the discipline of second language acquisition (SLA). Mitterer, Reinisch, and McQueen (2018) addressed the question of whether it is phonemic or allophonic representation that exists in the minds of the speakers. For this, they designed three experiments with learners of different languages. In the first experiment, they attempted to test the generalization of selective adaptation of various allophones of Dutch /r/ and /l/. In the other two experiments, they focused on German fricatives, comparing phonemes and allophones. All these experiments confirmed that phonemic representation was not as necessary for processing the adaptation of sounds in language as allophonic representation was. Therefore, they conclude that it is the allophonic representation that matters in language learning.

Grenon's inquiry (2015) presents a highly relevant query concerning the potential ease of acquiring allophonic variation in the context of second language acquisition. This assertion posits that the context-dependence of allophonic variance could facilitate the acquisition process, as the surrounding linguistic context of the target sound might aid in the perceptual differentiation of allophones. To substantiate this proposition, an empirical experiment was conducted involving Canadian French listeners tasked with discerning English vowels. The outcomes of this investigation yielded empirical evidence that aligns with Grenon's perspective.

Syed (2014, 2015) did multiple experiments to study the acquisition of allophones of English by Pakistani learners. The first study (Syed, 2014) focuses on allophonic variance in English plosives, and the second one (Syed, 2015) focuses on the acquisition of allophonic contrast in L2 English laterals. The first of this series of experiments was a study on the impact of L1 on the acquisition of L2 aspiration contrast (Syed, 2014). This experiment was conducted with advanced Pakistani learners of English. The focus of this was the acquisition of context-bound allophonic variance in the aspiration of English plosives by Pakistani learners. The findings suggest that adult learners can acquire allophonic variance in English plosives, but certain phonetic factors like articulatory constraints may affect such learning either positively or negatively. The second part of this experiment was a study of allophonic contrast in English laterals by adult learners of English. This study was based on the perception of English laterals by adult learners. The findings of his study suggest that advanced learners of English can acquire allophonic contrast in English laterals (Syed, 2015). These studies have significance for the current study as they focus on the same topics adopted by the current author. These studies are relevant to the current study in that both focus on the acquisition of English allophonic contrast in the laterals. However, there are no studies on the acquisition of allophonic variance in L2 English by adult Arabic L1 speakers. The current study is an attempt to fill this gap in the literature.

Method

This section provides a concise overview of the data collection methods employed in the study and outlines the characteristics of the study participants. The subsections below include information on the instruments used for data collection, the tools utilized for acoustic analyses, and a list of stimuli.

Participants

The current study involved a sample comprising 16 participants, evenly distributed with 8 males and 8 females. These individuals were enrolled as undergraduate students at a public university in Saudi Arabia, with their academic progression placing them at an intermediate stage within their Bachelor of Arts (BA) degree program. The participants' ages spanned from 19 to 26 years, with a mean age of 21.44 years and a standard deviation of 01.67. It is noteworthy that their participation in the experiment was entirely voluntary, and the selection process relied on the principles of availability and convenience sampling.

Instruments

Two sound files were prepared for use as stimuli for data collection in this experiment. In one file, a non-native speaker of English (whose L1 was Saraiki), who had spent almost five years in England and had obtained an MA in English Language and Linguistics and a PhD in Phonology from a university in England, produced nonce words comprising VC syllables. Three quantum vowels (a:, i:, and u:) as V and two laterals (dark and clear) as C were used in the stimuli of the VC structure. There were three repetitions of each stimulus in the set. In this way, a total of 18 tokens (3 vowels * 2 laterals * 3 repetitions) with each of the three long vowels [i: u: a:] immediately followed by an English clear and a dark lateral with three repetitions of each were recorded in all. The sequence of the tokens was randomized for participants. The list of tokens is given in the first column of Table 1 in subsection 4.1.

The second file also consisted of another set of 18 tokens. In this file were nonce words of VCV,

CV, and CVCV syllables, and each syllable template had only aspirated and unaspirated coronals. The speaker of these words was a phonetician and a native speaker of Saraiki (the same speaker who had produced nonce words carrying tokens of laterals for the previous file). Saraiki is an Indo-Aryan language spoken in Pakistan (Bashir & Connors, 2019). He produced each syllable three times with aspirated coronal (dental) stops and three times with unaspirated coronal stops. In this way, 18 tokens (3 syllable templates* 2 aspiration contrast* 3 repetitions) were obtained. Saraiki stops are produced at the labial, coronal, and velar places of articulation (Shackle, 1976); the same places of articulation are used for Arabic labial, coronal, and velar stops. Labials are bilabials, coronal stops are dental in Arabic and Saraiki, and velar stops are also articulatorily the same in Arabic and Saraiki. Arabic non-emphatic stops are produced with aspiration (Alanazi, 2017). In Saraiki, aspiration contrast is phonemic in plosives. Thus, the aspirated tokens produced by the native speaker of Saraiki were very similar to Arabic non-emphatic coronal stops in terms of place and manner of articulation. The aim of using these tokens for a perception test was to see if Arabic L1 students could identify aspirated stops in the tokens as their L1 non-emphatic stops because of a common prominent feature, i.e., the presentation of aspiration in both. Similarly, a common feature between Saraiki unaspirated and Arabic emphatic stops is that both lack aspiration. Thus, the research question in mind was whether adult L2 learners can correlate, identify, and/or discriminate foreign sounds because of some common acoustic phonetic features between the foreign sounds and the corresponding L1 sounds.

Data Collection

Before starting the experiment, the researcher made sure that the participants were familiar with the dark and clear laterals of Arabic. They were all native speakers of a northern Saudi dialect of Arabic spoken in Arar. The researcher had explained the concept of allophonic variance with examples from Arabic laterals to make sure that the learners understood the concept of allophonic

variance before the experiment started. Moreover, the learners were also students of the phonetics and phonology course at the time of the experiment, so they were familiar with the basic concept of allophonic variance.

Two sets of answer sheets were prepared to facilitate the administration of two distinct perception tests. Each list of tokens was printed individually on separate sheets of paper by the researcher. Each participant received a copy of the two answer sheets (see the appendices for details). Detailed copies of these answer sheets can be referenced in the Appendix section of this study.

Audacity, which is audio software, was used to edit and play the recordings during the experiments. Instructions for each test were provided to the participants in Arabic and English in order to avoid any misunderstandings among participants.

Identification of laterals

The researcher first played the audio file for laterals. The participants were instructed to listen to those productions and decide which one carried a lateral closer to the CLEAR lateral and which one carried a consonant closer to the DARK lateral of Arabic. They were also informed that the productions were not quite identical to the actual Arabic laterals but were somewhat closer to the Arabic clear or dark lateral because the tokens were produced as English, not Arabic dark and clear laterals. The participants listened to those productions and decided which one carried 'a closer to clear lateral' and which one had 'a closer to dark lateral' consonant while keeping in mind Arabic's clear and dark laterals. The participants were asked to check the relevant box on the given answer sheet. Once all participants had made their decisions about the first token in the proper cell of the answer sheet, the researcher played the next stimulus.

In the evaluation of these answers, one mark was awarded for each correct answer. The participants' response was considered correct if they had identified the dark and clear laterals in the token as Arabic dark and clear lateral, respectively. SPSS software version 26 was used to analyze the data.

Identification of Coronal Stops

In this test, the researcher played 18 token recordings and gave each participant an answer sheet, which also had 18 cells. After filling in the first line, which asked about the number, age, gender, and degree program, each of the participants listened to the file carrying 18 words in an unknown language. The files contained words in Saraiki, but the participants were not told that it was Saraiki. They were told that they were listening to the words of a speaker of an unknown L1 who was learning Arabic and had produced emphatic and non-emphatic coronal plosives of Arabic. They were also informed that they would listen to productions consisting of only vowels and coronal stops. The participants were asked to determine, in the tokens, which of the coronal consonants in the productions were closer to non-emphatic and which ones were closer to emphatic coronal consonants in Arabic. The stimuli had vowels and only coronal stop consonants in VCV, CV, and CVCV formats. The tokens consisted of the following words from Saraiki:

/əṭa:/ grant, /əṭha:/ deep, /tu:/ you, /ṭhu:/ spit, /ṭoṭa:/ parrot, /ṭhoṭha:/ weightless.

As this list shows, the words have vowels and only coronal stops. There are two types of coronals in this list of stimuli: aspirated and unaspirated. Since these words of Saraiki were produced by a native speaker of Saraiki, which has aspiration contrast at the phonemic level, the aspiration contrast was quite clear in the productions.

The voiceless aspirated coronal stops found in Saraiki exhibit similarities to the non-emphatic coronal stops present in Arabic concerning features such as aspiration. In the context of this study, participants were given a phonological discrimination task. Specifically, they were required to listen to a series of words and make determinations regarding whether the coronal stops in these words resembled emphatic-like or non-emphatic-like sounds.

Participants were provided with guidance that the words presented in the recordings contained consonants that bore resemblances to both Arabic non-emphatic and emphatic consonants, although

they might not precisely replicate the target sounds of Arabic. It was emphasized that the consonants in the presented tokens exhibited varying degrees of similarity to Arabic emphatic and non-emphatic coronal stops. Consequently, participants were instructed to make their judgments while considering even subtle similarities between the consonants in the list of stimuli and Arabic emphatics and non-emphatic coronal stops. During the experiment, participants listened to the provided tokens and documented their responses by marking the relevant checkboxes on the provided answer sheets. Detailed copies of these answer sheets are located in the appendices section of this study.

The answer sheets were collected by the researcher after the experiment. The experiment was conducted with each participant separately. One mark was awarded for each correct identification. If an aspirated sound of the stimuli was identified as non-emphatic Arabic, it was treated as the correct response because Arabic non-emphatic is also produced with aspiration. On the other hand, Arabic emphatic sounds are unaspirated, so if the participants identified unaspirated coronals in the stimuli as emphatics, they were awarded one mark. In fact, the test aimed to determine if the participants could recognize the presence or absence of aspiration. If they could, it means they were able to differentiate between allophonic variants of English stops, which were also different because of aspiration contrast. A zero was awarded for incorrect responses.

Data Analysis

Percentage marks, means of the marks, and standard deviations of the data were calculated. Parametric analyses were performed using inferential statistical techniques. For this purpose, repeated measures analysis of variance (RMANOVA) was the main test applied for in-depth analyses of the obtained data. For a comparison of male and female performance, where required, male and female data were processed separately, considering gender as a variable. However, where gender had no effect on the performance of the participants, a cumulative

analysis was done based on the mean marks of all participants, regardless of their gender.

perception test of laterals are presented, followed by the test that focuses on coronal stops.

Results

In this study, the focus is on the allophones of laterals and coronal stops. The experiment consisted of two tests. The first test was about the perception of laterals, and the second was about coronal stops. In this section, the results of the

Laterals

Response The mean scores of participants are reported below.

Table 1. Descriptive Statistics All Participants Laterals

<i>Tokens</i>	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>M</i>	<i>SD</i>	<i>Accuracy (percentage)</i>
[a:l]	16	1.00	3.00	2.75	0.577	91.67
[al]	16	.00	3.00	1.37	1.360	45.67
[i:l]	16	.00	3.00	1.25	1.291	41.67
[i:l]	16	.00	3.00	2.25	1.183	75.00
[u:l]	16	.00	3.00	2.68	0.793	89.33
[u:l]	16	.00	3.00	1.06	1.124	35.33

The tokens in the first column above have three quantum vowels followed by either dark and or clear laterals. The mean marks are out of 3 because there were three repetitions for each stimulus. The results show that participants achieved accuracy in their perception of dark and clear laterals ranging between 41% and 91%. However, there is variance in their perception of clear and dark lateral in the sense that the best result is seen in the dark lateral followed by /a:/ and the worst result is seen in the perception of dark lateral followed by /i:/. The reason for this is that in Arabic, a clear lateral is produced after the high front vowels 'kasrah كسره'. Therefore, the participants perceived laterals after the high front

vowel as clear in more tokens. Similarly, in Arabic, the lateral after the low 'Fatha فتحة' and the high back rounded vowel 'Damma ضمة' is produced as dark. However, accuracy in tokens carrying a dark lateral after a high front vowel and a clear lateral after a low and rounded vowel indicates that learners depended on their own perception based on acoustic cues in identifying the target allophones. In this scenario, the whole data were combined, regardless of the vocalic context, to see a consolidated picture of their performance. Table 2 shows cumulative results based on the participants' perceptions of clear and dark laterals.

Table 2. Cumulative Results

<i>Allophone</i>	<i>Scores</i>	<i>Mean</i>	<i>Accuracy (percentage)</i>
<i>Dark</i>	6.68	2.23	74.22
<i>Clear</i>	4.68	1.56	52.00

Table 3 shows a better and more accurate picture of the performance of participants in this study. The results confirm that male participants have a better perception of allophones of the laterals than female participants. The accuracy of female participants is 62.56% for dark lateral and 40.22% for clear lateral, whereas the same is 86.00% and 63.89% for male

participants, respectively. In this regard, both groups perform better on the perception of dark lateral than on the perception of clear lateral. Figure 1 illustrates a clear comparative picture of the gender-wise performance of the participants on perception of allophones of laterals.

Table 3. Gender-wise accuracy in participants' responses

<i>Gender</i>	<i>Allophone</i>	<i>Score</i>	<i>M</i>	<i>Accuracy (percentage)</i>
Female	Dark	5.63	1.88	62.56
	Clear	3.62	1.21	40.22
Male	Dark	7.74	2.58	86.00
	Clear	5.75	1.92	63.89

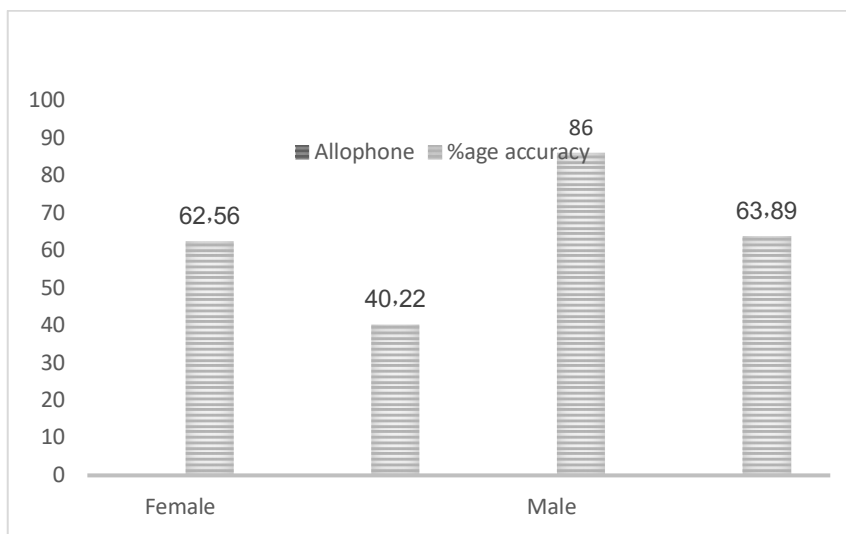


Figure 1. Gender-based performance of participants in laterals

Results obtained in the perception of coronal stops are presented in the following sub-section.

Coronal Stop Consonants

In this test, participants were instructed to listen to tokens carrying aspirated and unaspirated coronal stops. Their job task was to determine which consonant was closer to Arabic emphatics and which one was closer to non-emphatic coronal Arabic.

Arabic non-emphatic stops are also aspirated, whereas emphatic stops are produced without aspiration. Therefore, aspiration was used as a feature to test the perceptions of participants. If a participant perceived an aspirated coronal as non-emphatic or an unaspirated stop as emphatic, it was considered a correct answer. One mark was awarded for each correct response. The results are reported in Table 4.

Table 4. Descriptive Statistics Coronal Stops

<i>Tokens</i>	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>M</i>	<i>SD</i>	<i>Accuracy (Percentage)</i>
/əṭa:/	16	0.00	3.00	1.93	1.12	64.33
/əṭha:/	16	1.00	3.00	2.06	0.77	68.67
/tu:/	16	2.00	3.00	2.75	0.44	91.67
/thu:/	16	1.00	3.00	2.18	0.65	72.67
/toṭa:/	16	1.00	3.00	2.56	0.72	85.33
/thoṭha:/	16	1.00	3.00	2.06	0.77	68.67

The mean values in this table are out of a total of 3 because there were three repetitions for each token and one mark was awarded for one response. It is apparent that the accuracy percentage ranges between 64% and 91%, which is very good overall. A repeated measures analysis of variance (RMANOVA) was applied to these data to determine the significance of the differences in these results. The test shows that the effect of gender is non-

significant ($p > 0.5$), but that of vowel ($F = 4.748, p = 0.038$) and emphasis ($F = 6.938, p = 0.020$) is significant. A three-way interaction is also significant ($F = 5.412, p = 0.014$). All other interactions are non-significant ($p > 0.5$). Since there is no difference between male and female participants in this test, the combined results of both groups are presented below to show an overall picture. The overall accuracy of participants' perceptions is presented in Table 5.

Table 5. Overall results of Coronal stops

<i>Consonant</i>	<i>Total</i>	<i>M</i>	<i>Percentage</i>
Emphatic	7.25	2.41	80.55
Non-Emphatic	6.31	2.10	70.13

Stability of Ratings

These results indicate that participants performed better in perceiving emphatic coronal stops as unaspirated stops than in perceiving non-emphatic stops as aspirated stops. However, the overall performance of participants in their perception of both target sounds is excellent since

they have achieved above 70% accuracy in this test. Figure 2 shows participants' performance in both target consonants.

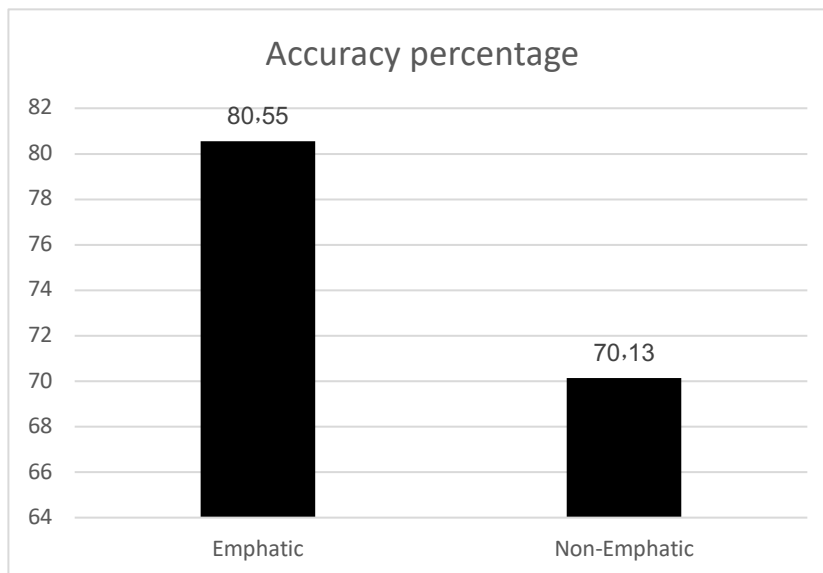


Figure 2. Accuracy (percentage) in coronal stops

Analysis and Discussion

Two perception tests were carried out in this study. The first test was about laterals, and the second one was about coronal stops. In the first test, participants heard productions of dark and clear laterals along with vowels and identified the allophones of laterals. The second test was slightly tricky. It carried aspirated and unaspirated coronal stops of another language (Saraiki), which the participants heard. In the L1 of the participants (Arabic), non-emphatic stops are aspirated and emphatic ones are unaspirated; therefore, the test was developed to confirm if Arabic learners of English identify aspirated and non-aspirated coronal plosives as unemphatic and emphatic stops of Arabic, respectively, on the basis of the presence and absence of aspiration. If the participants could do that, it

means they could equate L1 and L2 sounds on the basis of acoustic signals, as is commonly predicted by researchers in the field of adult language acquisition (Flege & Bohn, 2021).

The results of the first experiment show that participants achieved approximately 52% to 74% accuracy in identifying clear and dark laterals in the stimuli as their L1 lateral allophones, respectively. The effect of vowels on the identification of sounds was significant. It is already known in the literature that adjacent vowels have a significant effect on the perception of listeners in L2 studies (Iverson et al., 2003). Male participants in the current study were also slightly better than female participants in their performance.

In the second test, the participants showed 65% to 91% accuracy in correlating aspirated and unaspirated coronal stops in the tokens with the

corresponding non-emphatic and emphatic coronal stops in Arabic. Overall, it is a good result. The gender difference was not significant, which means male and female participants in this study performed equally well in this test. However, the effect of adjacent vowels on the perception of consonants was significant. Importantly, participants performed better in identifying unaspirated coronal stops as emphatic coronal stops of their L1, although overall they were excellent in their performance on both types of stops.

An interesting and important aspect of the results is that listeners who were adult learners of English identified allophones of another language as allophones or phonemes of their L1 on account of the acoustic similarity between the corresponding sounds. For a long time, researchers have been interested in knowing the basis of L1 interference in L2 perception. Different views have been expressed in this regard by different researchers. Some claim that listeners perceive sounds because of articulatory gestures (Best, 1994, 1995; Best & Tyler, 2007). Others think that listeners' perceptions are based on phonological features (Brown, 1997, 1998, 2000). But Flege established his viewpoint after large-scale empirical expectations that listeners depend on acoustic phonetic cues in correlating or equating the phonemes of two languages (Flege, 1987a, 1993; Flege, Shirru, & Mackay, 2003). This is what he calls 'equivalence classification' (Flege, 1987a). The results of the current experiments support this final view. As pointed out earlier, two versions of coronal stops in the stimuli tokens share a common feature with the corresponding L1 emphatic and non-emphatic stops because of one feature, which is the absence or presence of aspiration. Similarly, variance in laterals in different languages is caused by F3 lowering (Ladefoged & Maddieson, 1996). In the current study, adult Arabic learners of English acquired maximum accuracy of 74% in laterals and 91% accuracy in coronal stops in the correct identification of these consonants. These results confirm that listeners can successfully depend on the acoustic phonetic signals of sounds to learn new and difficult phonemes in a foreign or second language.

Emphatics are unique sounds found in Arabic. They have their own specific features.

Highlighting the grammatical features that are common between English and Arabic can help not only Arabic L1 students learn L2 English, but also those learners of L2 Arabic who speak English as L1.

Conclusion

Drawing upon the outcomes of this investigation, it can be deduced that adult L2 learners exhibit a pronounced reliance on the acoustic-phonetic attributes of sounds when engaged in the perception of novel L2 sounds. Their perceptual processes tend to hinge upon the identification of one or two salient phonetic features that are typically shared between the newly encountered L2 sounds and their respective counterparts in the learners' L1.

This perceptual strategy leads to the development of a form of equivalence classification between the L1 and L2 sounds, a cognitive mechanism that substantially aids the process of acquiring new phonemic elements within L2. Consequently, educators instructing English to students across different proficiency levels in Saudi Arabia may find it advantageous to incorporate these acoustic cues into their pedagogical approaches. By emphasizing the common phonetic attributes shared by L1 and L2 phonemes, instructors can potentially enhance their students' effectiveness in acquiring and mastering new and intricate English phonemes.

The acquisition of allophones is considered a great difficulty for L2 learners since they are not written differently in many languages, including English and Arabic. Orthography can mislead learners. But they can be made easy by a comparative study of L1 and L2 sounds. Incidentally, lateral has variants in the English and Arabic languages. In English, a lateral is dark when it occurs in coda position. Otherwise, it is a clear lateral. In Arabic, the word 'Allah, when preceded by the front vowel /i/, is produced as dark. In other words, Arabic and English laterals have context-specific allophonic variance. Most non-native learners of English face difficulty learning allophonic variance in laterals. Teachers of English can highlight such similarity between L1 and L2 to their learners, based on which students are expected to develop 'equivalence classification'

between variants of allophones in the two laterals. Such exercises may enhance the chances of learning English for adult L2 learners in general and in the Arab world in particular. This is not only valid for learners of English in Saudi Arabia but also for learners of Arabic around the world. This is not only valid for learners of English in Saudi Arabia but also for learners of Arabic around the world. Thus, teachers can depend on models of second language acquisition when teaching English to Arabic learners and Arabic to non-Arab learners. This line of action may be helpful for both kinds of learners.

It is important to elucidate the precise focus and boundaries of this research endeavor. The study in question has deliberately concentrated its efforts on a delimited subset, specifically encompassing only four allophones inherent to the English language. This methodological choice aligns harmoniously with established research conventions, wherein scholars frequently employ purposive sampling techniques to hone their investigations. It is essential to underscore that a sample, by design, constitutes a subset extracted from a broader and more extensive population. Similarly, when researchers delve into the nuances of a particular domain of study, they often opt to scrutinize a specific facet or issue therein.

The findings derived from this study emanate from an exhaustive analysis conducted with a meticulously curated sample size. This characteristic underscores the potential for subsequent replication with a more expansive and diverse sample. The replication of these research endeavors holds the promise of facilitating the extrapolation of the findings to encompass a more comprehensive and representative population, particularly focusing on Arabic learners engaged in the study of the English language. Furthermore, it is conceivable that forthcoming investigations may opt to employ the same research methodology when dealing with analogous groups of learners. This iterative approach has the potential to fortify and substantiate the outcomes of this study.

Moreover, it is worthy of note that future researchers may choose to explore alternate phonetic elements within the context of English as a second language, thereby delving into assessments of the

associated levels of complexity encountered by learners. Similarly, the identical research methodology is amenable to adaptation and application among non-Arab learners who are engaged in the study of the Arabic language, encompassing individuals from diverse linguistic backgrounds across the globe. In conclusion, this work provides a preliminary basis for future research in this emerging academic field.

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Appendices

Appendix A. Answer sheet No. 1 for Phonetic laterals

Participant No. Age: Gender: Class:

S. No.	Dark Lateral as after Fatch and Damma in Arabic	Clear Lateral after Kasra and elsewhere in Arabic
1		
2		
3		
4		
5		
6		

7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		

There are 18 stimulus words in this test. In these 18 words, either dark or clear lateral is used. Please listen carefully and decide by ticking in either first or second column if you have heard dark or clear lateral in each of the stimuli.

Appendix B. Answer sheet No. 2 for Phonetic Emphatics/No-emphatics

		Participant No.	Age:	Gender:	Class:
S. No.		Emphatic-like		Non-emphatic-like	
1					
2					
3					
4					
5					

6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		

In this test, you will hear 18 words of an unknown language. Each word carries vowels and only coronal stops in VCV, CV, CVCV format. You decide if the coronal stops in which of the words are emphatic-like, or non-emphatic like. Tick the relevant cell after listening.