

Investigating Iraqi EFL Learners' Perception of English Gliding Vowels

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ABSTRACT:

This study investigates how Iraqi EFL learners perceive English gliding vowels. The major goal is to determine the difficulties that learners struggle with when perceiving gliding vowels and come up with rank order that shows the nature of difficulties and to what extent these difficulties are interpreted based on L1 transfer. Although gliding vowels are fundamental in English phonology, their perception by Arabic-speaking learners particularly Iraqis remains poorly studied. To do this, thirty Iraqi learners from the University of Anbar, College of Education for Women, English language department. To exclude the potential effects of gender and age factors, all participants were females and ranged in age from 19 to 25. They participated in a perception test that featured 107 English words, each has one gliding vowel. The words were pronounced by a native speaker, recorded and played for the learners, who are supposed to listen and choose a word from a group of four written words. After gathering the responses, the data were statistically analyzed to find out which vowels were most frequently misidentified. Overall, the perception test findings showed a significant range in learners' ability to distinguish between various English gliding vowels. Some vowels were constantly accurately heard, while others presented substantial difficulty to the participants. The study found that certain vowels, particularly /oɪə/, /əʊə/ and /ɪə/, caused more confusion than others, while other vowels like /aɪ/ and /eɪ/ were among the easiest for learners to perceive. The learners' inability to perceive some diphthongs and triphthongs, especially those that are not present in their L1 inventory, indicates that native language phonology has a significant influence. This study offers a unique contribution by emphasizing specifically on the perception of English gliding vowels among Iraqi EFL learners, an area that has received little prior attention. The PAM and SLM framework are supported by these results, which emphasize the necessity of focused auditory training. Thus, to reduce the perceptual gaps, it is advised that Iraqi learners get EFL instruction that includes comparative phonetic analysis and targeted listening activities

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Introduction

The study of phonological difficulties in the acquisition of second languages (SLA), research has been revitalized in recent years and is getting more attention than it did a decade ago (Hammarberg, 1988). Mastering the phonetic system of a second language is an essential first step in learning to communicate in that language. The foundation for successful pronunciation is established by accurate perception and production of the L2 phonemes (e.g., Baker, 2006;

Celce-Murcia, Brinton, & Goodwin, 1996; Dalton & Seidlhofer, 1994) and proficient speaking, listening and communication abilities (Gilbert, 1993; Meador, Flege & MacKay, 2000; Murphy, 1991; Rogers & Dalby, 2005).

Previous studies have shown that perception plays a crucial role in pronunciation, particularly for non-native speakers (Flege, 1995; Bradlow et al., 1997). If learners do not perceive vowel distinctions accurately, they may not be able to produce the corresponding sounds correctly. Learners whose native languages lack certain English diphthongs may find it challenging to perceive these sounds accurately. Individuals from linguistic backgrounds that do not include certain English diphthongs may struggle with their production. For example, Indonesian learners often find pronouncing English diphthongs challenging due to the absence of similar sounds in their native language (Donal, 2016)

Determining how the listener derives a linguistic message from the input signal in spite of the intricate mappings between the linguistic units and their auditory realizations has been a fundamental problem in speech perception research. Even though there are fundamental differences amongst contemporary theoretical approaches to speech perception, some of these approaches, such as gesturalist theories (Lieberman & Mattingly, 1985; Fowler, 1986) and exemplar theories (e.g., Goldinger, 1997; Pierrehumbert, 2002), agree that parity between speaking and listening forms is necessary for effective communication.

Successful communication must be explained by phonetic theories: how do listeners comprehend the speech that a speaker produces? The significant degree of variability in the voice signal must be taken into account in order to comprehend the mechanisms underlying effective communication. Numerous elements, including regional dialect, anatomical differences between speakers, socio-indexical information about the interlocutor, and segmental context, have been established by researchers as contributing to varied production (Johnson et al., 1993; Ohala, 1993; Bent & Holt, 2017).

The nature of Iraqi learners' exposure to English makes it difficult for them to achieve intelligible pronunciation. Listening skills are almost entirely overlooked in the classroom, either due to a lack of proper sound labs or to the approaches used by professors who do not appear to believe in the need for listening to L2 as a crucial step toward speaking effectively. Accurate perception and production of L2 phonemes provide the basis for effective listening and speaking that result in effective overall communication.

Acquiring vowel sounds in a second language is one of the key challenges for L2 learners due to cross-linguistic differences in phonetic and phonological systems. L2 vowel acquisition involves the process of learning to perceive, produce, and categorize vowel sounds that may not exist in a learner's first language (L1). This challenge can be understood through several theoretical frameworks, such as the Speech Learning Model (SLM) by Flege (1995) and the Perceptual Assimilation Model (PAM) by Best (1995).

Flege's SLM posits that L2 learners strive to maintain separate phonetic categories for L1 and L2 sounds, but if L2 sounds are perceived as similar to existing L1 categories, they may not develop fully distinct representations. According to this model, learners may have difficulty distinguishing L2 vowels that are acoustically close to their L1 vowels (Flege, 1995). On the other hand, PAM focuses on how learners perceptually assimilate non-native sounds into their existing L1 categories. Best (1995) argues that learners tend to assimilate unfamiliar L2 vowels to the closest L1 equivalent, which can result in inaccurate production and perception of L2

vowels. For instance, English learners of French may struggle with the distinction between /u/ and /y/ because English lacks a front rounded vowel like /y/ (Best, 1995). SLM does not assume that all L2 production errors are perceptually motivated (Flege, 1995). Though SLM is primarily concerned with production, it is also applicable to speech perception, and the hypotheses proposed by this model are widely utilized to analyze both perception and production investigations. According to Best and Tyler (2007), the PAM-L2 postulates that there is phonological and phonetic interaction between the L1 and L2 sound systems. Because listeners may recognize L1 and L2 sounds as functionally equal even when their phonetic representations differ, the researchers explain how the phonological system is essential to nonnative speech perception.

Problem statement

The connection between speech production and perception is crucial for learning a foreign language, particularly when learning difficult phonetic features. Despite the significance of gliding vowels in English phonology, there is limited understanding of how Iraqi EFL learners perceive these sounds. A limited number of research, including Al-Kan'aan (2014) and Al Abdely et al. (2016), have investigated Arabic learners' perceptions of English vowels, with an even smaller subset concentrating on gliding vowels. Effective pedagogical strategies to enhance learners' perception can be impeded by a lack of knowledge about this speech perception.

Objective research

The present study aims to achieve the following objectives:

1. To determine the extent to which Iraqi EFL learners may perceive English gliding vowels.
2. To investigate the impact of L1 on Iraqi EFL learners' perception of English gliding vowels

Research questions

1. To what extent may Iraqi EFL learners perceive English gliding vowels?
2. What is the impact of L1 on Iraqi EFL learners' perception of English gliding vowels?

Scope of the Study

The study's focus on a specific set of Iraqi learners may limit the findings' applicability to other EFL learners. Furthermore, the study focusses just on gliding vowels, therefore its findings may not be applicable to other types of English. There is no attempt to discuss consonant perception or English's suprasegmental features, such as stress, rhythm, or intonation. This study looks at the effects of L1 transfer on perception. This study does not address other characteristics such as age of learning, level of skill, or native exposure.

Literature Review

Speech Perception Theories

1. Motor Theory

Motor theory is a psychological and physiological concept that emphasizes the role of motor processes in the perception and production of speech. Proposed by Alvin Liberman and his colleagues in the mid-20th century, the theory suggests that speech perception involves accessing the motor commands used to produce speech sounds. The Motor Theory of Speech Perception was presented in the 1960s as a way to explain this uniqueness. This approach implies a close link between speech production and perception, making it distinct from purely acoustic theories of speech perception.

The Motor Theory of Speech Perception has been a pivotal topic in understanding the interplay between speech production and perception. The Motor Theory suggests that listeners perceive speech by referencing their own speech production mechanisms. This theory proposes a neural mapping system that connects acoustic signals to articulatory gestures. However, it has faced criticism for its oversimplified view of speech production and limited neurophysiological evidence. (Liberman & Mattingly, 1985). A long-standing study in psychology aims to explain how we perceive speech. The project is inspired by evidence that appears to show that the cognitive processing of speech sounds differs from the regular processing used in hearing.

According to the motor theory of speech perception, articulatory movements and sensory input serve as a bridge between the acoustic stimuli and speech perception. The theory is based on an assessment of variations in identification likelihood, latency, and discrimination accuracy caused by changes in synthetic speech stimuli. It examines the experiments cited in favor of the idea. Oppositional evidence is offered. It is demonstrated that identification and discrimination functions for nonspeech stimuli are identical to those for speech stimuli when obtained under comparable settings (Lane, 1965).

2. *The Perceptual Assimilation Model (PAM)*

The Perceptual Assimilation Model (PAM) is a theoretical framework that explains how listeners perceive and categorize unfamiliar non-native speech sounds in relation to their native phonetic system. Developed by Best (1995), PAM posits that when encountering non-native (L2) speech sounds, listeners attempt to assimilate them to the closest equivalent categories in their L1 phonological system. The degree of similarity or difference between L1 and L2 sounds influences how accurately learners perceive and eventually acquire L2 phonemes.

Some L2 contrasts are easier to learn than others, which can be explained by these patterns. PAM has major implications for language teaching as well. Because of single-category or category-goodness assimilation, teachers can provide pronunciation instruction that emphasizes contrasts that are likely to be perceptually difficult. Furthermore, when learners gain experience and start to construct new perceptual categories, PAM has been expanded in recent research to take into consideration the dynamic nature of perception during L2 learning (Best & Tyler, 2007).

PAM focuses more on phonetic perception than on phonological acquisition. PAM has been influential in explaining cross-language speech perception and has guided subsequent models such as the Perceptual Assimilation Model for L2 learners (PAM-L2) (Best & Tyler, 2007), which extends the original framework to include the influence of experience and learning on L2 perception.

3. *The Perceptual Assimilation Model for L2 (PAM-L2)*

The Perceptual Assimilation Model for L2 (PAM-L2) is an extension of the original Perceptual Assimilation Model (PAM), developed by Best (1995), specifically designed to explain the challenges that second language learners face when perceiving non-native speech sounds. PAM-L2 focuses on how L2 learners process sounds that may not exist in their first language (L1) and how this affects their ability to perceive and eventually produce the sounds correctly.

In PAM-L2, the perception of L2 sounds is influenced by the phonetic categories of the learner's L1. Learners attempt to map L2 sounds onto the closest equivalent L1 categories, which may cause errors in distinguishing between similar-sounding L2 phonemes. For instance, a native Spanish speaker may perceive the English /ʃ/ (as in "ship") as /s/ because Spanish does not have a /ʃ/ sound, leading to confusion between words like "ship" and "sip."

PAM-L2 describes several types of perceptual assimilation, which predict the relative ease or difficulty of L2 phoneme discrimination:

1. *Two-Category (TC) Assimilation:*

When two L2 phonemes are mapped onto distinct L1 categories, learners are likely to discriminate them accurately. For example, English speakers learning Spanish can easily distinguish between /b/ and /p/ because these contrasts exist in English.

2. *Single-Category (SC) Assimilation:*

In SC assimilation, two L2 phonemes are perceived as belonging to the same L1 category. Discrimination is poor because learners fail to recognize the phonetic distinction. This is commonly observed in Japanese learners of English, who struggle to distinguish between /r/ and /l/ (Best & Tyler, 2007).

3. *Category-Goodness (CG) Assimilation:*

This occurs when both L2 sounds are mapped to the same L1 category, but one is perceived as a better exemplar of that category than the other. Discrimination performance is moderate since learners recognize subtle differences between the two sounds but still rely on a single L1 category for identification.

4. *Non-Assimilable (NA) Sounds:*

When L2 sounds do not match any existing L1 category, they may be perceived as non-speech sounds or as entirely novel. In such cases, learners face significant difficulty in identifying and producing these sounds until they develop new phonological representations.

PAM-L2 highlights that L2 learners' initial perceptual difficulties arise due to L1 interference. As learners continue to be exposed to the L2, they may refine their ability to perceive non-native sounds. In some cases, training and practice can help learners adjust their perception, making it easier for them to distinguish previously difficult sounds. The way learners perceive L2 sounds often influences their ability to produce those sounds correctly. If they have trouble perceiving a sound accurately, they are more likely to produce it incorrectly. This is why L2 pronunciation training often begins with improving perception first. Through focused training

or exposure, L2 learners can recalibrate their phonetic system to accommodate sounds that do not exist in their L1, moving beyond reliance on L1 categories.

Numerous studies have validated the predictions of PAM-L2 across various language pairs. For instance, Flege (1995) found that Spanish learners of English have difficulty perceiving certain English vowel contrasts because these do not exist in Spanish. Similarly, Best and Tyler (2007) demonstrated that Japanese learners of English face challenges in distinguishing between /r/ and /l/ due to SC assimilation, as these phonemes are mapped onto a single Japanese category. These findings underscore the role of L1 phonological influence in shaping L2 speech perception.

The Perceptual Assimilation Model, particularly its extension to L2 acquisition, offers valuable insights into the cognitive processes underlying L2 speech learning. By predicting the relative ease or difficulty of L2 phoneme perception based on L1 influence, PAM-L2 serves as a useful framework for understanding cross-linguistic variation in L2 acquisition and informing language teaching practices.

4. Speech Learning Model (SLM)

The Speech Learning Model (SLM), developed by Flege (1995), is a theoretical framework that seeks to explain how second language learners acquire the phonetic system of a new language. It primarily focuses on the interaction between the phonetic systems of a speaker's first language (L1) and their L2. According to the SLM, L2 learners perceive L2 sounds based on their L1 phonetic categories, which can lead to difficulties in acquiring native-like pronunciation if the L1 and L2 sounds are perceived as identical or highly similar (Flege, 1995).

Flege developed the speech learning model (SLM) to explain age-related factors on learners' ability to pronounce L2 sounds in a native-like manner. Since SLM focuses on the ultimate goal of L2 pronunciation, studies within SLM typically focus on learners who have been exposed to the L2 and may have been speaking it for years. Because of the extensive and intense exposure to the L1, learners' speech perception is attuned to the contrastive phonetic elements of their L1, which means that these learners may not be able to distinguish phonetic differences between L2 sound pairs or between L2 and L1 sounds. While SLM does not strictly adhere to the idea of a "critical period," it recognizes that age impacts L2 speech learning, with younger learners often achieving greater phonetic accuracy (Lenneberg, 1967). Learners may equate similar L1 and L2 sounds, leading to difficulties in mastering L2 phonetics. For example, English learners of Italian may struggle with differentiating [ɪ] and [i:] (Flege & MacKay, 2004).

According to Flege (1987), L1 speakers are able to recognize consistent phonetic categories in the presence of sensory variation through a cognitive technique known as equivalence categorization, which will impact L2 learning. This process hinders natively perceived and production by preventing L2 learners from differentiating the subtle acoustic variations between comparable L1 and L2 sounds.

Gliding Vowels in Iraqi Arabic and RP English

Any basic description of Arabic vowels is likely to begin with the well-known vowel 'triangle' of the major vowels, as coined by Gairdner (1925), a pioneer of contemporary Arabic

phonetics and the first to position the Arabic vowels on the Cardinal Vowel Diagram. This represented the physical positions described by mediaeval Arabic philologists such as Sibawayh, the pen name of Abu Bishr Amr b. Uthman b. Qanbar (d. late 8th century) and Ibn Jinni (10th century), as both descriptions are perception-based and strongly tied to tongue locations.

According to Ramelan (1999), diphthongs are sounds that are created when two vowels are combined into a single syllable, or when a deliberate glide is made from one vowel position to another. Many languages use the diphthong sounds, and each language has its own unique way of pronouncing these sounds. For instance, the English language contains three diphthongs: cow (/kaʊ/), light (/laɪt/), and boycott (/boɪ.kɒt/) (Yunisrina et al, 2021). The English and Malay diphthongs, such as laut (sea), kait (saw), and kaloi (fish), are comparable.

In contrast, Arabic diphthongs only contain two sounds, such as dayf /daɪf/ (guest) and qawl /qawl/ (word), which do not have the /ɔɪ/ sound. According to Abdulrazzaq et al. (2023) and Mustafa (2022), the Arabic vowel sounds are composed of three primary sounds: /a/, /u/, and /i/, as well as two diphthong sounds: /aɪ/ and /aʊ/, which are a combination of /a/ and /j/, as well as /a/ and /w/.

In the past tense, Arabic diphthongs exhibit a range of phonological modifications among its nouns and weak verbs (al-Bahansāwī, 2008, & al-Ṣaḡīr, 2008). Specific guidelines including several features are needed for every change. Some words use a variety of phonological processes, including assimilation, deletion, disintegration, among other things. These procedures vary according to a number of criteria, including segmentations and phonemes (Hale & Charles, 2008). Previous analyses of Arabic diphthongs did not use any phonological theories or principles and were dependent on quotes from ancient scholars (Norlin, 1985; Abdelgadir, 2021 & Mohammed, 2023) (Mashaqba et al., 2021). Thus, this study analyzes the Arabic diphthongs in deficient verbs using a few phonological theories and criteria.

The phonological constraints of BA have a significant impact on the perceptual patterns of Iraqi learners of English. In this dialect, there are only two common diphthongs: /aj/ (as in bayt "house") and /aw/ (as in nawma "sleep"). In casual speech, these diphthongs frequently get monophthongized, with /aj/ being realized as [e:] and /aw/ as [o:], simplifying vocalic contrasts. Iraqi learners may experience perceptual issues when they encounter English diphthongs or triphthongs, such as /oiə/, /əʊə/, and /ɪə/, that are absent in their native system due to the phonological gap caused by Baghdadi Arabic's lack of complex diphthongs and triphthongs. Learners may perceive these foreign sounds as distinct segments or assimilate them to the nearest monophthongs in their first language. In L2 speech, this phonological mismatch leads to misinterpretation and misproduction (youssef, 2023)

In RPA diphthong is defined by Ladefoged and Johnson (2011) as a sound that incorporates a shift within a single vowel. According to Kelly (2000), a diphthong is "a combination of vowel sounds." According to Roach (2010), these vowel-like sounds are made up of a glide or movement from one vowel to another. Similar to other phonemes, diphthongs are grouped based on where they are articulated. Because a central vowel known as "schwa" serves as the last point, centering diphthongs are referred to as "centering." Likewise, closing diphthongs are referred to as "closing".

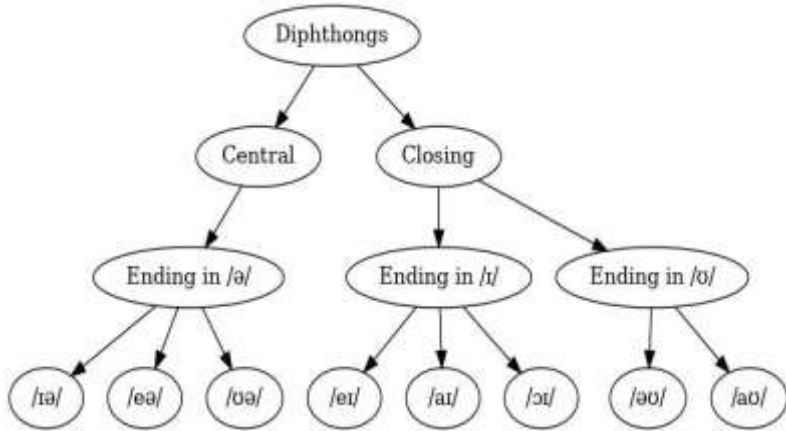


Figure 1: categorization of diphthongs vowel sounds

The most intricate English vowel sounds are triphthongs. They need to smoothly transition from one vowel to another and subsequently to a third (Roach, 2010). RP has five triphthongs, each of which is made up of a final schwa sound and a closing diphthong. It is more probable that triphthongs will be regarded as monosyllabic sounds in terms like tower (taʊə) or power (paʊə). According to Roach (2010), nouns that contain a suffix, like player /pleɪə/ or lower /ləʊə/, are more likely to be interpreted as bisyllabic sounds.

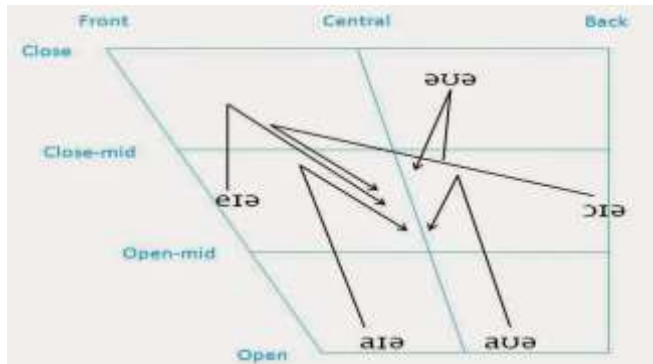


Chart 1: Triphthong vowel sounds

Previous Studies on the perception of Arab learners of English

It is well known that Arabs who learn English as a second language face problems with speaking, as shown by Flege and Port (1981), Smith (2001), and Joseph and Odisho (2005). However, not many studies have looked into the problems that Arab English learners have with how they hear these English vowel sounds. Scholars who have studied Arab English learners' perception of English have focused on different kinds of Arabic, as well as different study goals and methods. Such discrepancies limit the ability to draw generalizable conclusions or identify consistent patterns of perception difficulties. Some of these studies looked at the link between how vowels are perceived and how they are produced (Almbark

2012, Nikolova 2010), while others only looked at how vowels are produced (Ali 2013, Al-Tamimi 2007, Munro 1993).

Speech production and speech perception are not strictly linked. For example, being able to tell the difference between two sounds does not always mean that the production is right. The SLM's assumptions about how speech will be made do not seem to be completely right. More study is needed to look into how well EFL learners from different language backgrounds can understand and use language (chan, 2014). Mostly, the perception and production of speech have been checked out separately. Because of this, the close connection between producing and perceiving speech has not gotten much attention. This issue is significant because effective spoken communication needs the listener to correctly perceive the speaker's message. We will focus on two main areas where it makes sense to look into the connection between producing speech and perceiving speech: the public domain, where people speak and listeners understand what they say; and the private domain, where articulatory mechanisms help people speak and perceptual mechanisms help people understand speech (Fowler & Galantucci, 2005).

When Arab English learners try to learn English sound system, they face many of challenges when, including vowel acquisition. In 1987, the California State Department of Education did a study that found English vowels are regarded to be the most challenging sounds for learners to pronounce. This can be explained phonetically since the phonetic difference between these vowels is typically not enough to correctly identify them. For instance, studies have looked at the link between productive capacity and perceptual sharpness, as well as age-related factors and the differences between L1 and L2 vowel systems (Jacewicz, 2000).

Smith (2001) said that some sound clues made it easy to tell what language Arab English learners were speaking when they were speaking English. Smith says that Arabic does not follow the natural clusters of the English language because it has more stressed syllables, fewer unique vowel articulations, and a glottal stop before starting vowels a lot of the time. Smith did not mention any particular Arabic accent; nonetheless, Asfoor (1982) says that there are different types of Arabic, such as Iraqi, Egyptian, and Damascene. Each of these types has its own rules for writing letters, stress patterns, and sound lists.

Almbark (2012) look into how Syrian Arabic (SA) foreign language (FL) learners perceive and produce Standard Southern British English (SSBE) vowels. In her study, a group of FL learners' L2 perceptual and production patterns were experimentally examined, including knowledge from L2 learning models SLM (Flege, 1995) and contemporary cross-language speech perception PAM (Best 1994, 1995, 1999). According to Almbark (2012), FL learners can demonstrate reasonable proficiency in a number of language domains, including phonology, syntax, and L2 structures, despite not having enough natural interaction with the L2. According to the study, perception and production are closely related, and learners' patterns of perception might anticipate their patterns of production.

L1 transfer in perception is about how past experiences, information, or habits can change or stop us from understanding what we are hearing or seeing. When competing stimuli or previously learned information come up with the same sensory signals as the present, this is called L1 transfer. For instance, when someone is learning a second language, the structures of their first language may affect their ability to perceive sounds or grammar that are special to the second language. This kind of perceptual interference has been studied a lot, especially in phonological studies, where learners may find it difficult to tell the difference between non-native phonemes because of how their first language affects them (Flege, 1995). Perceptual

interference also happens when people misunderstand or ignore important parts of sensory data because of attentional biases caused by past experiences (Lavie, 2005).

According to Best (1994, 1995), speech is perceived by directly picking out the articulatory movements in the speech sounds, rather than processing the auditory information in a roundabout way. This is part of the Perceptual Assimilation Model (PAM). Language-specific people often change new L2 sounds to fit L1 patterns because many distal gestures are shared by all languages in the world.

So, based on how L1 and L2 are structurally different, L1 may help or hinder the learning of L2. For example, in a study on the evaluation of foreign accents by L1 speakers, it was discovered that L1 English listeners correctly recognized the English vowels /i/ and /i/ produced by L1 speakers of German as the intended phone (Flege et al., 1997).

Matsubara (2015) says that many studies have looked at how L1 affects how English vowels are perceived, focusing on languages like German, Italian, Japanese, Korean, Mandarin, and Spanish. However, many studies have shown that other things, such as learning age, length of residence, type and amount of L2 exposure, L2 use, and skill level, also play a role (Baker and Trofimovich, 2006; Cebrian, 2006; Fabra and Romero, 2012). Bohn and Flege (1990) and Flege, Bohn, and Jang (1997) are two examples of these kinds of works.

Nikolova (2010) did a recent study that explores the interference of L1 in the acquisition of vowels. She dealt with the variations in Arabic and English phonological systems and their effect on the acquisition of vowels by EFL learners from Saudi Arabia. Learners found significant challenges in her study, particularly when discussing identical speech segments of both languages, as well as speech segments that do not exist in Arabic but are commonly used in English. However, the scope of this study is confined to ten vowels in American English. Her research found little evidence that experience improved Saudi EFL learners' perception and production of English vowels. Beginners and advanced learners had the greatest errors in perceiving the vowel /e/, with /b/ being the most troublesome vowel for production.

Ammar and Thai (2016) aimed to investigate the perception and production of English vowels by Iraqi learners of English as a foreign language to identify the interference and effects of L1 proficiency in these processes. The study also examines the perception-production relationship of Iraqi learners of English as a foreign language. The results revealed that Iraqi learners of English as a foreign language had significant difficulties in perceiving and producing most of the vowels. The results showed that perception and speech production are significantly different from each other, indicating an asymmetrical relationship between them where speech production may be more developed than speech perception.

To the best of the researchers' knowledge, no research has been conducted on the perception of English gliding vowels by Iraqi learners. Thus, the current work aims to fill this gap in the literature. (BA) Baghdadi Arabic, was chosen for inquiry because it is the dialect most often used by Iraqis and is now considered as the country's lingua franca, according to Al-Bazi (2006). This study used the mainstream British English variant known as Received Pronunciation (RP). This variant was chosen because it is the one most used by English students in multiple disciplines at Iraqi universities.

Methodology

Research design

The study is quantitative since it evaluates data scientifically and summarizes it in numerical indices using descriptive statistics. However, a theoretical analysis of the data obtained in this study is also performed to account for Iraqi EFL learners' perception of English gliding vowels using current speech perception models. This dual approach quantitative and theoretical represents a mixed-method design, integrating numerical evaluation and conceptual analysis to elucidate the perception of English gliding vowels among Iraqi EFL learners. Since L1 transfer may influence how learners perceive second language sounds, the study design controls for this by selecting participants from the same dialect background (Baghdadi Arabic) and by including both familiar and unfamiliar gliding vowels in the test items. This helps explore how prior phonological knowledge affects their ability to perceive sounds that are either present or absent in their native language.

Participants

Thirty Iraqi EFL learners who speak Baghdadi Arabic participated in this study. They were all female learners from the University of Anbar, College of Education for Women, English language department. To exclude the potential effects of gender and age factors, all participants were females and ranged in age from 19 to 25. The study's informants were exposed to English in a non-naturalistic environment, a classroom. They were selected due to their familiarity with these sounds, which they had utilized and articulated during their academic experience. Since Arabic language variants are believed to include vowel systems with varying widths and vowels with varying phonetic properties, only Iraqi English language learners were permitted to take part in the study. Only Iraqi Baghdadi speakers were permitted to take part in the study to prevent any dialectal variance interventions that would compromise the validity of the findings.

Perception Test

To identify the difficulties Iraqi EFL learners encountered in the perception of English gliding vowels, a perception test was conducted. The list of words containing the 13th English gliding vowel (8 Diphthongs and 5 Triphthongs) used in this study were frequent, monosyllabic words. They represent glidings in three different positions (initial, medial, and final) where possible. Hence, 107 words were selected from Roach's (2009) book and the Oxford Dictionary. In the perception test, the pronunciation was recorded by a native speaker from the United Kingdom, who speaks RP variety. Each vowel category was documented individually, with each recording comprising precisely the words associated with a certain vowel. The recordings were then processed and slowed down to ensure clarity and allow learners to perceive them accurately. The perception test was allocated in the English language lab at Anbar University's College of Education for Women. The lab is acoustically separated and silent, making it suitable for auditory testing. Learners listened to the recordings through laptops using headphones to ensure clear audio reception. For each of the 107 items, participants were given a printed sheet with four choices (words) and instructed to choose the word they heard. The aim of the test was to evaluate students' ability to perceive English gliding vowels. Scores were calculated out of 107 based on correct responses. Microsoft Excel was used to assess test reliability, and both errors and correct responses were analyzed statistically. The data were

used to determine the relative difficulty of each vowel sound and to identify patterns in the learners' perceptual tendencies.

Data Analysis Method

To analyze the perception test data, each gliding vowel's total number of trials was first calculated by multiplying the total number of participants (30 learners) by the total number of words representing each vowel. Then, each learner's responses were compared to the correct answers, and the number of correct and incorrect responses was documented. These figures were used to determine the number of errors for each vowel, and subsequently, percentages were calculated to measure the overall accuracy and difficulty of each gliding vowel. Microsoft Excel was used to organize the data, compute scores, and visualize performance trends.

In order to examine the role of L1 transfer, the results were interpreted in light of the phonological system of Arabic, the learners' native language. By comparing the accuracy rates of vowels that have close equivalents in Arabic to those that do not, it was possible to infer which perceptual difficulties might be attributed to negative transfer from the learners' first language. The analysis focused on whether unfamiliar gliding vowels were consistently misidentified, which would indicate the influence of L1 phonological interference.

Results

Perception test results are presented in this section to identify English gliding vowels that were difficult to perceive by Iraqi EFL learners. Overall, the results of the perception test indicate that Iraqi EFL learners showed varying degrees of success in identifying English gliding vowels, with moderate performance across most of the vowel sounds. According to the perception test results, Iraqi EFL learners had the greatest difficulty perceiving the vowel sound /ɔɪə/ and the least difficulty perceiving /eɪ/. This variation can be attributed to the influence of the learners' first language (Arabic). The error percentages of the Iraqi learners in the perception test for each vowel are shown in Figure 2 below.

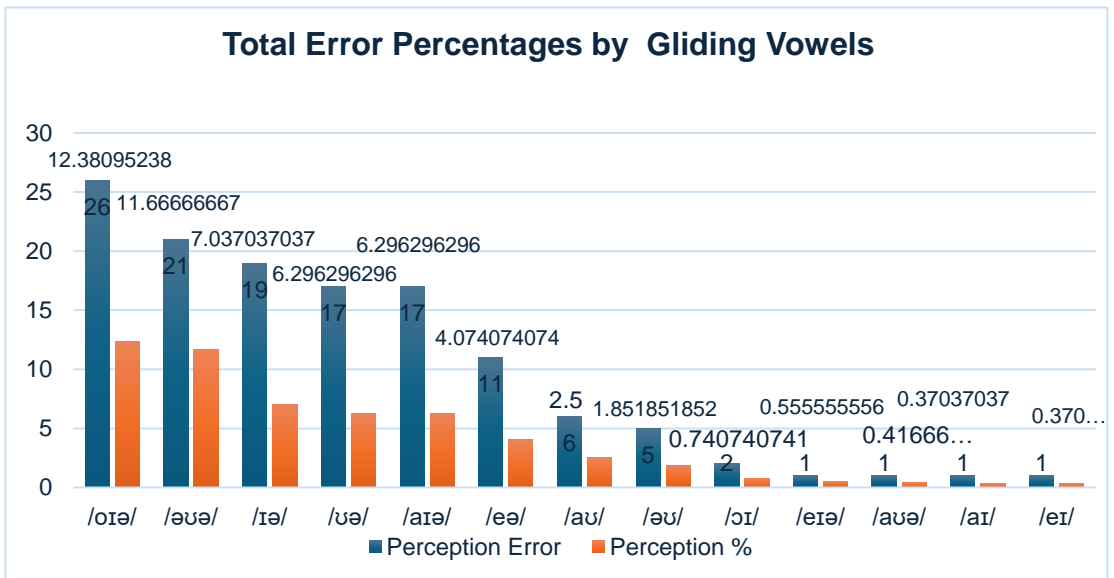


Figure 2 Total Error Percentages by Gliding Vowels

With a (12%) mistake rate, learners were unable to accurately perceive /ɔɪə/, as shown in Figure 6 above. Similarly, they struggled with /əʊə/ and /iə/ with error rates of (11%) and (7%) respectively. Learners found it easy to distinguish between /ʊə/ and /aɪə/ each with a (6%). Some diphthongs can be relatively easy to perceive such as /eə/ (4.07%), /aʊ/ (2.5%), /əʊ/ (1.85%), and /ɔɪ/ (0.74%). Only the vowels /eɪə/ (0.55%), /aʊə/ (0.41%), /aɪ/ (0.37%), and /eɪ/ (0.37%) were very easy for learners to perceive.

Table 1 below shows English gliding vowels rank order starting with the most difficult one to perceive by Iraqi EFL learners.

Table 1: Rank order, error counts and error percentages of the perception test (No. of trials)

Vowel	Trials	Perception Errors	Error Rate (%)	Rank Order (Difficulty)
/ɔɪə/	210	26	12.38095	1
/əʊə/	180	21	11.66667	2
/iə/	270	19	7.037037	3
/ʊə/	270	17	6.296296	4
/aɪə/	270	17	6.296296	5
/eə/	270	11	4.074074	6
/aʊ/	240	6	2.5	7
/əʊ/	270	5	1.851852	8
/ɔɪ/	270	2	0.740741	9
/eɪə/	180	1	0.555556	10
/aʊə/	240	1	0.416667	11
/eɪ/	270	1	0.37037	12
/aɪ/	270	1	0.37037	12

The perception test revealed varying degrees of difficulty among the gliding vowels according to table 1 above. The vowel /ɔɪə/ represented the highest number of errors (26 errors, 12.38%), ranking first in terms of difficulty. Following it, /əʊə/ showed 21 errors (11.66%), placing it in second place. /iə/ ranked third with 19 errors (7.03%). Both /ʊə/ and /aɪə/ had 17 errors each (6.29%), sharing the fourth and fifth positions respectively. The vowel /eə/ had 11 errors (4.07%), ranking sixth. /aʊ/ had 6 errors (2.5%), placing it at seventh position. /əʊ/ followed with 5 errors (1.85%), ranked eighth. /ɔɪ/ had 2 errors (0.74%), securing the ninth place. The vowels /eɪə/, /aʊə/, /aɪ/, and /eɪ/ each had only 1 error, with percentages ranging between 0.37% and 0.55%, placing them jointly in the tenth to twelfth positions.

Discussion

How learners could recognize English gliding vowels with different level of success was shown by error percentages in the perception test which is similar to other results of previous studies (Jeske 2012; Best and Tyler 2007). These studies concluded that not all nonnative portions are equally difficult to distinguish. Some are discriminated moderately well, while others are nearly native-like. According to the data analyzed in this study, some English gliding vowels are more difficult to recognize than others.

To interpret these findings, the study draws on two complementary theoretical models: the Perceptual Assimilation Model (PAM) by Best (1995) and the Speech Learning Model (SLM) by Flege (1995). This section attempts to account for the perceptual challenges encountered

by Iraqi EFL learners using these frameworks. PAM explains how unfamiliar L2 sounds are often assimilated into the closest existing L1 categories. When a clear match is absent, this leads to perceptual confusion. The findings of the perception test revealed a distinct pattern of difficulty with particular diphthongs and triphthongs. Notably, triphthongs without direct parallels in Iraqi Arabic were the most frequently misperceived, such as /ɔɪə/ (26 errors), /əʊə/ (21 errors), and /ɪə/ (19 errors). This implies that internal reference points for these new vowel transitions were absent from the learners' phonological system, especially in sequences involving the schwa /ə/, which is not phonemic in Arabic. This supports the results of Al-Kan'aan (2014), who found that "English diphthongs that show some similarity to the Arabic ones are much easier for the subjects to identify than those which do not" (p. 48). Al Abdely et al. (2016) similarly discovered that Iraqi learners encountered difficulties in perceiving English vowels as a result of the influence of their L1 phonological system.

SLM, on the other hand, provides insight into the gradual process of perceptual learning. It implies that L2 sounds are more likely to be classified as new categories if they are phonetically distinct from any L1 sound. With prolonged exposure, this enables more accurate acquisition, notwithstanding the possibility of initial inaccuracies. Vowels that are far from Arabic sounds, such as /əʊə/ and /ɔɪə/, were difficult to pronounce because of this theoretical framework. However, gliding vowels that have characteristics with Arabic diphthongs, such as /eɪ/ and /aɪ/, were more accurately recognized, perhaps as a result of positive transfer or assimilation into well-known L1 categories.

Together, PAM and SLM provide a comprehensive account of the perception patterns observed in the study, linking learners' difficulties to both phonological assimilation processes and the degree of phonetic similarity between L1 and L2 vowel systems.

The triphthong /ɔɪə/, for example, which combines three different vowel qualities that do not constitute a typical sequence in Iraqi Arabic, has the highest mistake rate (12.38%). Similarly, the centered vowel components or transitions in /əʊə/ and /aɪə/, which had mistaken rates of 11.66% and 6.29%, respectively, are uncommon or nonexistent in the learners' home tongue. It's possible that this phonological gap prevented appropriate perception and led to test taker confusion between similar-sounding answers. Conversely, diphthongs that closely resemble Iraqi Arabic diphthongs like /aw/, /ay/, and /aay/, like /aʊ/, /aɪ/, and /eɪ/, exhibited little perception problems. Positive transfer from their native phonetic inventory probably made it easier for the learners to identify these sounds.

According to the findings, triphthongs like /ɔɪə/, /əʊə/, and /aɪə/ were among the most difficult vowel sounds for Iraqi EFL learners to correctly identify. This can probably be explained by the intrinsic phonetic complexity of triphthongs, which are composed of three vowel parts that are spoken quickly one after the other. The auditory processing skills of learners who are unfamiliar with such vowel sequences in their mother tongue may be overloaded by this additional complexity. Triphthongs need a higher degree of phonological awareness and auditory discrimination than diphthongs, which are sometimes easier for learners to perceive because they only have two gliding vowel components. This implies that the level of vowel complexity has a big impact on how accurately learners perceive words.

According to this research, learners most frequently have trouble identifying vowels that:

1. Contain three vowel parts (triphthongs).
2. The learners' native dialect does not have phonological analogies.

This suggests that learners' recognition skills could be greatly enhanced by focused perceptual instruction on these particular diphthongs, which would then lead to improved pronunciation results.

Many English gliding vowels may therefore be perceived to be approximate versions of well-known L1 sounds or integrated into a single native category. For example, the English diphthong /eɪ/ may be mistaken for the Arabic /e:/, resulting in accurate identification but inaccurate reproduction. On the other hand, vowels that have no obvious Arabic equivalents, such as /ɔɪ/ or /əʊ/, may be classified as non-assimilable, leading to both production problems and perceptual confusion. This supports the use of PAM in examining perception of second language learning by explaining why Arabic speakers find it easier to distinguish some English vowels than others. This theory is succeeding in accounting for the results of this study, which demonstrate that some English gliding vowels, such /eɪ/ or /aʊ/, are rather easy for Arabic-speaking learners to understand. This is probably due to the fact that they sound similar to Arabic diphthongs or vowel sequences.

Conclusion

The perception test results obtained in this study provide valuable new insights into how Iraqi learners in general, and speakers of the Baghdadi Arabic (gilit) dialect in particular, interpret English gliding vowels. The findings indicate that learners encountered varying levels of difficulty according to how phonetically similar English diphthongs and triphthongs were to their native vowel system. These difficulties are strongly associated with the absence of phonological equivalents in the learners' native dialect, which leads to perceptual confusion. This study contributes to the field by emphasizing the necessity of integrating targeted perceptual training into pronunciation instruction specifically for gliding vowels not found in the learners' L1. Such training could significantly improve both perception and production accuracy, supporting more effective L2 acquisition among Arabic-speaking learners. The study effectively establishes a hierarchy of difficulty and analyses it through the impact of L1 phonological transfer, fulfilling its primary aim.

Recommendations

The results of the study suggest that when teaching English vowels to learners who speak Arabic,

1. More targeted teaching strategies are required to address the specific gliding vowels that pose perceptual difficulties, particularly those that do not exist in the Arabic phonological system.
2. Both receptive (listening) and productive (speaking) practice should concentrate on triphthongs and certain diphthongs that are absent in Baghdadi Arabic, as these sounds were associated with the highest perceptual difficulties.
3. Additionally, by starting with diphthongs that closely resemble Arabic sounds (/aɪ/ and /eɪ/) and working their way up to more challenging or unfamiliar patterns (/əʊ/ and /ɔɪ/), learners could progressively increase their confidence and perceptual awareness.
4. Simple pair discrimination activities can help learners become more aware of subtle differences, especially when contrasting similar-sounding vowels.

5. Additionally, teachers should include listening exercises that expose learners to natural speech contexts that feature these complex vowels to help them gradually imprint these sounds onto their auditory system.
6. Incorporating native language comparisons and offering targeted training on cross-linguistic phonetic interference can further improve learners' perception and long-term pronunciation outcomes.

التحقيق في إدراك متعلمي الإنجليزية كلغة أجنبية العراقيين للأصوات المتحركة المنزقة في اللغة الإنجليزية

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الكلمات المفتاحية | الأصوات المتحركة المنزقة، إدراك الكلام، اختبار الادراك، متعلمو الإنجليزية كلغة أجنبية من العراقيين، انتقال اللغة الأم

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المستخلص:

تبحث هذه الدراسة كيفية إدراك متعلمي اللغة الإنجليزية كلغة أجنبية في العراق للأصوات المتحركة المنزقة في اللغة الإنجليزية. الهدف الرئيسي هو تحديد الصعوبات التي يواجهها المتعلمون عند إدراك اصوات العلة المنزقة ووضع ترتيب يظهر طبيعة هذه الصعوبات وإلى أي مدى يمكن تفسيرها بناء على انتقال اللغة الأم. للقيام بذلك، شارك ثلاثون طالباً جامعياً عراقياً في اختبار إدراك تضمن 107 كلمات إنجليزية، كل منها يحتوي على صوت علة منزلق واحد. تم نطق الكلمات من قبل متحدث أصلي، وتسجيلها وتشغيلها للطلاب، الذين من المفترض أن يستمعوا ويختاروا كلمة من مجموعة من أربع كلمات مكتوبة. بعد جمع الاستجابات، تم تحليل البيانات إحصائياً لمعرفة أي الاصوات المتحركة تم التعرف عليها بشكل خاطئ بشكل متكرر. بشكل عام، أظهرت نتائج اختبار الإدراك نطاقاً كبيراً في قدرة المتعلمين على التمييز بين اصوات العلة المنزقة المختلفة في اللغة الإنجليزية. بعض الاصوات المتحركة كانت تُسمع بدقة باستمرار، بينما واجه المشاركون صعوبة كبيرة في تمييز اصوات متحركة أخرى. وجدت الدراسة أن بعض الاصوات المتحركة، وخاصة /oiə/ و /əuə/ و /iə/، تسببت في مزيد من الالتباس، بينما كانت اصوات متحركة أخرى مثل /ai/ و /ei/ من بين الأسهل على المتعلمين إدراكها. عدم قدرة المتعلمين على إدراك بعض الثنائيات والثلاثيات الصوتية، خاصة تلك التي لا توجد في مخزون لغتهم الأم، تشير إلى أن علم الأصوات في اللغة الأم له تأثير كبير. تدعم هذه النتائج كلاً من نموذج الاستيعاب الإدراكي PAM ونموذج تعلم النطق SLM، التي تؤكد على ضرورة التدريب السمعي المركز. لذا، لتقليل الفجوات الإدراكية، وعليه تصحح بأن تتضمن برامج تعليم اللغة الإنجليزية كلغة إنجليزية للمتعلمين العراقيين تحليلاً صوتياً مقارناً وأنشطة استماع موجهة لتقليل من فجوات الادراك.